THE TRANSMISSION OF WEIGHT-RELATED BEHAVIORS IN ADOLESCENT FRIENDSHIP NETWORK

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PRESENTER DISCLOSURE

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No relationships to disclose.

INTRODUCTION

- Excess body weight among children and adolescents is one of the most pressing health problems today

- The prevalence of overweight has more than doubled in children and adolescents since 1976-80 (Hedley et al. 2004)

- In 2003-2004, 37.2% of children ages 6 to 11, and 34.3% of adolescents ages 12 to 19 were at risk for overweight or were overweight (Ogden et al. 2006)

BACKGROUND

- Poor diets and lack of physical activity at home and in school have been linked to obesity among children and adolescents (Dollman, 2005; Millimet et al., 2008)
- Social interactions may have contributed to the rapid rise in obesity (Christakis and Fowler, 2007).
- Few studies have investigated weight-related peer effects (Fletcher 2006)

THE PRESENT STUDY

- OBJECTIVE
  - To investigate whether social interactions in friendship networks influence weight-related behaviors of adolescents
- DESIGN
  - Data from a nationally representative survey of adolescents are used to examine the association between peer and individual weight-related behaviors
  - Evidence from multivariate regression analysis controlling for an extensive list of individual- and family-level factors as well as school-level unobserved heterogeneity is obtained

DATA

- DATA

  - Samples from the National Longitudinal Study of Adolescent Health ("Add Health") of up to 3,898 male and female adolescents in grade levels 7 to 12 who nominated friends that were also in the dataset

  - Weight-related behaviors self reported by respondents in 1995-96

MEASURES

- WEIGHT-RELATED BEHAVIORS:
  - pursuing a sport
  - exercising regularly
  - hours of TV/Video viewing
  - sleeping six or fewer hours
  - eating breakfast on weekdays
  - frequency of eating at fast food restaurants
  - eating five servings of fruits/vegetables daily
  - consuming calorie-dense snacks

EMPIRICAL STRATEGY

- We estimate linear regression and probit models of adolescent weight-related behaviors. The propensity of participation in weight-related behaviors by individual *i* in school *s* during time *t* may be written as

$$Y_{ist} = \alpha + \beta_1 \overline{Y}_{jst} + \beta_2 X_{ist} + \beta_3 W_{ist,t-1} + \beta_4 \overline{W}_{ist,t-1} + \gamma_s + \varepsilon_{ist}$$

- where Y_{ist} and $\overline{Y}_{jst}$ refer to the adolescent participation in weight-related activities and peer group outcomes respectively (in 1996)
- X_{ist} is a vector of individual and family characteristics measured (in 1994 and 1996)
- $W_{ist,t-1}$ captures the adolescents' own BMI in 1996 and 1994
- $\overline{W}_{ist,t-1}$ is the 1996 and 1994 peer group BMI
- γ_s is a vector of school dummies

Estimates without School-Level Fixed Effects

Behavior	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Exercise	**0.076****	**0.074****	**0.073****	**0.075****	**0.087****	**0.083****	**0.083****
	(0.020)	(0.022)	(0.023)	(0.023)	(0.028)	(0.028)	(0.028)
Sports	**0.194****	**0.184****	**0.172****	**0.179****	**0.171****	**0.172****	**0.171****
	(0.020)	(0.023)	(0.030)	(0.024)	(0.029)	(0.029)	(0.030)
Hours TV/Video	0.083**	0.034	0.034	0.032	0.070*	0.070*	0.070*
	(0.020)	(0.023)	(0.023)	(0.023)	(0.028)	(0.028)	(0.028)
Sleep 6 hours or less	0.019	0.029†	0.027†	0.028†	0.027	0.026	0.025
	(0.014)	(0.015)	(0.015)	(0.015)	(0.018)	(0.018)	(0.018)
Eats Breakfast	0.078**	0.065**	0.057**	0.048*	0.057*	0.055*	0.055*
	(0.017)	(0.019)	(0.019)	(0.020)	(0.024)	(0.024)	(0.025)
Days eats Fast Food	**0.190****	**0.200****	**0.194****	**0.193****	**0.221****	**0.217****	**0.216****
	(0.020)	(0.023)	(0.023)	(0.023)	(0.027)	(0.028)	(0.028)
5 Servings Fruits/ Vege-tables	0.077**	0.077**	0.077**	0.074**	0.057*	0.062*	0.064*
	(0.019)	(0.022)	(0.022)	(0.022)	(0.062)	(0.028)	(0.028)
Calorie-dense snacks	0.061**	0.054**	0.056*	0.052*	0.076**	0.071*	0.068*
	(0.019)	(0.022)	(0.022)	(0.022)	(0.028)	(0.028)	(0.029)

Notes: The symbol ** indicates that the coefficient is statistically significant at the 1% level (or better); *significant at the 5% level; †significant at the 10% level.

Estimates with School-Level Fixed Effects

Behavior	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Exercise	**0.060****	**0.057***	**0.056***	**0.057***	**0.073***	**0.069***	**0.068***
	(0.020)	(0.024)	(0.024)	(0.024)	(0.030)	(0.030)	(0.031)
Sports	**0.166****	**0.151****	**0.137****	**0.145****	**0.136****	**0.137****	**0.132****
	(0.022)	(0.025)	(0.032)	(0.026)	(0.032)	(0.032)	(0.032)
Hours TV/Video	0.024	-0.021	-0.022	-0.022	0.010	0.011	0.011
	(0.021)	(0.024)	(0.024)	(0.024)	(0.030)	(0.031)	(0.031)
Sleep 6 hours or less	-0.005	0.009	0.008	0.012	0.016	0.013	0.011
	(0.017)	(0.019)	(0.018)	(0.019)	(0.024)	(0.024)	(0.025)
Eats Breakfast	0.037†	0.019	0.011	0.002	0.011	0.008	0.008
	(0.017)	(0.022)	(0.022)	(0.022)	(0.030)	(0.030)	(0.030)
Days eats Fast Food	**0.122****	**0.134****	**0.128****	**0.125****	**0.159****	**0.154****	**0.152****
	(0.021)	(0.025)	(0.025)	(0.025)	(0.029)	(0.030)	(0.030)
5 Servings Fruits/ Vege-tables	0.030	0.030	0.033	0.028	0.018	0.023	0.025
	(0.021)	(0.024)	(0.024)	(0.024)	(0.030)	(0.031)	(0.031)
Calorie-dense snacks	0.034†	0.025	0.027	0.025	0.035	0.028	0.026
	(0.020)	(0.024)	(0.024)	(0.024)	(0.031)	(0.031)	(0.031)

Notes: The symbol ** indicates that the coefficient is statistically significant at the 1% level (or better); *significant at the 5% level; †significant at the 10% level.

DISCUSSION

- The presence of peer effects in physical activities and eating at fast food restaurants suggests that the benefits from interventions that provide adolescents with greater incentives to be physically active and to make better food choices will be magnified by social interactions ("social multiplier effect")
- Programs might also seek to directly affect norms regarding sports, exercise, and eating fast food.
- Given that behavioral norms will tend to differ across groups, the effectiveness of an intervention likely can be enhanced by an approach that takes the particular situation of the peer environment into account
- The social transmission of weight-related behaviors emerges as an explanation for the spread of weight gain and obesity in social networks found in recent research (e.g., Christakis & Fowler, 2007)