Peer Effects, Fast Food Consumption and Adolescent Weight Gain

Bernard Fortin   Myra Yazbeck

Département d'économique, Université Laval

Département d'économie, Université d'Ottawa

Journée d'échanges sur l'économie de la santé
Université Laval

19 novembre 2018

Motivation : Cost of Obesity

- In 2016, 1.9 billions of adults ($= 39\%$) were overweight in the world and, among them, 650 millions were obese ($= 13\%$).

- Obesity is associated with serious health problems :

  - Type 2 diabetes (Maggio and Pi-Sunyer, 2003 ; Ford *et al.*, 1997 ; Hu *et al.*, 2001).

  - Heart disease (Calabru *et al.*, 2009 ; *Li et al.*, 2006).

  - Certain cancers (Calle, 2007 ; Abu-Abid et al., 2002).

  - psychological disorders.

- More deaths from overweight and obesity than from malnutrition.

- In 2012, it costed 2000 billions \$ in terms of loss of world GDP.

Motivation : Growth of Obesity

- ► Obesity rate has more than tripled in the world since 1975.

- ► Some researches (e.g., Mckinsey Council) predict than the rate of adults overweight will reach 50% in 2030.

- ► Genetic factors alone cannot explain this drastic increase.
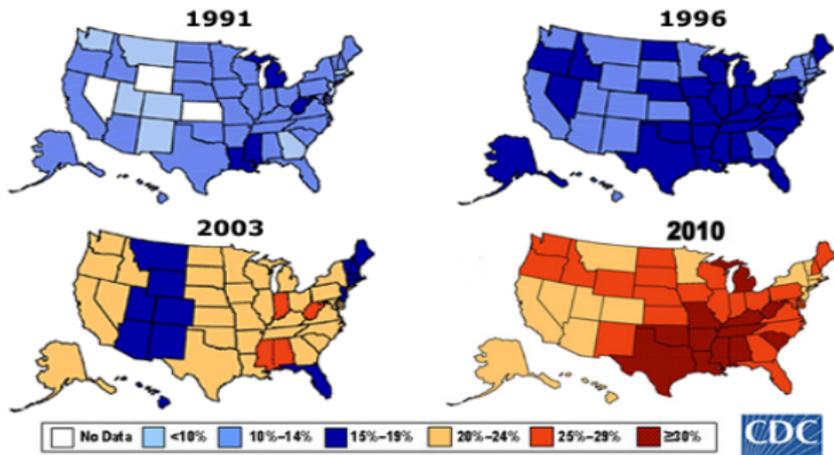
Motivation : Peer effects and obesity epidemics

- Recently, some authors have also argued that an important element in the obesity epidemics is *social*.
    - Peer effects in deleterious behaviour could partly explain obesity contagion.

TABLE: Literature on Peer Effects in Obesity

For	Against
Christakis and Fowler (2007)	Cohen-Cole and Fletcher (2008a)
Trogdon *et al.* (2008)	Cohen-Cole and Fletcher (2008b)
Yakusheva et al. (2014)	

- Some direct analysis of the impact of peers' obesity on an individual's obesity, but with few analyses of social mechanisms at work.

Research Question and Policy Relevance

Basic issue

- ▶ Which mechanisms influence peer effects in weight gain ?

We focus on the impact of peer effects in teenagers's eating habits on their BMI because :

- ▶ Important literature on the positive effect of eating habits on BMI.

- ▶ Peer effects in eating habits are likely to be important in adolescence.

Peer Effects and Social interaction

Peer (or social interaction) effects : definition

- Form of social interaction (outside the market) that exists when actions or attributes of a *reference group* influence your own actions.

- Reference group depends on the *context* : family, neighbours, surrounding, friends, social support group *etc*.

Peer Effect and Social Multiplier

One important form of social interactions may translate into a *spillover effect* :

- ▶ Source of a *Social Multiplier* (SM).

- ▶ If the SM is 1.5 => a shock (new Mac Do close to the school) that directly generates 2 more obese teenagers, will generate 3 obese teenagers when both direct and indirect (peer) effects taken into account.

- ▶ Total Effect = SM $\times$ Direct Effect $= 1.5 \times 2 = 3$

Data and Descriptive Statistics

► **The Add Health Survey**

  ► It is a nationally representative sample of American adolescents in grades 7 to 12.

  ► For the estimation of the peer effect model, we use wave II of Add Health Survey.

  ► For the estimation of the obesity production function we use all four waves.

  ► We focus on the saturation sample which is a sub-sample of the add health survey (around 3000 observations).

Data and Descriptive Statistics

- ▶ Particular advantages of this survey in general and the saturation sample in particular lies in the fact that we have :

  - ▶ Friends nominations ⇒ we can built networks of friends in school.

  - ▶ Information about the frequency of fast food consumption (MacDo's, Taco bell, Pizza Hutt etc....) as well as the nature of breakfast taken and their time use.

  - ▶ Information about the height and weight of the adolescents as well as information about their parent's weight.

Descriptive Statistics for the Peer Effect Equation

Variable	Mean	S.D
Fast Food Consumption (past 7 days)	2.33	1.74
Female	.50	.50
Age	16.36	1.44
Mother Present	.85	.35
Mother Education		
High school/GED/Vocational Instead of high school	.36	.48
Some College/Vocational After high school	.20	.39
College	.18	.38
Advanced Degree	.06	.24
Don't Know	.04	.20
Father Education		
High school/GED/Vocational Instead of high school	.32	.46
Some College/Vocational After high school	.17	.37
College	.18	.38
Advanced Degree	.08	.26
Don't Know	.03	.15
Missing	0.02	.16
Grade 9-10	.26	.44
Grade 11-12	.61	.48
Allowance	8.28	11.65
Observations :		2355

▶ The associated social multiplier for fast food consumption is 1.15.

▶ In the long run, a one-unit increase in the weekly frequency (in days) of fast food consumption produces an increase in zBMI by 4.4% within a year : direct effect.

▶ When peer effects are taken into account, the total impact of the same shock is 5.1% on zBMI, as compared with 4.4% with no peer effects => increase of 15%.

Summary and Conclusions

- In this paper we study peer effects in weight gain through social interactions in fast food consumption.

- Results from the peer effect + BMI equations suggest a significant (but not as large as in CF) social multiplier effect.