

# Unhappy Obesity and Happy Obesity

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## 1. Introduction

- Obesity has been identified as a serious issue in many developed countries due to its rapid prevalence. Such an extensive increase in the prevalence of obesity is considered to be deeply related with serious illnesses (Latner et al. 2013). In addition, many researchers have been examined the socioeconomic factors related to obesity, showing that **obesity is negatively correlated with the outcomes of marriage and labor markets** (Averett and Korenmann 1996; Cawley et al. 2006).
- In contrast, the relationship between obesity and self-rated health (SRH) is controversial. The results of studies using data from Western countries showed a negative association between obesity and SRH (Herman et al. 2013; Imai et al. 2008; Mota et al. 2012). However, the results using data from Asian countries, such as China, revealed a positive association between obesity and SRH (Noh et al. 2017).
- Most researchers point out that the findings obtained from China can be explained by the **differences in the perception of obesity**. According to Chinese traditions, obesity is positively perceived because only wealthy people could afford to buy food and gain weight (Noh et al 2017; Zhang et al. 2016). **Obesity was considered as a sign of prosperity. This suggests that the impact of obesity on health varies according to differences in the perception of obesity.**
- This relationship can also be applied to the effects of obesity on subjective well-being (SWB). However, **comparative studies that take into account the differences in the perception of obesity due to cultural backgrounds are limited.** Whether or not **the relationship between obesity and SWB is also different in the Western countries and China** is an interesting issue.
- The purpose of this study examines **the relationship between obesity and SWB between the United States and China.**

## 2. Data

- The Data used in this study is “**Preference Parameters Study**” carried out by Osaka University. (Data is available at [http://www.iser.osaka-u.ac.jp/survey\\_data/eng\\_application.html](http://www.iser.osaka-u.ac.jp/survey_data/eng_application.html)).
- The present study utilized the data of the United States and China from 2009 to 2013.

	Cross-section or Panel	Survey Period	Total Sample	Respondent	Region
China	Panel Data	2009-2013	5,139	men and women aged 20-69 years old	Beijing, Shanghai, Guangzhou, Chengdu, Wuhan, Shenyang
United States	Panel Data	2005-2013	40,806	men and women aged 18-99 years old	All region

## 3. Econometric Model

$$H_{it} = \alpha + \beta Obesity_{it} + \gamma X_{it} + \mu_i + \varepsilon_{it}$$

$H_{it}$  : subjectively rated happiness of individual  $i$  at time  $t$   $\rightarrow$  larger numbers indicate higher happiness

$Obesity_{it}$  : BMI or the dummy variables of obesity

$X_{it}$  : individual attributes (age, age squared, marital status, number of children, educational attainment, natural log of household income, the dummy variable of family register (1 if a respondent has an urban family register and 0 if other options are selected (only for China.))

$\mu_i$  : unobserved individual fixed effect,  $\varepsilon_{it}$  : error term

## 4. Results

### 1. Effects of obesity on happiness as estimated by pooled OLS

Dependent variable	Happiness			
	China: men	United States: men	China: women	United States: women
Underweight	-0.014 (0.146)	-0.072 (0.273)	-0.323*** (0.092)	-0.469*** (0.169)
Overweight	0.251*** (0.070)	-0.002 (0.062)	0.051 (0.077)	-0.045 (0.065)
Obese	-0.034 (0.181)	-0.269*** (0.069)	-0.256 (0.169)	-0.347*** (0.066)
BMI	0.020** (0.009)	-0.023*** (0.005)	-0.011 (0.007)	-0.020*** (0.004)
Estimation method	Pooled OLS			
R2	0.033	0.031	0.064	0.063
Observations	2,580	6,356	2,582	6,736

### 2. Effects of obesity on happiness as estimated by FE OLS

Dependent variable	Happiness			
	China: men	United States: men	China: women	United States: women
Under weight	-0.032 (0.133)	0.543* (0.307)	-0.149 (0.198)	-0.034 (0.219)
Over weight	0.239 (0.165)	0.130 (0.121)	0.198* (0.111)	-0.085 (0.129)
Obese	0.804*** (0.208)	0.115 (0.171)	0.254 (0.374)	0.016 (0.169)
BMI	0.124** (0.049)	-0.000 (0.012)	0.004 (0.035)	-0.007 (0.012)
Health indicators	Yes	Yes	Yes	Yes
Estimation method	FE OLS			
R2	0.041	0.044	0.131	0.110
Observations	2,580	6,356	2,582	6,736

### 3. Effect of obesity on happiness estimated by PSM

Dependent variable	Happiness											
	China: men			United States: men			China: women			United States: women		
Overweight or obese	0.226*** (0.067)	0.228*** (0.069)	0.234*** (0.068)	-0.012 (0.047)	-0.061 (0.061)	-0.036 (0.062)	0.016 (0.072)	-0.006 (0.076)	-0.013 (0.076)	-0.028 (0.045)	-0.057 (0.049)	-0.028 (0.055)
Estimation methods	Pooled OLS	PSM (kernel)	PSM (radius)	Pooled OLS	PSM (kernel)	PSM (radius)	Pooled OLS	PSM (kernel)	PSM (radius)	Pooled OLS	PSM (kernel)	PSM (radius)
R2	0.053			0.342			0.040			0.369		
Observations	2,580			6,356			2,582			6,736		

### 4. Effects of obesity on happiness as estimated by FE OLS: Lag obesity variables are used

Dependent variable	Happiness (t)			
	China: men	United States: men	China: women	United States: women
Under weight (t-1)	-0.225 (0.209)	0.312 (0.360)	-0.153 (0.229)	0.434* (0.239)
Over weight (t-1)	0.672*** (0.256)	0.233 (0.158)	0.407* (0.209)	-0.144 (0.169)
Obese (t-1)	0.852** (0.371)	0.082 (0.206)	0.673 (0.580)	-0.172 (0.210)
BMI (t-1)		0.174*** (0.062)	-0.000 (0.016)	0.003 (0.056)
Health indicators	Yes	Yes	Yes	Yes
Estimation method	FE OLS			
R2	0.114	0.107	0.156	0.103
Observations	1,436	3,644	1,463	3,931

### 5. Effect of obesity on happiness by age groups

Dependent variable	Happiness											
	China: men		United States: men		China: women		United States: women					
	Under 45	Over 45	Under 45	Over 45	Under 45	Over 45	Under 45	Over 45				
Under weight	-0.045 (0.154)	0.309* (0.159)	0.047 (0.404)	0.781* (0.435)	-0.164 (0.214)	0.262 (0.332)	-0.138 (0.295)	0.057 (0.311)				
Over weight	0.156 (0.334)	0.305** (0.151)	0.158 (0.169)	0.140 (0.172)	-0.082 (0.260)	0.259** (0.116)	-0.316 (0.198)	0.063 (0.170)				
Obese	0.678* (0.392)	0.887*** (0.183)	0.218 (0.221)	0.117 (0.255)	0.515* (0.309)	0.062 (0.486)	-0.459* (0.276)	0.330 (0.217)				
BMI	0.046 (0.072)	0.178*** (0.067)	0.018 (0.019)	-0.012 (0.015)	-0.082 (0.059)	0.059 (0.041)	-0.040* (0.021)	0.012 (0.015)				
Health indicators	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Estimation method	FE OLS											
R2	0.052	0.051	0.077	0.085	0.150	0.150	0.121	0.119				
Observations	1,334	1,246	2,980	3,376	1,277	1,306	2,011	2,110				

## 5. Conclusion

**Men who are obese in China are happier even after controlling the time-invariant individual heterogeneity. Beside, these effects are stronger in older age groups than younger age groups in China.**