

## Introduction and Motivation

- ▶ 41% of young adults 18-24 years of age attended college in 2012 and are exposed to peer-smoking, secondhand smoke, and tobacco industry promotions [1].
- ▶ 19% of young adults initiate smoking at 18-24; almost none initiates after age 25 [2].
- ▶ Health beliefs, including **weight gain concern** and **body image**, are among important factors driving smoking and quitting decisions and can significantly impact effectiveness of smoking cessation programs and policies, especially on university campuses.
- ▶ Weight gain concerns may prevent or delay quitting decisions by young adults resulting in lifetime patterns and potentially affect long-term health.

## Objective

Estimate (i) prevalence of weight control belief and (ii) its association with cigarette consumption and quitting behavior by socio-economic, demographic, and behavioral characteristics among university students.

## Data and Methods

- ▶ Cross-sectional data are collected during 2013 from four public universities in SC.
- ▶ All students (5,622) were invited and 1,339 students (24%) completed an online extensive questionnaire measuring tobacco use, quitting behavior, beliefs about smoking and quitting, social norming, and socio-economic and demographic factors.
- ▶ **Question of Interest** has asked of how much they agree or disagree with the “Someone who quits smoking will probably gain weight” statement.

**Table 1. Belief about Weight Gain and Quitting**

	All students		Students who smoke		Students who do not smoke	
	Female	Male	Female	Male	Female	Male
Strongly agree	7.4 %	8.5 %	15.2 %	16.7 %	6.0 %	5.9 %
Somewhat agree	33.1 %	31.8 %	39.2 %	35.6 %	32.0 %	30.7 %
Somewhat disagree	28.3 %	35.1 %	22.8 %	34.4 %	29.3 %	35.7 %
Strongly disagree	31.2 %	24.6 %	22.8 %	13.3 %	32.7 %	27.7 %

- ▶ **Modeling approach:** A Tobit model is used to estimate the effects of regressors including weight gain belief on cigarette consumption. This approach allows to model the corner solution outcome observed in cigarette consumption, which takes on the value of zero with positive probability but is continuous over strictly positive values.

$$C_i = \begin{cases} \mathbf{x}_i \boldsymbol{\beta} + u_i & \text{for all positive cigarette consumption} \\ 0 & \text{otherwise} \end{cases}$$

where  $C_i$  is the number of cigarettes smoked over the past 30 days and  $\mathbf{x}_i$  is a set of regressors (including belief about weight gain due to quitting) that are hypothesized to affect the amount of cigarette consumption.

- ▶ **Independent variables** control for socio-economic, demographic, and behavioral factors as well as tobacco use status as described.

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## Select References

1. US Census Bureau. Enrollment Status of the Population 3 Years Old and Over, by Sex, Age, Race, Hispanic Origin, Foreign Born, and Foreign-Born Parentage: October 2012. Available at: <http://www.census.gov/hhes/school/data/cps/2012/Tab01-01.xls>
2. U.S. Department of Health and Human Services (DHHS). Preventing Tobacco Use Among Youth and Young Adults: A Report of the Surgeon General. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2012.
3. Whooley MA, Avins AL, Miranda J, Browner WS. “Case-finding instruments for depression. Two questions are as good as many”. Journal of General Internal Medicine, 1997 Jul;12(7):439-45.

**Table 2. Regression Results**

Dep. Variable: number of cigarettes smoked over the past 30 days	Coef.	Std. Err.	t	p-value
Agree that:				
Someone who quits smoking will probably gain weight [ all ]	<b>54.414</b>	27.708	1.96	0.050
[ female ]	-21.972	35.906	-0.61	0.541
Nonsmokers are more attractive to you than smokers	<b>-68.036</b>	18.240	-3.73	0.000
Smoking cigarettes makes young people look cool or fit in	-23.620	30.820	-0.77	0.444
Young people who smoke cigarettes have more friends	-7.728	28.366	-0.27	0.785
Breathing smoke from other people's cigarettes is harmful to health	-18.573	31.263	-0.59	0.553
Inhaling smoke from someone else's cigarette can cause lung cancer.	2.220	27.161	0.08	0.935
Currently using e-cigarettes	<b>33.938</b>	19.191	1.77	0.077
Currently using smokeless tobacco	-1.111	27.977	-0.04	0.968
Heaviness of Smoking Index (ref.=not addicted/not smoking)				
Low addiction	<b>-583.801</b>	58.577	-9.97	0.000
Moderate addiction	<b>-220.074</b>	59.207	-3.72	0.000
Intention to quit smoking (1 = yes)	<b>30.181</b>	17.700	1.71	0.088
Stressed (1 = stressed) per Whooley et al. (1997) [3]	12.576	18.297	0.69	0.492
Were on a diet more than once in the past year (1 = yes)	-7.521	20.775	-0.36	0.717
Age (ref. = under 18)				
19 – 20	-13.619	28.288	-0.48	0.630
21 – 24	0.806	28.150	0.03	0.977
25 – 30	<b>87.458</b>	37.823	2.31	0.021
31 – 45	<b>124.205</b>	37.735	3.29	0.001
46 and up	<b>148.000</b>	48.818	3.03	0.002
Unknown	88.315	70.786	1.25	0.212
BMI (ref. = normal)				
Overweight	21.902	21.781	1.01	0.315
Obese	21.651	26.427	0.82	0.413
Health status (ref. = excellent/very good health)				
Good	-0.255	19.245	-0.01	0.989
Fair or poor	-15.329	32.272	-0.48	0.635
Health insurance (having = 1)				
Female (ref. male)	0.084	28.073	0.00	0.998
Does spouse/partner smoke? (1 = yes)	<b>44.384</b>	18.605	2.39	0.017
Race (ref. = white)				
Black	<b>-102.026</b>	27.155	-3.76	0.000
Asian/PI	96.115	93.723	1.03	0.305
Mixed race	-25.569	52.189	-0.49	0.624
Other	-55.245	51.338	-1.08	0.282
Constant	671.342	67.790	9.90	0.000

**Table 3. Weight Gain Belief and Intention to Quit among Current Smokers**

What best describes your intention to quit?	Someone who quits smoking will probably gain weight					
	All students		Female		Male	
	Disagree	Agree	Disagree	Agree	Disagree	Agree
In the future, not in the next 6 months	21.1 %	28.6 %	21.2 %	31.7 %	20.9 %	23.4 %
In the next 6 months	8.3 %	7.9 %	9.1 %	6.3 %	7.0 %	10.6 %
In the next month	13.8 %	11.9 %	18.2 %	10.1 %	7.0 %	14.9 %
Not sure	44.9 %	39.7 %	42.4 %	39.2 %	48.8 %	40.5 %
Do not expect to quit	11.9 %	11.9 %	9.1 %	12.7 %	16.3 %	10.6 %

## Results and Conclusions

- ▶ Compared to SC adult smokers (23%, 2012 BRFSS), only 15% of female and 21% of male students were smoking cigarettes.
- ▶ Young adults who smoke agree that quitting will lead to weight gain compared to non-smokers.
- ▶ This belief is almost equally shared by male and female young adults.
- ▶ Those who believe quitting will lead to weight gain, smoke significantly more.
- ▶ However, there was almost no difference in quitting intention among those who either agreed or disagreed that quitting may lead to weight gain.
- ▶ Effective health promotion campaigns and messaging to educate young adults over the impact of smoking on weight gain is needed.
- ▶ Suggesting alternative weight control mechanisms (e.g. physical activity, nutrition) may lead to decrease in the concern over weight gain due to quitting.