Tobacco-Related Health Disparities Seminar

Smoking and Socioeconomic Status: What Explains the Relationship?

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Topics for today

• Socioeconomic Disparities in Tobacco Use Nationally and in Washington State
• Literature Review and Theory
• Methods
• Preliminary Results
• Conclusions & Next Steps
Stuber, et al. (2009)

UW School of Social Work

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Changes in Smoking - by Education
(NHIS 1970-2006)

- Smoking prevalence has declined since 1970
- However educational disparities in smoking prevalence remain

Changes in Smoking – by Education
(WA BRFSS 1999 - 2007)

Similar trends and differences in tobacco prevalence are seen in Washington State.

Among age 25 and older
The relationship between education and tobacco use extends beyond prevalence

Education is also related to
• cessation
• initiation

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Fundamental Causes of Health Disparities
(Link and Phelan 1995)

- Epidemiological studies have been enormously successful in identifying risk factors for major diseases.
- However, most of this research has focused on risk factors that are relatively proximal causes of disease such as smoking, diet and exercise.
- We question the emphasis on individually-based risk factors and argue that greater attention must be paid to basic social conditions...
- Social factors such as socioeconomic status are likely fundamental causes of disease that, because they embody access to important resources, affect multiple disease outcomes through multiple mechanisms, and consequently maintain an association with disease even when intervening mechanisms change.

Why Focus on Education?

- Socioeconomic status has been defined by education, income and occupation;
- Each component provides different resources, displays different relationships to health outcomes, and would be addressed by different policies;
- **Education is the most basic SES component** since it shapes future occupational opportunities and earning potential. It also provides knowledge and life skills that allow better educated persons to gain more access to information and to resources to promote health;
- Winkleby et al. (1992) examined how education, income, and occupation relate to risk factors for cardiovascular disease; considered together, **only education was a significant predictor**.
Unique Contribution of this Study

- While education is clearly linked to tobacco use, the mechanisms responsible for the association are not well understood.
- Angell (1993) has observed that education, income, and occupation are not likely to have a direct effect, but to serve as proxies for other determinants.
- The main goal of this analysis is to examine mediators of the relationship between educational attainment and patterns of tobacco use.

Potential Explanations

- Job-Related Characteristics
- Mental Health
- Stress
- Knowledge of the Health Consequences of Smoking
- Social Unacceptability and Stigmatization of Smokers
Job-related characteristics

- In the United States, smoking prevalence among blue-collar workers is nearly twice that for individuals in white-collar occupations (Giovini, Pederson & Trosclair 2000);
- Job characteristics, including job control and stress, hazardous exposures at work, and the perceived rewards of the work setting have been linked to tobacco use (Eakin 1997);
- Income earned through employment is also a factor shown to be associated with tobacco use (USDHHS 2000).

Mental Health

- Rates of smoking are 2-4 times higher among people with psychiatric disorders (Kalman, Morissette & George 2005);
- Among current smokers, the most common current mental health diagnoses are: major depressive disorder, anxiety disorders, and substance abuse (Lasser, Wesely and Woolhandler 2000);
- Limited education and poverty are considered possible explanations for the higher rate of smoking among people with mental illness (Ziedonis, Williams, Smelson 2003).
Stress

- Most smokers report one reason they smoke is to handle stress;
- There are many types of stressor including major life events (e.g., the death of a family member, bankruptcy);
- These major life events are more commonly experienced by individuals of lower socioeconomic status (Bell et al. 2003).

Knowledge of the Health Consequences of Smoking

- Those with less education have less access to health information, pay less attention to health content, seek less information, lower recall and capacity to act on health information (Vishwanath 2000);
- Differences in the perceived risk of lung cancer from smoking and the potential to undue the harmful effects of tobacco use may be related to education and to tobacco use (HINTS study 2000).
Research shows characteristics of social support and social norms vary by social class and are potent correlates of smoking behavior (Sorensen 2002);

Devaluation and differential treatment of individual smokers may also reduce tobacco prevalence and may be experienced less often by persons of lower socioeconomic status (Stuber, Galea and Link 2008).

Research Questions
What are the patterns of tobacco use in adulthood?

Patterns of Persistence vs. Quitting Tobacco Use Ages 21 to 30

Is educational attainment predictive of different patterns of tobacco use in adulthood?

Educational Attainment

Poverty
Ethnicity
Gender
Adolescent Tobacco Use
Control

Patterns of Persistence vs. Quitting Tobacco Use Ages 21 to 30

Do these effects remain after controlling for Poverty, Ethnicity, Gender and Adolescent Tobacco Use?
What mediates the relationship between education and patterns of tobacco use?

- Educational Attainment
- Poverty
- Ethnicity
- Gender
- Adolescent Tobacco Use

Job-Related Characteristics
- Stress
- Depression
- Anxiety

Knowledge of the Health Consequences of Smoking

Perceived Social Unacceptability and Stigmatization of Smoking

Patterns of Persistence vs. Quitting Tobacco Use Ages 21 to 30

Kaplan’s Upstream and downstream determinants of population health

Social and Economic Policies
- Institutions
- Neighborhoods/Communities
- Living Conditions

Social Relationships
- Individual Risk Factors
- Genetic/Constitutional Factors
- Pathophysiologic pathways

Individual & Population Health

Life Course

Environment
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Seattle Social Development Project Overview

• J. David Hawkins, PI
  Richard F. Catalano, I
  Karl G. Hill, I
• A theory-driven longitudinal study of the etiology of prosocial and antisocial behaviors.
• In September 1985, 18 Seattle elementary schools were identified that over-represented students from high crime neighborhoods.
• 808 (77%) of the 5th grade students in these schools consented to participate in the longitudinal study; they constitute the study sample.
Seattle Social Development Project
- A Community Sample

- Gender
  Female 396 49%
  Male 412 51%

- Ethnic Group
  European-American 381 47%
  African-American 207 26%
  Asian-American 177 22%
  Native-American 43 5%
  of these 44 5% were Hispanic

- SES
  Eligible for free/reduced lunch (5th, 6th or 7th) 423 52%

SSDP Panel Ages and Retention

Longitudinal data have been collected on these Seattle youths and their parents from 1985 to 2005 (age 30).

<table>
<thead>
<tr>
<th>Elementary</th>
<th>Middle</th>
<th>High</th>
<th>Adult</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEAN AGE G2</td>
<td>10 11 12</td>
<td>13 14</td>
<td>15 16 (17) 18</td>
</tr>
<tr>
<td>%</td>
<td>87% 69% 81% 96% 97% 95% --</td>
<td>94% 95% 93% 92% 91% ?</td>
<td></td>
</tr>
</tbody>
</table>

Panel retention has been high.
Sample Distribution in 1990 (9th grade)

By Age 30
21% lived outside Washington State.

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A priori – Conceptual groupings based on dichotomous 0 (non-smoker) 1 (smoker) patterns over 21, 24, 27 and 30.

To do this we created a dichotomous 0/1 at each age and ran a pattern program on those 4 vars.

54 patterns were identified.

These patterns were then labeled following decision rules...
Identifying Patterns of Tobacco Use

Sample patterns:
0 = no smoking past month
1 = smoking past month
M = missing data that interview Pattern is at 21, 24, 27 and 30

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Prevalence</th>
<th>Group?</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000</td>
<td>0.42946</td>
<td>Non-smoker</td>
</tr>
<tr>
<td>1111</td>
<td>0.14851</td>
<td>Chronic smoker</td>
</tr>
<tr>
<td>1000</td>
<td>0.04579</td>
<td>Quitter</td>
</tr>
<tr>
<td>1110</td>
<td>0.03218</td>
<td>Quitter</td>
</tr>
<tr>
<td>1100</td>
<td>0.02723</td>
<td>Quitter</td>
</tr>
<tr>
<td>0111</td>
<td>0.02599</td>
<td>Escalator</td>
</tr>
<tr>
<td>MMMM</td>
<td>0.02228</td>
<td>Undeterminable</td>
</tr>
<tr>
<td>1101</td>
<td>0.02104</td>
<td>Quit attempter</td>
</tr>
<tr>
<td>0001</td>
<td>0.02104</td>
<td>Escalator</td>
</tr>
<tr>
<td>1011</td>
<td>0.01733</td>
<td>Quit attempter</td>
</tr>
</tbody>
</table>

54 patterns were identified

Identified Patterns
- **Chronic Smoker** (18%)
- **Non smoker** (47%)
- **Quit attempter** (6%)
- **Escalator** (6%)
- **Quitter** (16%)
- **Undeterminable** (7%)
Validation of Smoking Patterns Age 21-30

How were these patterns related to prevalence past month smoking?

- Chronic: 17.9%
- Non-Smoker: 46.7%
- Quitter: 15.8%
- Quit Attempter: 6.2%
- Escalator: 6.3%

Validation of Smoking Patterns Age 21-30

How were these patterns related to frequency of past month smoking?

- Non-smoker (46.7%)
- Escalator (6.3%)
- Quitter (15.8%)
- Quit Attempter (6.2%)
- Chronic smoker (17.9%)
Are these Smoking Patterns Significantly Related to Educational Attainment?

\[
\chi^2 = 10.03, \ p < .007 \\
\chi^2 = 67.94, \ p < .001
\]

What mediates the relationship between education and patterns of tobacco use?

Educational Attainment

- Poverty
- Ethnicity
- Gender
- Adolescent Tobacco Use

Control

Job-Related Characteristics

- Stress
- Depression
- Anxiety

Knowledge of the Health Consequences of Smoking

Perceived Social Unacceptability and Stigmatization of Smoking

Patterns of Persistence vs. Quitting Tobacco Use Ages 21 to 30
Bivariate Relationships Between Model Variables

- Employment Status
- Work-Costs/Noise-Injury
- Work Costs/Dead-End
- Occupation (White Collar)
- Income
- Stress
- Depression
- Anxiety
- Patterns of Persistence vs. Quitting Tobacco Use Ages 21 to 30

Control
- Educational Attainment
- Poverty
- Ethnicity
- Gender
- Adolescent Tobacco Use

all relationships are significant
Nested Multinomial Logistic Regression Results
Predicts group membership compared to non-smokers

What distinguishes the chronic-from the non-smokers?
What distinguishes the chronic from the non-smokers?

Control

Educational Attainment

Poverty

Ethnicity

Gender

Adolescent Tobacco Use

Employment Status

Work-Costs/Noise-Injury

Work Costs/Dead-End

Occupation (White Collar)

Income

Stress

Depression

Anxiety

Non-Smokers

Chronic

What distinguishes the chronic smokers from non-smokers?

Educational Attainment

Poverty

Ethnicity

Gender

Adolescent Tobacco Use

Employment Status

Work-Costs/Noise-Injury

Work Costs/Dead-End

Occupation (White Collar)

Income

Stress

Depression

Anxiety

Non-Smokers

Chronic
What distinguishes quitters from the non-smokers?

- Employment Status
- Work-Costs/Noise-Injury
- Work Costs/Dead-End
- Occupation (White Collar)
- Income

Control

- Educational Attainment
- Poverty
- Ethnicity
- Gender
- Adolescent Tobacco Use

Non-Smokers

Quitters

What distinguishes the quitters from the non-smokers?

- Employment Status
- Work-Costs/Noise-Injury
- Work Costs/Dead-End
- Occupation (White Collar)
- Income
- Stress
- Depression
- Anxiety

Control

- Educational Attainment
- Poverty
- Ethnicity
- Gender
- Adolescent Tobacco Use
What distinguishes the quitters from the non-smokers?

- Educational Attainment
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- Control
- Employment Status
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- Occupation (White Collar)
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- Depression
- Anxiety
- Non-Smokers
- Quitters

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Conclusions

- Adult work environment, stress and mental health are viable intervention targets in tobacco reduction.
- The strongest potential target appears to be the adult work environment (specifically, blue collar, noisy, high-injury jobs).
- There is a strong effect of educational attainment on patterns of tobacco use in adulthood.
- This effect was mediated in part through adult work environment and mental health.
- Adolescent tobacco use is the strongest predictor of patterns of tobacco use in adulthood, even after controlling for everything tested (control variables, education, work and mental health).

Next Steps in this Study

Path analysis to examine mediation
Cumulative Onset of Smoking Initiation by SES

Cumulative Onset of Smoking Initiation by Ethnicity