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Transitions in Conjoint Alcohol and Tobacco Use among Adolescents

Kristina M. Jackson
University of Missouri, Columbia & Missouri Alcoholism Research Center

Supported by National Institute on Alcohol Abuse and Alcoholism Grants R21 AA12383 to Kristina M. Jackson and P50 AA11998 to Andrew C. Heath
Introduction

- Alcohol and tobacco use co-occur
  - Social drinkers and alcoholics are more likely to smoke than are non-drinkers
  - Smokers are more likely than are non-smokers to drink and to develop alcohol use disorders
- Comorbidity could be due to directional influences between use of the two substances
- The relation between alcohol and tobacco use also may be due to common third variables (e.g., sex, race, personality)
Introduction

• Recent research has theoretically and empirically characterized developmental patterns of drinking and smoking
  – With 2 timepoints, we can consider stable versus unstable behavior
  – Chassin, Presson, Sherman, & Edwards (1991) categorized smoking into 4 patterns:
    • Stable nonsmoker
    • Late-onset smoker
    • Non-persistent smokers
    • Stable smokers
  – They found different correlates of the four patterns
The Current Study

- No research has considered alcohol-tobacco comorbidity when examining developmental patterns.
- The current study examined the prospective (1-year) relation between developmental patterns of alcohol and tobacco use in a nationally representative sample of adolescents.
National Longitudinal Study of Adolescent Health (AddHealth)

N=20,745 (49.5% male; 52% White, 22% Black, 17% Hispanic)

Current study sample N=14,466 (those who provided complete data at both waves)

Students from 132 schools in grades 7-12 were assessed in 1994/1995
- 45-60 minute school interview and 60-120 minute in-home interview
- 14,738 students re-contacted/re-interviewed in 1996
Measures

- Alcohol consumption (Times 1 and 2)
  - Past-year reference
    - Drink at least once/week
    - Drink heavily (5+ drinks/occ.) at least once/week
    - Get drunk at least once/week

- Tobacco use (Times 1 and 2)
  - 30-day reference
    - Smoke
    - Smoke $\geq$ half-pack (10 cigarettes) per occasion
    - Smoke daily
Measures (con’d)

- Demographics (Time 1 only)
  - Sex
  - Race
    - Dummy coded into Black, Hispanic, & Other
    - White as the reference group
  - Age (11 to 20)
A Priori Groupings

- Created 4-level (nominal) variables representing temporal patterns, based on responses at Years 1 & 2

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-drinker (non-smoker)</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Onset</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>Non-persistent</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Persistent</td>
<td>YES</td>
<td>YES</td>
</tr>
</tbody>
</table>
Analytic Procedure

● Examined relationship between 4-level drinking variable & 4-level smoking variable using multinomial logistic regression

● Controlled for sex, race, and age

● Complex sampling design
  – Clustering of observations
  – Stratification
  – Unequal probability of inclusion (e.g., oversampling of Blacks)
  – Adjusted for complex sampling and non-response using Stata
Prevalence of Drinking Patterns across Alternate Definitions of Drinking

<table>
<thead>
<tr>
<th>Pattern Defined By:</th>
<th>Pattern Defined By:</th>
<th>Pattern Defined By:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drink at least once/week</td>
<td>Drink heavily at least once/week</td>
<td>Get drunk at least once/week</td>
</tr>
<tr>
<td>Nondrinker</td>
<td>84.3%</td>
<td>88.6%</td>
</tr>
<tr>
<td>Onset</td>
<td>7.1%</td>
<td>5.2%</td>
</tr>
<tr>
<td>Non-persist</td>
<td>4.6%</td>
<td>3.6%</td>
</tr>
<tr>
<td>Persistent</td>
<td>4.0%</td>
<td>2.7%</td>
</tr>
</tbody>
</table>

Note. N’s range from 13,104 to 13,193.
## Prevalence of Smoking Patterns across Alternate Definitions of Smoking

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Smoke</th>
<th>Smoke half pack/occasion</th>
<th>Smoke daily</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonsmoker</td>
<td>75.4%</td>
<td>88.1%</td>
<td>85.2%</td>
</tr>
<tr>
<td>Onset</td>
<td>8.0%</td>
<td>4.9%</td>
<td>5.9%</td>
</tr>
<tr>
<td>Non-persist</td>
<td>3.8%</td>
<td>1.7%</td>
<td>1.9%</td>
</tr>
<tr>
<td>Persistent</td>
<td>12.8%</td>
<td>5.4%</td>
<td>7.0%</td>
</tr>
</tbody>
</table>

Note. N’s range from 13,104 to 13,193.
Smoking → Drinking

Range of Odds Ratios across Alternate Definitions

<table>
<thead>
<tr>
<th>Drinking</th>
<th>Smoking Onset</th>
<th>Smoking Non-persist</th>
<th>Smoking Persist</th>
<th>Non-persist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onset</td>
<td>3.77-8.29</td>
<td>1.37-4.75</td>
<td>4.33-7.29</td>
<td>4.33-7.29</td>
</tr>
<tr>
<td>Non-persist</td>
<td>3.35-5.93</td>
<td>5.73-11.22</td>
<td>5.43-10.53</td>
<td>5.43-10.53</td>
</tr>
<tr>
<td>Persistent</td>
<td>6.16-9.17</td>
<td>4.08-6.70</td>
<td>6.55-13.55</td>
<td></td>
</tr>
</tbody>
</table>

Note. Controlling for sex, race, and age. Parameters were obtained from multinomial logistic regressions predicting the 4-level drinking variable from the 4-level smoking variable, with non-drinkers/non-smokers as the reference groups.
Drinking → Smoking
Range of Odds Ratios across Alternate Definitions

<table>
<thead>
<tr>
<th>Drinking</th>
<th>Smoking Onset</th>
<th>Smoking Non-persist</th>
<th>Smoking Persist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onset</td>
<td>3.76-8.26</td>
<td>1.38-4.76</td>
<td>5.89-8.83</td>
</tr>
<tr>
<td>Non-persist</td>
<td>3.39-5.95</td>
<td>5.74-11.24</td>
<td>5.17-10.72</td>
</tr>
<tr>
<td>Persistent</td>
<td>5.89-8.83</td>
<td>4.00-6.55</td>
<td>6.41-13.42</td>
</tr>
</tbody>
</table>

Note. Controlling for sex, race, and age. Parameters were obtained from multinomial logistic regressions predicting the 4-level smoking variable from the 4-level drinking variable, with non-drinkers/non-smokers as the reference groups.
Summary of Findings

- Drinking and smoking were highly associated both cross-sectionally and prospectively.
- Relative to non-smokers, persistent smoking predicted drinking more than did any other smoking group.
- Alternate definitions of smoking and drinking yielded similar findings.
  - Contrary to what might be expected, given a dose-dependent association between drinking and smoking (Madden, Bucholz, Martin, & Heath, 2000).
  - Sample may have been too young to show full dose range.
Summary of Findings (con’d)

- Relative to non-drinkers, persistent drinking predicted smoking more than did any other drinking group
  - The only exception was that non-persistent drinking predicted non-persistent smoking most strongly, across all alternate definitions of smoking and drinking

- The alcohol-tobacco relation controlled for sex, race, and age, suggesting that the association was not due to these factors
  - Future research will consider the extent to which delinquency and negative affect account for the alcohol-tobacco relation
Limitations

● Different timeframes for drinking and smoking
  – Drinking was referenced to a 12-month timeframe
  – Smoking was referenced to a 30-day timeframe

● Time interval not long enough to be informative developmentally
  – Changes in substance use over one year might not be meaningful

● Unclear the extent to which unstable patterns were due to measurement error
  – Might have been further confounded by creating binary variables from continuous variables