Peers and Pot: 
Selection and Influence Mechanisms Associated with Marijuana Use in Adolescent Friendship Networks

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Marijuana Use In Adolescence: Prevalence and Risks

• In the U.S., 6% of adolescents have tried marijuana by 8th grade, and 42% have done so by 12th grade (Johnston et al., 2007)

• Adolescence is a critical period for marijuana (MJ) and drug use interventions
  – Early initiation of MJ use, and regular use in adolescence, predict drug use disorders in adulthood (Swift et al., 2008)
  – Experimental drug use in adolescence is associated with poorer young adult outcomes (Tucker et al., 2005)

Adolescent Substance Use: The Role of Peers and Friends

• Many risk and protective factors

• Peer influence is argued to play a central role
  – Key factor in theories of adolescent problem behavior
  – Peer/friend substance use is often correlated/predictive
  – A key focus of prevention programs

• Some evidence that friendships are an important contributing factor to adolescent marijuana use
  – Adolescent drug use is more strongly predicted by friend drug use than wider peer group norms (Duan et al., 2009)
  – Friends may be key social referents for illicit (covert) substance use and may provide opportunities for use

Friends and Marijuana Use: An Evolving Social System

• Substance use in adolescent social systems
  – Youth are influenced by their peers
  – And influence their peer setting via their selection of friends
  – Socially meaningful behaviors: a basis for friendship choices and socialization

• Marijuana: social selection and influence dynamics
  – Do adolescents seek out friends based on marijuana use?
  – Do friends also influence adolescent marijuana use?
    • Both selection and socialization effect observed for other substance use behaviors
    • Few studies teasing apart these processes for MJ use – a more covert behavior with mixed results
      (e.g., Pearson et al., 2006)

Susceptibility to Peer Effects on Marijuana Use

• It is unclear if particular adolescents are more/less susceptible to peer influence on marijuana use

• Multiplicative model of risk: Personal, family, and social risk factors may heighten risk of peer influence
  – Peer similarities in risk behaviors are stronger for youth with risk factors
    • Depression, social anxiety, internalized distress
    • Low academic achievement
    • Family dysfunction, parent substance use

• Peer effects on substance use also seem to be moderated by experiential differences
  – Gender, race/ethnicity, age (and variables related to developmental stage), social status
Research Questions

• Q1: To what extent are friendships based on marijuana use, and do friends also influence marijuana use?
  – Lifetime marijuana use (initial initiation of MJ use)
  – Frequency of marijuana use

• Q2: What personal, family, and school factors moderate friendship selection and influence associated with marijuana use?
  – Explore moderators of friendship choices
  – Test if risk factors heighten peer influence

Study Sample & Procedure

• Sample
  – National Longitudinal Study of Adolescent Health (Add Health)
  – Saturated school sample: all students invited to participate
    • Focus on the two largest high schools
    • Students captured at both waves (Grade 10/11 at Wave 1)
  – N = 1,612, nested in two schools
    • School 1: N = 1,193; School 2: N = 419
    • Retention rates 87-88%

• Procedure
  – In school questionnaires (baseline)
  – In home student and parent questionnaires (Wave 1 & Wave 2)

Measures

• Friendships
  – Name up to 5 male and 5 female friends
  – About 5% of sample limited to 1 M / 1 F nomination

• Marijuana use
  – Any lifetime use: number of times used marijuana in their lifetime (W1) and in the past year (W2) (1 = any use)
  – Frequency of past month use: number of times used marijuana in the past 30 days
    • Recoded to 5 pt, scale: 0 = none, 4 = 33 times or more

• Control attributes
  – Gender, grade cohort, family SES (parent report of education attainment)

Sample Descriptive Statistics

<table>
<thead>
<tr>
<th>Respondent attribute</th>
<th>School 1 (N = 1,193)</th>
<th>School 2 (N = 419)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male (%)</td>
<td>51</td>
<td>57</td>
</tr>
<tr>
<td>M age Wave 1</td>
<td>16.3</td>
<td>16.5</td>
</tr>
<tr>
<td>Race/ethnicity (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>40</td>
<td>1</td>
</tr>
<tr>
<td>Non-Hispanic white</td>
<td>93</td>
<td>99</td>
</tr>
<tr>
<td>Non-Hispanic black</td>
<td>26</td>
<td>0</td>
</tr>
<tr>
<td>Asian</td>
<td>15</td>
<td>3</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Parent education (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than high school</td>
<td>25</td>
<td>4</td>
</tr>
<tr>
<td>High school</td>
<td>70</td>
<td>32</td>
</tr>
<tr>
<td>Some college or trade school</td>
<td>29</td>
<td>35</td>
</tr>
<tr>
<td>Graduate of college/university</td>
<td>19</td>
<td>20</td>
</tr>
</tbody>
</table>

Marijuana Use Descriptive Statistics

- Lifetime Marijuana Use
  - No use: 37%, 1-2 times: 5%, 3-10 times: 10%, more than 10 times: 4%
  - School 1: 35% vs 40%; School 2: 34% vs 38%

- Frequency of Past Month Marijuana Use
  - No use: 35%, 1-2 times: 5%, 3-10 times: 10%, more than 10 times: 4%
  - School 1: 35% vs 40%; School 2: 34% vs 38%
Network Descriptive Statistics

Characteristics of the friendship network: Wave 1 to Wave 2

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Wave 1</th>
<th>Wave 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>M (SD) friends nominated</td>
<td>2.04</td>
<td>1.75</td>
</tr>
<tr>
<td>Range nominations received</td>
<td>0</td>
<td>0.15</td>
</tr>
<tr>
<td>Reciprocity index</td>
<td>3.10</td>
<td>2.75</td>
</tr>
<tr>
<td>Transitivity index</td>
<td>2.40</td>
<td>2.10</td>
</tr>
</tbody>
</table>

Results: Lifetime Marijuana Use

- Lifetime marijuana use predicted friendship choices
  - Users nominated fewer friends
  - Users attracted fewer friends (S1)
  - Selected friends with same lifetime use

- Initiation of marijuana use:
  - Not predicted by friend MJ use
  - Not predicted by covariates

Results: Frequency of Marijuana Use

- Frequency of past month MJ use predicted friendship choices
  - MJ use not associated with making or receiving friend nominations
  - Selected friends with similar frequency of MJ use

- Change in frequency of MJ use:
  - Predicted by friend MJ use in School 1, but not School 2
  - Predicted by parent education in School 1

Post Hoc Test: Drivers of Friendship Selection

- Marijuana-based friendship selection
  - Is lifetime MJ use, or frequency of MJ use, more important?

- Additional SAB model
  - Co-evolution of friendship network, lifetime MJ use, and frequency of past month MJ use
  - Does frequency of MJ use predict friendship choices over and above lifetime MJ use?
    - Estimate effects of lifetime use, score test effects of MJ freq.

- Result: Role of marijuana in friend choices differed by school
  - School 1: friendship choices predicted by similarities in lifetime MJ use and similarities in frequency of MJ use
  - School 2: friendship choices explained by similarities in lifetime MJ use

Moderators of Friend Selection and Influence for Marijuana Use

- Re-estimate the SAB model for the co-evolution of the friendship network and frequency of marijuana use

- Addition of moderating effects of personal, family, and school factors on:
  - Selection of friends with similar MJ use
  - Effect of friend MJ use on adolescent use (multiplicative risk?)
Results: Moderators of Friend Selection and Influence for MJ Use

- **Moderators of friend selection based on similar MJ use**
  - School 1:
    - Delinquency (-)
    - Popularity (-)
  - School 2:
    - Family support (-)

- **Friend influence on adolescent MJ use**
  - School 1:
    - School trouble (+)

Summary of Results

- **Evidence of friend influence on adolescent marijuana use was only evident in School 1**
  - Adolescents' frequency of MJ use was predicted by friends' frequency of use over the year-long study
  - Ego alter tables indicate that in School 1:
    - Youth whose friends abstain from MJ use, were likely to remain (or become) non-users
    - Youth whose friends used marijuana more frequently, were at most risk of becoming (or remaining) frequent users

- **Initiation of marijuana use was not influenced by school friends in either school**
  - Nor was it predicted by covariates

Summary of Results: Moderators

- **Few significant moderators of friend selection or friend influence for marijuana use**
  - Most personal, school, family risk factors did not heighten risk of friend influence on marijuana use
  - School trouble (School 1): youth who got in trouble at school were more likely to be influenced by their friends' MJ use
  - Significant moderating effects of MJ-based friend selection differed by school
    - Risk factors seems to attenuate tendency to select friends based on MJ-use similarities
      - Delinquency, popularity (School 1)

  - **Overall, MJ based friend selection and influence effects were pervasive**

Final Conclusions and Implications

- **Context matters**
  - Friend influence on MJ use, and the role of MJ use in friendship choices, differed between the two school contexts

- **When friend influence on marijuana use was observed, the effect was pervasive**
  - Little evidence of moderating factors at the individual level

- **Future work: sampling multiple friendship networks**
  - What factors at the school (setting) level make marijuana use (and other drugs) salient to friendships?
  - Interventions may need to target different individual, peer, or setting-level processes, depending on the context

Thank you

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