Adolescent Substance Use: Patterns and Trends

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1. The Nature of Adolescent Substance Use: A Range of Behaviors/Problems (and Some Differences from Adults)

Substance use varies in:
- Frequency, Quantity, Number of Substances, and Associated Problems

Different “stages” of use
- Initiation/Experimentation
- Escalation—Regular Use
- Heavy or Problem Use
- Cessation/Relapse

Adolescents (Compared to Adults) have
- More Poly-Drug Use—General versus Specific
- More Binge Use --- increases risk for consequences
Compared to Adults, Adolescents drink…

less frequently, but in higher quantity

2005 National Survey on Drug Use and Health, SAMHSA
But-- Substance Use is NOT Substance Use Disorder (SUD)

- SUDs involve:
  - Maladaptive pattern of use, which causes impairment or distress
  - Abuse (Use despite recurrent problems-work, family, legal)
  - Dependence (Compulsive Use, Loss of control, tolerance, withdrawal)
  - Separate disorders or a continuum?
Research Questions: Developmental Issues in Diagnosing SUDs

- Developmental appropriateness of criteria? (Martin et al.)
  - Tolerance versus learning
  - Inability to limit
  - Diagnostic “orphans”

- Do adolescents meet criteria at lower levels of intake than do adults? (Kandel; marijuana and tobacco)
  - Methodological Artifact?
  - Greater sensitivity?
Intervention Questions

• **Appropriate Target(s) of Intervention**
  – Any Use
  – Early Onset Use (later)
  – Heavy Use or Use-Related Problems/SUDs (Harm-Reduction)
  – Substance-Specific versus General
    • “Take a pouch instead of a puff”
### 2. Prevalence: Some Substance Use During Adolescence is Common

<table>
<thead>
<tr>
<th>Grade Level:</th>
<th>8th</th>
<th>10th</th>
<th>12th</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cigarettes</td>
<td>22.1</td>
<td>34.6</td>
<td>46.2</td>
</tr>
<tr>
<td>Alcohol</td>
<td>38.9</td>
<td>61.7</td>
<td>72.2</td>
</tr>
<tr>
<td>Marijuana</td>
<td>14.2</td>
<td>31.0</td>
<td>41.8</td>
</tr>
<tr>
<td>Any Illegal not Marijuana</td>
<td>11.1</td>
<td>18.2</td>
<td>25.5</td>
</tr>
</tbody>
</table>

Monitoring the Future, 2007
Substance Use Disorders (SUD): Less Frequent but Sufficient Prevalence for Concern

<table>
<thead>
<tr>
<th>Age:</th>
<th>12-17 y</th>
<th>18-25 y</th>
<th>26 y or older</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol</td>
<td>2.2</td>
<td>7.3</td>
<td>2.9</td>
</tr>
<tr>
<td>Either Alcohol or Illicit Drug</td>
<td>3.8</td>
<td>11.2</td>
<td>3.8</td>
</tr>
</tbody>
</table>

Past Year Diagnosis of Dependence (%)

National Survey on Substance and Health, SAMHSA, 2007
3. “Historical” Trends

FIGURE 1
Trends in Annual Prevalence of an Illicit Drug Use Index
Grades 8, 10, and 12

Source: The Monitoring the Future study, the University of Michigan.
Waxing and Waning of Specific Drugs (MTF)

- **Declining in 2007:**
  - Marijuana, amphetamines, ritalin, meth, crystal meth, steroids

- **Holding Steady in 2007:**
  - Cocaine, crack, LSD, other hallucinogens, most prescription drugs (sedatives, oxycontin, vicodin), cough syrup

- **Increasing in 2007:**
  - Ecstasy

- Alcohol and cigarettes—steady or small decline

- “Generational Forgetting”
4. Demographic Variation

• No simple story

• Correlations among demographic factors (e.g., race/ethnicity and SES)

• Reporting biases and school drop-outs

• Varies with specific substance

• So—an over-simplified view

• Bottom Line—Substance Use and Problems are not Confined to a particular demographic subgroup
4. Demographic Variation

- **Gender**
  - varies with substance- overall males use more (SLT, steroids, heavy drinking) or equal
  - But- females may show faster progression

- **SES**
  - Low SES adolescents more likely to smoke cigarettes (especially for low parent education)
  - But no relation between SES and adolescent alcohol or marijuana use (Hanson & Chen 2007 review)
  - Curvilinear? Poverty and Affluence (Luthar)
4. Demographic Variation

• Race/Ethnicity
  – Measurement issues-
    • self-reports, school drop out
  – African American adolescents lowest use rates
  – Hispanics highest in lower grades (drop-out effect)
  – Native Americans high rates
FIGURE 6
Any Illicit Drug: Trends in Annual Prevalence by Race/Ethnicity*

Source. The Monitoring the Future study, the University of Michigan.

*To derive percentages for each racial subgroup, data for the specified year and the previous year have been combined to increase subgroup sample sizes and thus provide more stable estimates.
FIGURE 156
Alcohol: Trends in 30-Day Prevalence of Having Been Drunk by Race/Ethnicity*

Source. The Monitoring the Future study, the University of Michigan.

*To derive percentages for each racial subgroup, data for the specified year and the previous year have been combined to increase subgroup sample sizes and thus provide more stable estimates.
Biopsychosocial risk pathways: Children in Families, Schools, & Peer Groups

(from Sher, 1991)

- Deviance Proneness (Externalizing Spectrum)
- Stress & Negative Affect (Internalizing Spectrum)
- Enhanced Reinforcement
- Parent Alcoholism
- SUD

Macro-context: Social Norms and Opportunities: neighborhood, college, social policy, historical context
5. Developmental Course

• For both Use and SUDs:
  – Adolescent Onset
  – Peak in Emerging Adulthood (18-early 20s)
  – Declines in Adulthood
    – Role Occupancies?
    – Neurobiological Development?
Prevalence of Past-year DSM-IV Alcohol Dependence by Age

18 + yrs. - NIAAA NESARC (Grant, et al., 2004) Drug and Alcohol Dependence, 74:223-234
12-17 yrs - U.S. Substance Abuse and Mental Health Services Administration 2003 National Survey on Drug Use and Health (NSDUH)
But-Also Heterogeneity in Course

• Heterogeneity in:
  – age of onset, speed of progression, persistence over time

• Relevant both to theories of etiology and to intervention
### Some (Correlated) Predictors of Course

<table>
<thead>
<tr>
<th>Factor:</th>
<th>Predicts:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family History</td>
<td>Early Onset, Time to dx, Persistence, Risk for dx</td>
</tr>
<tr>
<td>Early Onset of Use</td>
<td>Risk for dx</td>
</tr>
<tr>
<td>Initial Experience</td>
<td>Time to dx, Risk for dx</td>
</tr>
<tr>
<td>Externalizing and Internalizing Symptoms</td>
<td>Early Onset; Time to dx</td>
</tr>
<tr>
<td>Adult Roles and Timing of Adult Roles</td>
<td>Persistence</td>
</tr>
</tbody>
</table>

(Bachman & Schulenberg, Chassin et al., Hussong et al., Kandel et al., Sartor et al., Sher et al.)
EARLY ONSET RAISES RISK FOR SUD (Lifetime alcohol dependence)


Source: 2001-2002 National Epidemiologic Survey on Alcohol and Related Conditions
Why is Early Onset associated with SUD?

• Just a marker?
  – But—Animal Data
  – Propensity Scoring approaches
    • Odgers et al., 2008

• Are adolescents more vulnerable to substance use effects than are other age groups?

• If so, then importance of prevention of early onset
  – What age groups are best to target?
Predicting Persistence: Early Role Occupancy Is Not Protective (Parent Role)

Little, Handley, Leuthe, & Chassin, in press
More Research Questions: Risk Factors, SUD Course, and Adolescent Development

- How do pre-existing SUD risk factors (genetic and early environmental adversity) affect the adolescent development of systems underlying reward and regulation?

- How does early exposure to substances influence these developing systems?

- Are adolescents more vulnerable than adults to substance use effects?
Summary

• Adolescence is a common time for initiation

• Substance Use is very prevalent; SUDs are less common, but a significant public health impact

• Demographic differences exist, but substance use affects kids across wide range of demographics
• Variability in developmental course is relevant for etiology, prevention, and intervention

• Multiple factors affect developmental course (including both pre-existing factors and early exposure to substances)

• Risk Factors are both general (for “problem behavior”) and specific to substance use

• Early Onset is associated with risk for SUD
  – Are adolescents differentially vulnerable to effects?
  – Importance of preventing early onset?