

TRAJECTORIES OF HIGH-RISK SEXUAL BEHAVIOR AND SUBSTANCE USE DURING YOUNG ADULTHOOD

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Background

Adolescence and young adulthood are critical transitional periods ^{1,2}

- Unhealthy behavioral patterns established during these developmental periods can have detrimental long-term consequences ³⁻⁶

1) risky sexual behaviors 2) alcohol and other drug use 3) and tobacco use were identified by the CDC as 3 of 6 health risk behaviors that they monitor closely as they contribute to the leading causes of death and disability among youth and adults⁷

HRSB and Substance use

High-risk sexual behaviors (HRSBs) and substance use are highly prevalent in the general population⁸

Early and persistent engagement in these behaviors increases risk for adverse outcomes and is highly costly

- HIV/AIDS, lowered IQ and suicide ^{3, 4,12-14}
- Health care expenditures estimated to reach more than \$740 billion dollars in the U.S. ^{4,15-16}

Trajectories of HRSB and Substance use

Substance use

- Prior research has found between 4–6 different trajectory classes ²¹⁻²⁶
 - stable low substance users
 - stable high substance users
 - increasing substance users
 - decreasing substance users

HRSB¹⁷⁻²⁰

- Fewer studies investigated trajectories of HRSB, however they have also identified multiple trajectory patterns

Most trajectory research limited to ages 11-25

- The few studies on substance use that looked beyond age 25 found variations in developmental course
- No studies to my knowledge have looked at variation in trajectories of HRSB beyond age 24

Extending the Literature: Young Adulthood

Much of the current research on HRBs is focused on adolescence

- Epidemiologic data suggest that risk behaviors tend to peak in the early 20s, and then decline^{10,13}
 - Developmental changes = “mature out”- behaviors are incompatible with new “adult-roles” (i.e. work, marriage, parenthood)^{27,28}
 - Biological changes = prefrontal cortex, responsible for executive functions, such as risk assessment and self-regulation, reaches full maturation at age 26²⁹

Young adulthood is still a critical time

- More normative time to be engaging in sexual activity so more people are doing it
 - e.g. By age 15 around 20% of people have ever had sexual intercourse whereas by age 30 it increases around 97%³⁰⁻³¹
- Young adults in the U.S. delaying developmental milestones (i.e., marriage, children)
 - e.g. In 1960, the median age of first marriage was 24 for men and 21 for women and by 2010 it had increased to 28 for men and 27 for women³²

The Present Study

Aim:

- Use growth mixture modeling (GMM) to identify trajectories of HRSB and substance use (tobacco, alcohol, marijuana) during young adulthood.

Hypothesis:

- Various trajectories of HRSB and substance use during young adulthood would emerge

Participants

998 individuals and their families

- Three public middle schools when youth were in sixth grade (average age of 12.2 years)
- 526 males and 472 females (47.3%).
- Ethnic distribution, based on self-identification: 42.3% European American, 29.1% African American, 6.8% Latino, 5.2% Asian American, and 16.4% other ethnicities, including biracial.
- Annual family income ranged from less than \$5,000 to more than \$90,000, with the median being \$30–\$40,000

Procedures - Overview

Study uses data from a larger longitudinal study (Project Alliance 1; see Dishion and Kavanagh, 2003)

- Participants underwent 9 developmentally appropriate assessments from age 12- age 30
 - Ages 22-30 - young adults were administered the Young Adult Interview³⁵, which included detailed sections on substance use and sexual behavior

Retention rate = approximately 80% across the longitudinal span of the study

Measures - HRSB

4 time points: age 22, age 24, age 26, age 28

Score based on Guo et al., 2002, King et al., 2012, Caruthers et al, 2014

- Count of the number of sex partners **over the past 3 months**
 - Dichotomized (>1 = high risk)
- Count of
 - 1) the number of times they had sex with people who were IV-drug users
 - 2) the number of times they had sex with people who were also having sexual intercourse with other people
 - 3) the number of times they had sex with someone who they didn't know very well **over the past 3 months**
 - Dichotomized (>0 = high risk)
- Propensity, in general to have sex under influence of drugs/alcohol (0=never to 4=every time)
 - Dichotomized (>0 = high risk)

Items summed to arrive at a final HRSB score

Measures – Substance Use

4 time points: age 22, age 24, age 26, age 28

Tobacco, alcohol and marijuana

- Individual asked about frequency of substance use **over the past 3 months**
 - 8-point scales ranging from never to 2–3 times a day or more for each substance

Analytic Plan- Preliminary Analyses

Mplus version 7

Missing data

- Full information maximum likelihood estimation

Data examined for skewness (2.0) and kurtosis (7.0)

Correlations inspected to assess relations among study variables

Analytic Plan- Trajectory Analyses

Growth mixture modeling (GMM) used to model HRSB and substance use (tobacco, alcohol, and marijuana) from age 22 to 30

- Linear and quadratic growth trajectories

Model fit

- (a) Bayesian information criterion (BIC)
- (b) Sample-size adjusted BIC (SSABIC)
- (c) Lo–Mendell–Rubin adjusted likelihood ratio (LMR-LR) test
- (d) Bootstrapped likelihood ratio test (BLRT)
- (e) Interpretability and parsimony of the solution
- (f) Entropy

HRSB Trajectory Classes

Three-class quadratic solution emerged as the best fitting model

- 1) **Stable, low HRSB class**
74.7% (n = 700) of the sample
- 2) **Increasing HRSB class**
11.5% (n = 95) of the sample
- 3) **Decreasing HRSB class**
13.7% (n = 113) of the sample

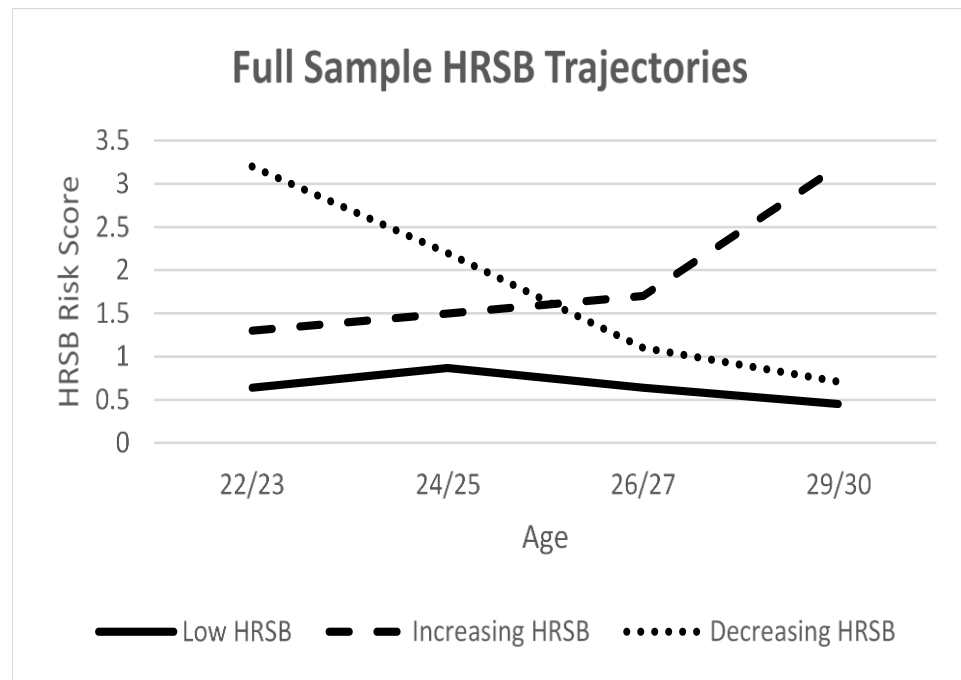


Figure 2. Full sample high-risk sexual behavior trajectory classes during young adulthood.

Tobacco Use Trajectory Classes

Four-class quadratic solution emerged as the best fitting model

- 1) **Stable, low tobacco use class**
56.9% (n = 531) of the sample
- 2) **Increasing tobacco use class**
7.3% (n = 60) of the sample
- 3) **Decreasing tobacco use class**
10.8% (n = 96) of the sample
- 4) **Stable, high tobacco use class**
24.9% (n = 234) of the sample

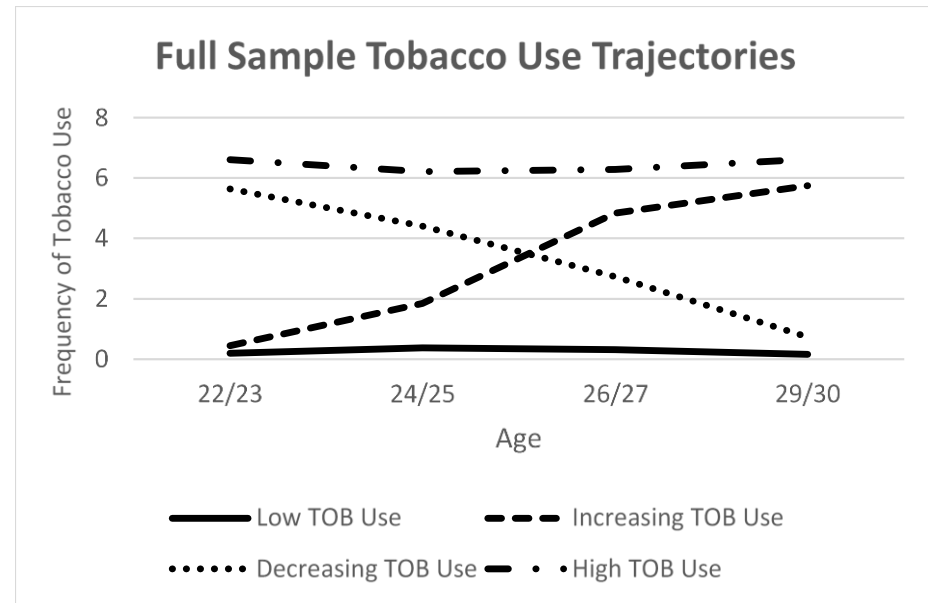


Figure 3. Full sample tobacco use trajectory classes during young adulthood.

Alcohol Use Trajectory Classes

Four-class quadratic solution emerged as the best fitting model

- 1) **Stable, low alcohol use class**
21.6% (n = 205) of the sample
- 2) **Increasing alcohol use class**
22.9% (n = 206) of the sample
- 3) **Decreasing alcohol use class**
17.3% (n = 140) of the sample
- 4) **Stable, high alcohol use class**
38.1% (n = 370) of the sample

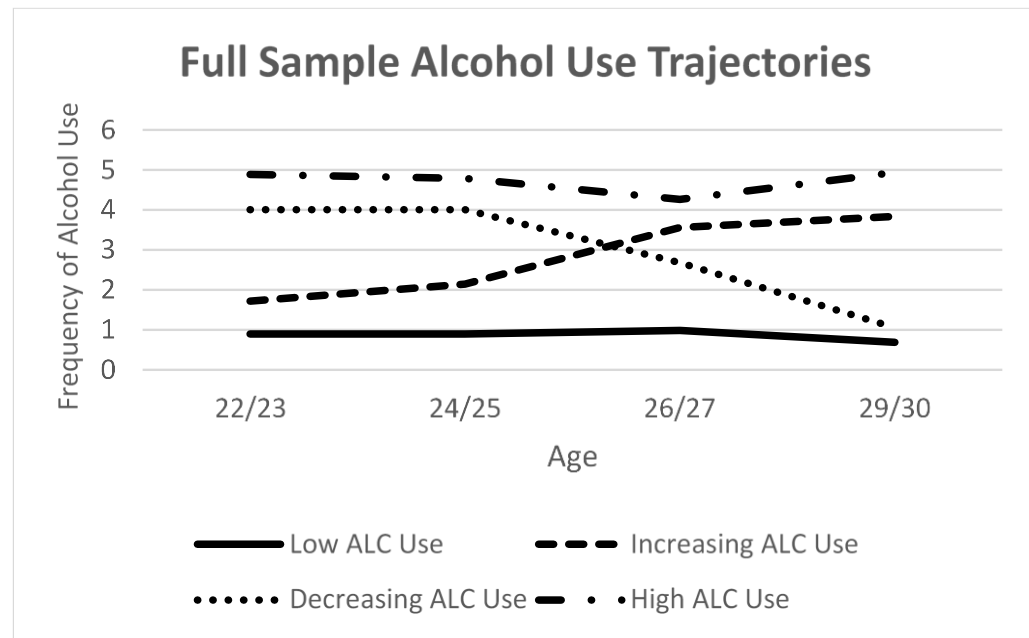


Figure 4. Full sample alcohol use trajectory classes during young adulthood.

Marijuana Use Trajectory Classes

Four-class quadratic solution emerged as the best fitting model

- 1) **Stable, low marijuana use class**
65% (n = 610) of the sample
- 2) **Increasing marijuana use class**
12% (n = 101) of the sample
- 3) **Decreasing marijuana use class**
9.1% (n = 81) of the sample
- 4) **Stable, high marijuana use class**
13.9% (n = 129) of the sample

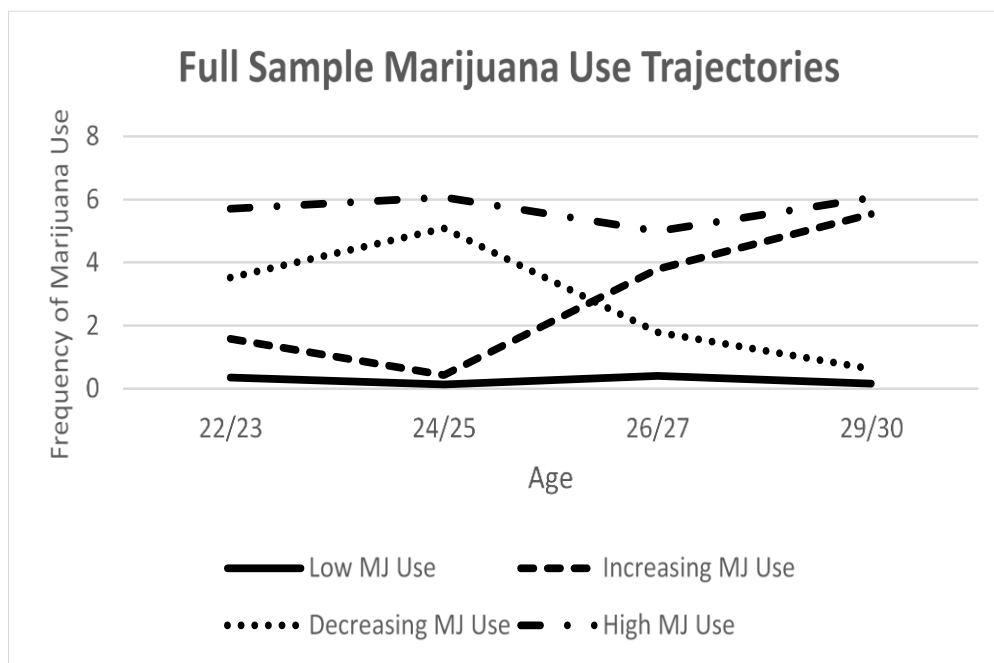


Figure 5. Full sample marijuana use trajectory classes during young adulthood.

Health Risk Behavior Trajectory Analyses

There are distinct developmental trajectories of health risk behaviors that extend across young adulthood

- First study to investigate varying trajectories of HRSB beyond age 24
 - Identified 3 distinct trajectories of HRSB
- Confirmed prior research which identified 4 to 6 different types of substance use trajectories ²¹⁻²⁶

These findings challenge prior research which has suggested that most individuals “mature out” of health risk behaviors after early adulthood
10,13,27-29,32

Young adulthood is a critical developmental time-period for studying and targeting health risk behaviors

Strengths

Original study design

- Large sample size (N = 998)
- Prospective design
 - Establish temporal precedence, minimize recall bias
- Extended period of follow-up
 - Nine measurements over the span of 20 years
- Ethnically diverse, community sample
 - Improves generalizability of the findings

Limitations

Measurement of health risk behaviors

- Primary measures were self-reports about behavior over the past three months
 - Participant recall might not be accurate and may be subject to informant biases
- **1 year between assessments**
 - Health risk behaviors in past three months might not be representative of health risk behaviors since last assessment
- **Measurement of substance use relied on only frequency of use at each time point**
 - Patterns of use may differ depending on whether frequency, quantity, or other combinations of variables are measured

Only examined trajectories of health risk behaviors from age 22-30

Future Directions

Expand our understanding of the developmental course of health risk behaviors across the full lifespan and with unique populations, such as Veterans

- Little is known about risk for engaging in health risk behaviors beyond early adulthood
 - E.g., mid-to-late life events that may convey risk for HRBs (divorce, losing a job, retirement)

Investigate characteristics and predictors of varying trajectories of health risk behaviors

More accurate and frequent ways to prospectively measure health risk behaviors and factors that influence health risk behaviors

- Wrist-worn alcohol biosensors³⁶⁻³⁸
- Ecological momentary assessment and direct observation³⁹

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