



The Woodlawn Study: 35 Years and Counting

CALDAR Summer Institute

August 13, 2008

**Margaret E. Ensminger, Elaine E. Doherty, Kate E. Fothergill
Kerry M. Green, Hee-Soon Juon, Judith A. Robertson**

Funded by NIDA

Woodlawn Collaborators

- Sheppard G. Kellam
- Jeannette Branch*
- Hee Soon Juon
- Joan McCord*
- Judy Robertson
- Kim Sydnor
- Janice Bowie
- Jill Jacobsen Ashman
- Gregory Breeden
- Kate Fothergill
- Kerry Green
- Roslyn Lee
- Sophia Lo
- Chyvette Williams
- Elaine Doherty

*deceased

Woodlawn Advisory Board

- Derian King, Convenor
- Rebecca Holbrook
- Earl Hollins
- Annie Jackson*
- Phyllis Jones
- John Marshall
- Fred Ross
- Jeannette Branch*, Consultant

*deceased

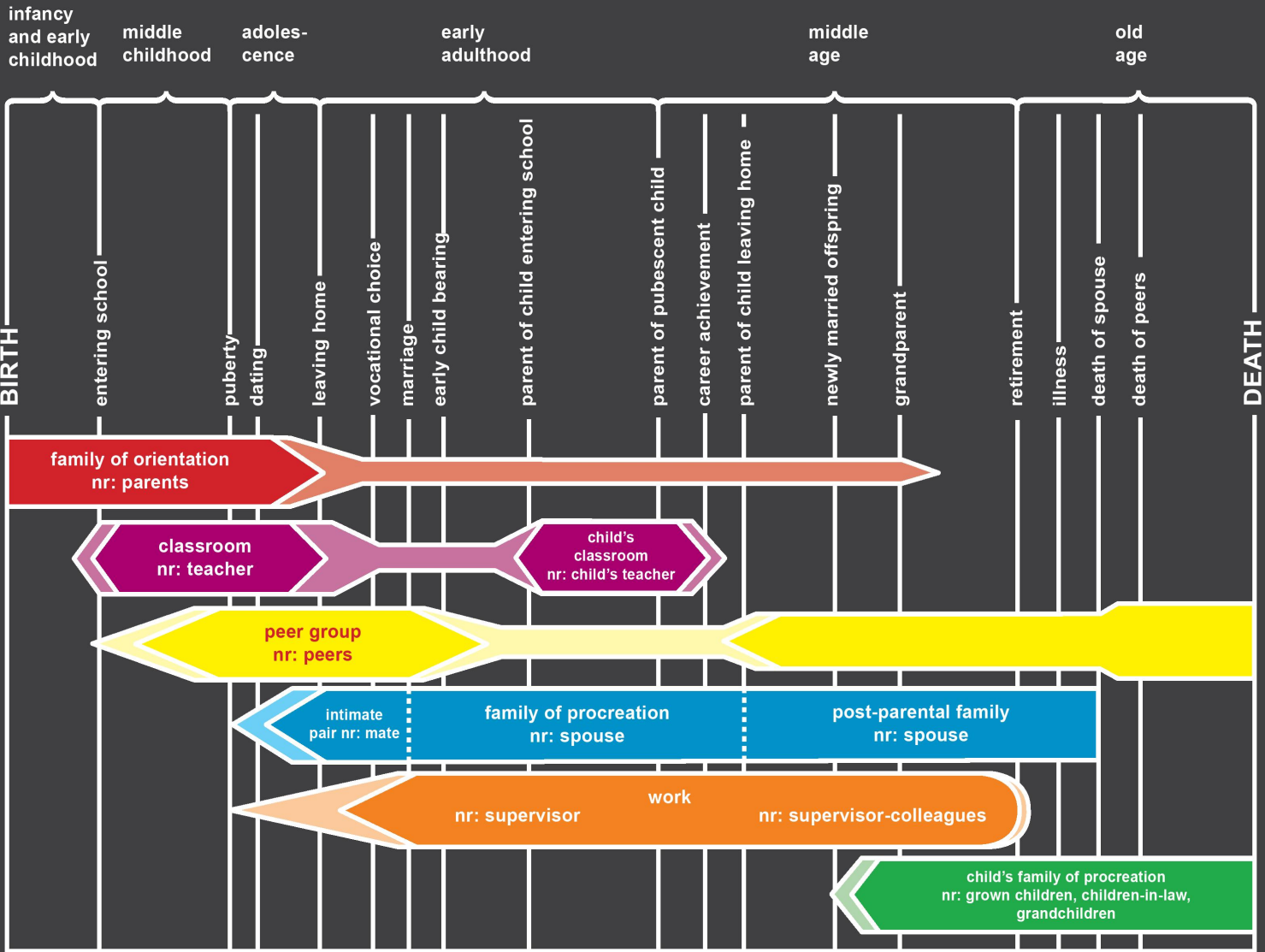
Aims of Presentation

- High risk community of First Graders—What influences later drug use as Adolescents and Adults
- Antecedents and consequences of drug use
- Comparisons of drug use of Woodlawn sample with national samples
- Prevention based on risk factors for drug use
- Advantages and disadvantages of Woodlawn longitudinal study design for the study of drug use

The Woodlawn Study

- Urban, low-income, African American community-based population
- Followed from age 6-42
- All first graders in Woodlawn public and private schools
- N=1242 (636 females, 606 males)
- Data from cohort members, mothers, teachers and official school, criminal and death records
- Conceptual Framework—Life Course Social Field

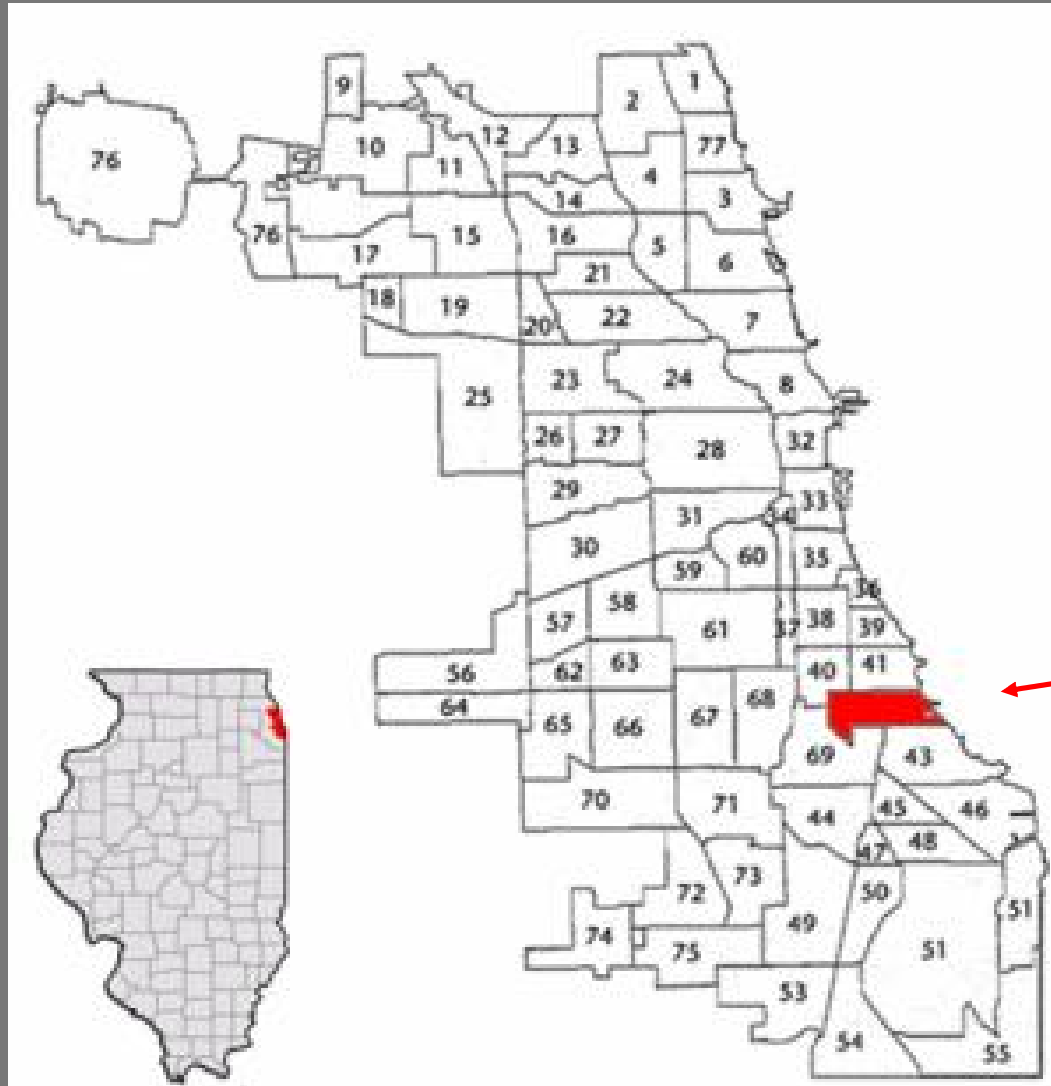
stages of life



LIFE COURSE-SOCIAL FIELD CONCEPT

Kellam, S., Branch, J., Agrawal, K., & Ensminger, M. (1976). *Mental Health and Going to School: The Woodlawn Program of Assessment, Early Intervention, and Evaluation*. Chicago, IL: The University of Chicago Press.

The Woodlawn Community

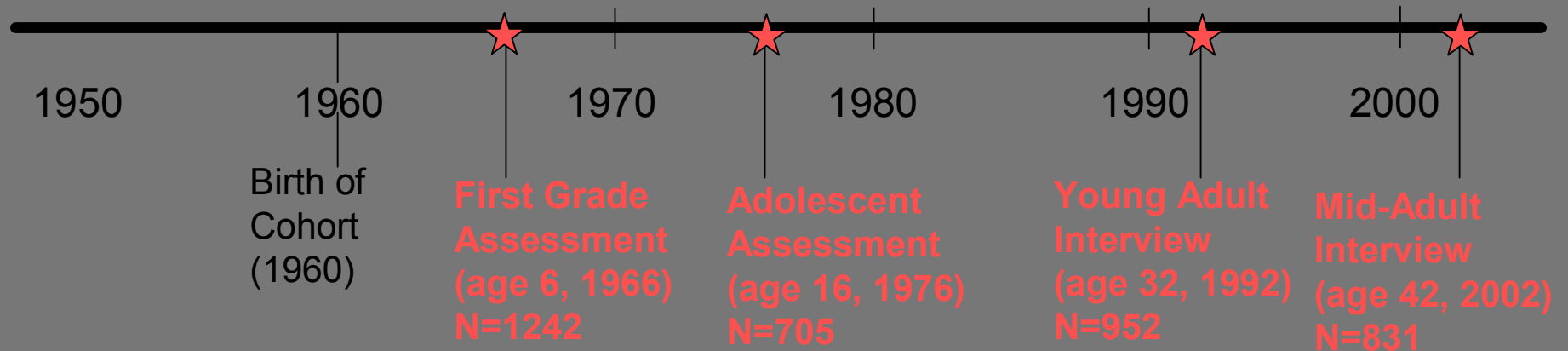


**Woodlawn
neighborhood**

Census Data (1970): Woodlawn and Chicago

	Woodlawn	Chicago
African American	96%	33%
Families (with children <18) below poverty	32%	15%
Families (with children <18) with female heads	46%	21%
Vacant housing units	15%	6%
Median schooling	10 years	11 years

Woodlawn Dataset



Events for Woodlawn Cohort (1)

- | <u>Years</u> | <u>Age</u> | <u>Events Affecting Cohort</u> |
|--------------|------------|---|
| – 1950s | - | – Migration from South to Chicago and Woodlawn |
| – 1960 | 0 | – Birth of cohort |
| – 1960s | 0+ | – Civil rights movement |
| – 1966 | 6 | – First grade |
| – 1968 | 8 | – Assassination of Martin Luther King |
| – 1970s | 10+ | – Woodlawn Gang Activity--
Blackstone Rangers, El Rukins |

Events for Woodlawn Cohort (2)

<u>Years</u>	<u>Age</u>	<u>Events Affecting Cohort</u>
– 1978	18	– HS graduation (on time)
– 1978	18	– Year of highest student drug use according to Monitoring the Future
– 1980s	20+	– High Chicago murder rate
– 1982	22	– High unemployment
– 1983	24	– Election--Mayor Harold Washington
– 1986	26	– HIV infection recognized
– 1990s	30+	– Crack/cocaine use increases
– 1996	36	– Welfare reform
– 2008	48	– Barak Obama candidate for president

Antecedents of Drug Use

- Adolescence
- Young Adulthood
- Mid Adulthood

Social Fields

- First Grade:
 - Success at Classroom Tasks
 - Aggressive Behavior
 - Shy and Withdrawn Behavior
 - Family
 - Structure
 - Interaction Patterns
 - Social Resources
 - Poverty
 - Mother's Education

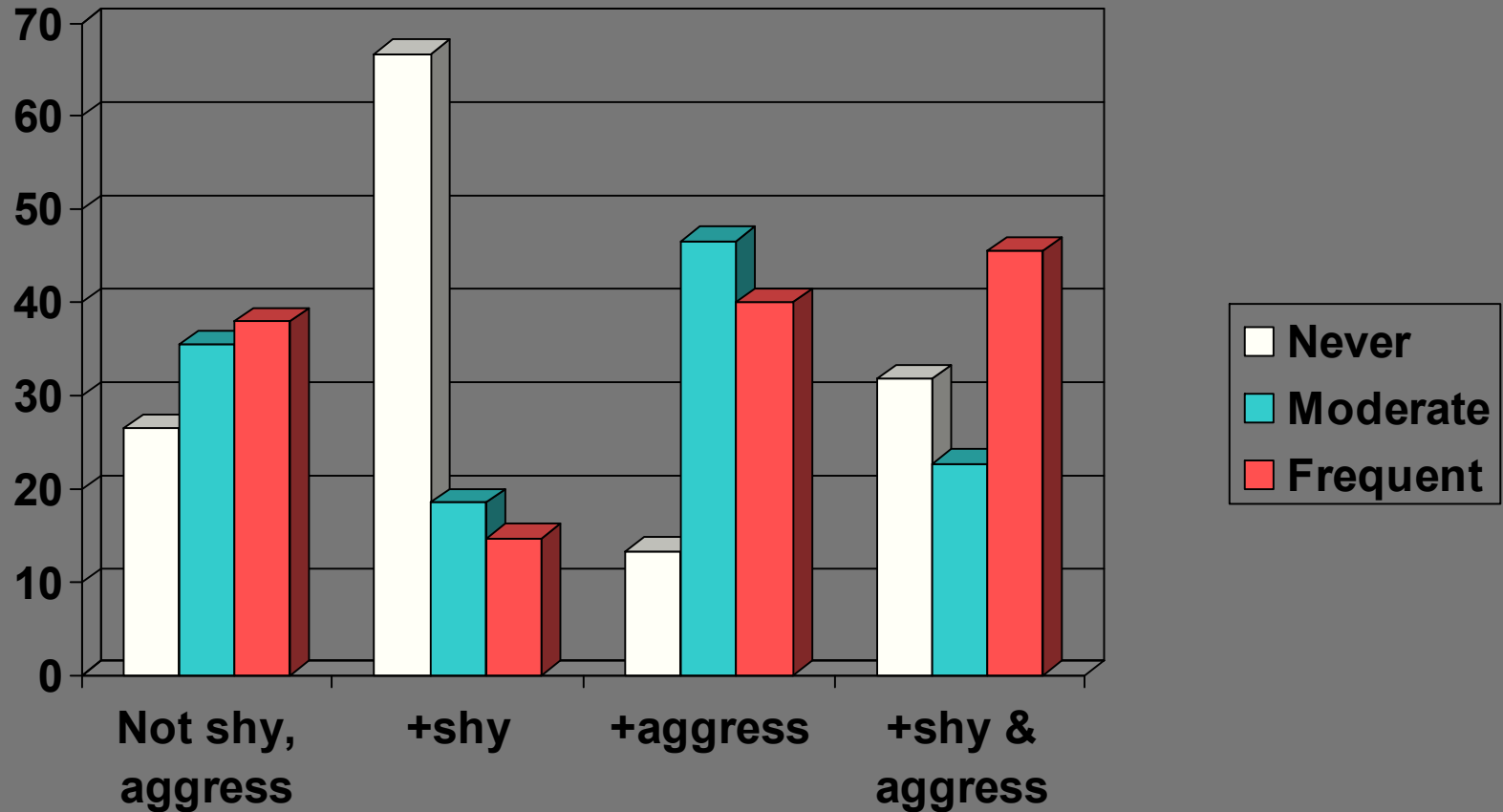
Social Adaptation in 1st Grade

	Males	Females
Not Shy or Aggressive	45.0%	58.8%
Shy Only	16.2%	16.4%
Aggressive Only	19.9%	14.4%
Shy and Aggressive	18.9%	10.4%

N=1242, Chi-Square=32.1, 3 df, $p<.001$

Adolescence

First Grade SAS and Adolescent Marijuana Use Ever: Males

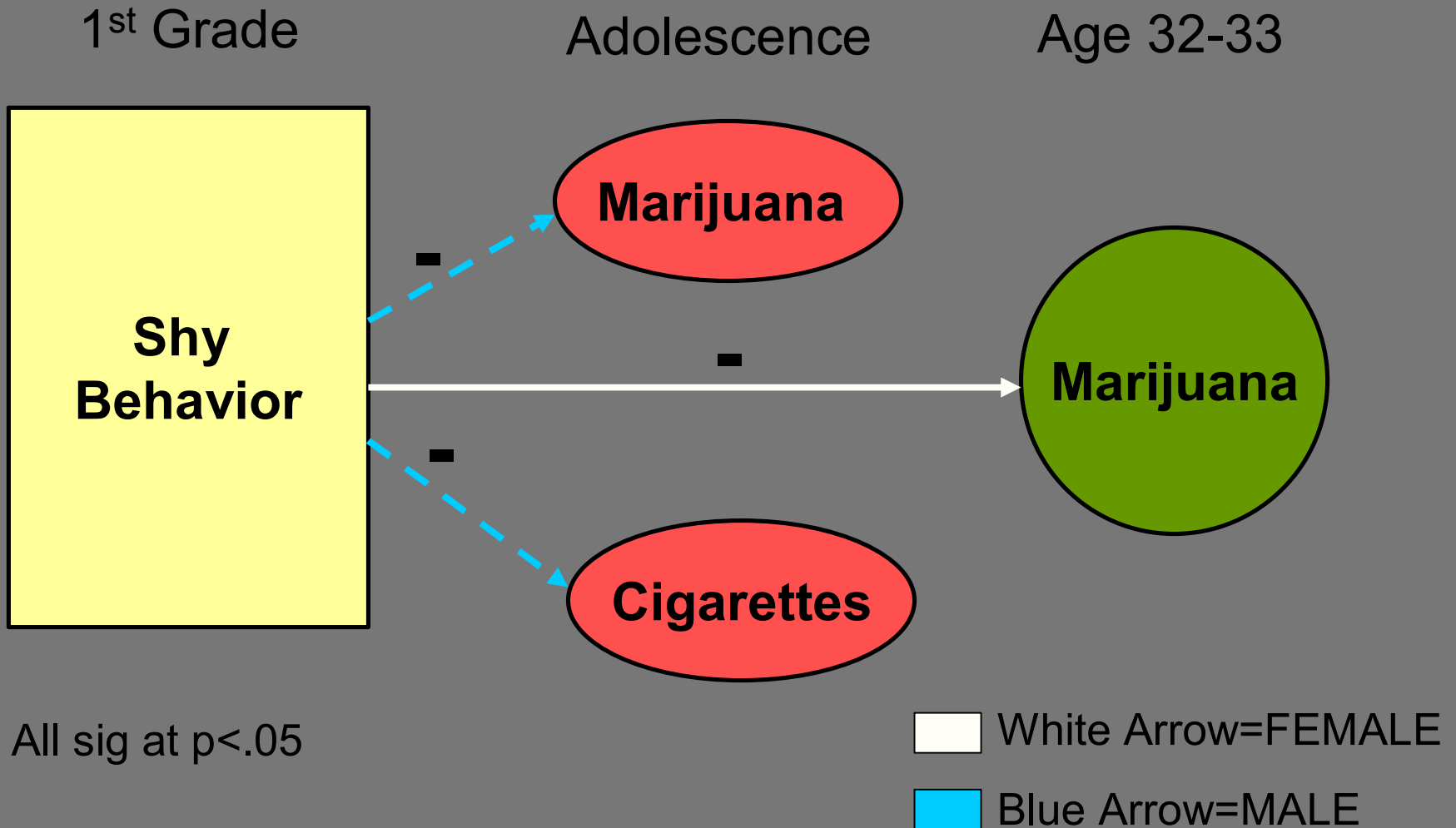


$X^2=27.0$, 6 df, $p<.001$

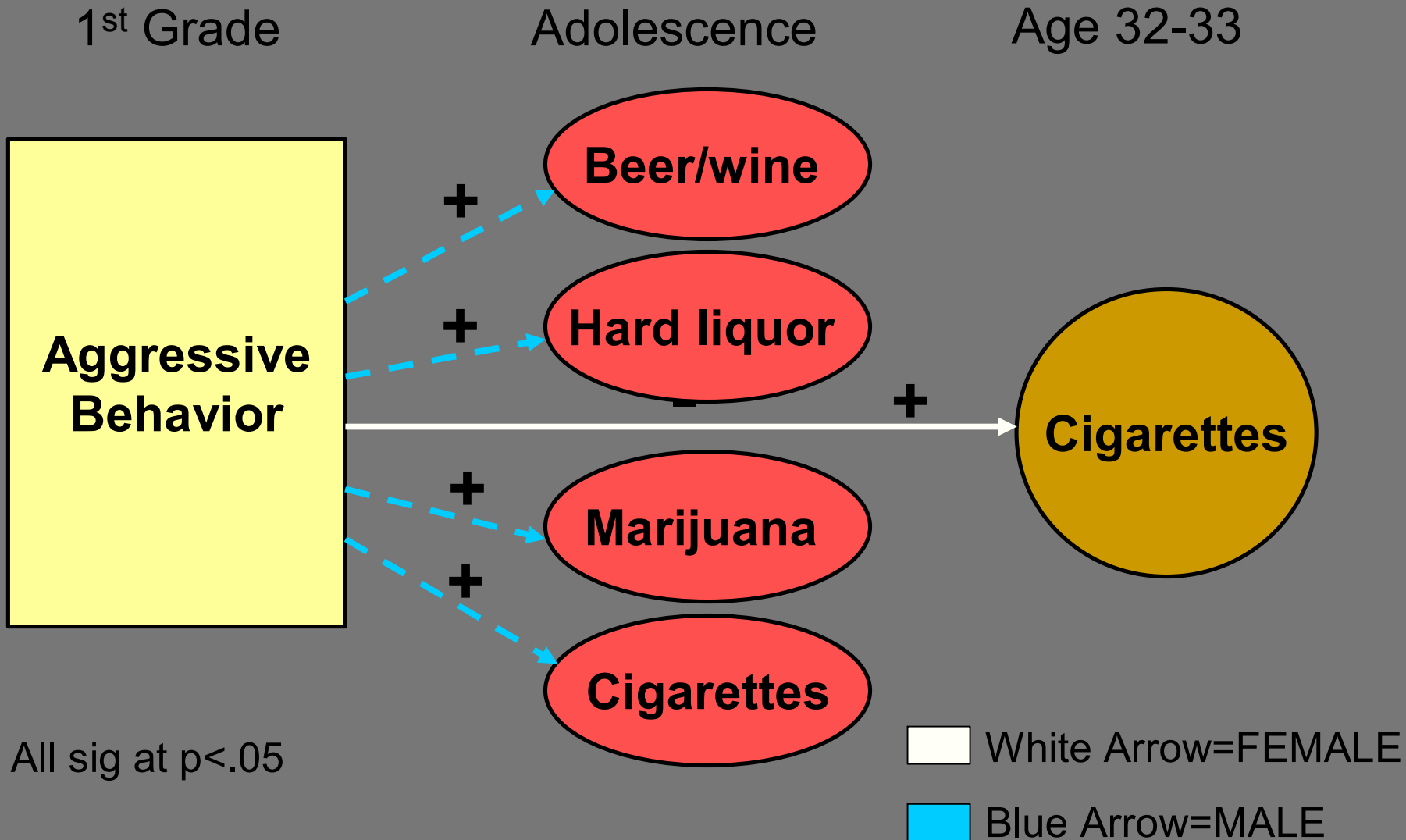
Description of Woodlawn Respondents at Early and Mid Adult Interviews

	<u>Age 32-33</u>	<u>Age 42-43</u>
N	952	833
Marital Status:		
Married	36%	42%
Never married	44%	31%
Children in HH	61%	56%
Completed HS	80%	82%
Employed	63%	74%
Poverty Level:		
<100%	39%	26%
100-200%	19%	11%
>200%	43%	53%
Incarcerated	3.8%	2.2%

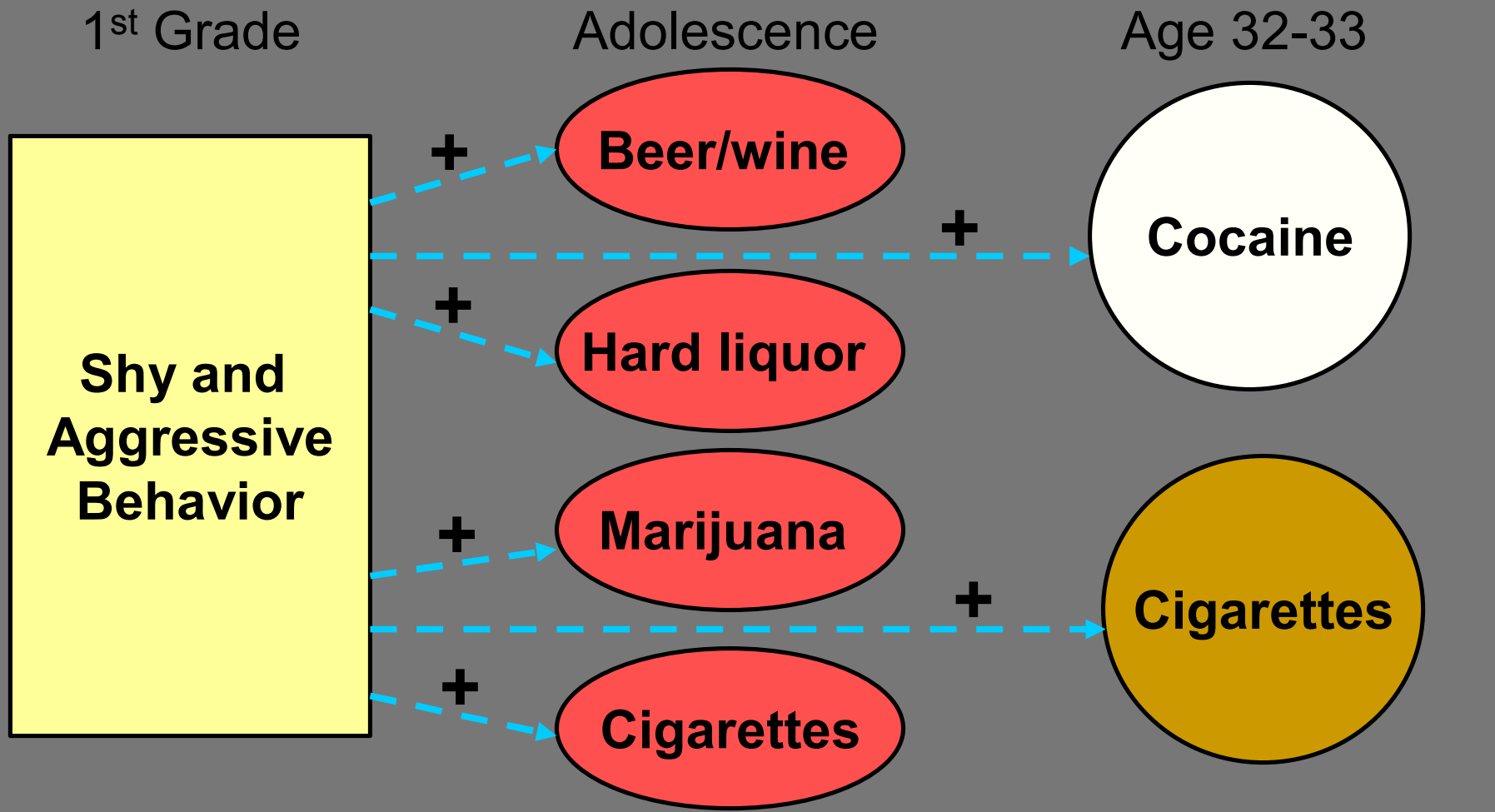
Shy Behavior in 1st Grade and Substance Use



Aggressive Behavior in 1st Grade and Substance Use



Shy and Aggressive Behavior in 1st Grade and Substance Use

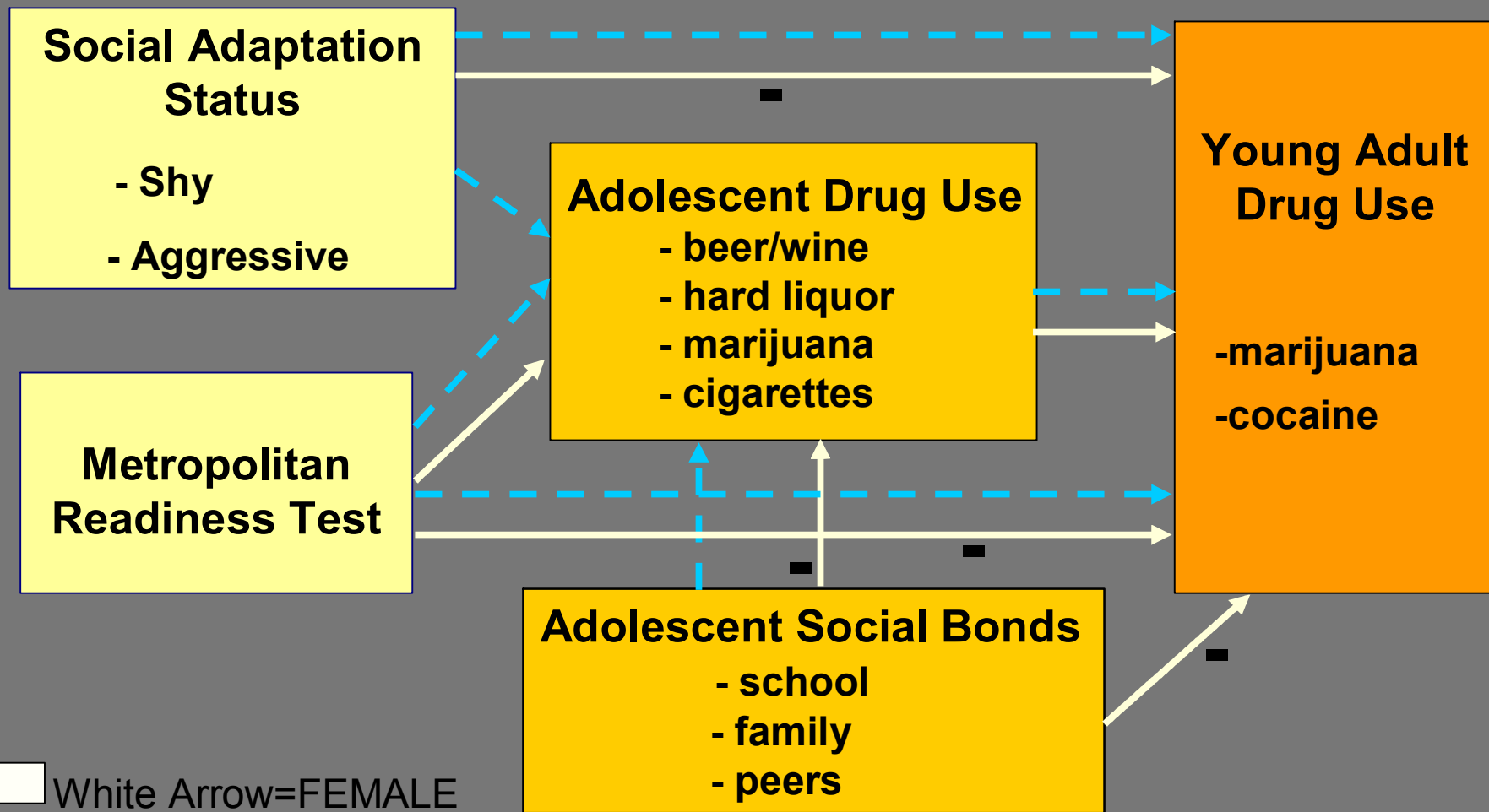


Risk and Protective Factors: Substance Use by Gender

1st Grade

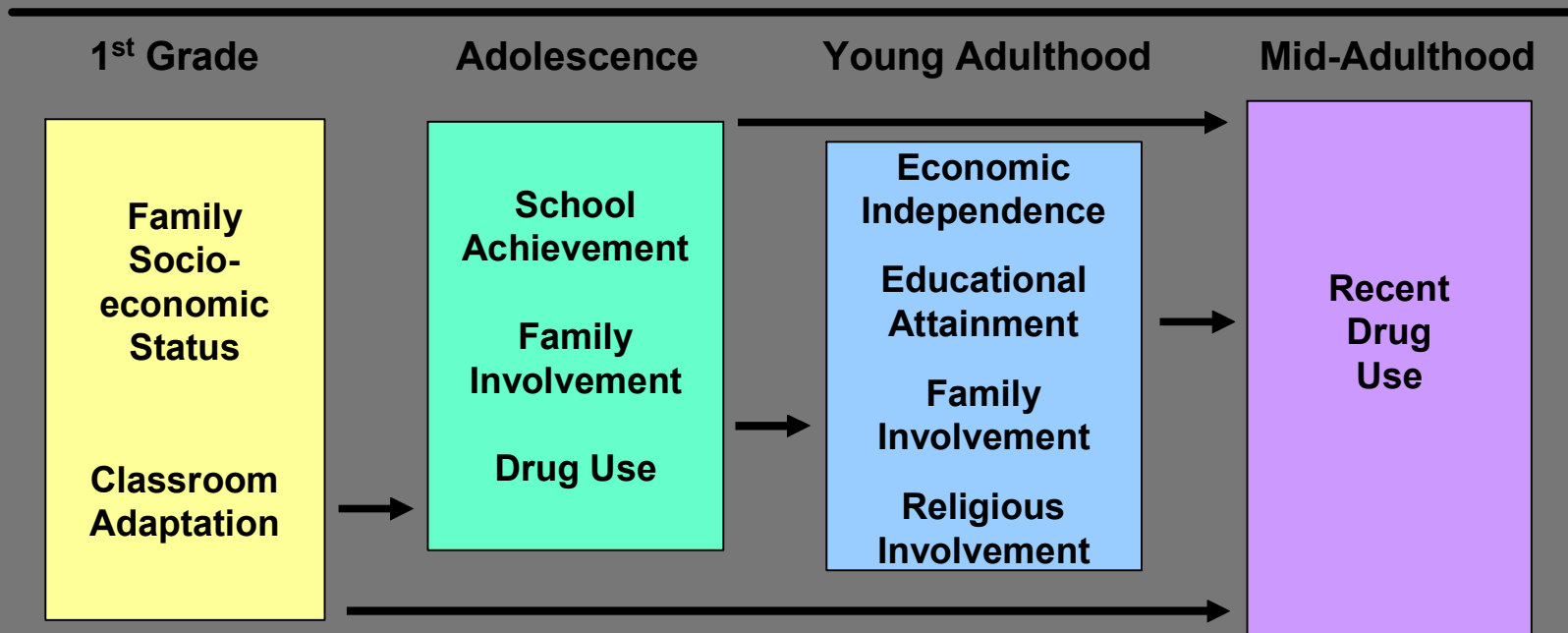
Adolescence

Age 32=33



Childhood and Adolescent Antecedents of Marijuana and Cocaine Use in Mid-Adulthood: A Longitudinal Study

Conceptual Framework



Fothergill, KE et al., Pathways to Adult Marijuana and Cocaine Use: A Prospective Study of African Americans from Age 6 to 42. *Journal of Health and Social Behavior*, in press.

Childhood and Adolescent Antecedents of Marijuana and Cocaine Use in Mid-Adulthood: A Longitudinal Study

Significant Predictors of Cocaine and/or Marijuana Use In Mid-Adulthood

Direct Effects

Indirect Effects

Marijuana: *1st Grade Shyness (p<.10)*
Adolescent Drug Use
Church Attendance - Young Adult
Income - Young Adult

1st Grade Aggression
Adol School
Achieve

Cocaine: *1st Grade Shyness*
Adolescent Drug Use
Church Attendance - Young Adult
Income - Young Adult

1st Grade Aggression

All direct effects are significant at $p<.05$ except for 1st Grade Shyness and marijuana use ($p<.10$).

Fothergill, KE et al., Pathways to Adult Marijuana and Cocaine Use: A Prospective Study of African Americans from Age 6 to 42. *Journal of Health and Social Behavior*, in press.

Risk and Protective Factors (1)

- Aggression—first grade teacher ratings
 - Aggressive behavior risk for drug use in adolescence for males
 - Aggressive behavior risk for cigarette use in young adulthood for males
 - Aggressive behavior indirect effects for drug use in mid-adulthood

Risk and Protective Factors (2)

- Shy Behavior—first grade teacher ratings
 - Shy behavior is protective for adolescent drug use for males
 - Shy behavior is protective for marijuana use in young adulthood for females
 - Shy behavior is protective for drug use in mid adulthood

Risk and Protective Factors (3)

- Combined Shy and Aggressive Behavior—
first grade teacher ratings
 - Shy and aggressive behavior risk for drug use in adolescence for males (all drugs)
 - Shy and aggressive behavior risk for cigarette and cocaine use in young adulthood for males

Risk and Protective Factors (4)

- Early Readiness (standardized MRT scores in first grade)
 - Risk for Adolescent drug use for males—those more ready were more likely to be using drugs
 - By young adulthood—those who were ready for school early were more likely to have ceased drug use than those less ready

Risk and Protective Factors (5)

- Social Bonds
 - Bonds to school and parental supervision were protective for adolescent drug use for both males and females.
 - Bonds to school and parental supervision in adolescence were protective for young adult drug use for females.

Risk and Protective Factors

- Church attendance in young adulthood was protective for drug use in mid adulthood (even when controlling for church attendance in mid adulthood)

Relationships to Other Studies (1)

- Risk and protective factors very similar to those found in other studies with varying populations
 - Early aggressive behavior a very commonly found risk factor
 - Those who have examined the combination of shy and aggressive behavior also find it a risk
 - Shy behavior has not been reported so frequently— not sure if it is because it hasn't been examined or hasn't been found

Relationships to Other Studies (2)

- Social bonds
 - School bonds and parental supervision very commonly found protective factors in other studies—most studies have not examined these past early adulthood
- Early academic achievement
 - Shedler and Block found similar relationships with early academic achievement and adolescent drug use—more achieving children were more likely to use drugs as adolescents—may be a cohort phenomenon

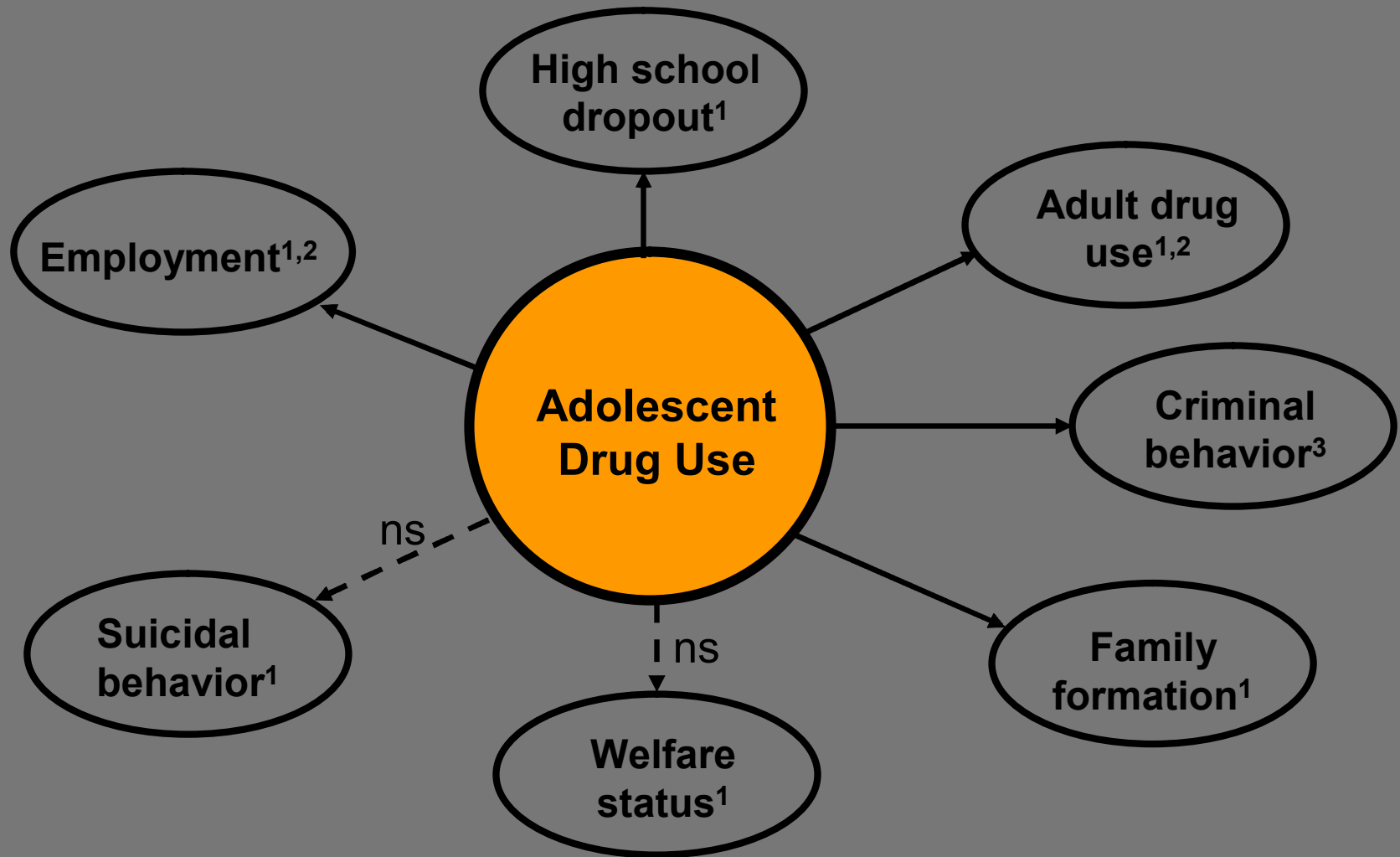
Consequences of Drug Use

- Use propensity scores as a way of understanding consequences of drug use
- Results come from:
- Green, KM, Ensminger, ME, Stuart, E., Fothergill, K. 2008. Adult Physical and Psychological Health Consequences of Adolescent Substance Use: A Longitudinal Study of a Community-Based Population of Urban African Americans. Presentation at Society for Research on Adolescence, Chicago, IL.

Propensity Score Matching

- Statistical technique to handle confounding in observational data when attempting to draw causal inferences
- Replicates random assignment with respect to observed covariates
- Less sensitive to modeling assumptions than multivariate regression

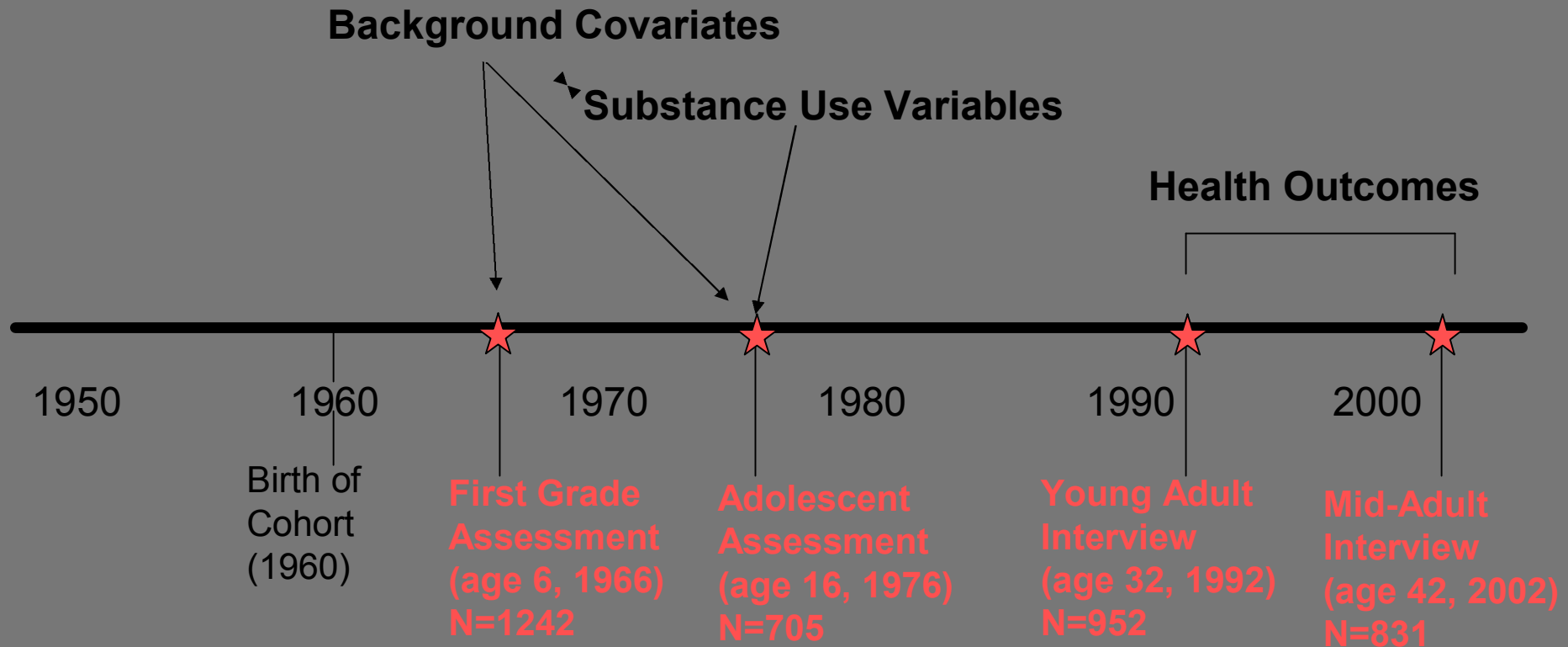
Consequences at Age 32 of Adolescent Drug Use



Effect of Adolescent Substance use On Adult Health

- Does adolescent **marijuana/alcohol use** affect adult physical and psychological health **once predisposing factors are taken into account?**
- Are the effects of marijuana and alcohol use the same?
- Are there **gender differences** in consequences?

Woodlawn Datasets



Adult Health Outcomes

- Drug and alcohol use disorders
- HIV risk
- Smoking
- Major depressive disorder
- Poor or fair self-rated physical health
- Mortality

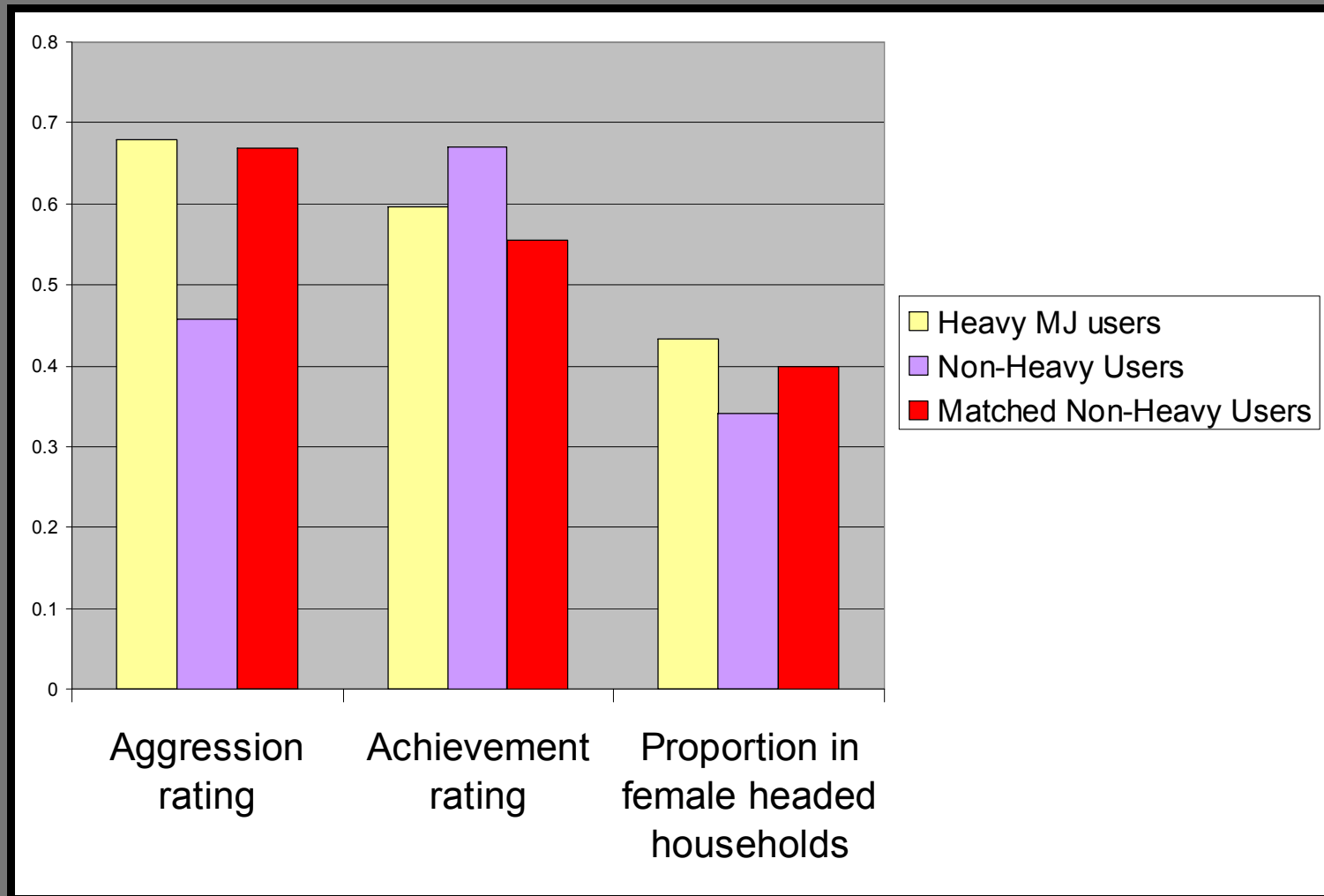
Substance Use Variables

- Heavy marijuana use (20+ times by age 16)
 - Represents 26% of the population (Male: 36%; Female: 17%)
- Heavy alcohol use (20+ times by age 16)
 - Represents 25% of the population (Male: 36%; Female: 16%)

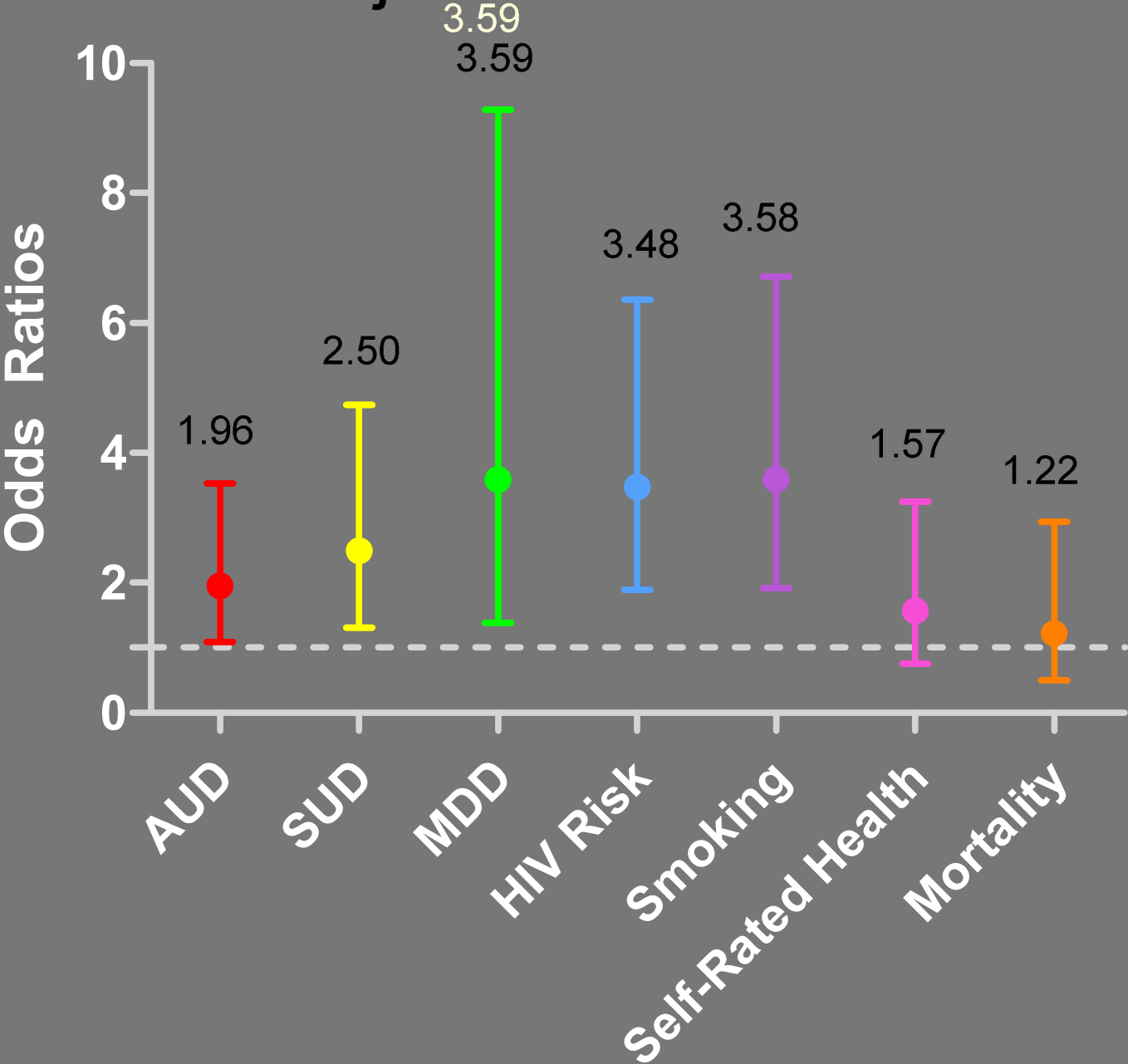
Matching Variables

- **Early health:** low birth weight, mothers' and adolescents' ratings of health, hospitalization for injuries and illnesses
- **Family history** of physical and mental health problems and mother's history of alcohol/drug problems
- **Family functioning:** punishment and affection
- **SES:** Mother's years of education, number of children in the home, residential mobility, poverty status, female-headed household
- **First grade teacher's rating** of aggression, shyness, restlessness, immaturity, and achievement
- **Sex**

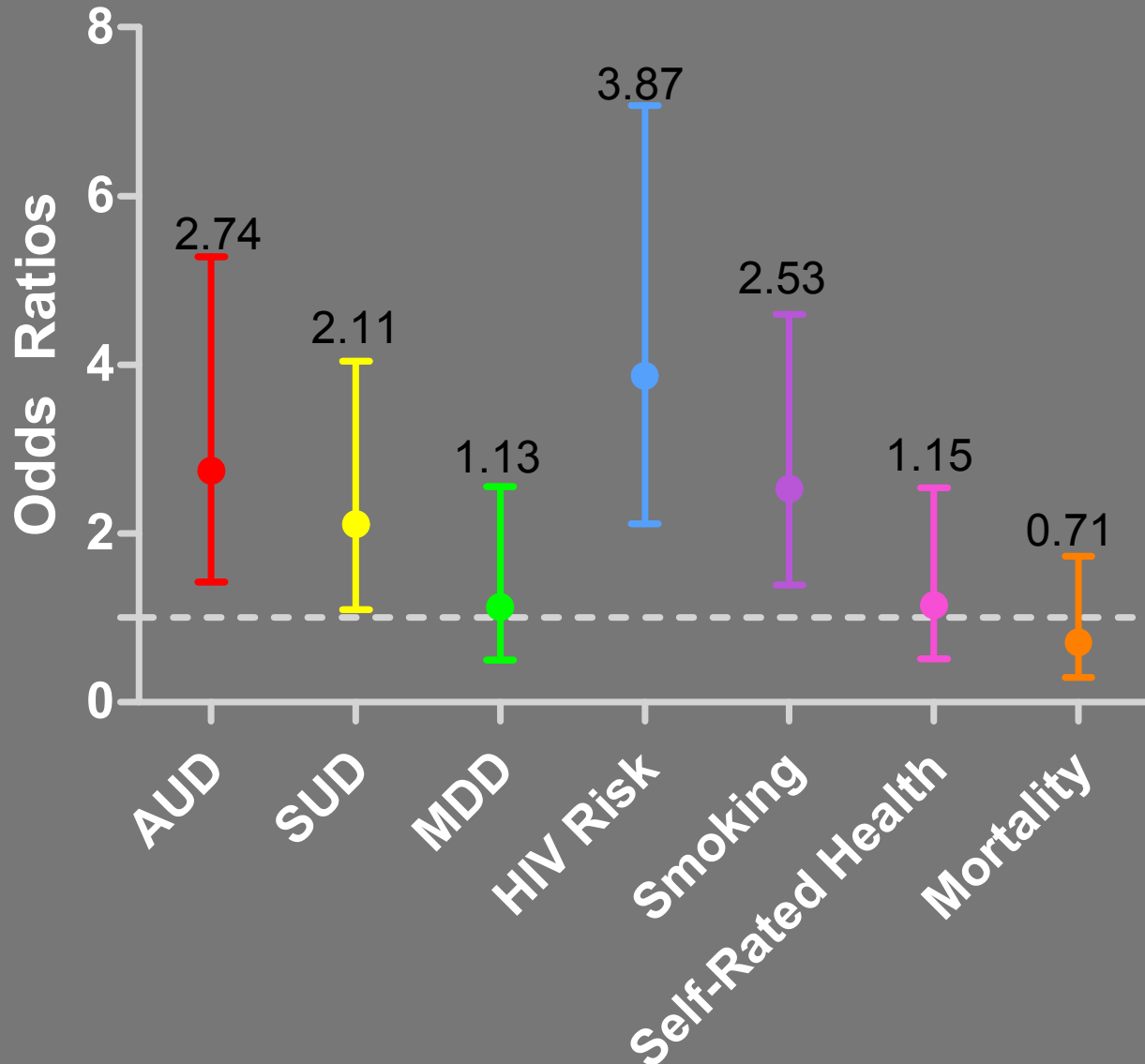
Covariate Difference Before & After Matching



Adolescent Marijuana Use and Adult Health



Adolescent Alcohol Use and Adult Health



Gender Differences in Results

- No significant differences
- While gender is related to the prevalence of adolescent substance use and the prevalence of outcomes, it is not related to the presence or strength of the association between them.

Conclusions

- Adolescent substance use is related to multiple health behaviors and outcomes in adulthood
- Few differences between effects of adolescent marijuana and alcohol use
 - Notable exception is Adol MJ Use → Adult MDD

Considerations

- Attrition
 - Are the heavy substance users with the worst consequences most likely to drop out?
 - Are findings underestimated?
- Validity of self-reported substance use during adolescence
- To whom do the results generalize?

Comparison of Woodlawn Drug Use with Other Populations

- Special population—how does its drug use compare with others of the same age?
- Crossover effect?

The Population As Adolescents: Lifetime Substance Use Comparison

	Woodlawn 8-10 th Graders	Monitoring the Future 12 th Graders 1978*
Total	705	17,800
Alcohol	79.7%	93.1%
Marijuana	61.2%	59.2%
Cocaine	7.5%	12.9%
Smoking	82.2%	75.3%

*Most of Woodlawn cohort would have been in 12th grade in 1978.

Current Drug Use As Adolescents: Comparison With MTF

	Woodlawn (past 2 months)	Monitoring the Future (past 30 days) 1978*	
		White	African Am
Marijuana	53%	50%	40%
Alcohol	74%	75%	49%
Cocaine	6%	8%	5%
Heroin	1.6%	0.8%	0.6%

- Most of Woodlawn cohort would have been in 12th grade in 1978.
- Heroin for MTF is past year

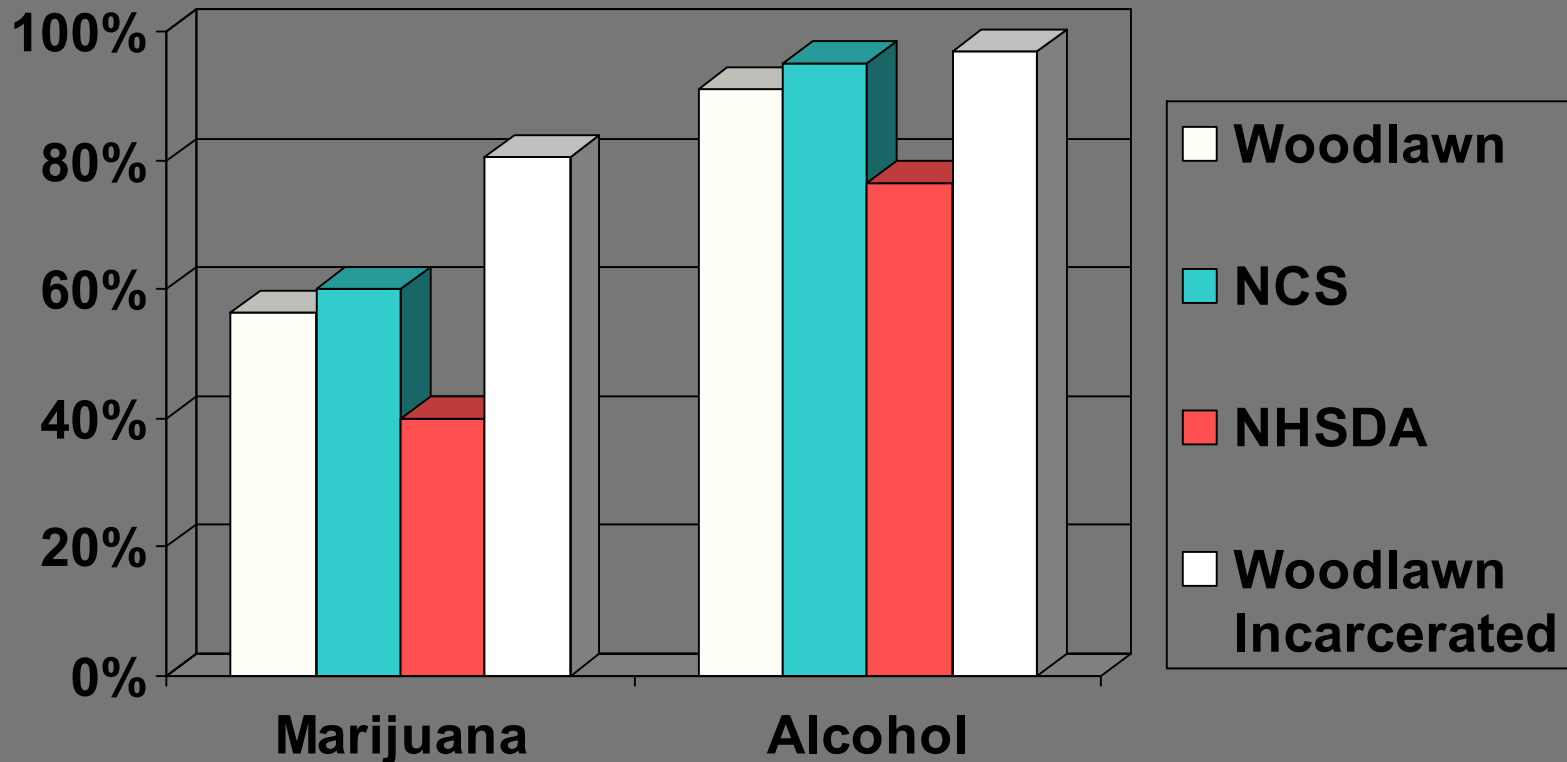
Comments: Woodlawn and MTF (1)

- Data not totally comparable
 - MTF same cohort but in 12th grade, Woodlawn in 9th-10th grade
 - Current use—MTF past 30 days, Woodlawn past 2 months

Comments: Woodlawn and MTF (2)

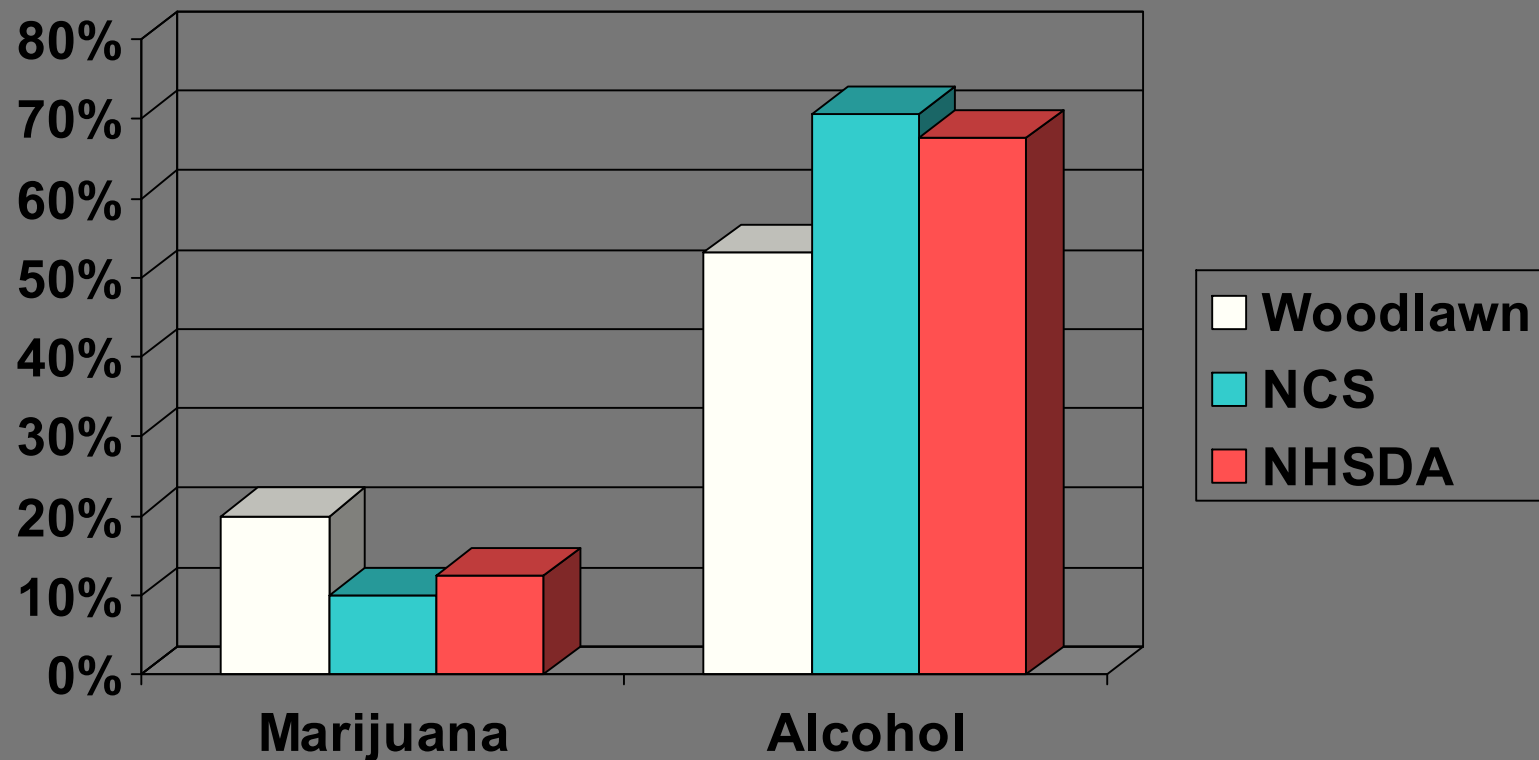
- Lifetime
 - Lifetime alcohol—less for Woodlawn
 - Lifetime marijuana—similar
 - Lifetime smoking—more for Woodlawn
- Current Use
 - Alcohol and marijuana similar in rates
 - Woodlawn frequencies closer to MTF Whites than to MTF African Americans
 - Cocaine and heroin too infrequent for comparisons

Comparison of Lifetime Drug Use Age 30-34



NCS=National Comorbidity Survey (1990-92) , age 30-34, N=1050
NHSDA=National Household Survey on Drug Abuse (1992), age 30-34
African American, N=286

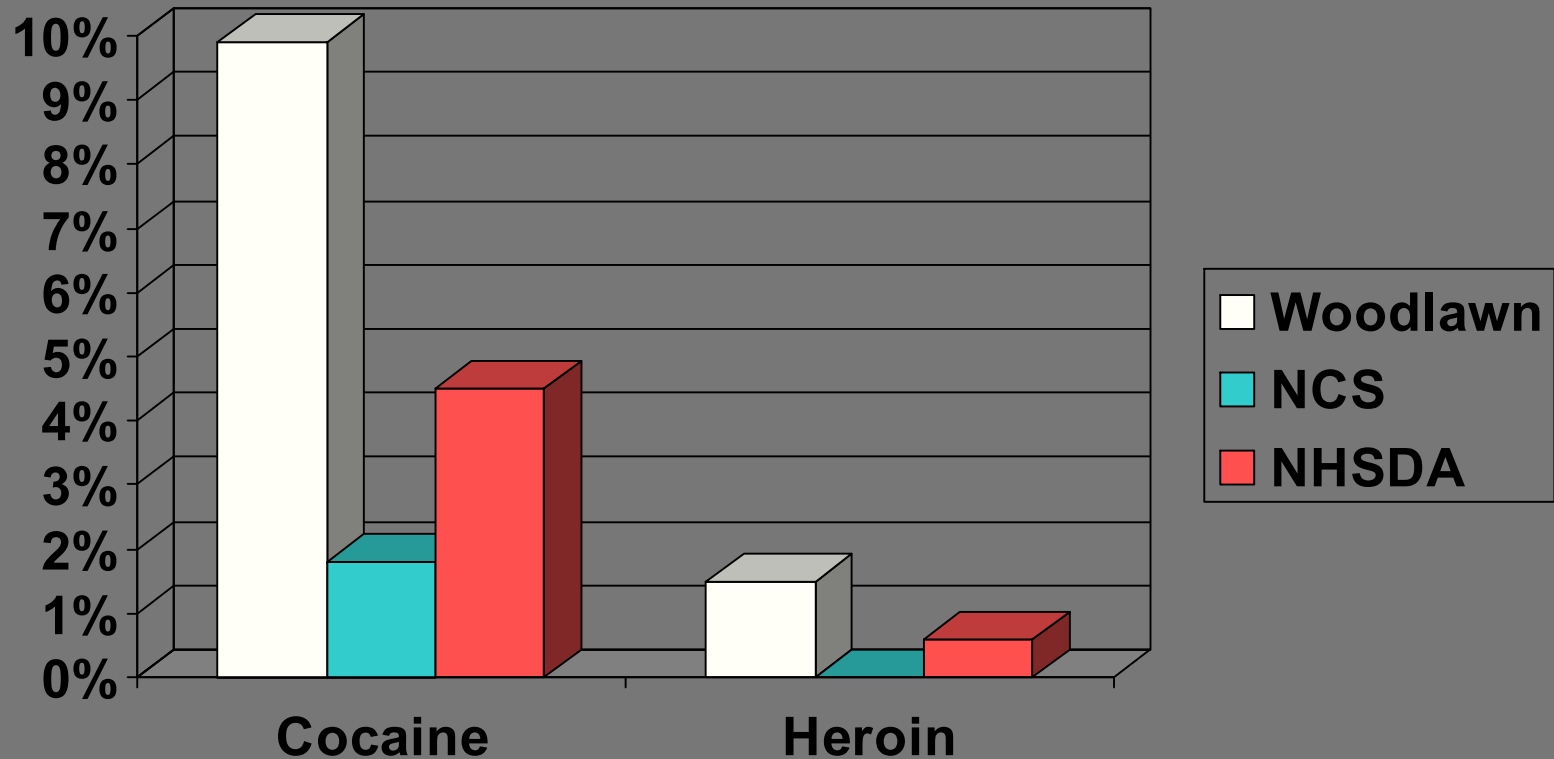
Comparison of Past Year Drug Use Age 30-34



NCS=National Comorbidity Survey (1990-92) , age 30-34

**NHSDA=National Household Survey on Drug Abuse (1992), age 30-34
African American**

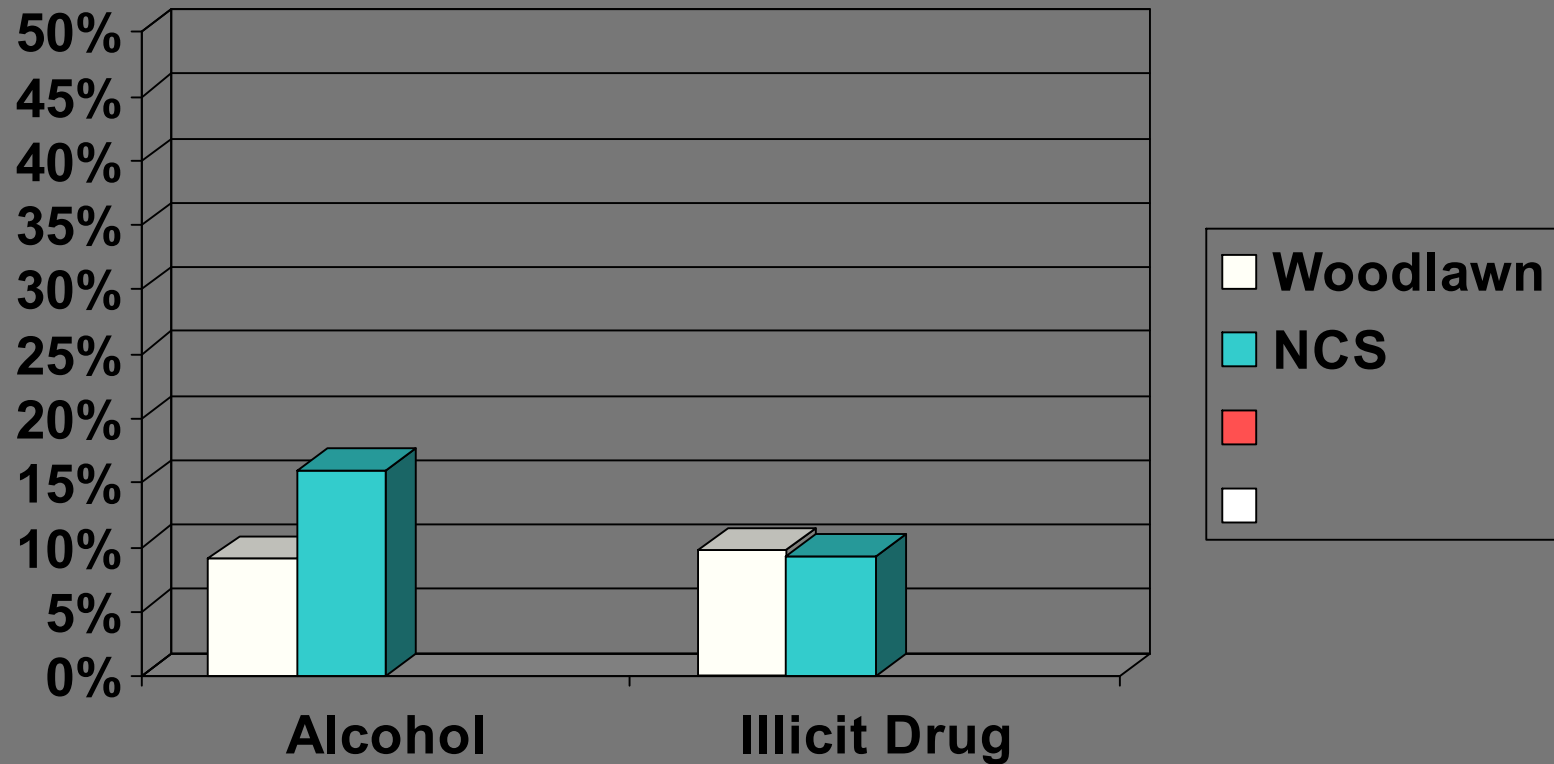
Comparison of Past Year Drug Use Age 34



NCS=National Comorbidity Survey (1990-92) , age 30-34

**NHSDA=National Household Survey on Drug Abuse (1992), age 30- 34
African American**

Comparison of Lifetime Alcohol and Drug Dependence, Age 30-34



NCS=National Comorbidity Survey (1990-92) , age 30-34

**NHSDA=National Household Survey on Drug Abuse (1992), age 30- 34
African American**

Woodlawn Incarcerated N=36

Comments: Woodlawn, NCS and NHSDA Age 32 (1)

- Comparability High
 - Woodlawn drug questions modeled on NCS
 - All three surveys occurred around the same time (1990-1992)
 - Data shown is for very similar age cohorts—ages 30-34
 - NHSDA data is based on African Americans from 6 central cities

Comments: Woodlawn, NCS & NHSDA

Age 32 (2)

- Lifetime prevalence—
 - Woodlawn and NCS rates similar for alcohol, marijuana, and cocaine
 - NHSDA African American sample—lower on alcohol, marijuana and cocaine
 - Woodlawn higher on heroin than both
 - Woodlawn incarcerated rates much higher on all drugs
- Current Use (Past Year)
 - Alcohol—Woodlawn lower than other two
 - Marijuana, Cocaine, Heroin—Woodlawn higher –Crossover effect??
- Dependence—
 - Woodlawn and NCS similar on drug dependence
 - Woodlawn lower on alcohol dependence

Findings

- **Lifetime** prevalence of drugs for Woodlawn similar to national study
- **Current** prevalence of illegal drugs higher for Woodlawn compared to national study—consistent with crossover effect

Early Risk in Prevention Research

- Over the last four decades much has been learned about early risk factors and paths leading to drug abuse, and other behavioral, mental health, and school problems. Many findings similar to what Woodlawn findings have been.
- Aggressive, disruptive behavior as early as 1st grade has been repeatedly found a risk factor for later drug and alcohol abuse and disorders, delinquency, violence, tobacco use, high risk sex, and other high risk behaviors.

- Kellam and colleagues designed an intervention program in Baltimore to test whether a classroom intervention could change aggressive behavior in first grade and if it did would it impact later outcomes
- Partially based on Woodlawn findings.

Kellam, S. G. et al. 2008. Effects of a universal classroom behavior management program in first and second grades on young adult behavioral psychiatric and social outcomes. *Drug and Alcohol Dependence*, 95, Supplement 1, June 2008.

Goals of the Good Behavior Game (GBG)

- Provide teachers a classroom-wide method to socialize children into the role of student
- Reduce classroom aggressive, disruptive behavior among children to enhance classroom teaching and learning
- Prevent later drug abuse, delinquency, school failure and other problem outcomes

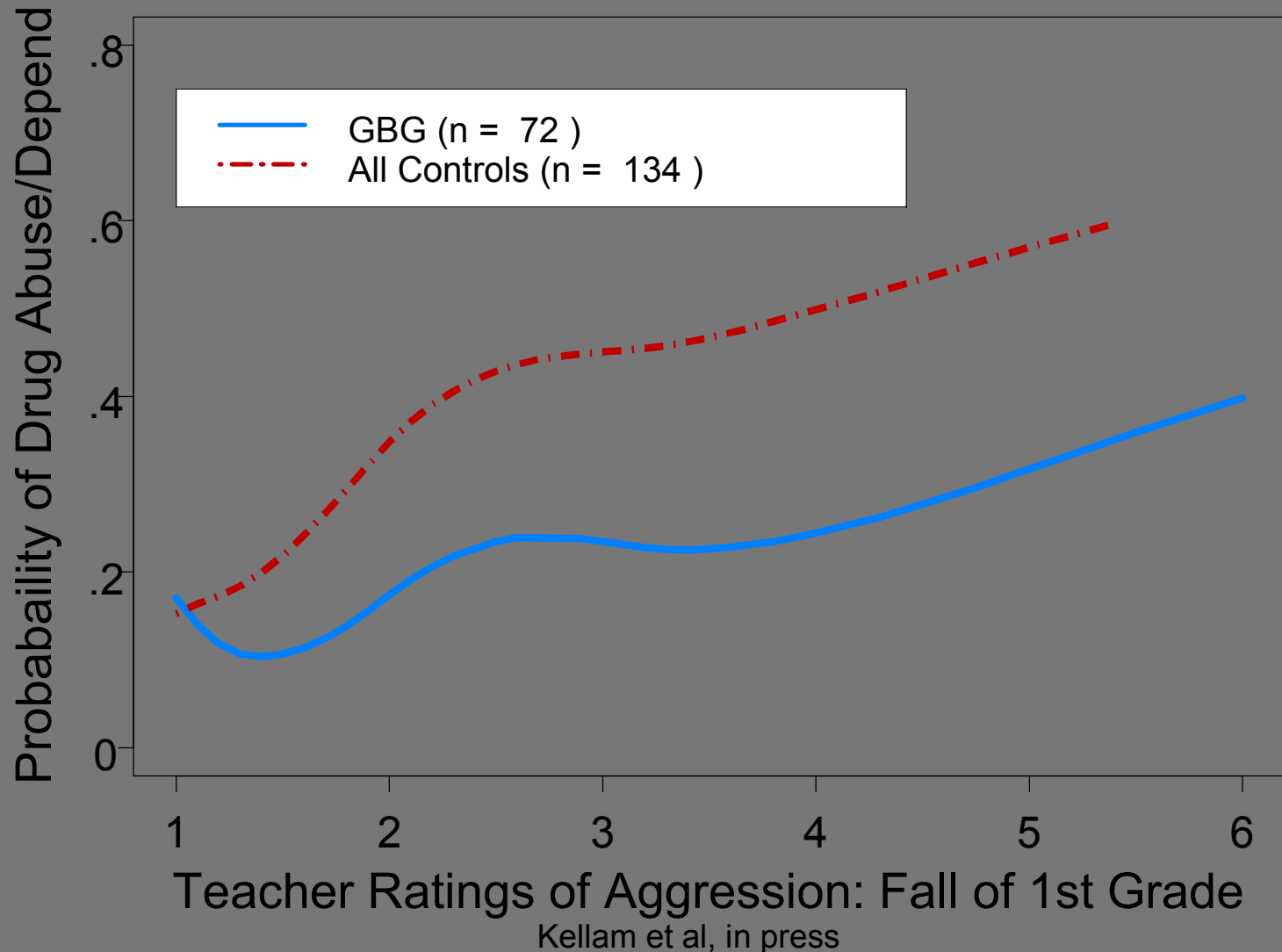
Design of 1st Generation Baltimore Trial: Two Separate Classroom Interventions Aimed at Aggressive Behavior and Poor Achievement

- 41 1st grade classrooms in 19 schools
- **Across schools:** 3 or 4 schools in each of 5 low to low/mid SES urban areas were matched. 70% African American. Schools in each set were randomly assigned either to the standard program (control); or to an enhanced curriculum (Mastery Learning--ML); or to a classroom behavior management program (Good Behavior Game--GBG).
- **Within intervention schools:** Children were balanced across all 1st grade classrooms. 1st grade classrooms and teachers were randomly assigned to standard program classrooms or to intervention classrooms.

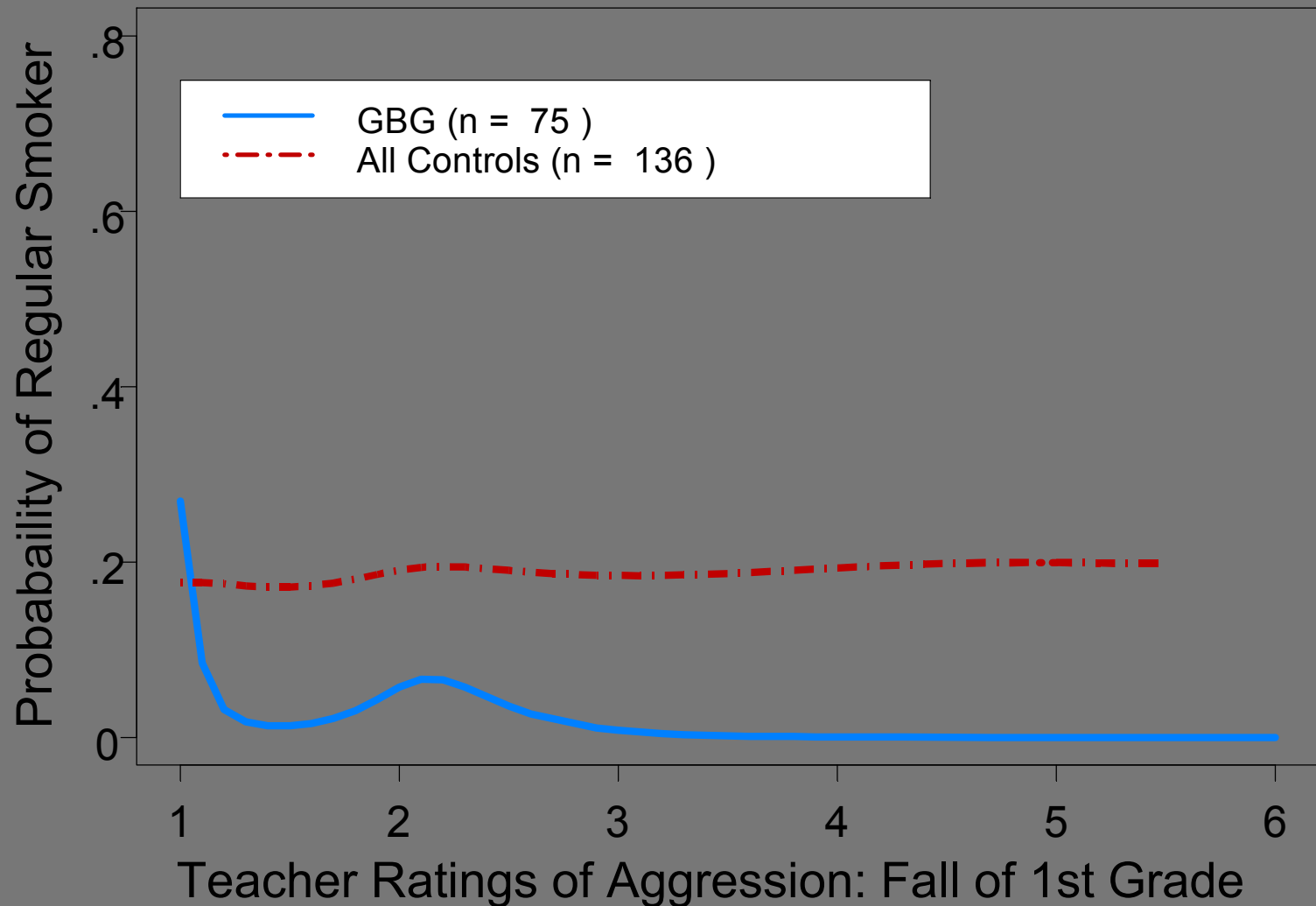
Study Design (continued)

- In the 1st generation, the GBG trial was done over 1st and 2nd grades in 2 consecutive first grade cohorts.
- 1st cohort with 40 hours of teacher training and support thru the year. This was the effectiveness trial
- 2nd cohort with same teachers with little training and support, tested the sustainability of results.

GBG vs All Controls on Drug Abuse or Dependence Disorders for Males



Impact of GBG done in 1st and 2nd Grades on Regular Smoking by Males by Age 19-21 (all controls combined)



Summary

- Risk and Protective Factors for Adolescent, Young Adult, and Mid Adult Drug Use in a High Risk Population were identified.
- Consequences of Adolescent Drug Use in Adulthood were examined.
- Drug Use in this special population studied in relation to national samples, by age.
- Results of intervention program that used Woodlawn findings to identify early risks for drug use and other outcomes.

Cautions of Study

- Generalizability
- Improvement in Measurement Techniques between 1966 and 1992
- Self reports of drug use throughout the study
- Attrition

Unique Aspects of Study Design (1)

- Developmental Epidemiology of a Community of Inner City Children
 - Starting with young children means that sample is not based on who is in school in adolescence
 - In adulthood, includes participants who are incarcerated, homeless—not so in household surveys
 - In adulthood, since looking for specific people, may include those who would not be included in household surveys
 - Issue with generalizability—with Woodlawn data cannot study impact of cohort, ethnicity, age, except by comparing with other data

Unique Aspects of Study Design (2)

- Multiple Sources of Information—Teachers, Mothers, Children, School, Criminal, Death Records
 - Less confounding of data with use of multiple sources—teachers' and mothers' ratings of behavior are distinct from child/adolescent view
 - Official records give outside information, separate from self reports—consequences (school dropout, criminal arrest, death) not influenced by recall bias.

Unique Aspects of Study Design (3)

Data Collection over Life Span—Childhood to Adulthood

- An advantage of initiating study before drug use has begun
- Obvious advantage of prospectively collected data

Unique Aspects of Study Design (4)

- “Experimental” i.e., intervention data reinforces results from longitudinal study—intervention to intervene with early aggressive behavior influences later substance use.

- SUPPLEMENTARY SLIDES

The Population's Readiness in 1st Grade (MRT)

	Males	Females
Unready	17.6%	16.6%
Low Normal	45.1%	38.6%
Average	26.2%	32.4%
High or Superior	11.1%	12.4%

N=1030, Chi-Square=6.5, 3 df, $p=.089$

School Bonds in Adolescence

	Males	Females
High	30.6%	42.1%
Medium	31.1%	29.4%
Low	38.3%	28.5%

n=691, Chi-Square=11.4, 2 df, $p=.003$