

DRUG ABUSE & ADDICTION

Preventable Brain Diseases

Wilson M. Compton, M.D., M.P.E.

Director, Division of Epidemiology, Services & Prevention Research

National Institute on Drug Abuse



Acknowledgement:

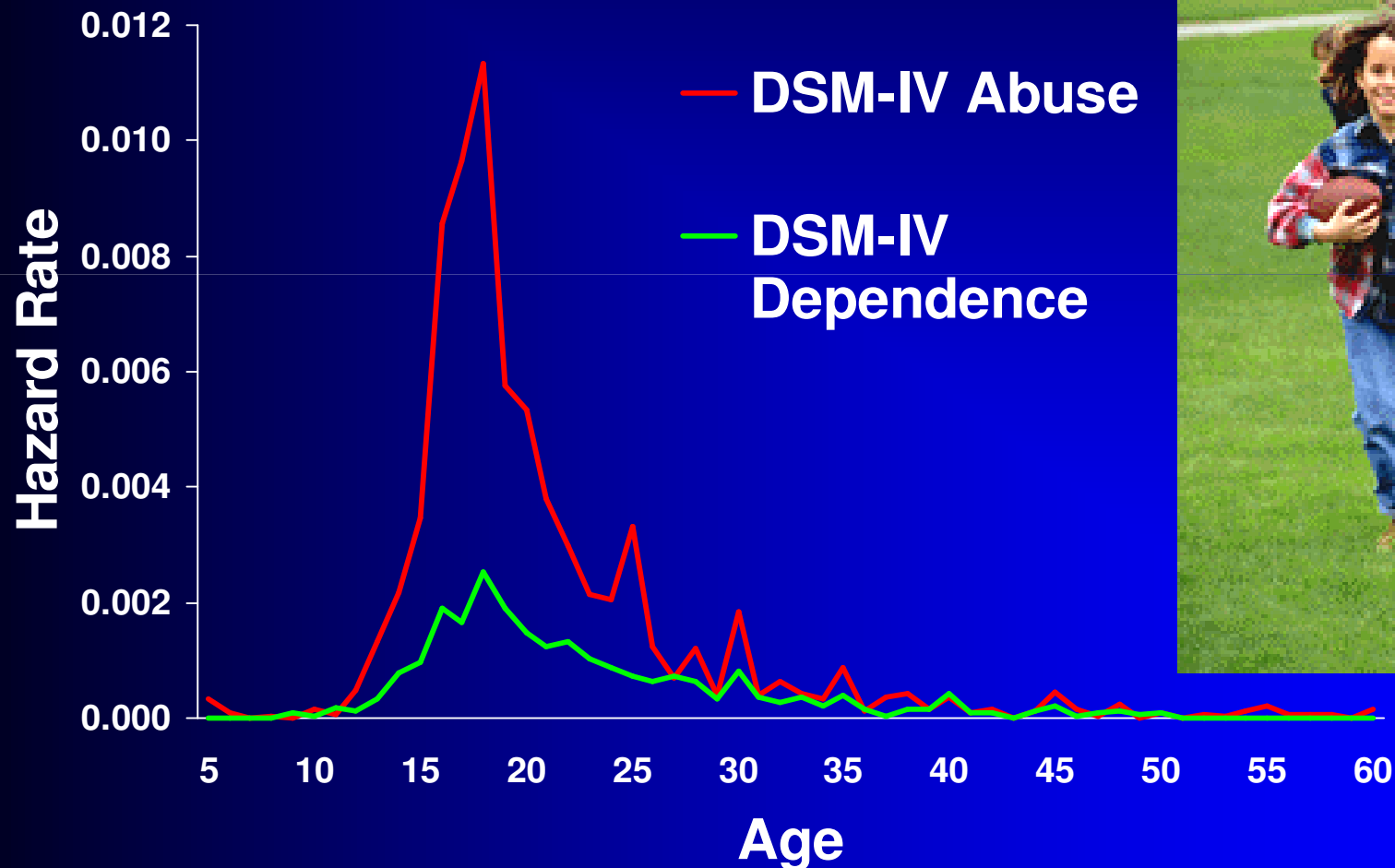
Elizabeth B. Robertson, Ph.D.
Chief, Prevention Research Branch
National Institute on Drug Abuse
National Institutes of Health
U.S. Department of Health and Human Services



- *A key principle...*

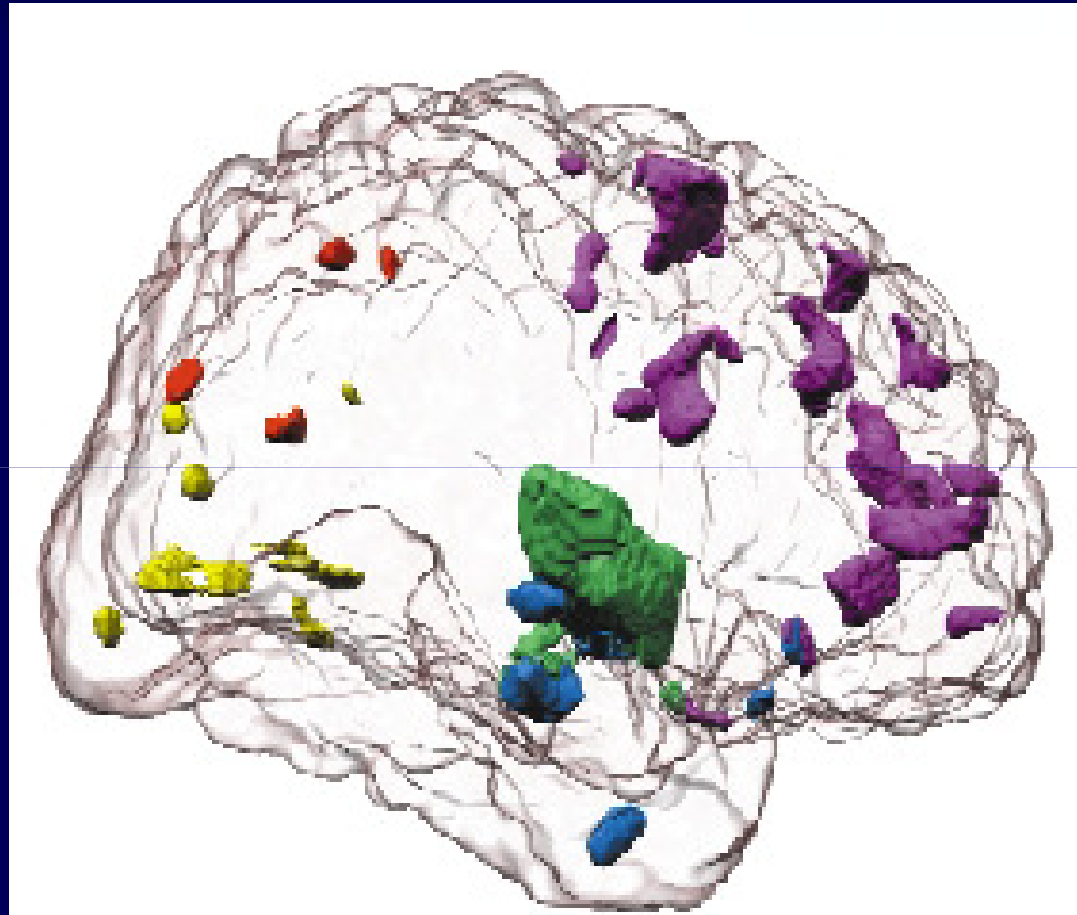
Drug Abuse and Addiction are
Developmental Disorders

Key Epidemiology Finding: *Addiction begins during Adoclescence*



Source: Compton, Archives of General Psychiatry, May 2007

Recent Studies Have Shown that Maturation of the Brain's Gray Matter Moves from Back to Front

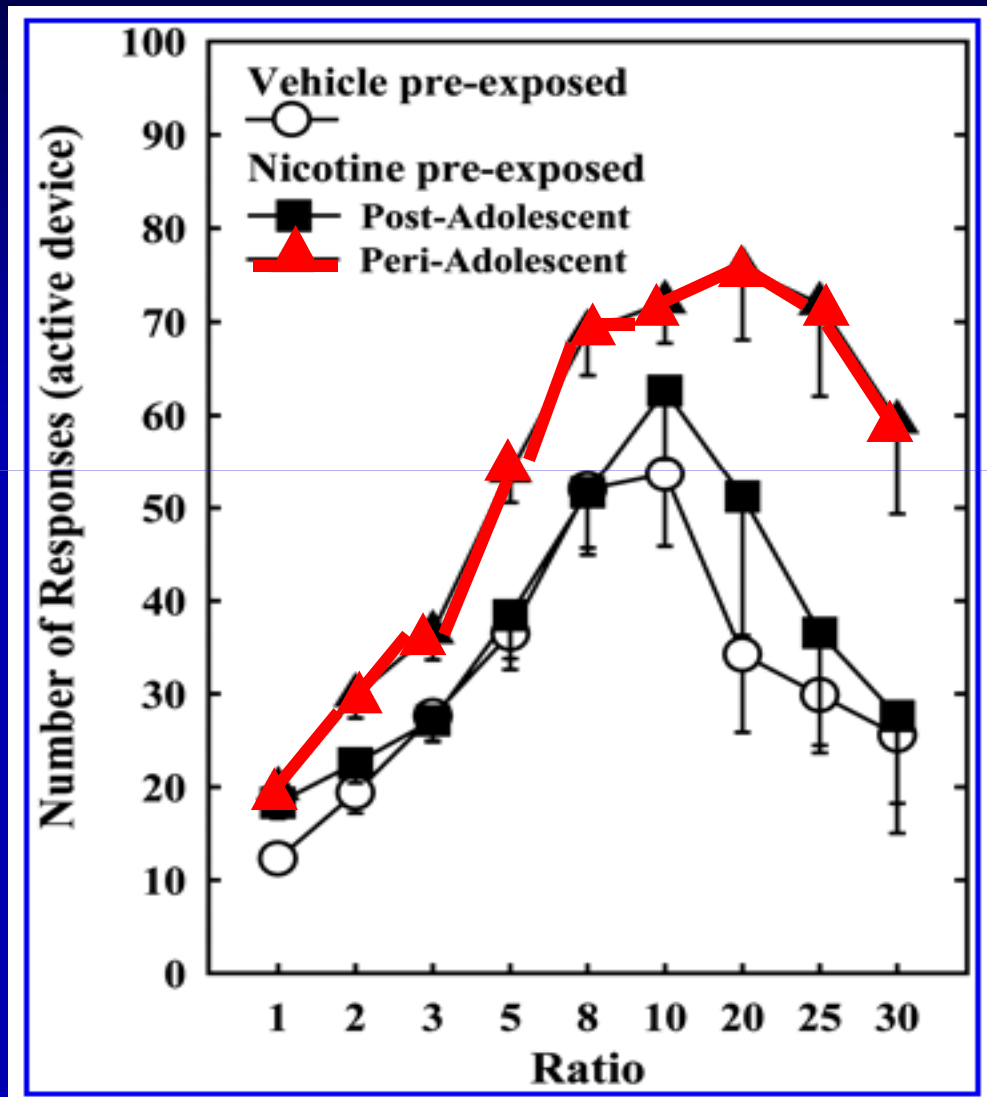


Brain areas where volumes differ in adolescents compared to young adults

Source: Sowell, E.R. et al., Nature Neuroscience, 2(10), pp. 859-861, 1999

Animals Pre-Exposed to Nicotine During Peri- and Post-Adolescence Differed...

During A Between
Session Progressive
Ratio Schedule for
Nicotine Self
Administration



Source: Adriana, W. et al., *J of Neurosci*, 23(11), pp. 4712-4716, June 1, 2003.

Implications:

- **Developmental differences must be considered in designing treatment and prevention strategies.**

NIDA's
“Red Book”
has 18
Principles of
Prevention

National Institute on Drug Abuse

Preventing Drug Use
among Children and Adolescents

A Research-Based Guide
for Parents, Educators, and Community Leaders

Second Edition

U.S. DEPARTMENT OF
HEALTH AND HUMAN SERVICES
National Institutes of Health

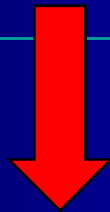
Drug Abuse Prevention Principles Relate to:

- Risk and protective factors
- Targeting the *local community* drug abuse issues
- Addressing all forms of drug abuse
- Combining approaches
- Presenting consistent messages across settings

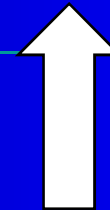
Family-level Risk and Protective Factors

<i>Risk Factors</i>	<i>Protective Factors</i>
Harsh discipline	Consistent discipline
Rejection/neglect	Close family bond
Lax supervision	Monitoring/supervision
Parent/sibling drug use	Anti-drug family rules
High family conflict	Family communication
Parent mental illness or life stress	Functional family

Reduce these



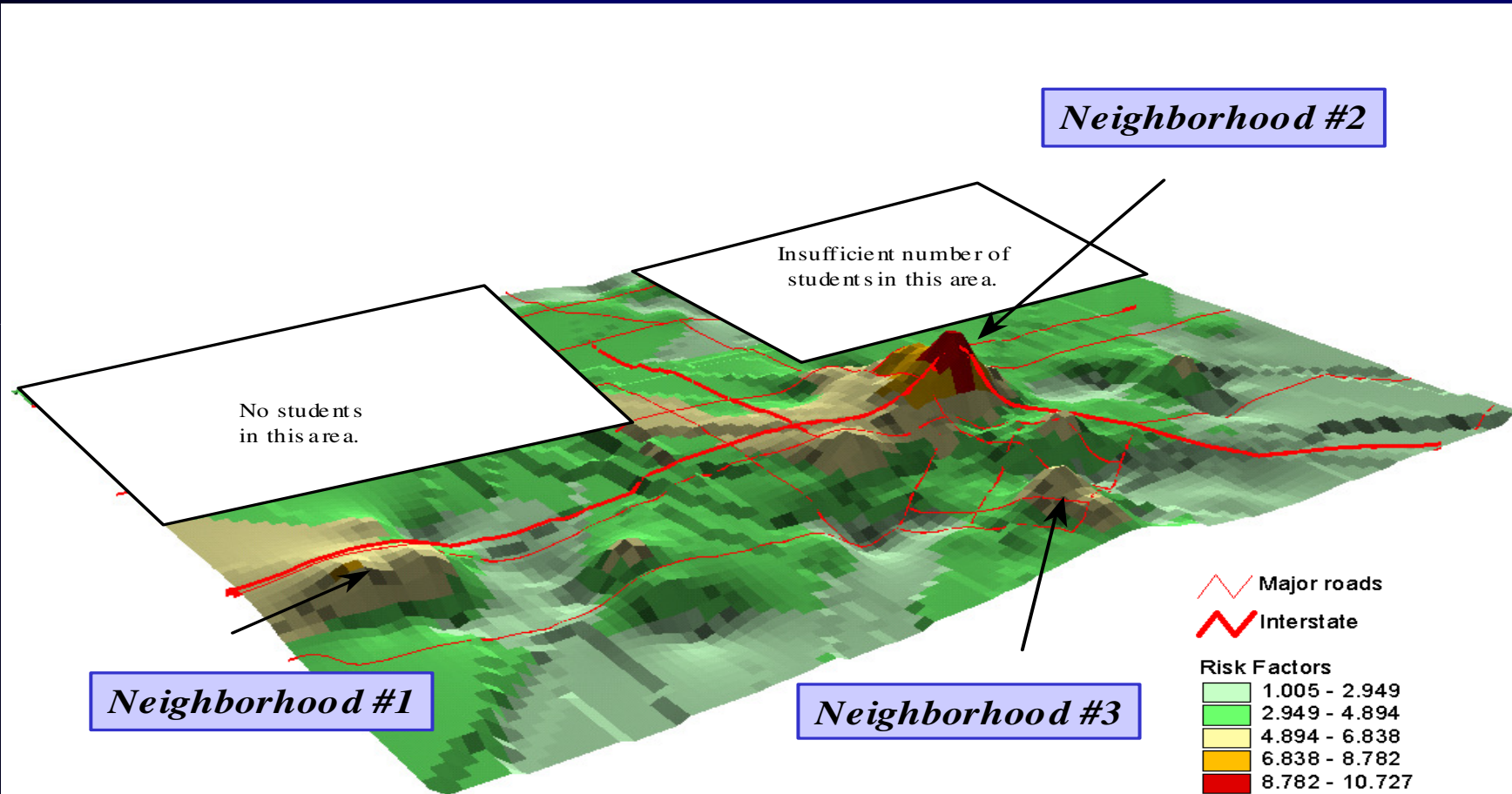
Elevate these



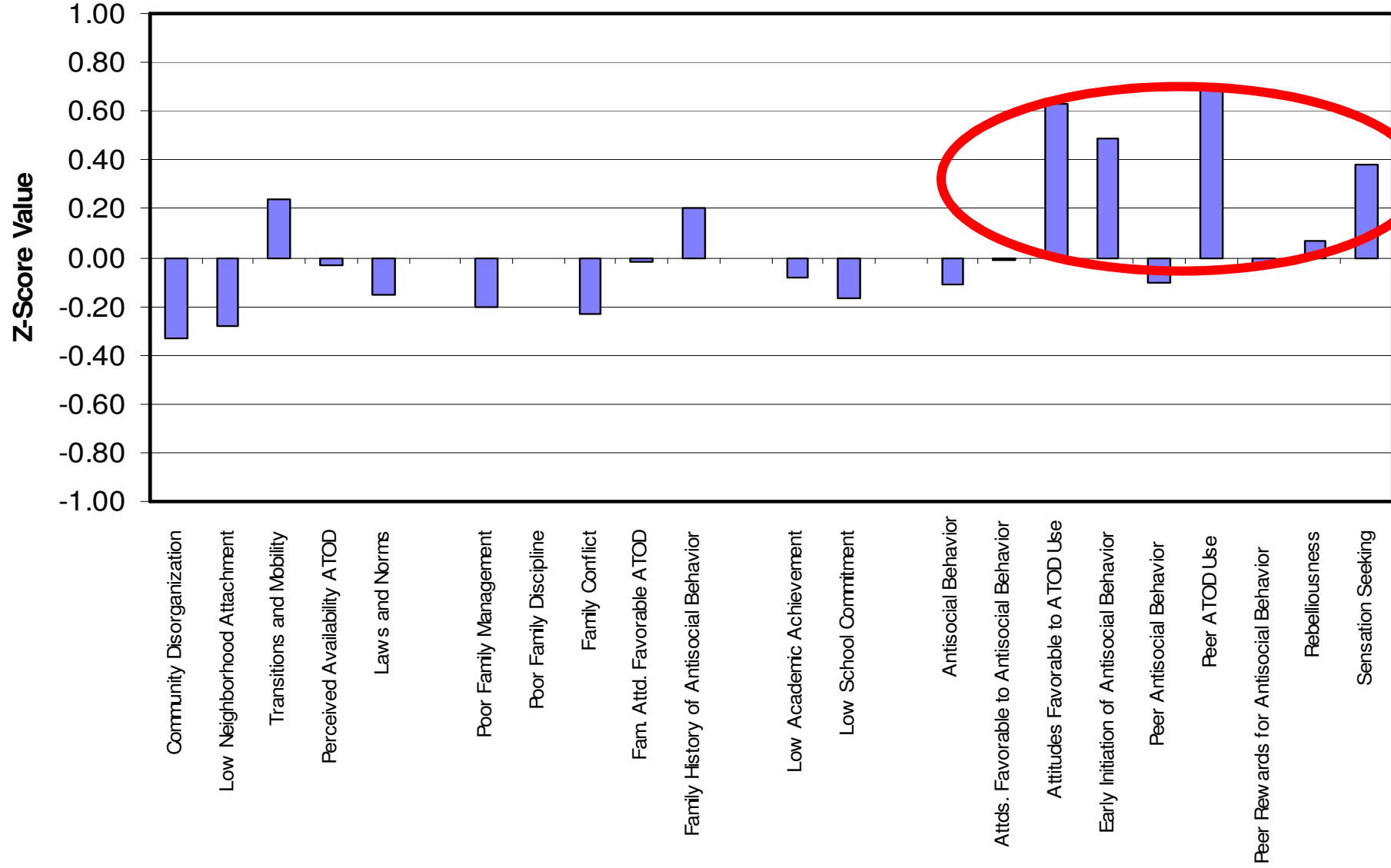
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Mapping Neighborhood Risk Factors



Profile of Neighborhood Risk Factors

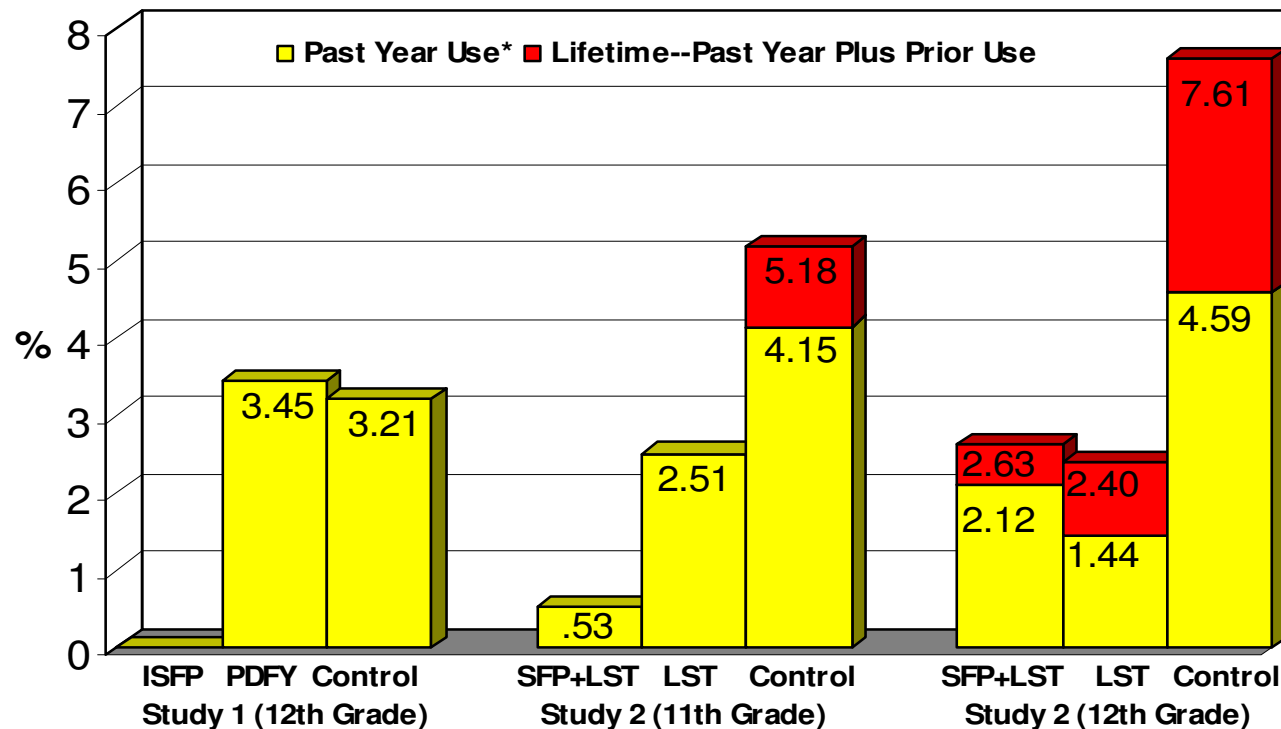


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Universal Family-based Prevention Reduces Methamphetamine Use

Lifetime and Past Year Meth Use at 4½-6½ Years Past Baseline



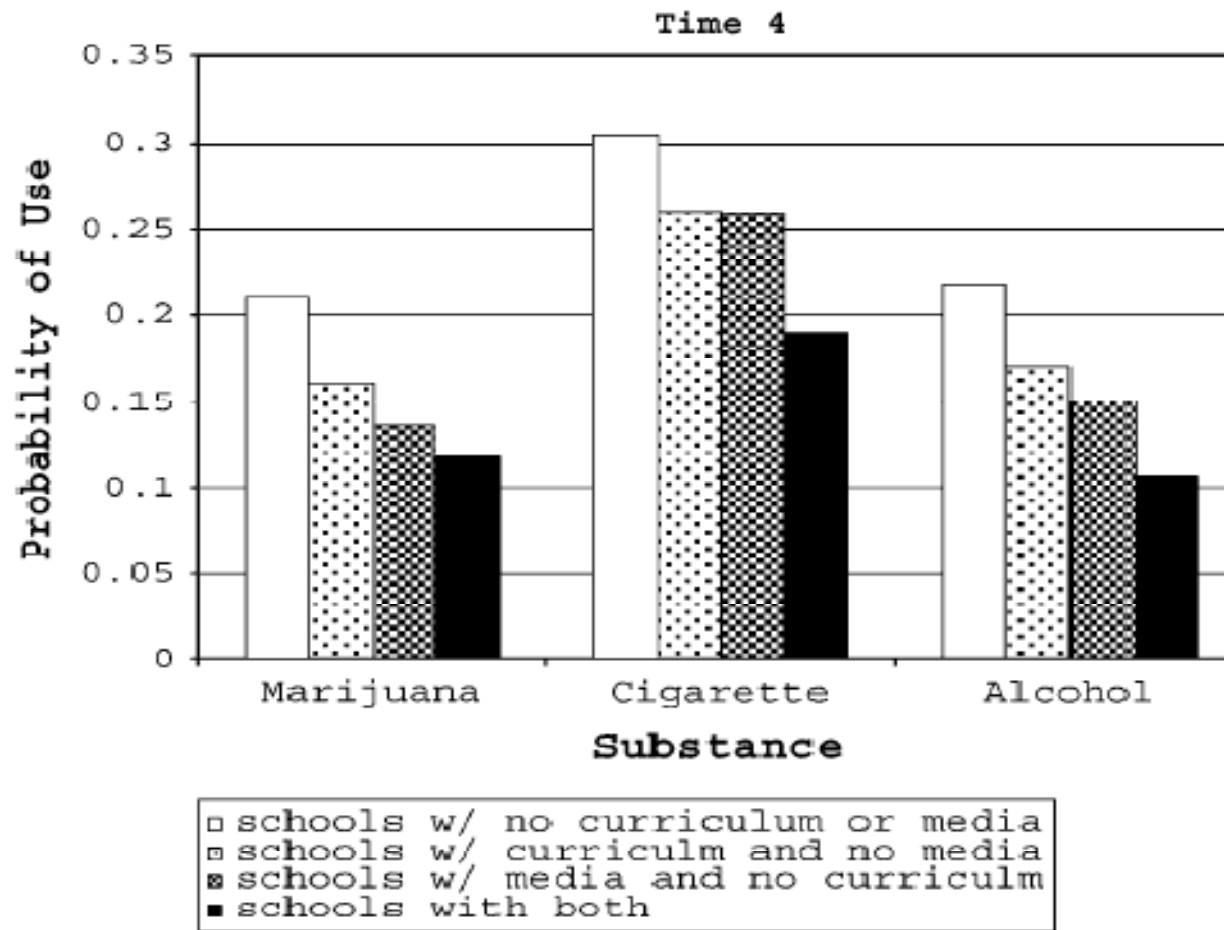
Source: Spoth, et al. 2006 Arch Pediatr Adolesc Med. Two randomized studies of the long-term effects of brief universal preventive interventions on adolescent methamphetamine use

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Effects of Media Campaign + School Curriculum on Drug use

Percent of Youth Using Each Substance by Study Condition at Wave 4 Post-test (n = 4,216)



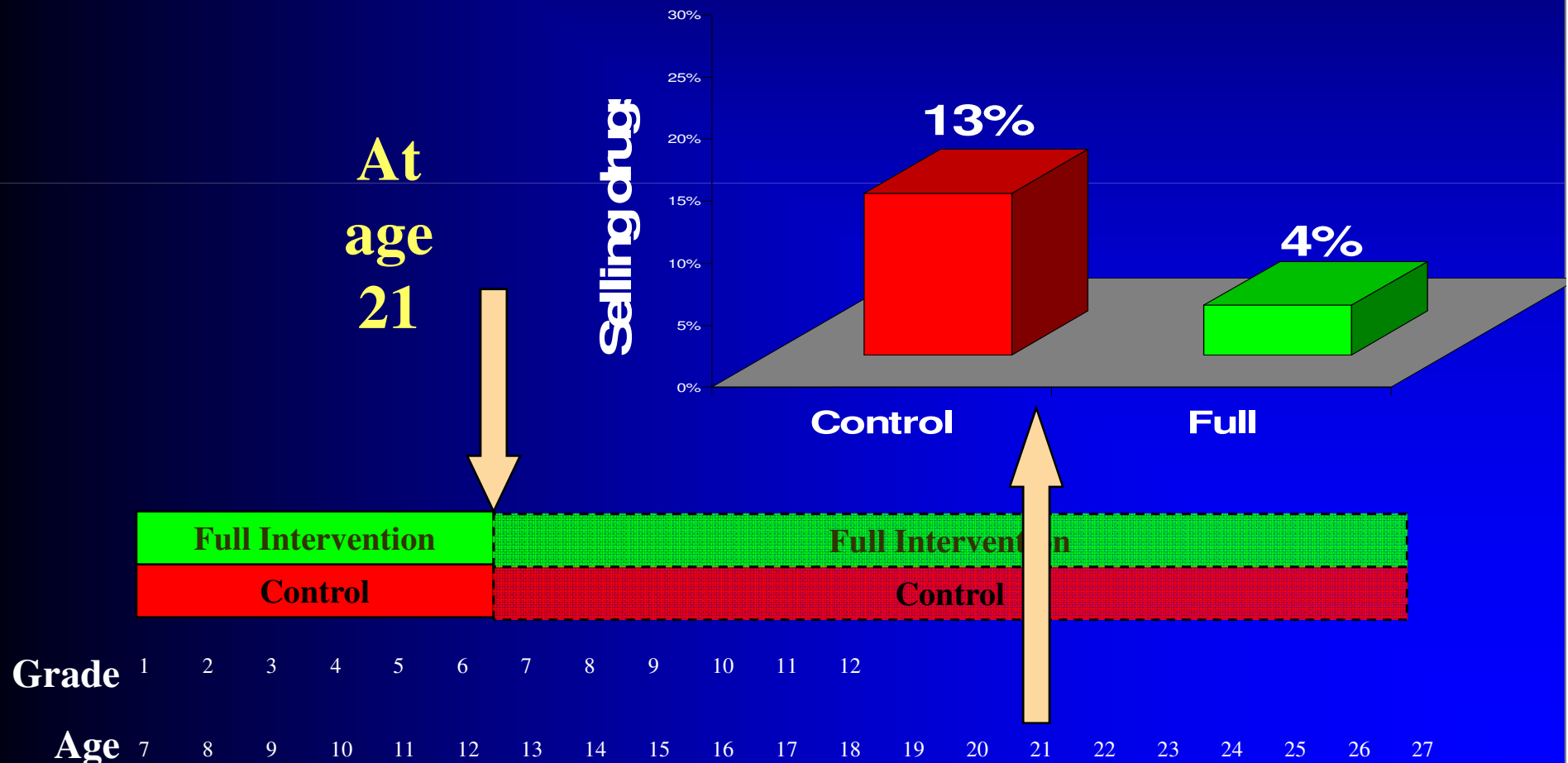
Slater et al. (2006). Combining in-school and community-based media efforts: Reducing marijuana and alcohol uptake among younger adolescents. *Health Education Research*, 21, 157-176.

Emerging Principles

**Preventive Interventions Can Have
Long Term Effects**

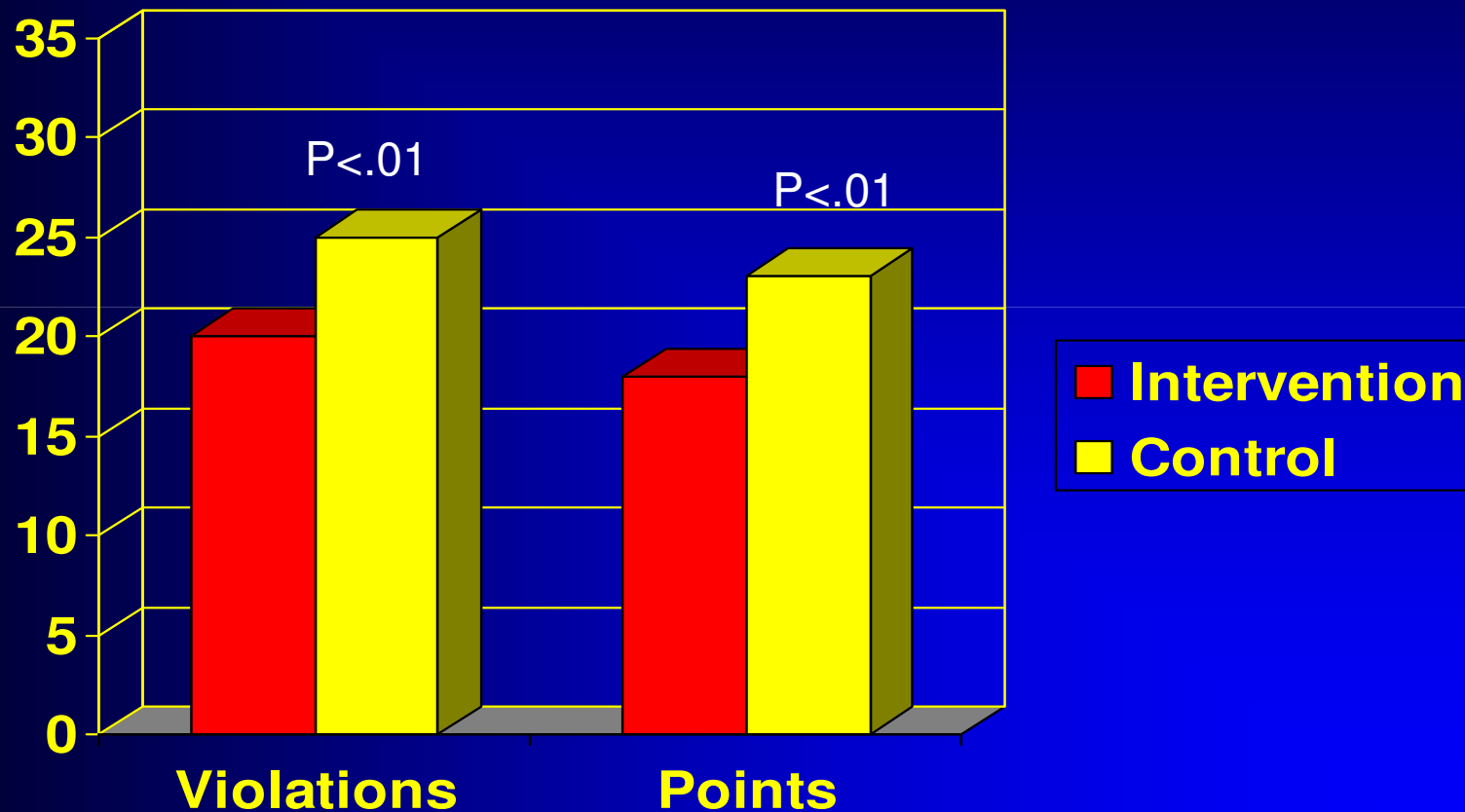
Long Term Effects of the SSDP Intervention on Selling Drugs

Hawkins, et al. (2005)



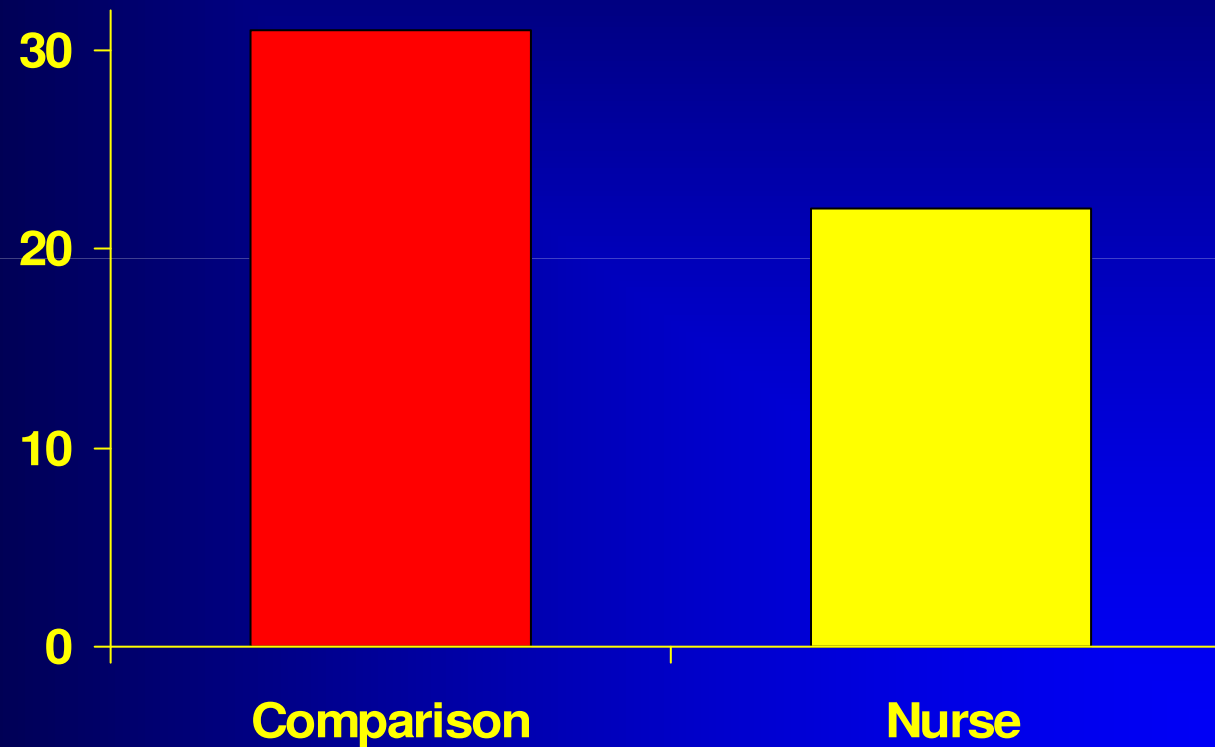
**Preventive Interventions Can Have
Cross Over Effects**

Life Skills Training Program Six-Year Follow-up: Cross-over Effect on Driving Behaviors



**Early Intervention May Alter The Life
Course Trajectory In A Positive Direction**

% Borderline/Clinical Internalizing Problems (Self-Report) – Child Age 12



P = .044, OR = 0.63

Source: D. Olds et al.

**High Risk Populations May Benefit The
Most From Prevention Interventions**

High Risk Populations Benefit the Most

H.S. Resnick et al. / Addictive Behaviors 32 (2007) 2032–2045

2041

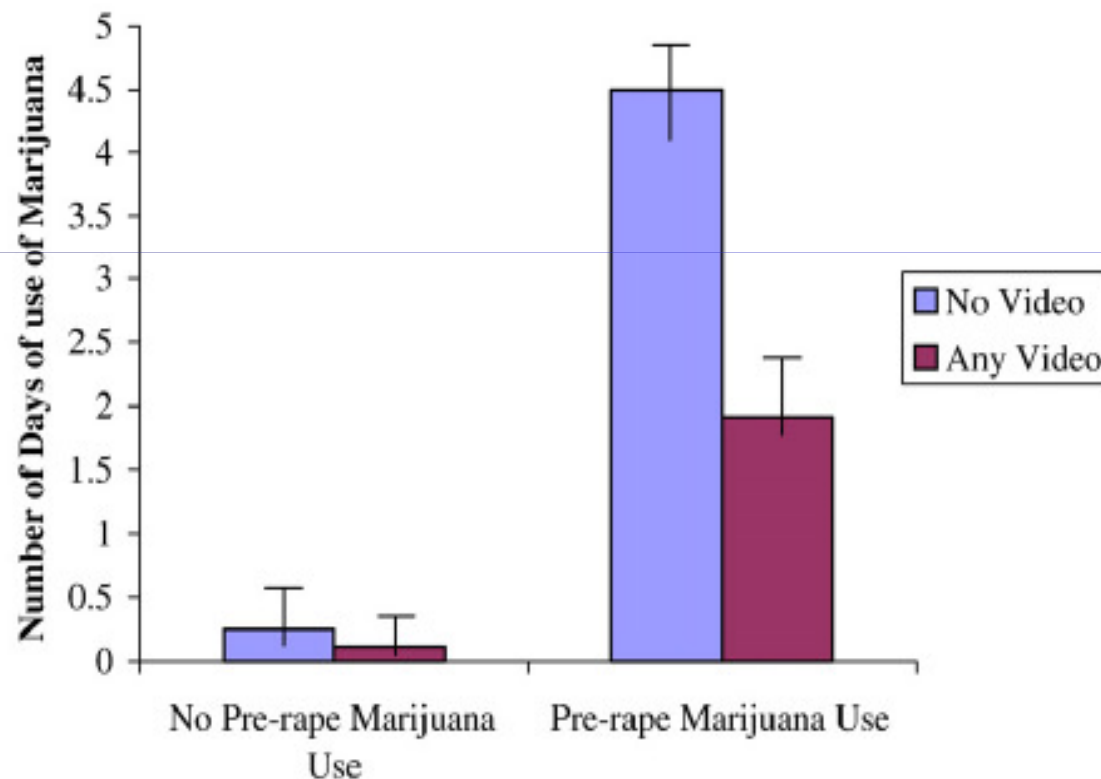
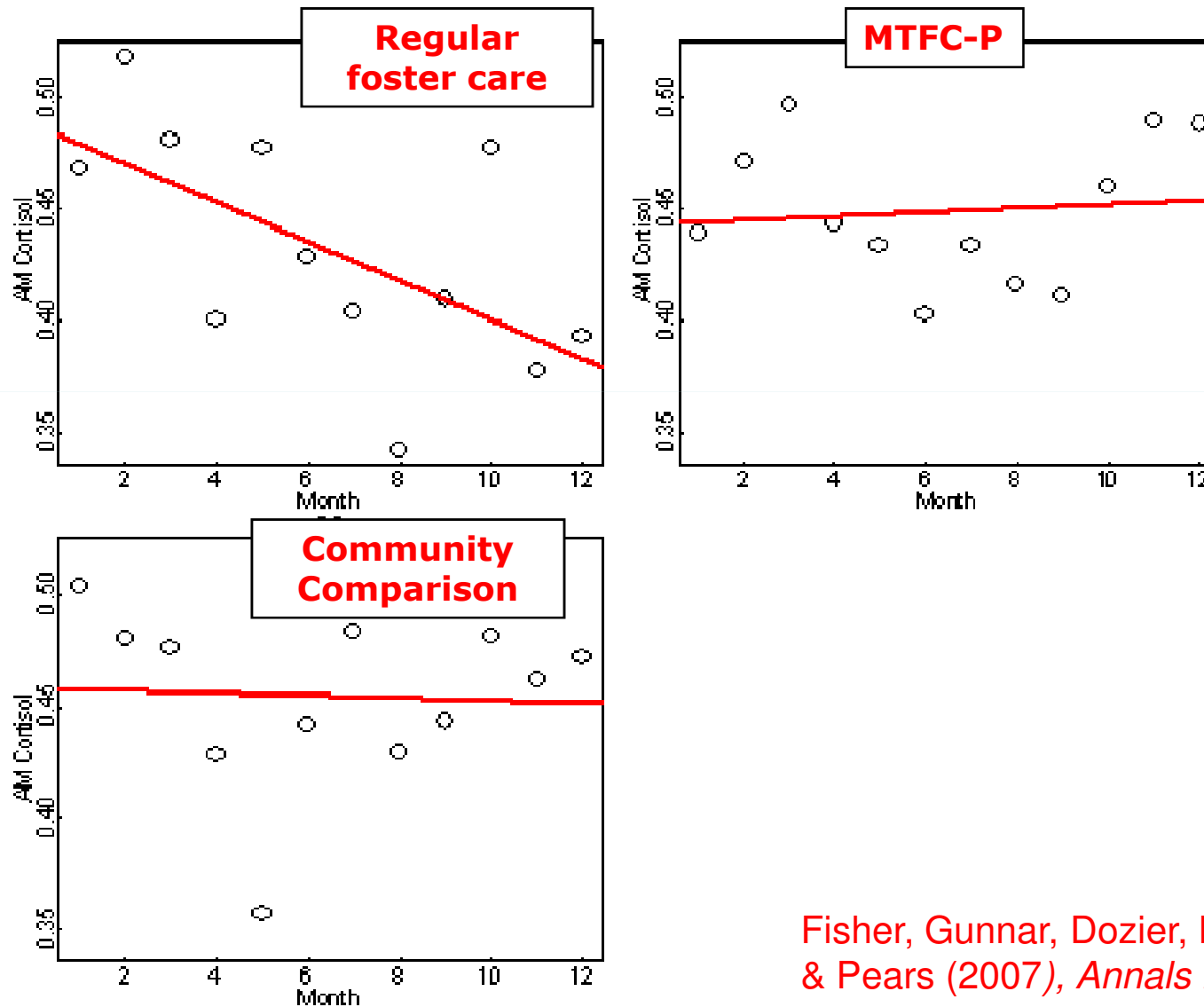


Fig. 1. Number of days of marijuana use in the previous two weeks as a function of pre-assault use and treatment group. Note: The data presented in this figure are from Time 1. The same pattern of results was found at Times 2 and 3.

**Prevention Interventions Can
Influence Physiological
Functioning**

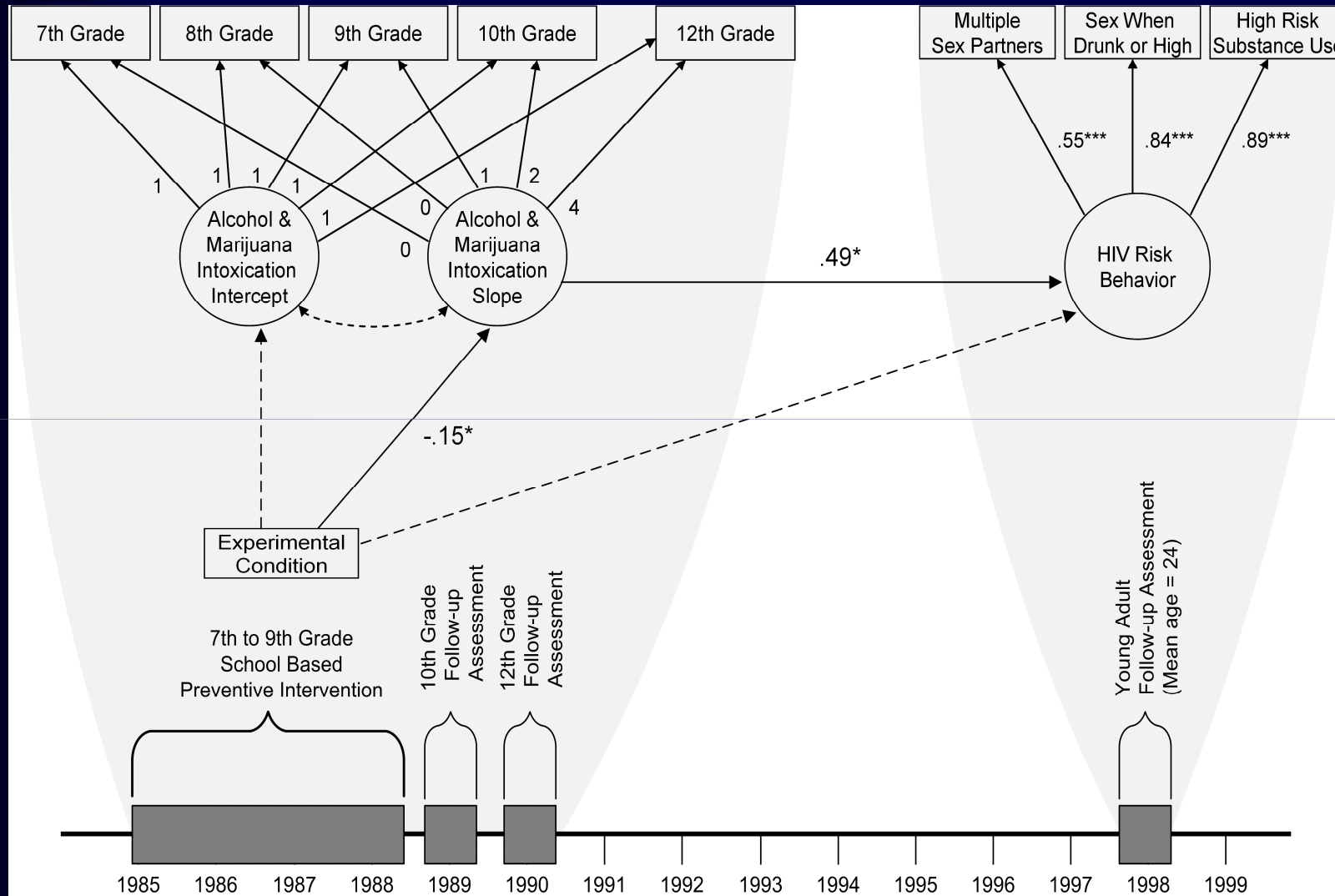
Group effects on morning cortisol levels across time *for all children*



Fisher, Gunnar, Dozier, Bruce,
& Pears (2007), *Annals NYAS*

**Drug Abuse Prevention Is HIV
Prevention**

Drug Abuse Prevention as HIV Prevention:



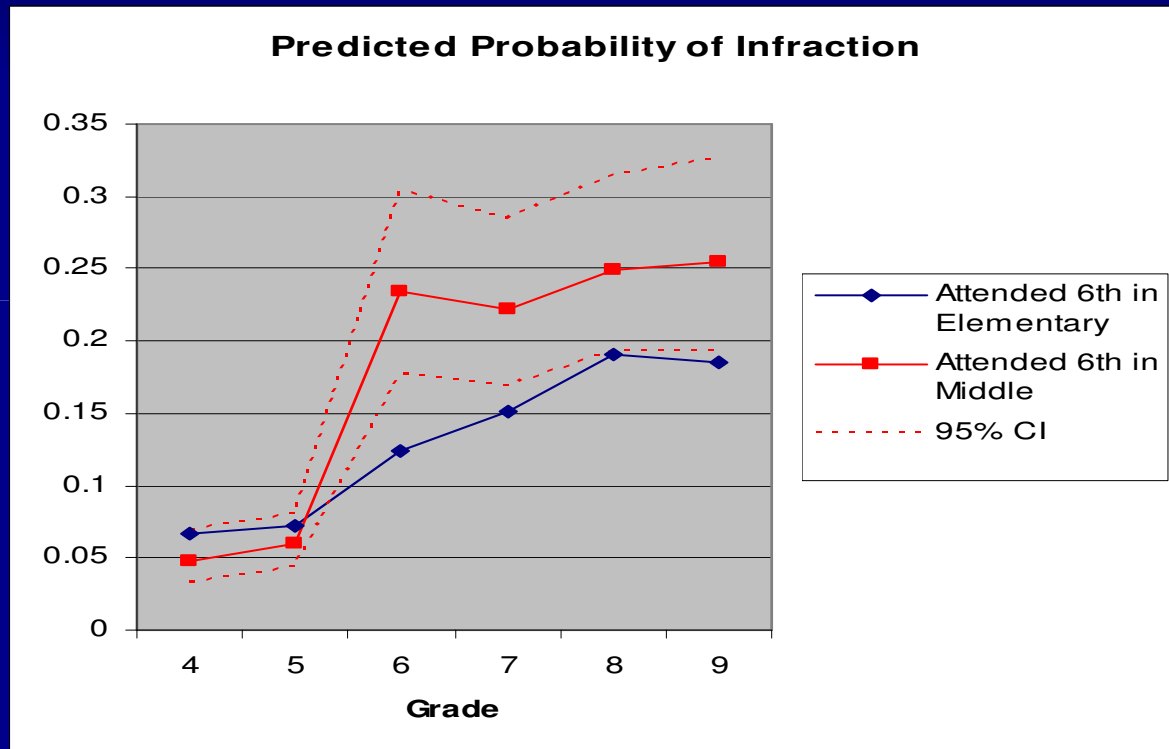
Latent Growth Model of LST Intervention Effects on HIV Risk Behavior During Young Adulthood in Suburban White Youth: Partial Mediation of Prevention Effects via Reduced Growth in Alcohol and Marijuana Intoxication [Griffin et al., 2006]

Environment Can Be A Natural Intervention

Sixth Graders in Middle School Behave Worse than Those in Elementary School

Source: n = 76,915 -

Administrative database covering all public schools and students in the state of North Carolina. The indicators of behavioral problems are derived from a statewide database of disciplinary infractions recorded during the 2000-2001 academic year. Each disciplinary report reflects a decision on the part of a school official (usually a teacher) of whether to “write up” a student for misbehaving, and then a decision on the part of the principal of whether to report to the state.



Duke Univ TPRC - P20 DA017589 - Philip Cook, Robert MacCoun and Clara Muschkin (2007). Sixth Graders in Middle School Behave Worse than Sixth Graders in Elementary School. Under Review, revised 5/06.

Emerging Principles

- Preventive interventions can have long term and cross over effects
- Early intervention may alter the life course trajectory in a positive direction
- High risk populations may benefit the most from prevention interventions
- Prevention interventions can influence physiological functioning
- Drug abuse prevention is HIV prevention
- Environment can be a natural intervention

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The Science of Drug Abuse & Addiction

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- [Inhalant Abuse: Research Report](#)

Students & Young Adults

Education resources & materials on drugs of abuse, marijuana, ecstasy, smoking, steroids, ([more](#))

Parents & Teachers

Drug information & facts, education materials, curriculum guides, classroom tools, ([more](#))

Researchers & Health Professionals

Grants & funding, research at NIDA, clinical trials, meetings, ([more](#))

Drugs of Abuse

- ◆ [Acid/LSD](#)
- ◆ [Alcohol](#)
- ◆ [Club Drugs](#)
- ◆ [Cocaine](#)
- ◆ [Ecstasy/MDMA](#)
- ◆ [Heroin](#)
- ◆ [Inhalants](#)
- ◆ [Marijuana](#)
- ◆ [Methamphetamine](#)
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- ◆ [Prevention Research](#)
- ◆ [Stress & Drug Abuse](#)
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NIDA Sites

- ◆ backtoschool.drugabuse.gov
- ◆ smoking.drugabuse.gov
- ◆ hiv.drugabuse.gov
- ◆ marijuana-info.gov
- ◆ clubdrugs.org

[Teen Drug Use Declines 2003-2004 - Results from the Monitoring the Future Survey, 2004](#)

[Application for 2005 NIDA Directors' Travel Awards to CPDD, Orlando, Florida](#)

[Application for the 2005](#)

www.drugabuse.gov