

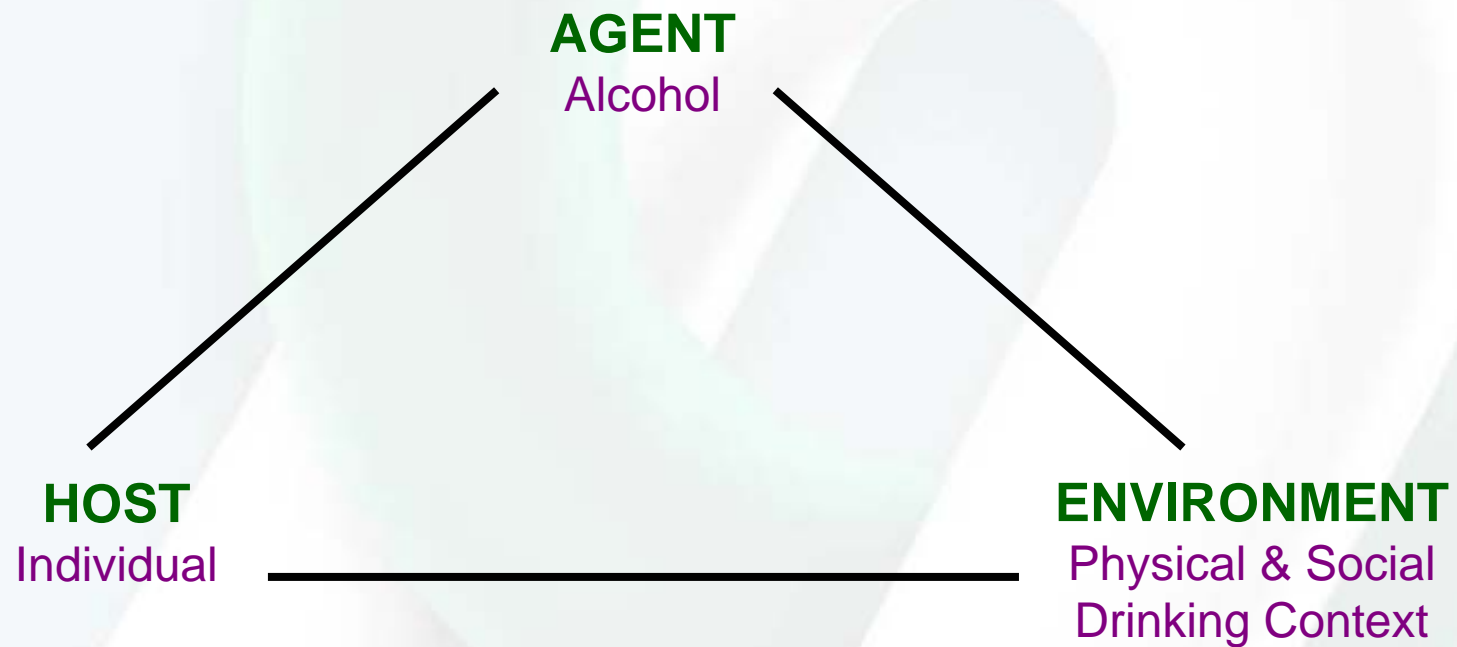
Developmental Pathways to Addictive Behavior: Etiology and Prevention

Hiram E. Fitzgerald, Ph.D.
Michigan State University

Regional Center for Child and Adolescent Psychiatry, Oslo, Norway

August 30, 2004

Public Health Model



Types of Prevention Based on Risk

- Universal prevention
 - Directed to entire population
- Selected interventions
 - Directed to at-risk population
- Indicated interventions
 - Directed to symptomatic population

Places to Intervene

Individual	Environment	Agent
School	Liquor stores	Alcohol content
Family	Bars and restaurants	
Workplace	Highways	
Health clinic	Community	
	Media	
	Economy	

Prevention in Schools

Sample Programs

Life skills training

SMART

DARE

AMPS

STAR

Focus on Programs

Increasing social skills

Learning how to resist pressure to drink

Highways

Correcting the impression that everyone drinks

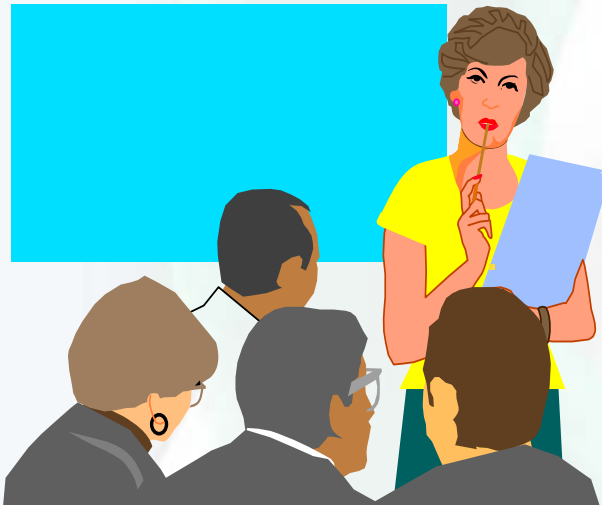
Social Learning Theory

- Self-efficacy
 - “Can I resist?”
- Modeling
 - “I want to be like her”
- Reinforcements
 - Positive or negative

College-based Prevention Interventions

- Individual
 - Raise awareness, affect attitudes, provide training
 - Motivation interviews and follow-up
 - Counseling, crisis intervention
- Environmental
 - Promote and develop alcohol-free events and venues
 - Reduce alcohol availability on and around campus
 - Monitor alcohol outlets to prevent sales to underage and intoxicated persons and control promotions
 - Dispel myth of heavy alcohol consumption by peers

Family Interventions



STAR approach

- Parent-children exercises
- Parent skills training
- Community activities

Health Belief Model



- Perceived susceptibility
- Perceived severity
- Perceived benefits
- Perceived barriers

Educational Prevention Efforts

Beverage Warning Label:

GOVERNMENT WARNING: (1) ACCORDING TO THE SURGEON GENERAL, WOMEN SHOULD NOT DRINK ALCOHOLIC BEVERAGES DURING PREGNANCY BECAUSE OF THE RISK OF BIRTH DEFECTS. (2) CONSUMPTION OF ALCOHOLIC BEVERAGES IMPAIRS YOUR ABILITY TO DRIVE A CAR OR OPERATE MACHINERY AND MAY CAUSE HEALTH PROBLEMS.

California Point-of-Sale Poster:

WARNING:

Drinking Distilled Spirits,
Beer, Coolers, Wine and
Other Alcoholic Beverages
May Increase Cancer Risk,
and, During Pregnancy, Can
Cause Birth Defects.

Media:

FLORIDA TIMES

**College Students'
Drinking Leads to
Riot**

Predictors of Limiting Drinking for Health Reasons

Women of Childbearing Age (n = 844)

	Odds Ratio
Saw 3 messages on birth defects (vs. none)	2.83**
Believes any alcohol very dangerous (vs. somewhat and not dangerous)	1.57*
Pregnant within last 12 months (vs. not)	1.76*

* $p \leq .05$; ** $p \leq .01$

Warning Label Effectiveness

Studies of At-Risk Pregnant Women (Selected Prevention)

	Warning Labels	Ads	Signs	Media	Talks
Ever exposed	77%	83%	57%	78%	96%
Believable	87%	94%	82%	88%	--
Understandable	88%	94%	91%	100%	--
Influenced	33%	41%	46%	56%	61%

n = 23

Warning Label Effectiveness

Studies of At-Risk Pregnant Women (Selected Prevention)

Effect of Messages	Drinkers	Abstainers
Felt more aware, watchful	57%	49%
Felt negative toward self*	33%	11%
Not attentive/no impact*	25%	12%
Felt sad for the baby	18%	31%
Negative toward other women**	14%	25%
Acknowledged/endorsed**	12%	22%
Already aware/no impact	8%	15%

* p =< 0.0001; ** p =< 0.05

Early Start Plus

Standard Drink Sizes




Beverage	Volume (oz.)	Alcohol Content (%)
Spirits	1	40
Table wine	4	12
Fortified wine	3	18
Wine cooler	12	4 – 5
Regular beer	12	4
Malt liquor	8	6 – 7

Early Start Plus

From Tutorial Computer Screen:

WinQue IGTSTD2

STANDARD DRINK VS. YOUR DRINK OF WINE

Size of your drink	Size of standard drink	# of standard drinks in your drink size
7 oz.	4 oz.	1 3/4
		

As you can see, your drink size of wine is 1 3/4 times the size of a standard drink size of wine.

Since your drink size is bigger than a standard size, you are drinking more alcohol than you probably think. And that alcohol is reaching your baby.

Do you see how that comparison works? (PROBE)

(PRESS ANY KEY TO CONTINUE)

Previous Next

Protecting the Next Pregnancy

- Standard drinks for guidance
- Sensible drinking: day and week limits
- Goal making: abstinence or cutting down
- Ways to slow down drinking:
 - Measure* - Trade off with soda, juice
 - Dilute* - Eat food when drinking
 - Sip* - Time drinks

Drunk Driving Statistics

(U.S., 1997)

- Traffic accidents are the leading cause of death for persons under age 35, 5th leading cause for death across all age groups (NCHS, 1994)
- 45% of all traffic accidents are associated with alcohol use (NHTSA, 1994) at an annual cost of \$148 billion, or \$1.09 per each drink consumed (Blincoe & Faigin, 1992; Miller & Blincoe, 1994)

Strategies to Reduce DUIs

General Deterrence Policies

Strategy	Impact
Administrative license revocation	9% decline in alcohol-related fatal crashes
Sobriety checkpoints	17% decline in alcohol-related fatal crashes
Lower <i>per se</i> limits	16% decline of proportion of fatal crashes with 0.08% BAC drivers
Zero tolerance laws	20% decline in proportion of single-vehicle, nighttime fatal crashes among 15 – 20 year old drivers

Strategies to Reduce DUIs

Alcohol Control Policies

Strategy	Impact
Minimum legal drinking age	10 – 15% decline in alcohol-related traffic deaths among drivers age 21
Increased alcohol excise taxes	15% decline in traffic deaths among drivers ages 18 – 21
Responsible beverage service	23% decline in single-vehicle, nighttime fatal crashes

Access Controls

- State monopoly of retail outlets for alcohol
- Number of outlets restricted within an area
- Limited hours and days for alcohol sales

Project Northland

Individual Activities, Part 1

- Slick Tracy home team program – role models Slick Tracy & Breathest Mahoney
- Family fun night, an evening fair and poster show
- “Awesome Autumn Party”
- Peer-led curriculum; alcohol-free activities; newsletters for parents
- Class games, role playing, and strategies for resisting influences to drink

Project Northland

Individual Activities, Part 2

- Peer leaders chosen whom students liked and respected
- Peer leadership to plan alcohol-free activities with adult volunteers
- Leadership training sessions
- Theater production: “It’s My Party”
- Student interviews with community leaders about their attitudes toward alcohol
- Student-led town meeting toward policy change

Project Northland

Environment Activities

- 13 task forces of government officials, law enforcement, school and business representatives, health professionals, youth projects, parents, concerned citizens, clergy and adolescents
- Sponsorship of alcohol-free events, e.g., theater
- Ordinances to increase ID checks and reduce sales to underage and intoxicated customers
- Student Discount Cards for pledges to be drug- and alcohol-free

Environmental Prevention Programs

Communities Mobilizing for Change on Alcohol (CMCA)

- Decreased sales to youth and youth DUI

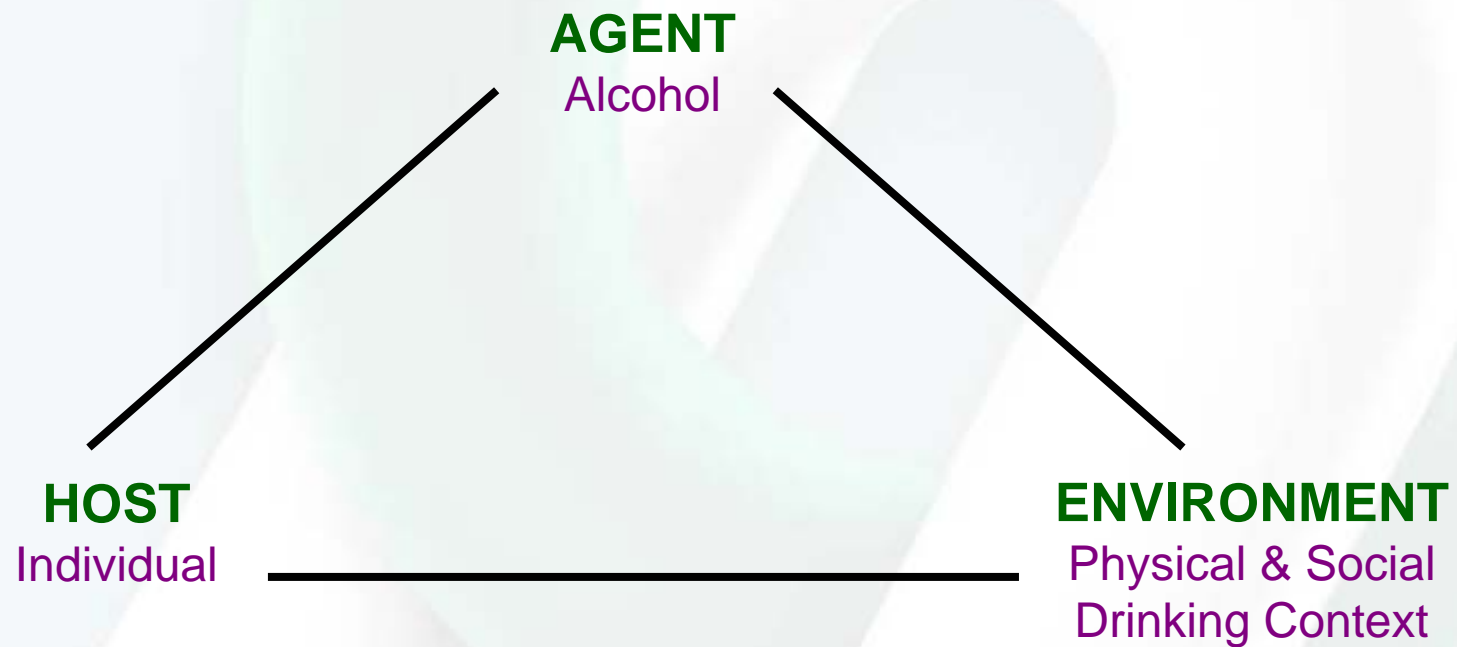
Community Trials Project

- 13% decline: nighttime fatalities and alcohol-related crashes
- 50% decline: BAL's at roadside checks and alcohol-related assaults (ER)

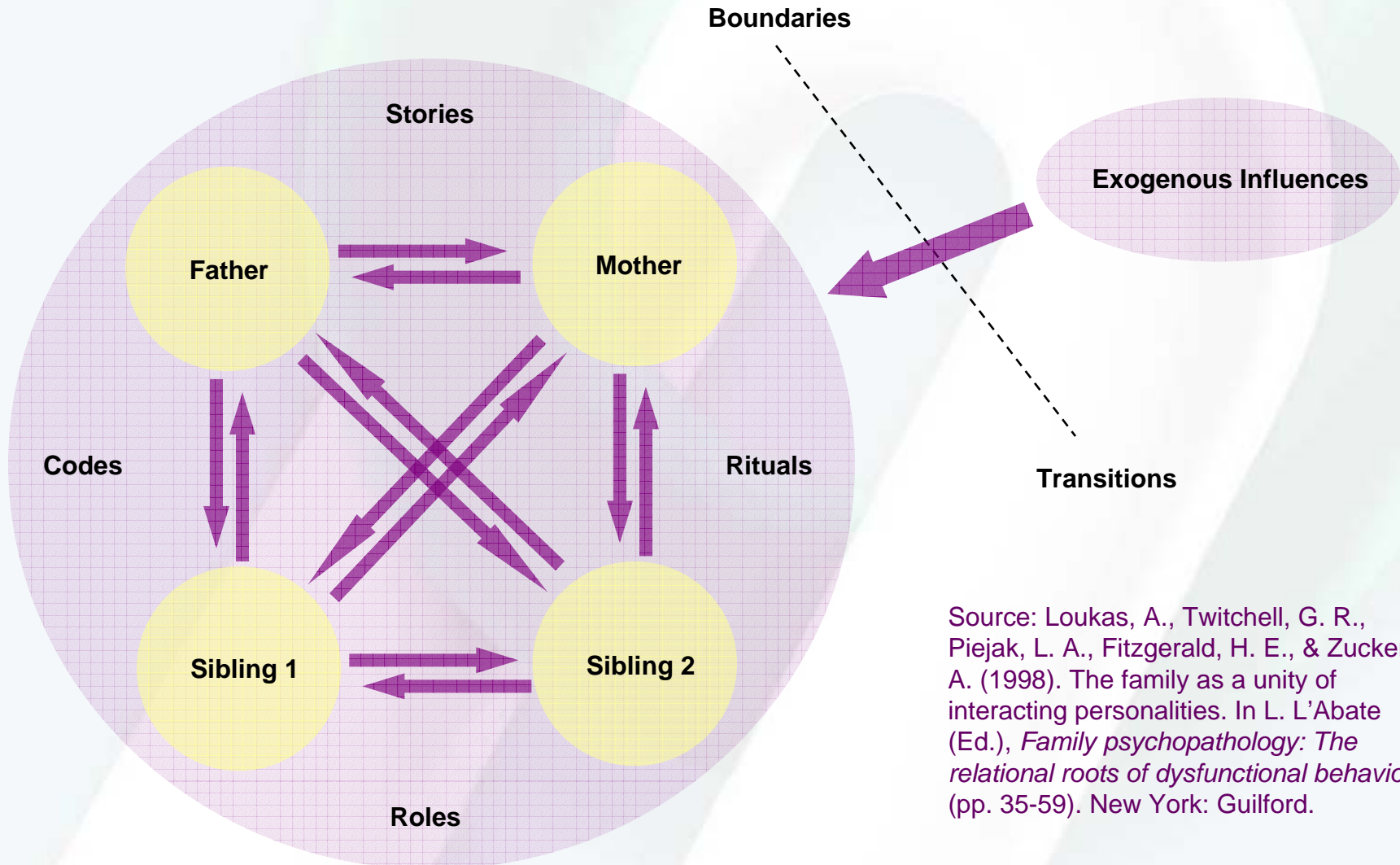
Saving Lives Program

- 25% decline: fatal crashes
- 42% decline: alcohol-related fatal crashes
- 40% decline: youth drinking driving

Public Health Model



Possible Transactional Linkages in a Primary Family System



Source: Loukas, A., Twitchell, G. R., Piejak, L. A., Fitzgerald, H. E., & Zucker, R. A. (1998). The family as a unity of interacting personalities. In L. L'Abate (Ed.), *Family psychopathology: The relational roots of dysfunctional behavior* (pp. 35-59). New York: Guilford.



Understanding Risk Development



What We Wish to Prevent



Establishing Risk

Establishing Risk

- a. Through family characteristics

Establishing Risk

a. Through family characteristics

- Children of alcoholics
- Children of drug abusing or drug addicted parents
- Children of parents with antisocial personality disorder

Establishing Risk

- a. Through family characteristics
- b. Through individual characteristics

Establishing Risk

- a. Through family characteristics
- b. Through individual characteristics
 - Externalizing behavior, aggression, behavioral undercontrol, oppositional defiant disorder
 - Negative emotionality, depression
 - Attention problems, ADHD
 - Shyness, social withdrawal, social phobia

Establishing Risk

- a. Through family characteristics
- b. Through individual characteristics
- c. Through social environments

Establishing Risk

- a. Through family characteristics
- b. Through individual characteristics
- c. Through social environments
 - High drug use environments
 - High stress environments (violence, poverty, unemployment)



How early are these factors detectable?

Family Risk and Social Risk

- We can identify these factors at birth.
- Should prevention programming take place at this point?

Family Risk and Social Risk

- We can identify these factors at birth.
- Should prevention programming take place at this point?
 - No. . . Several reasons. . .
 - Political, economic, social stigma issues, individual differences.

Individual Risk

- We know about these factors in late childhood and adolescence.
- Most targeted prevention programming occurs in this age range.
- Is this the right time to begin?

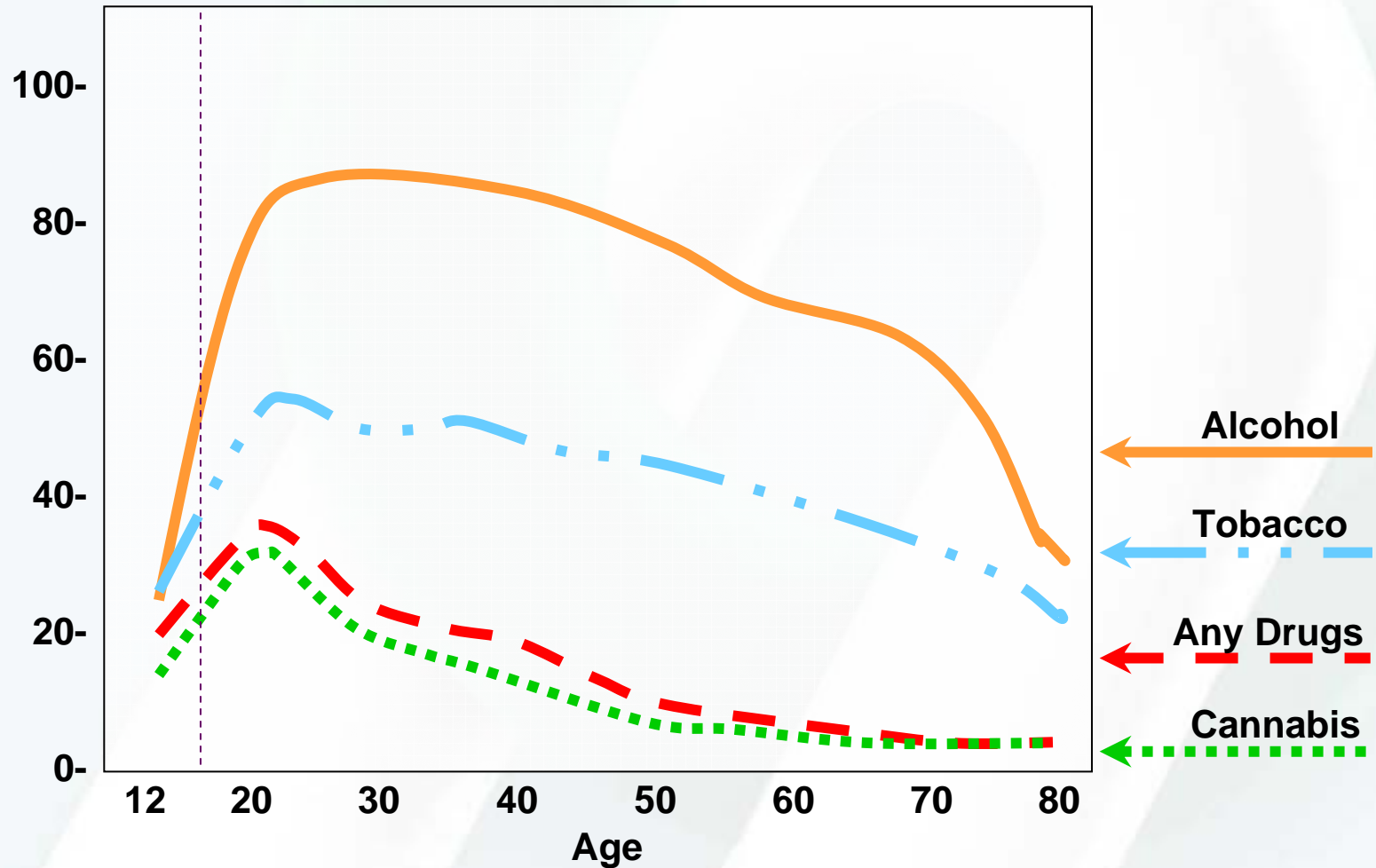
Individual Risk

- We now can identify risk for substance abuse 12 years before it happens.
- These findings inform us about different times when we should intervene and prevent.



What We Know About the Development of High Risk:
Recent Findings from the Michigan – Michigan State Longitudinal Study

Primary Onset of Substance Use Occurs between Ages 12 and 20



Source: Anthony, J.C., & Arria, A.M. (1999). Epidemiology of substance abuse in adulthood. In P.J. Ott, R.E. Tarter, & R.T. Amerman (Eds). Sourcebook on substance abuse. Etiology, epidemiology, assessment and treatment. Boston, MA: Allyn and Bacon.

Early first drink (EFD ≤ 14 vs. NFD) as a proxy for . . .

- Adult alcoholism: Rate of alcohol dependence 4Xs higher among EFD (Grant & Dawson, 1997).
- Lifetime risk of injury: 12X greater (Hingson et al., 2000).
- Adolescent problem drug use: More problem drinking, injuries, violence, other drug use during adolescence (Gruber et al., 1996).

So earlier starting is worse. . .Why?

1. A marker of a damaged social environment: What kind of family would let one so young have access? (Indicates a failure in monitoring, or even more significantly, the early encouragement of addictive behavior).
2. Creates disruption of life tasks (school achievement, peer competence).
3. Provides a head start on problem use, with more troubled peers, where use is more likely to continue.



What predicts early alcohol and other drug use?

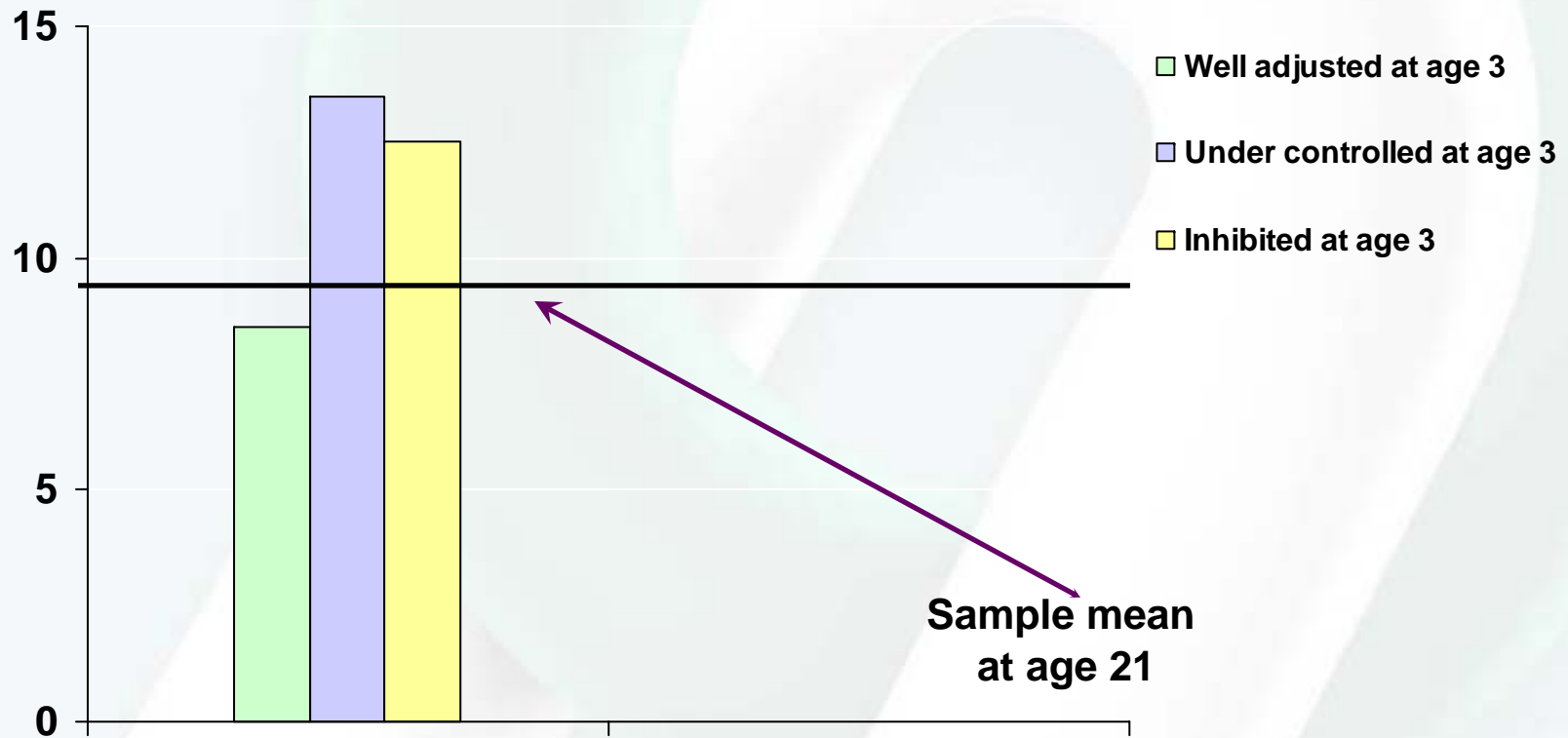
Externalizing Behavior as a Predictor

- Aggressiveness
- Delinquent activity
- Hyperactivity
- Inattention

High Levels of Internalizing Behavior as a Predictor

- Sadness
- Depression
- Anxiety
- Social withdrawal
- Somatizing complaints

Association between Behavior Styles at Age 3 and Adult Alcohol Dependence (Percent at Age 21)

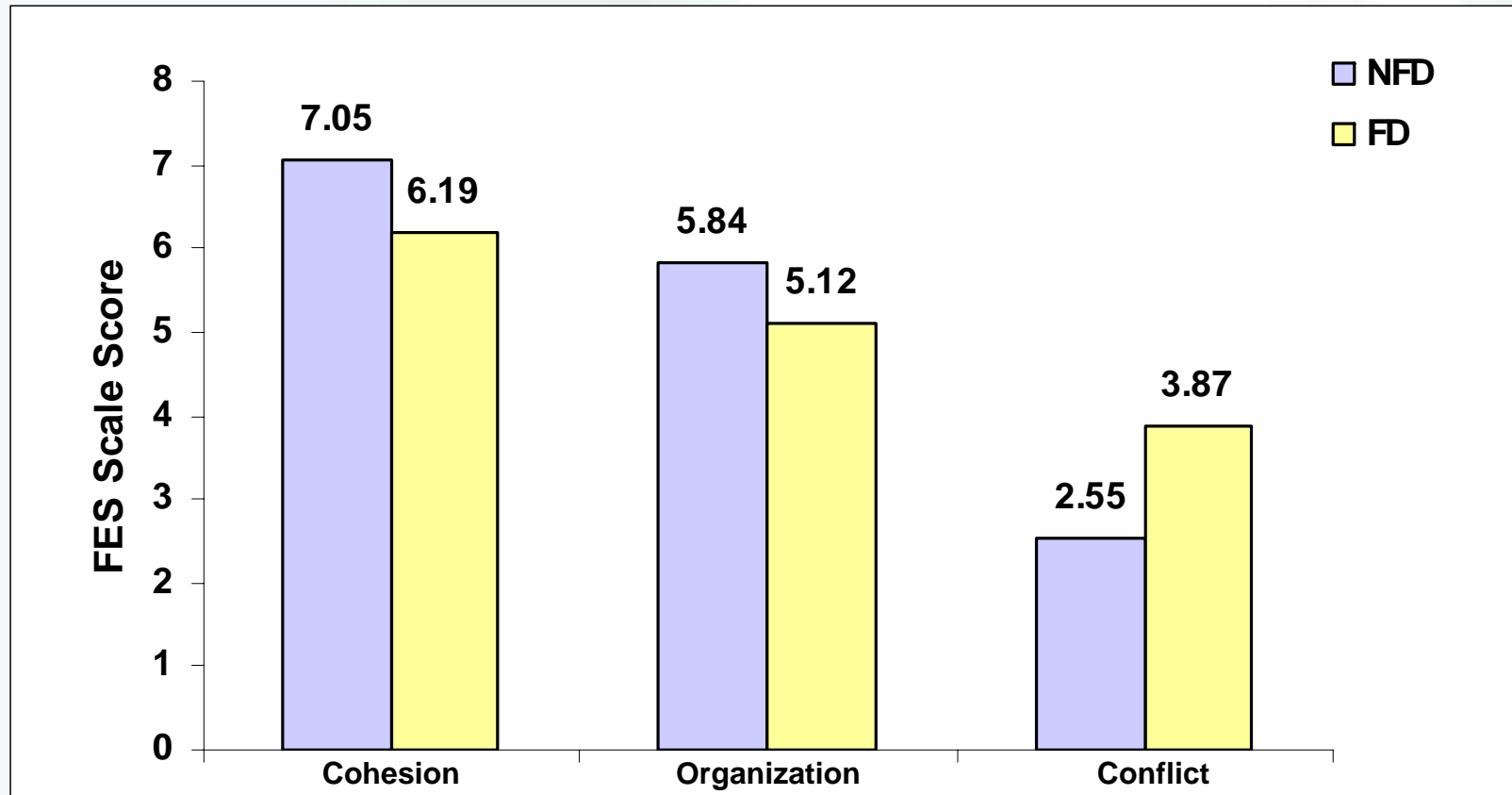


Source: Caspi et al. 1996, p. 1038



What other factors in early childhood (ages 3 – 4) predict early drinking & drug use onset in adolescence?

Relation of Preschool Family Environment Indicators to Early First Drink Experience



Moos Family Environment Scale scores

What Happens between Early Childhood and Adolescence?

- Looking backward from adolescence and looking forward from early childhood suggests that the behavior is stable over the course of childhood.
- But the developmental evidence shows that these risky behaviors are stable over time for some characteristics and not for others.

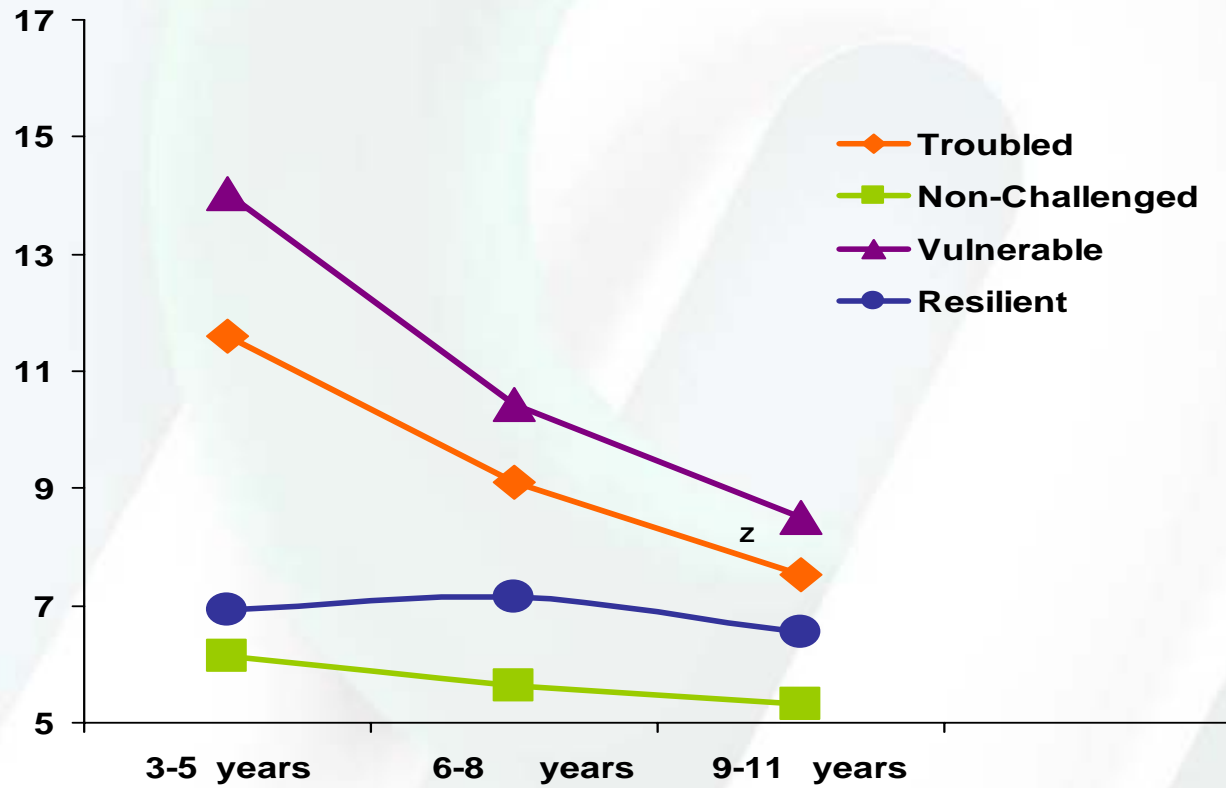


The combination of both early child risk (individual risk) and family environment (social risk) determine differences in course from early childhood to adolescence. . .

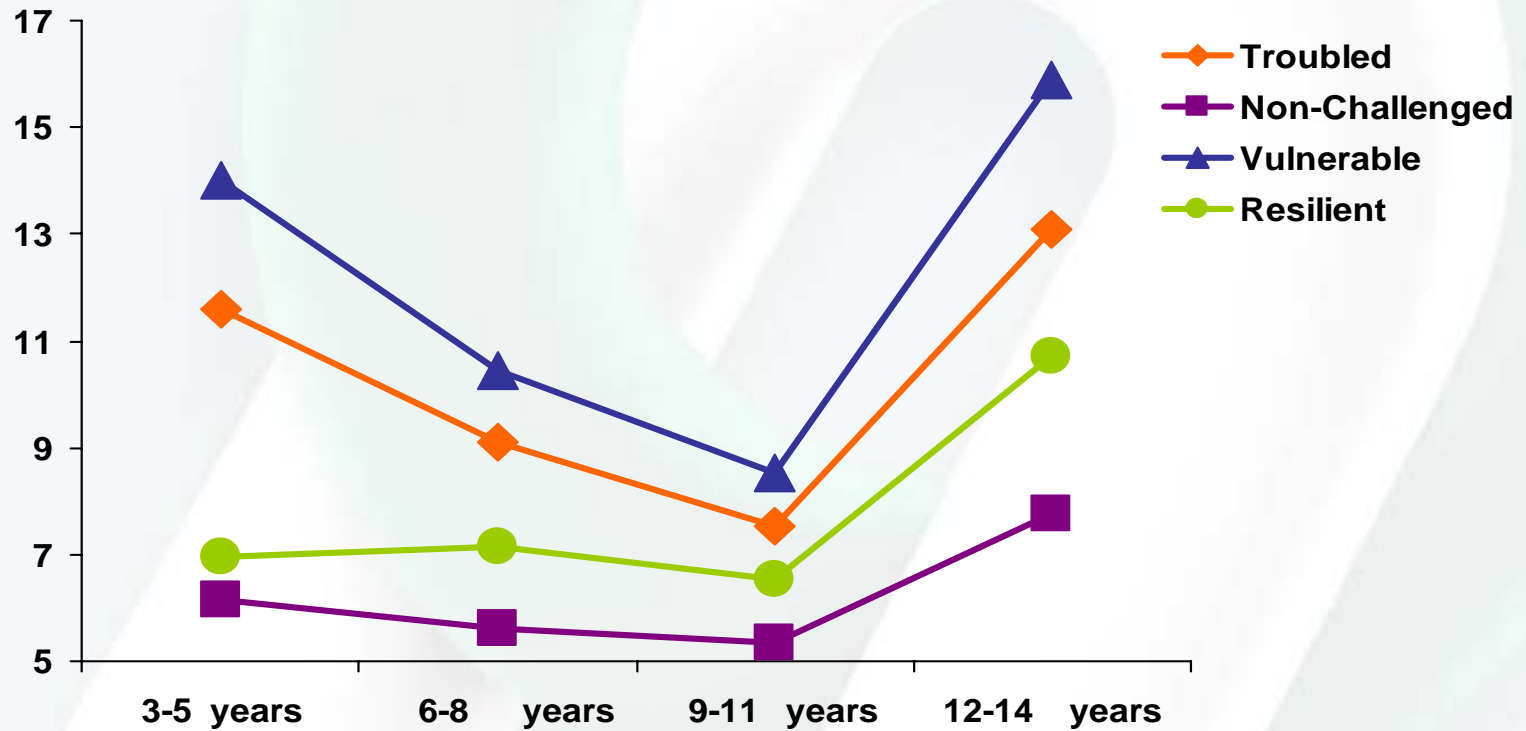
The Different Adaptation Groups During the Preschool Years

		Child Psychopathology	
		<i>In Normal Range</i>	<i>High</i>
Family Adversity	<i>Low</i>	Non-challenged	Troubled
	<i>High</i>	Resilient	Vulnerable

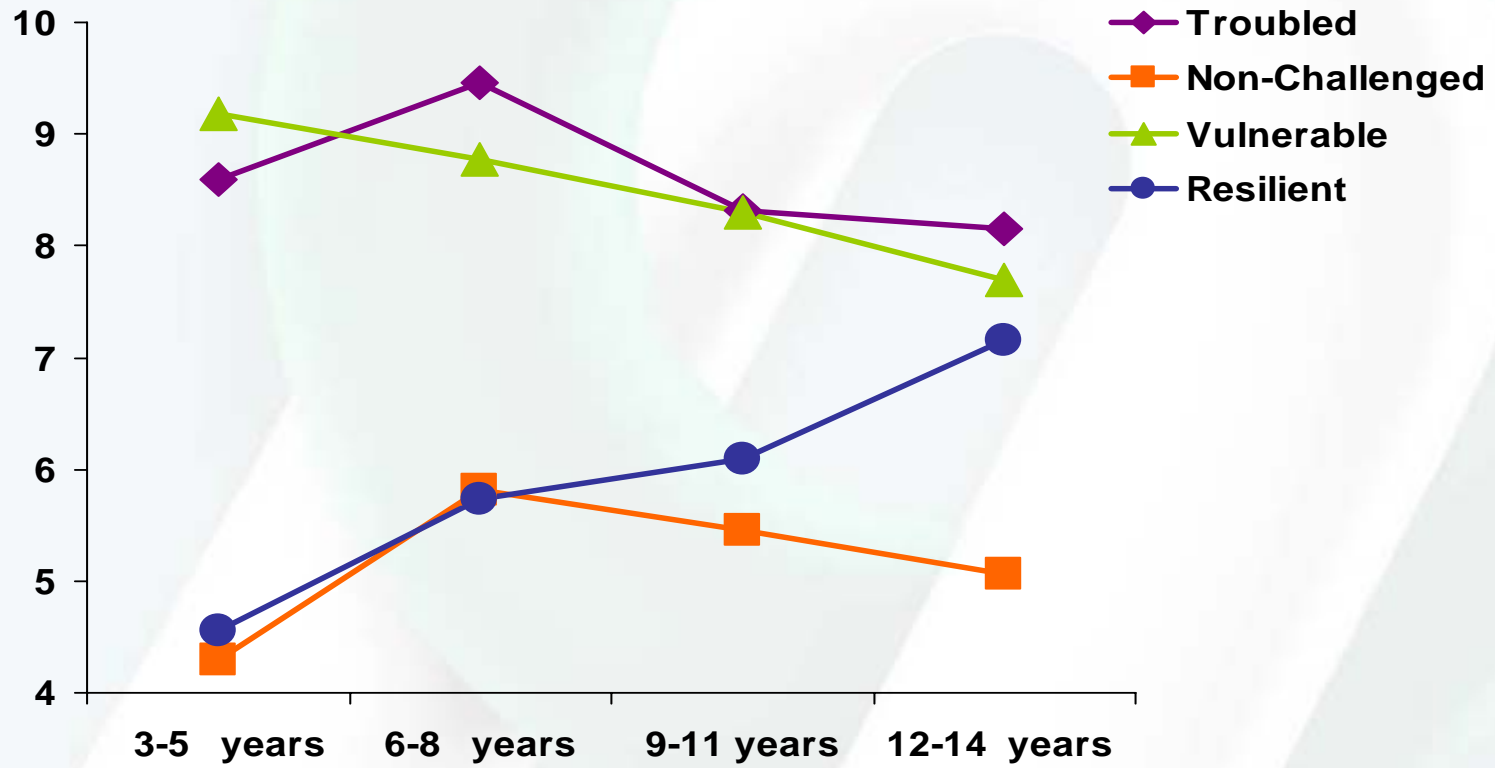
Externalizing Symptoms During Early Childhood and the Elementary School Years



Stability and Change in Externalizing Symptoms During the Transition into High School



Internalizing Symptoms



- The most damaged children (and those at highest risk) are those who temperamentally have the vulnerability (behavioral indicators of undercontrol, roughness, irritability, early mood dysregulation, sadness, depression, sleep problems), and they show higher levels of antisocial behavior early.
- They also are growing up in high adversity, very difficult environments.

Social Costs of the High Continuity Trajectory

- Academic difficulty and failure
- Date rape/sexual assault
- Other kinds of physical injury to self and others (e.g. automobile accidents)
- Impaired social relationships
- Loss of social capital; foreclosure of future opportunities, higher poverty risk



Three Development Pathways into Substance Use Disorder

Risk Over Time: The Continuity Pathway

Preschool	Externalizing behavior problems, social withdrawal, poor school readiness.
Childhood	Behavior problems, oppositional behavior, impulsivity, social withdrawal, poor school performance.
Late middle childhood	Family disorganization (divorce/separation, loss of job, health or social problems of other family member); poorer parent monitoring.
Adolescence	Earlier onset of alcohol and other drug involvement, heavier alcohol and other drug problems, delinquency, depression.
Adulthood	Antisocial personality disorder, mood disorder, substance abuse disorder.

Adapted from Fitzgerald, Zucher, Puttler, Caplan & Mun (2000)

Risk Over Time: The Discontinuity Pathway I

Preschool

School readiness, behavior within normal limits, adaptive temperament.

Childhood

Good school adaptation and performance; good friendship network.

Late middle childhood

Family disorganization (divorce/separation, loss of job, health or social problems of other family member); poorer parent monitoring; shift in more deviant peer network; increasing emergence of externalizing behavior, developing pattern of internalizing problems.

Adolescence

Alcohol and other drug involvement, minor delinquency. Poor or adverse outsider response or parent response; undependability of both parents, less available prosocial network. Difficulties self correcting.

Risk Over Time: The Discontinuity Pathway II

Preschool

School readiness, behavior within normal limits, adaptive temperament.

Childhood

Good school adaptation and performance; good friendship network.

Late middle childhood

Family disorganization (divorce/separation, loss of job, health or social problems of other family member); poorer parent monitoring; shift in peer network; increasing emergence of externalizing behavior.

Adolescence

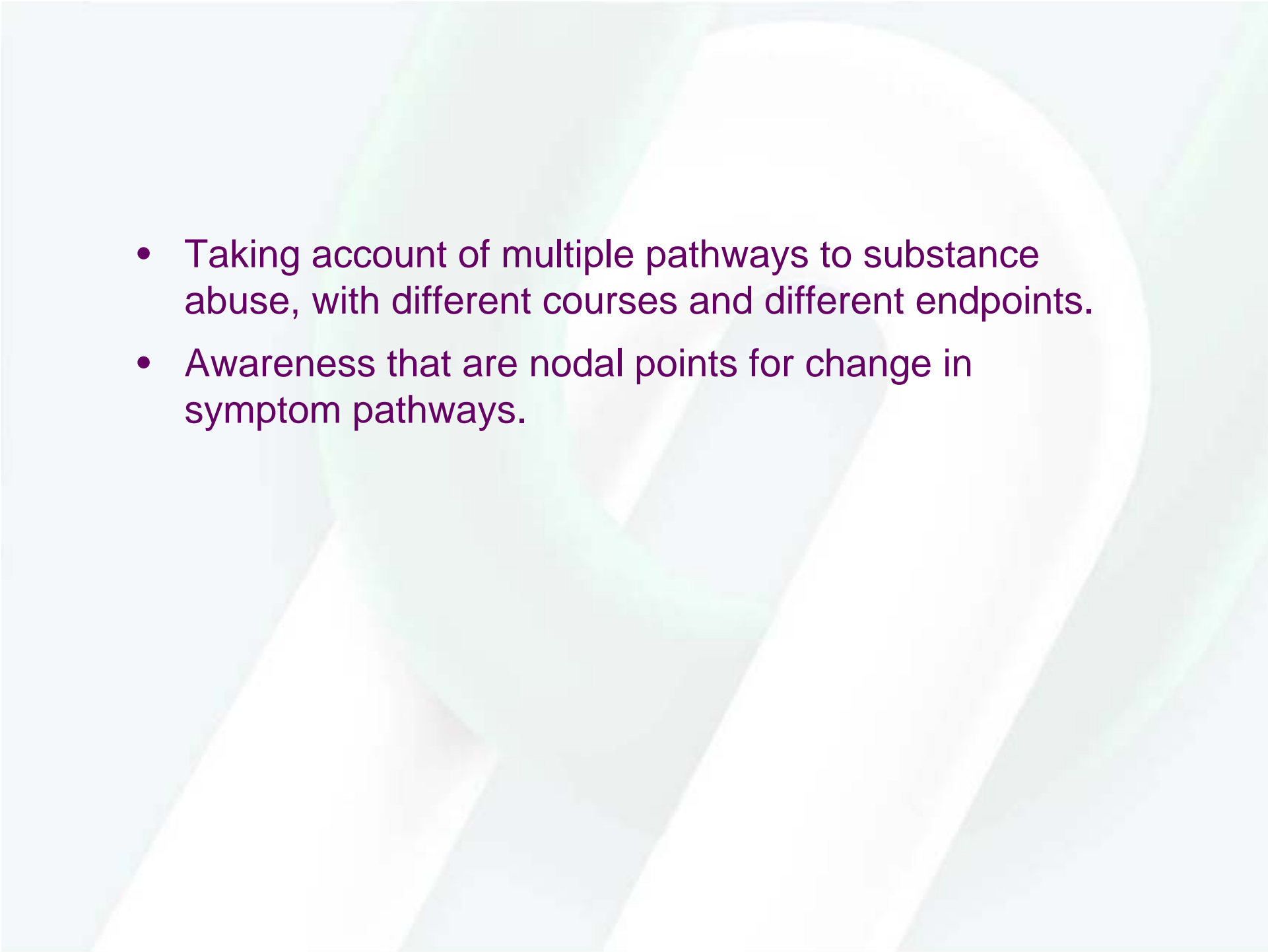
Alcohol and other drug involvement, minor delinquency. Parent or outsider response and/or personal concern moving back on track; shorter clinical course.



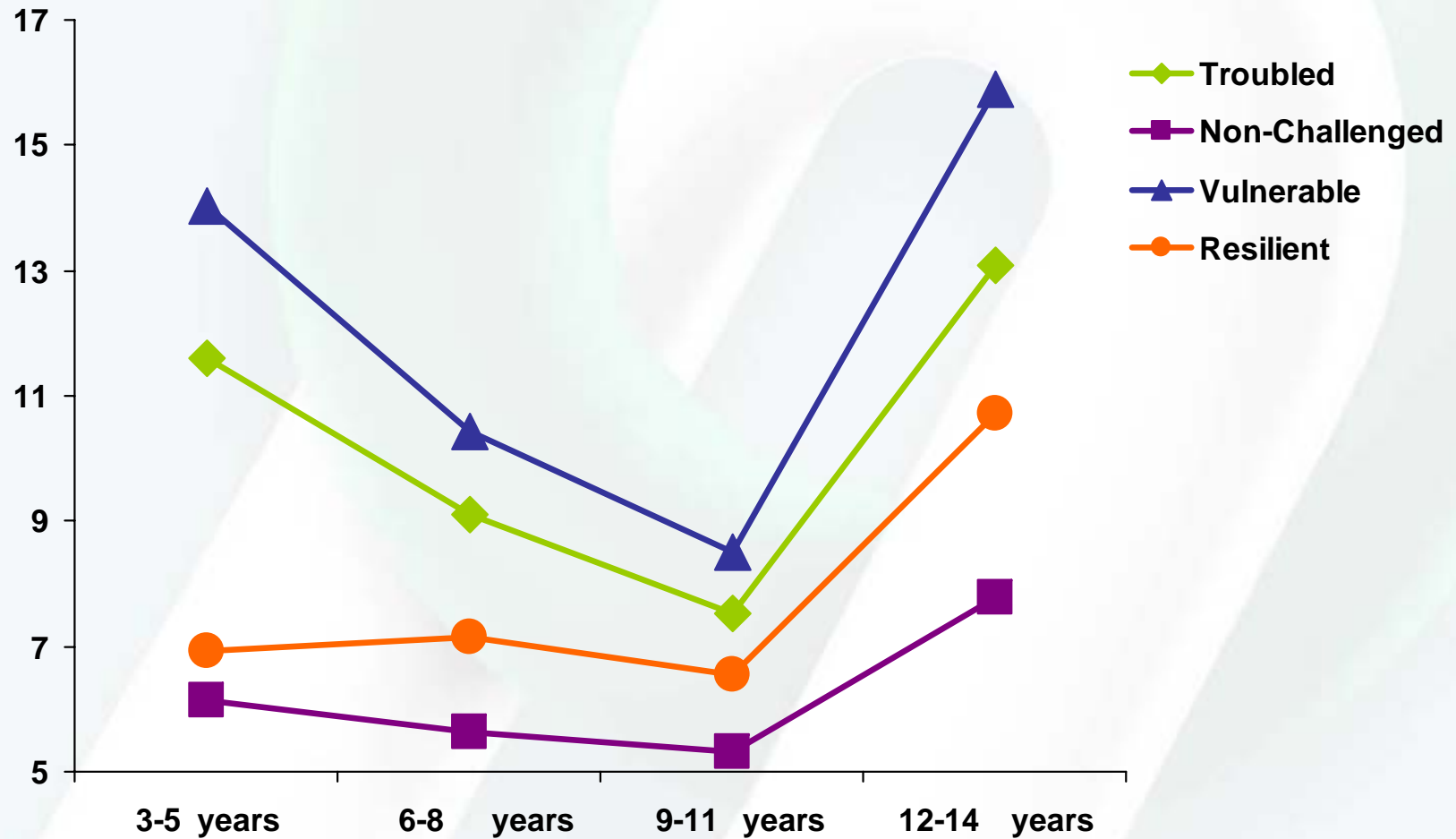
Treatment

The Problem of Heterogeneity in Symptom Trajectories

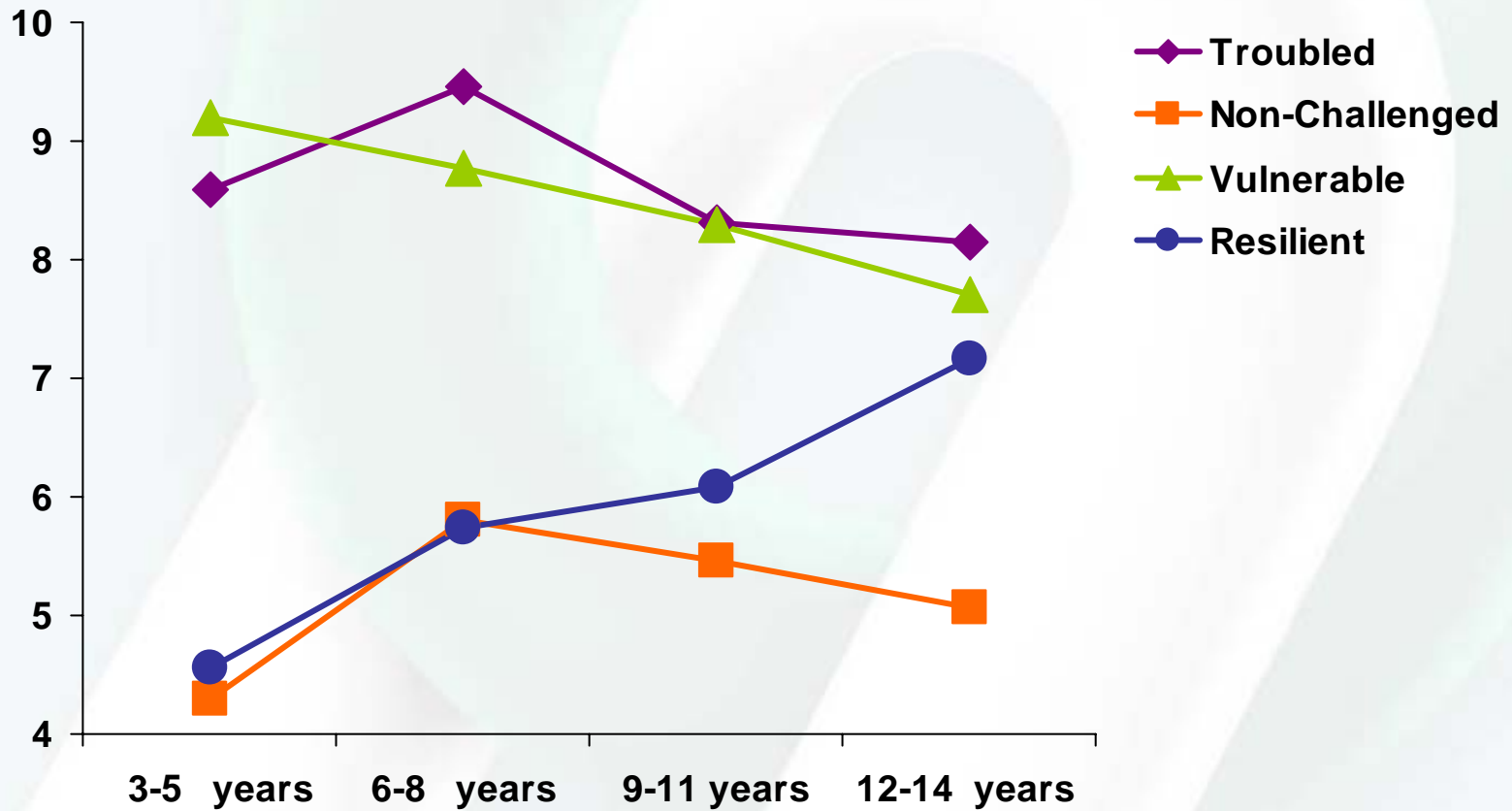
- In clinical practice, trajectory (or symptom) variation tends to get ignored, sometimes is not even detected, because of the relatively short time frame of the clinical contact.
- Yet the data from prospective studies show that this is essential information in evaluating course and prognosis.
- Developmental assessment as a way of evaluating risk.

- 
- Taking account of multiple pathways to substance abuse, with different courses and different endpoints.
 - Awareness that are nodal points for change in symptom pathways.

Stability and Change in Externalizing Symptoms During the Transition into High School



Internalizing Symptoms



Family Adversity Indicators

- High drug involvement in the parent(s)
- Familial assortment of the substance use disorder (family history)
- Currency and persistence of parent(s)' disorder (the need for family patterns of use)
- Presence of antisocial personality disorder in the parent(s)
- Parental noncompliance in child treatment
- Poor parent monitoring

Children's Risky Rearing Environments

- Parental history of regulatory system dysfunction
- Parental history of psychopathology
 - Antisocial behavior disorder and aggression
 - Depression
 - Alcoholism and other drug use
- Parental history of relationship disturbances
- Parental poor value structures
- Parental cognitive deficiencies
- Family low socioeconomic status
- Family residence in risk aggregated neighborhoods

Children's Risky Behavior

- Self regulatory dysfunction
- Difficult temperament
- Attachment (relationship) disorders
- Internalizing/externalizing behavior problems
- Parent-child relationship disturbances
- Schemas for alcohol use and alcohol-linked behavior
- Poor value structure
- Cognitive deficiencies
- High risk peer network



The work reported here was supported by National Institute on Alcohol Abuse and Alcoholism grants R37 AA 07065, R01 AA 12217, and T32 AA 07477

Collaborators

Robert A. Zucker, Ph.D.

Hiram E. Fitzgerald, Ph.D.

Leon I. Puttler, Ph.D.

Susan Refior, M.S.W.

Maria M. Wong, Ph.D.

Margit Burmeister, Ph.D.

Scott F. Stoltenberg, Ph.D.

Andrea Hussong, Ph.D.

Kirk J. Brower, M.D.

Frank Floyd, Ph.D.

Joel Nigg, Ph.D.

Susan Nolen-Hoeksema, Ph.D.

Deborah A. Ellis, Ph.D.

Jennie Jester, Ph.D.

Kenneth M. Adams, Ph.D.

Jennifer Glass, Ph.D.

James Cranford, Ph.D.

Mary J. McAweeney, Ph.D.

Colleen Corte, R.N., Ph.D.

Edwin Poon, Ph.D.

Past Collaborators

Eve E. Reider, Ph.D.
Alexandra Loukas, Ph.D.
Fernando E. Gonzalez, Ph.D.
Roseanne D. Brower, Ph.D.
Lucilla Nerenberg, M.D.
Michael A. Ichiyama, Ph.D.
Sondra Wallen, M.A.
Michelle Klotz Dougherty, M.A.
Helene M. Caplan, Ph.D.
Gregory Hanna, M.D.
Ed Cook, M.D.
Gregory S. Greenberg, Ph.D.
William J. Curtis, M.A.
Robert R. Mueller, Ph.D.
Diane M. Pallas, Psy.D.
Robert B. Noll, Ph.D.

C. Raymond Bingham, Ph.D.
Roni Mayzer, M. A.
Cynthia L. Nye, Ph.D.
Eun-Young Mun, Ph..D.
Eugene T. Maguin, Ph.D.
W. Hobart Davies, Ph.D.
Steven Kincaid, Ph.D.
Roger Jansen, M.A.
Lisa Piejack, Ph.D.
Geoffrey Twitchell, Ph.D.
Karley Y. Little, M.D.
Ellen E. Whipple, Ph.D.
Hae-Young Yang, Ph.D.
Hazen P. Ham, Ph.D.
Keith P. Sanford, Ph.D.