Substance Abuse and ADHD Among Adolescents and Young Adults

Prevalence and Developmental Considerations

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Support provided by NIAAA, NIDA, NIMH, OJJDP, NICHD, and the U.S. Department of Education.

No pharmaceutical funding.

Youth and Family Research Program
University of Pittsburgh, Department of Psychiatry
www.yfrp.pitt.edu

- Long-term course and treatment of ADHD, particularly as it relates to substance abuse
- Single and multi-site longitudinal studies of children with ADHD including brain structure and function and offspring mental health
- Treatment trials for ADHD in childhood, adolescence, and adulthood
- ADHD treatment in primary care with a focus on prevention of stimulant misuse

ADHD

- What is ADHD?
  - *Impairing* symptoms of inattention, impulsivity, and hyperactivity or restlessness
- Begins in childhood (*late onset is controversial*)
- 5.3% of children globally *(Polanczyk et al., 2007)*
- More common among boys in childhood (5-9 boys:1 female) but ratio changes in adulthood ~2:1
- Annual costs $143-$266 billion *(Doshi et al., 2012)*
  - Compare to annual cost of depression, $210 billion
  - Most in adulthood due to productivity and income losses
  - In childhood, due to healthcare and education costs
  - Spillover costs borne by family members also substantial

What is the long-term prognosis for ADHD?

Persistence of diagnosis and impairment

- ~ 2/3 still diagnosable with ADHD as adolescents
- ~ 1/2 still diagnosable with ADHD as adults
- Impairment often stretches beyond the diagnosis
- More on this later

Educational and occupational under-performance

- 8% of symptom persistent finished college,
- 18% of remitted cases finished college,
- 37% of nonADHD finished college *(Hechtman et al., 2016)*
- 543-616K USD less in earnings over lifetime *(Altszuler et al., 2016)*

Co-occurring mental health problems and behaviors

- Delinquency, Criminality
- Depression
- Social differences, but this is complicated
- and…substance use and abuse (emphasis of my talk today)

Why ADHD as a Risk Factor for Substance Abuse?

- Consider symptoms that begin in childhood
  - Inattention, hyperactivity-impulsivity*
    - Poor inhibitory control – verbal, motor, cognitive
    - Difficulty delaying gratification
    - Greater disregard for future (delayed) consequences
    - Excessive task-irrelevant behavior (e.g., fidgity) as a consequence of impaired motor control (as form of poor inhibitory control); lessens w age to sense of internal restlessness
    - Emotionally impulsive; difficulty down-regulating

*Molina & Pelham, 2014; *Barkley et al., 2008*

The Marshmallow Experiment

- An illustration of delaying gratification
- See it on YouTube
- https://www.youtube.com/watch?v=QX_oy9614HQ
- *Mischel, W., Ebbesen, E.B., Raskoff Zeiss, A. (1972). Cognitive and attentional mechanisms in delay of gratification. Journal of Personality and Social Psychology, 21(2), 204-218.*

Impulsivity as an Enduring Trait with Behavioral and Neurobiological Connections to Addiction

- Impulsivity is a well-established risk factor for addiction (Sher, 2005)
- Individual components increase risk for addiction
- Highly heritable and stable (e.g., Niv et al., 2012)
- Clear connections to neurobiological substrates
- Yet, there is meaningful variance in impulsive choice and action to be better understood (McCarthy et al., 2017)

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ADHD and EMA

"Ecological Momentary Assessment"

Assessing thoughts, behaviors, and context IN THE MOMENT to better understand the immediate circumstances that drive behaviors for individuals with ADHD

ADHD is Highly Persistent

- About 50%, ranging from 35% - 65%, of children with ADHD have symptom persistence into adulthood *(Owens et al., 2015)*
- There is subtype inconsistency *(Lahey et al., 2005; Molina et al., 2009)*
  - Often moving from combined to inattentive subtype
  - But is that real?
  - Are we simply measuring impulsivity poorly?
- Implications for substance abuse vulnerability
- What is driving the risk? Symptoms?
  - Only the children with severe conduct problems?
  - Impairments from ADHD?
    - academic, vocational, behavioral, social

Pathways to Addiction

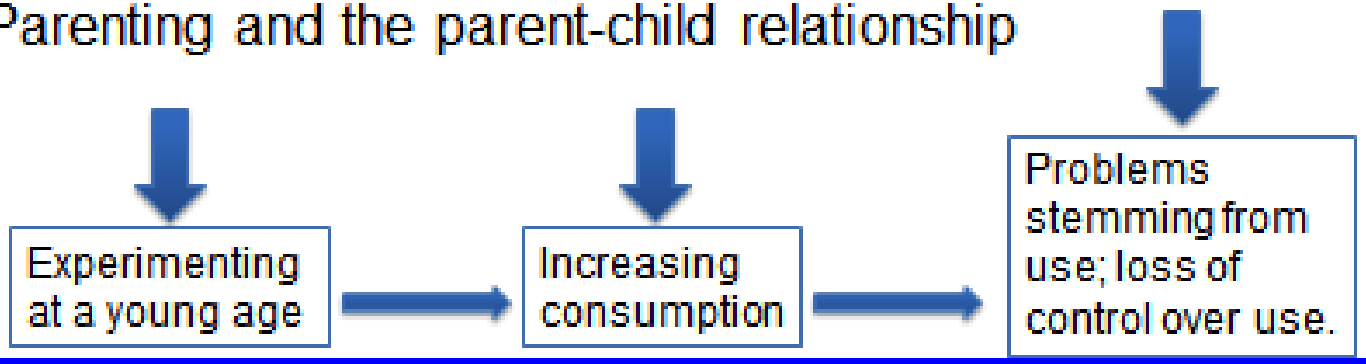
- *Molina, B.S.G. & Pelham, W.E. (2014). Attention-deficit/hyperactivity disorder and risk of substance use disorder: Developmental considerations, potential pathways, and opportunities for research. Annual Review of Clinical Psychology, 10, 607-639.*

- Additional reviews
  - *Adisetiyo & Gray, 2017; Flory & Lynam, 2003; Groenman et al., 2015; Kennedy et al., in press; Wilens & Biederman, 2006*

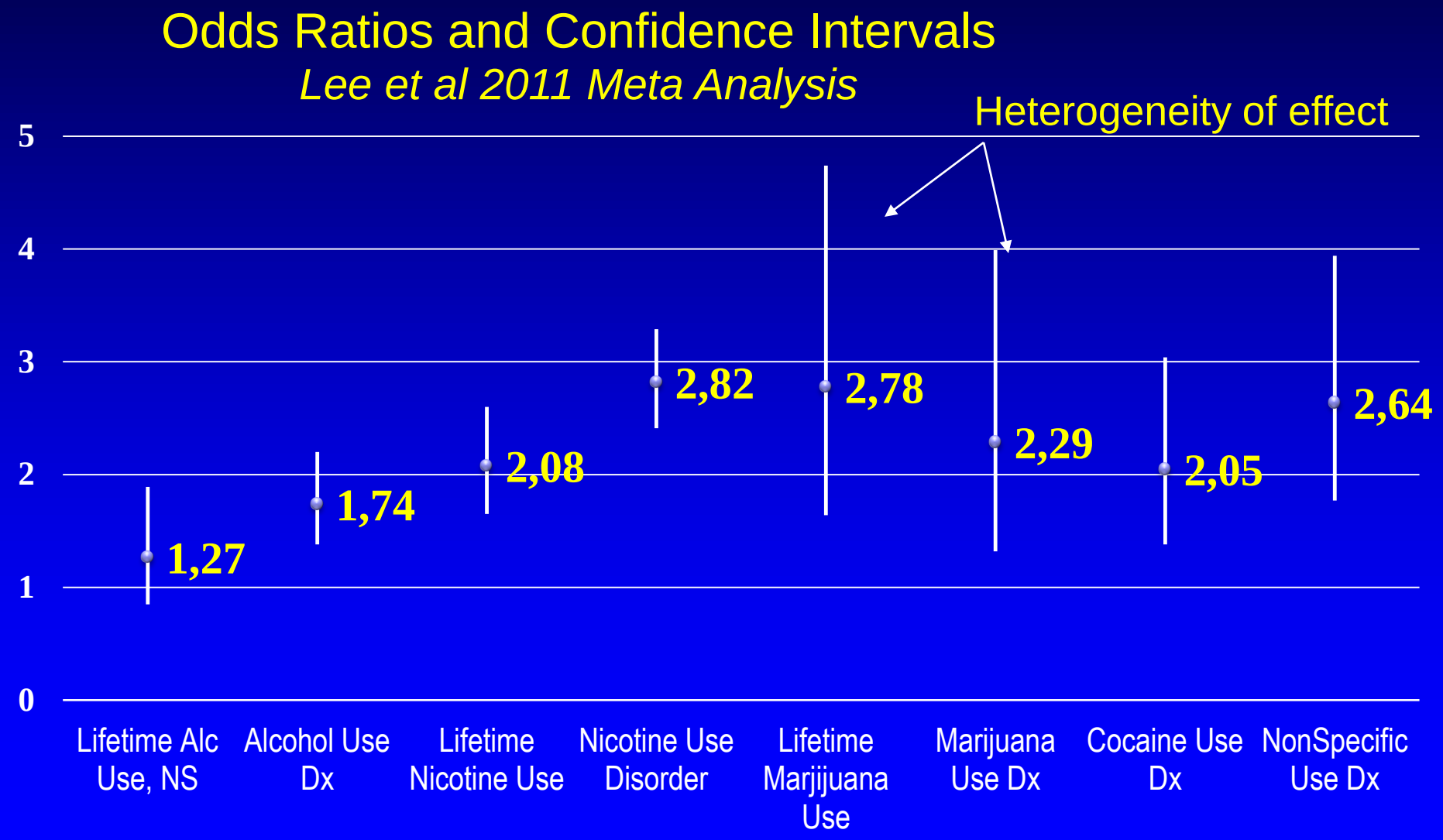
Contributing Factors to Substance Abuse in ADHD

Molina & Pelham, 2014, Annual Review of Clinical Psychology

- Biological (genetic, teratogenic)
- Familial (substance use, mental health)
- Biological response to drugs of abuse
- Impairments in daily life functioning
  - School difficulties
  - Behavior problems
  - Social difficulties that promote behavior problems
- Persisting symptoms
- Poor emotional control; insufficient coping skills
- Peers
- Parenting and the parent-child relationship



Variability in ADHD-Related Substance Use Outcomes: 1.7 to 2.8



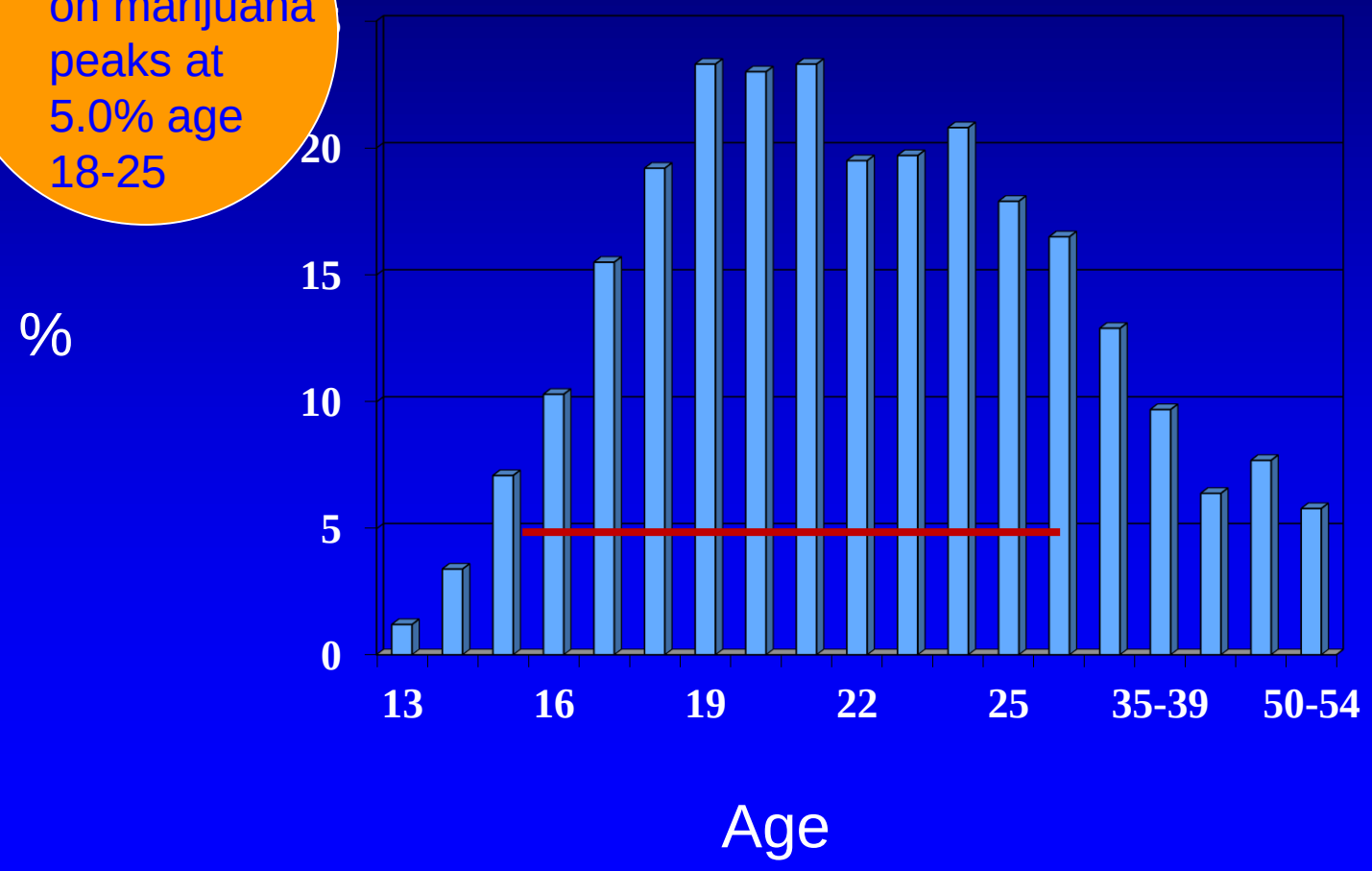
Variability in ADHD-Related Substance Use Outcomes is Caused by a Number of Factors

- Implications of sample selection
  - Clinic versus primary care versus epidemiologic
  - Varying severity and comorbidity
- How substance use outcomes are defined and measured
  - Any substance use versus heavy or frequent use
  - Problems from the use (consequences; diagnosis of abuse, dependence, disorder)
  - Treatment or hospitalization
- Age at assessment. Most longitudinal studies have not reached far into adulthood.

Past Month Marijuana Use

National Household Study on Drug Use and Health

Past year abuse/dep on marijuana peaks at 5.0% age 18-25

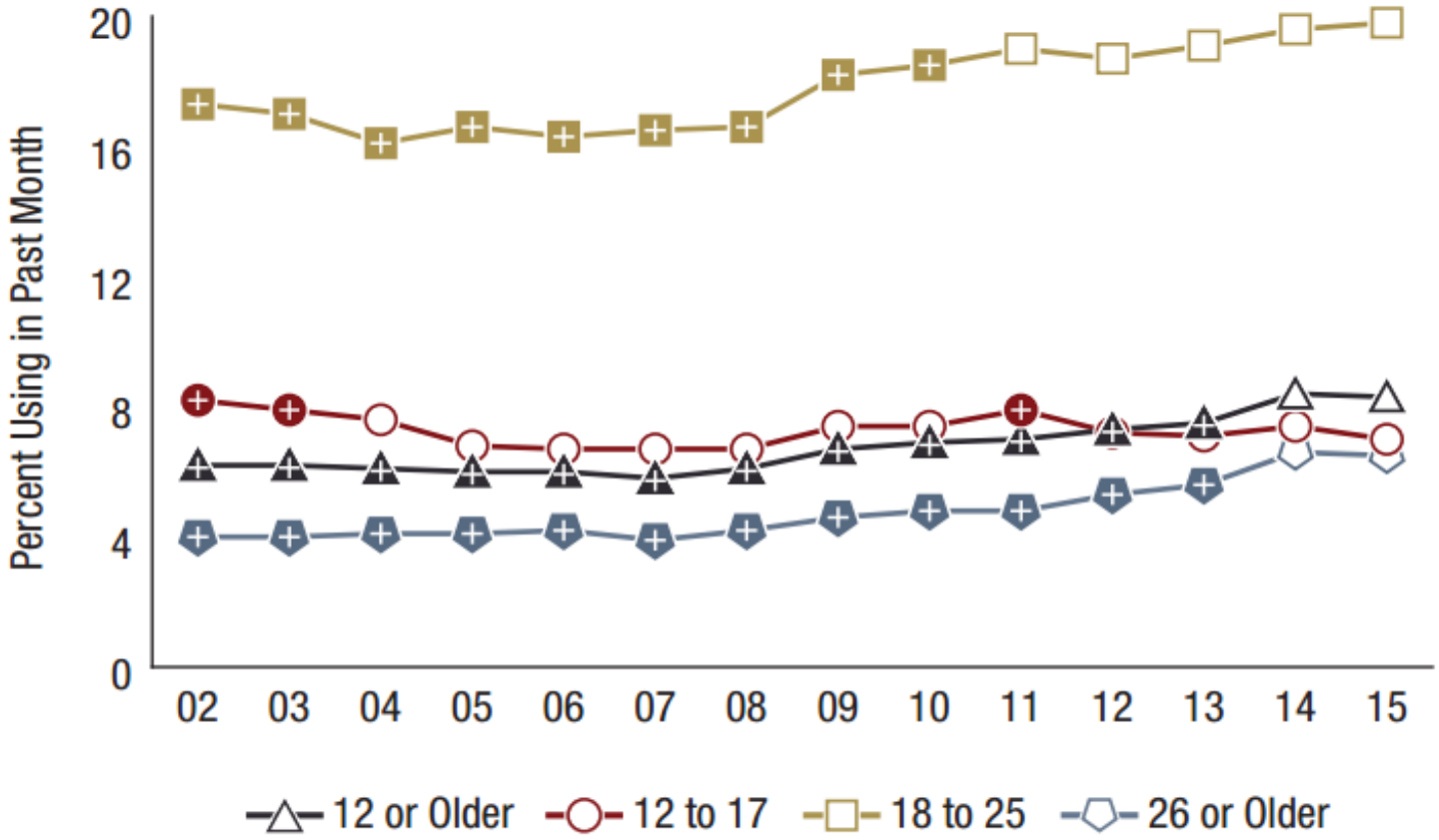


2016

2015 National Survey on Drug Use and Health

www.samhsa.gov

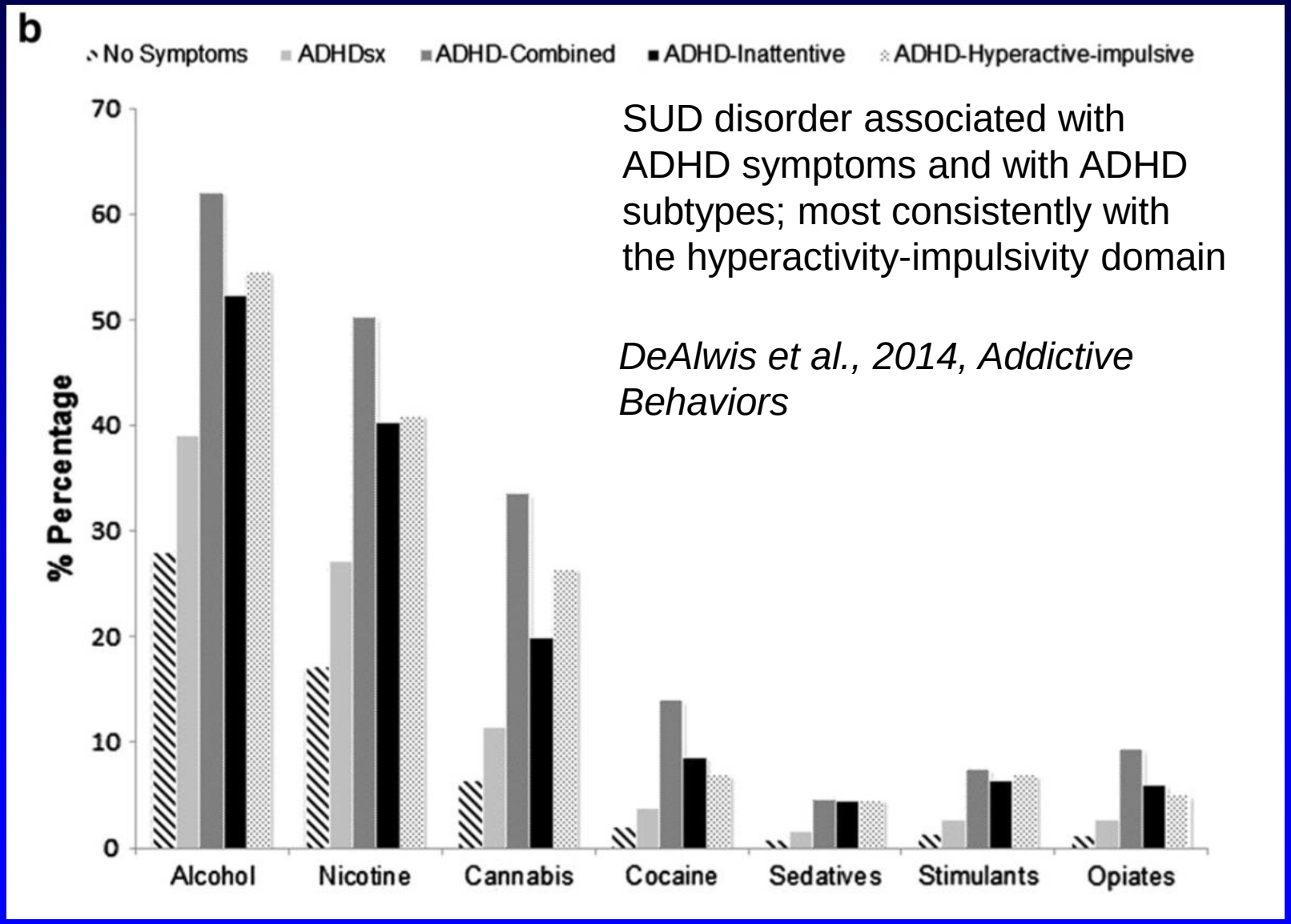
Figure 3. Past Month Marijuana Use among People Aged 12 or Older, by Age Group: Percentages, 2002-2015



More Studies of ADHD and SUD Accumulating

- *Breyer, Lee, Winters et al (2014, Psychology of Addictive Behaviors)*
  - alcohol, marijuana, nicotine dependence to ages 18-22 increased for ADHD-persistent
- *DeAlwis, Lynskey et al (2014, Addictive Behaviors)*
  - Retrospectively reported ADHD symptoms associated with substance use and SUD in national USA epi study (NESARC)
- *Dalsgaard et al (2014, Addictive Behaviors)*
  - Study in Denmark; community diagnosed alcohol and other SUD by M age 31; increased SUD and alcohol problems

NESARC: Large National Survey Study of Adults in the USA (n=33,588)



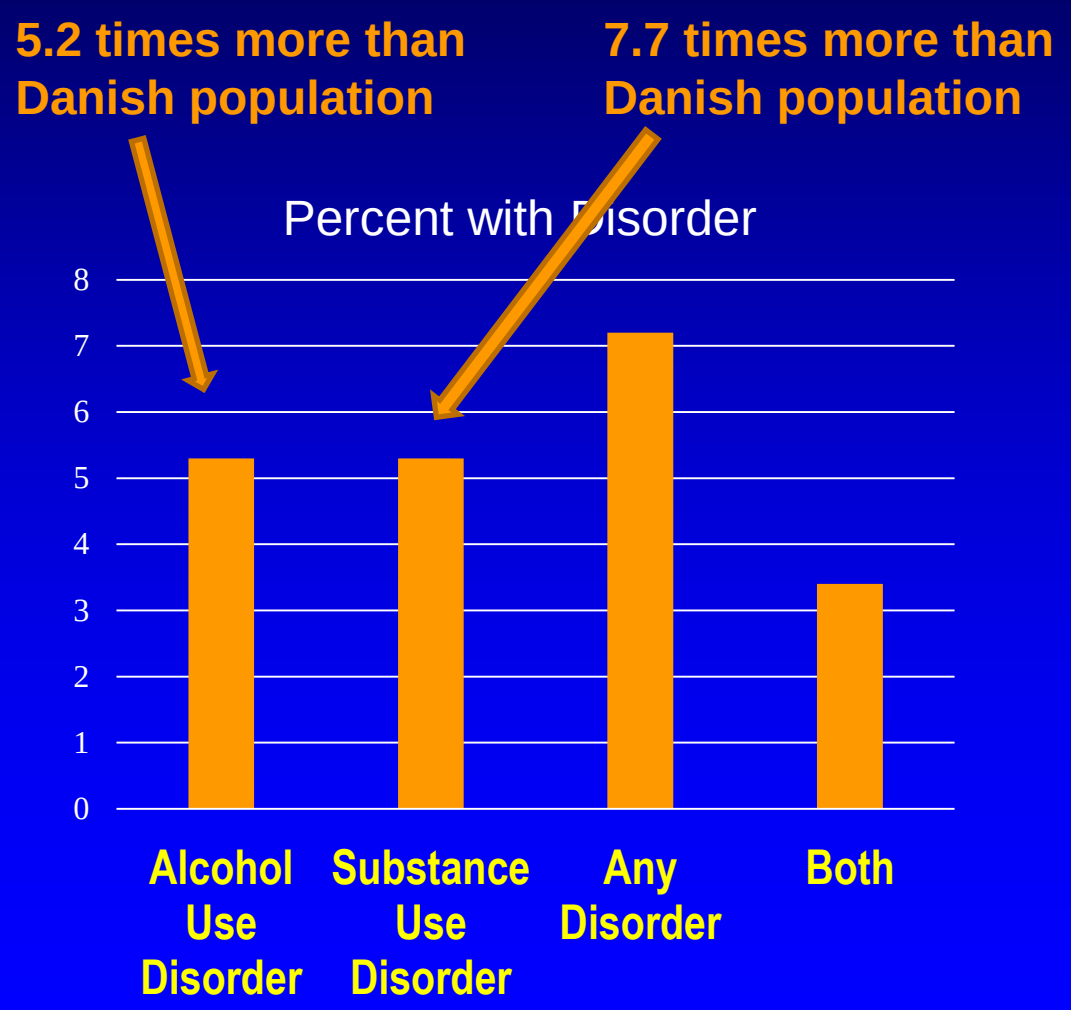
SUD disorder associated with ADHD symptoms and with ADHD subtypes; most consistently with the hyperactivity-impulsivity domain

DeAlwis et al., 2014, Addictive Behaviors

Denmark Study of ADHD and SUD

Dalsgaard et al. (2014) Addictive Behaviors

- 208 children and adolescents with ADHD
- 183 boys, 25 girls
- Records examined to mean age of 31
- Substance use disorder diagnoses associated with inpatient or day-patient psychiatric admissions; data from Danish Psychiatric Central Register



MTA and PALS
samples for consideration…

- MTA: Longitudinal Follow-Up of the Children in the Multimodal Treatment of ADHD Study
- PALS: Pittsburgh ADHD Longitudinal Study

NIAAA, NIDA, NIMH - funded

U Pittsburgh

Duke U

UC Irvine

UC Berkeley

Montreal/NYU

Columbia U

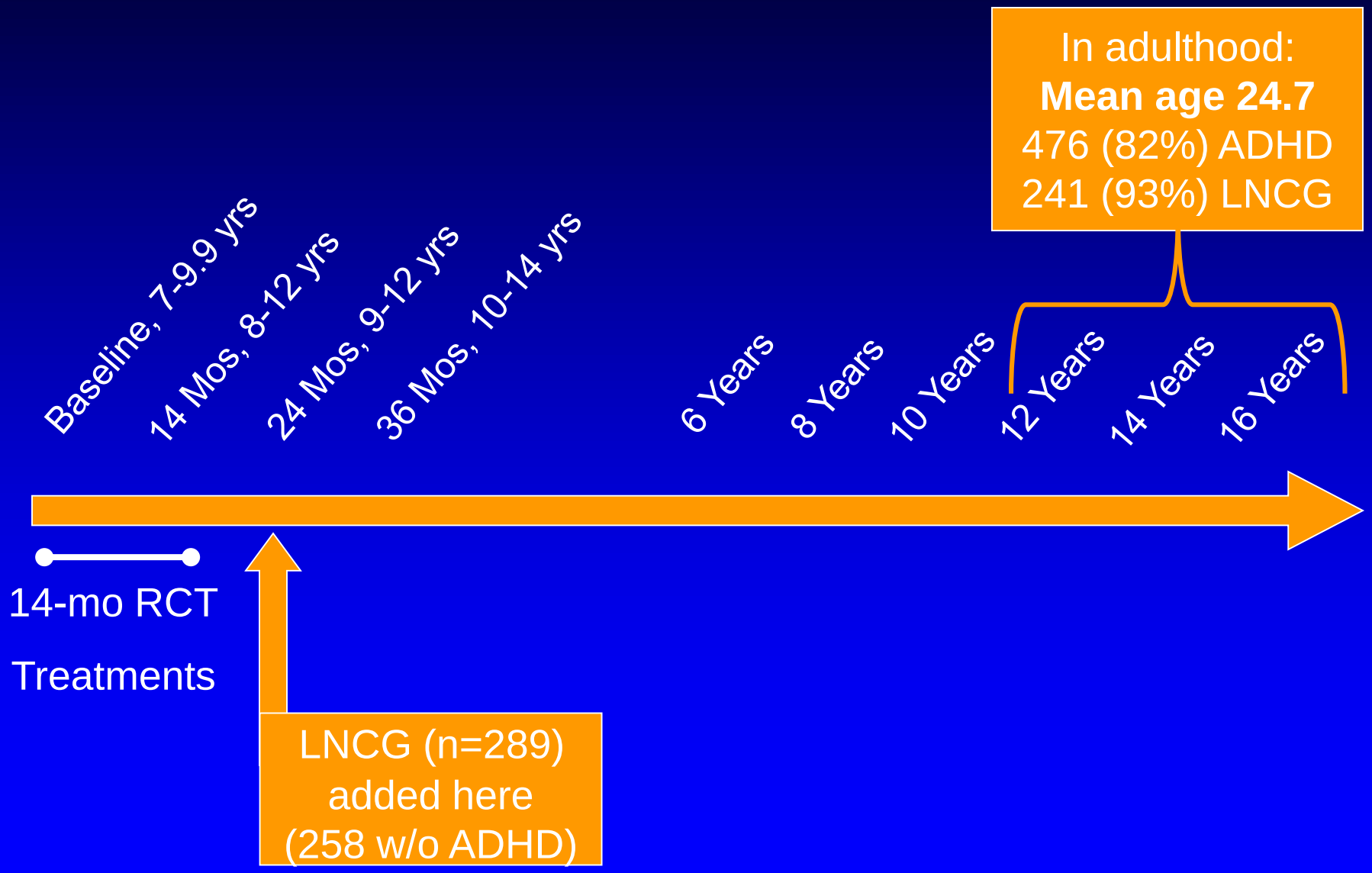
The MTA
Multimodal Treatment of ADHD

- 579 children with DSM-IV ADHD Combined Subtype aged 7-9.9 ➔ large sample, recent diagnostic criteria
- Six site study, diverse sample across multiple geographic and cultural settings ➔ generalizability
- Random assignment to:
  - Med management only (MedMgt)
  - Behavioral treatment only (Beh)
  - Combination (Comb)
  - Community Comparison (not treated by MTA) (CC)

Treated for 14 months

NIMH; NIDA; OJJDP; Dept Ed

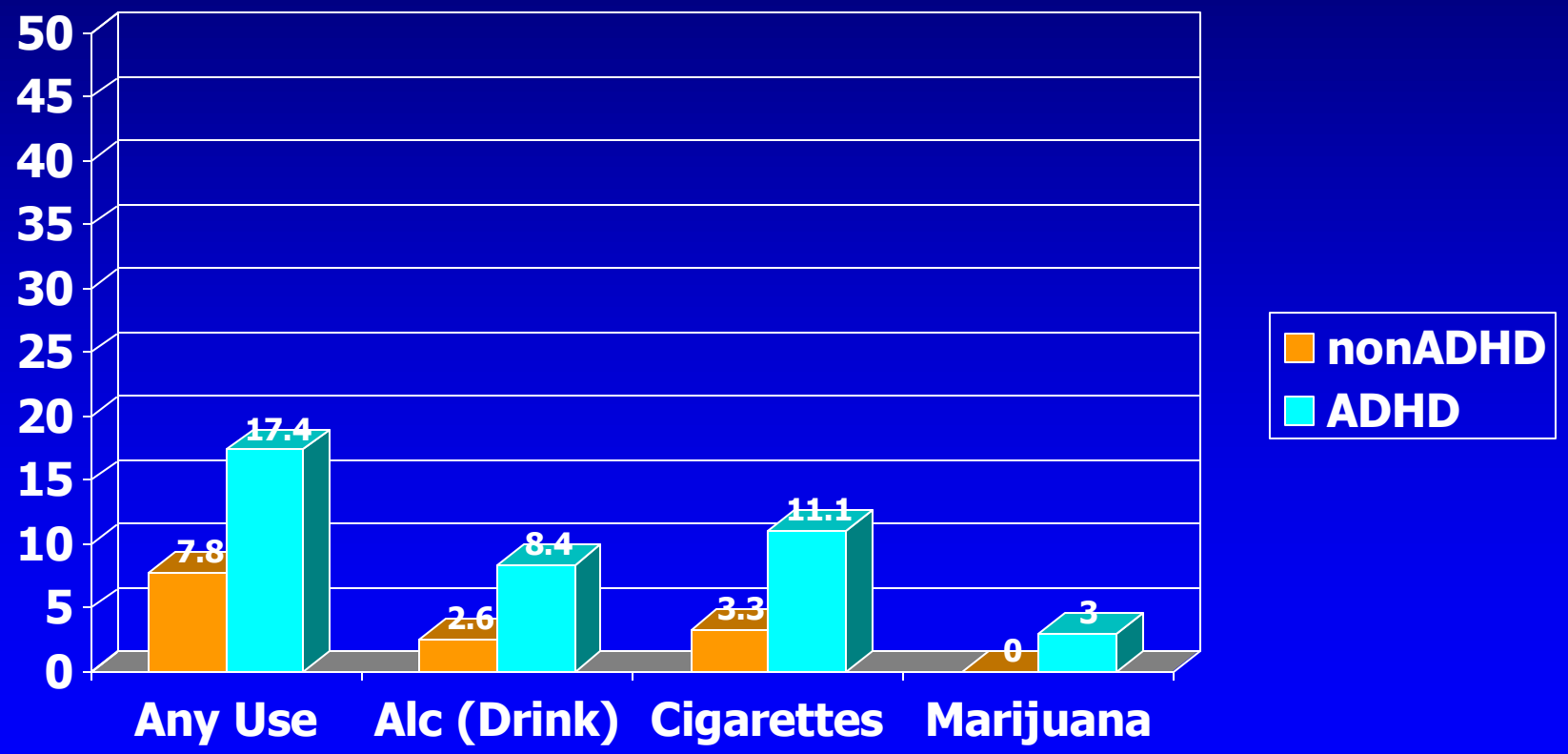
MTA Timeline



MTA Children in Early Adolescence (10-14 Years)

Molina et al., 2007, JAACAP

Early Initial Use

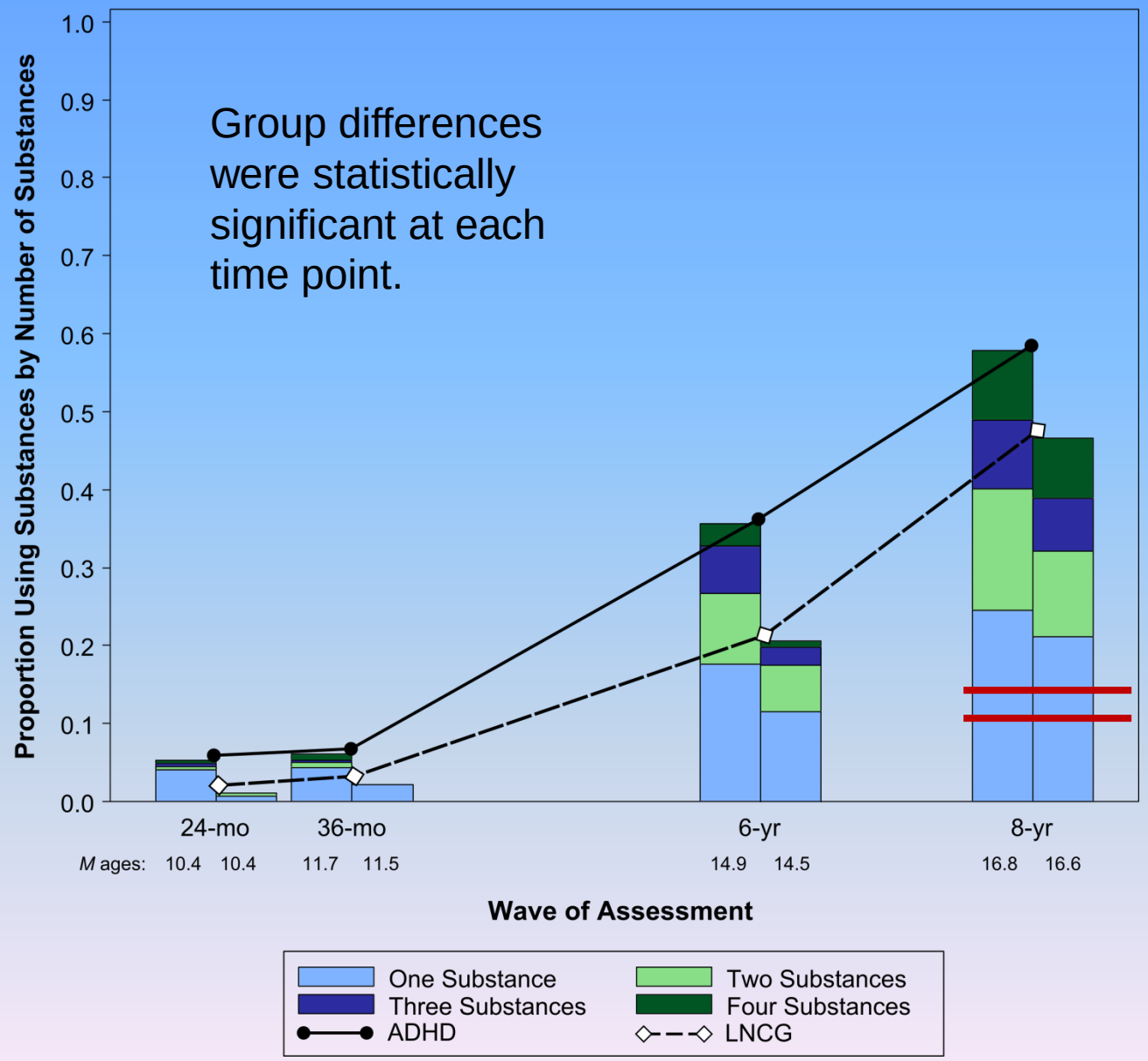


Group differences p<.001. Also sign diff at 24 mos, 11.7 vs 5.6%, p=.003.

MTA Children at Mean Age 17
Substance Use Variables Adjusted for Age

- Alcohol: drank alcohol (more than just a sip) more than 5 times in life or became drunk at least once
- Tobacco: smoked cigarettes or tried chewing tobacco more than a few times
- Marijuana: more than once
- Drug: have used inhalants, hallucinogens, cocaine, or have used amphetamines/stimulants, barbiturates/sedatives, opioids/narcotics on own without a prescription or used more than prescribed

MTA Children at Mean Age 17: Substance Use

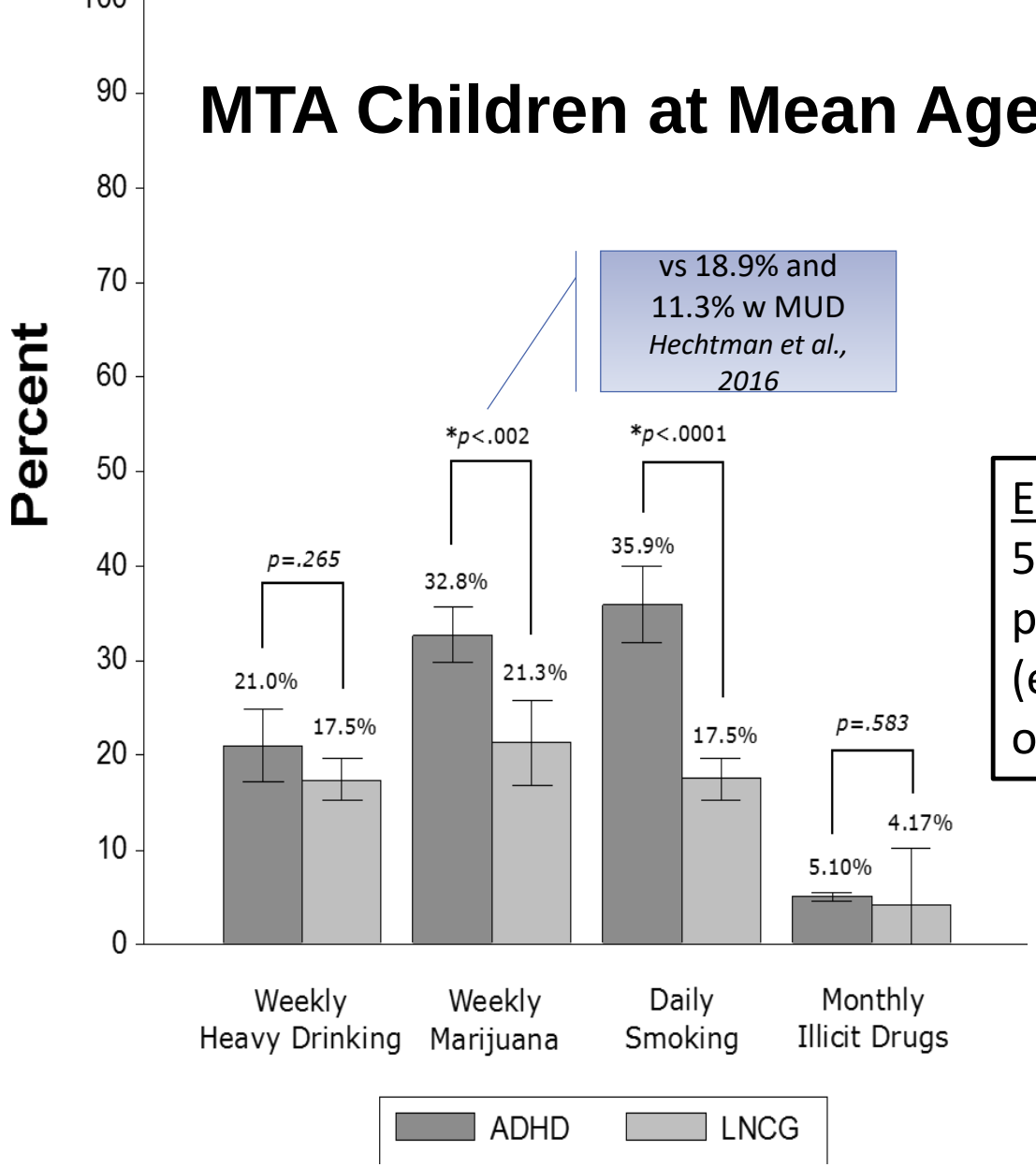


Daily Smoking: 16.7% vs 7.9%

SUD: ADHD > LNCG

Molina, MTA, 2013, JAACAP

MTA Children at Mean Age 25: Substance Use



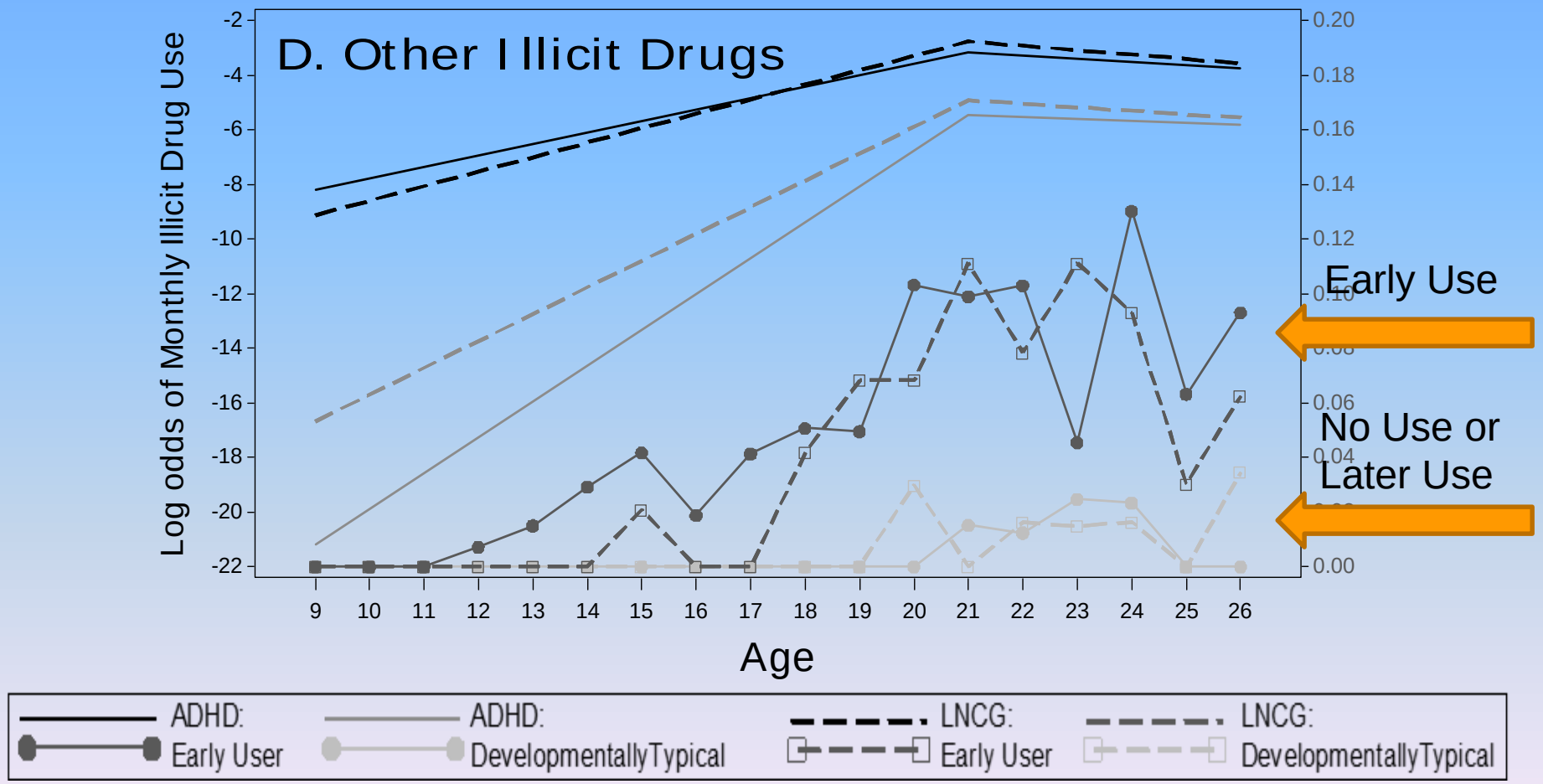
Early Substance Use

57.6% ADHD vs. 40.3% nonADHD, p<.0001

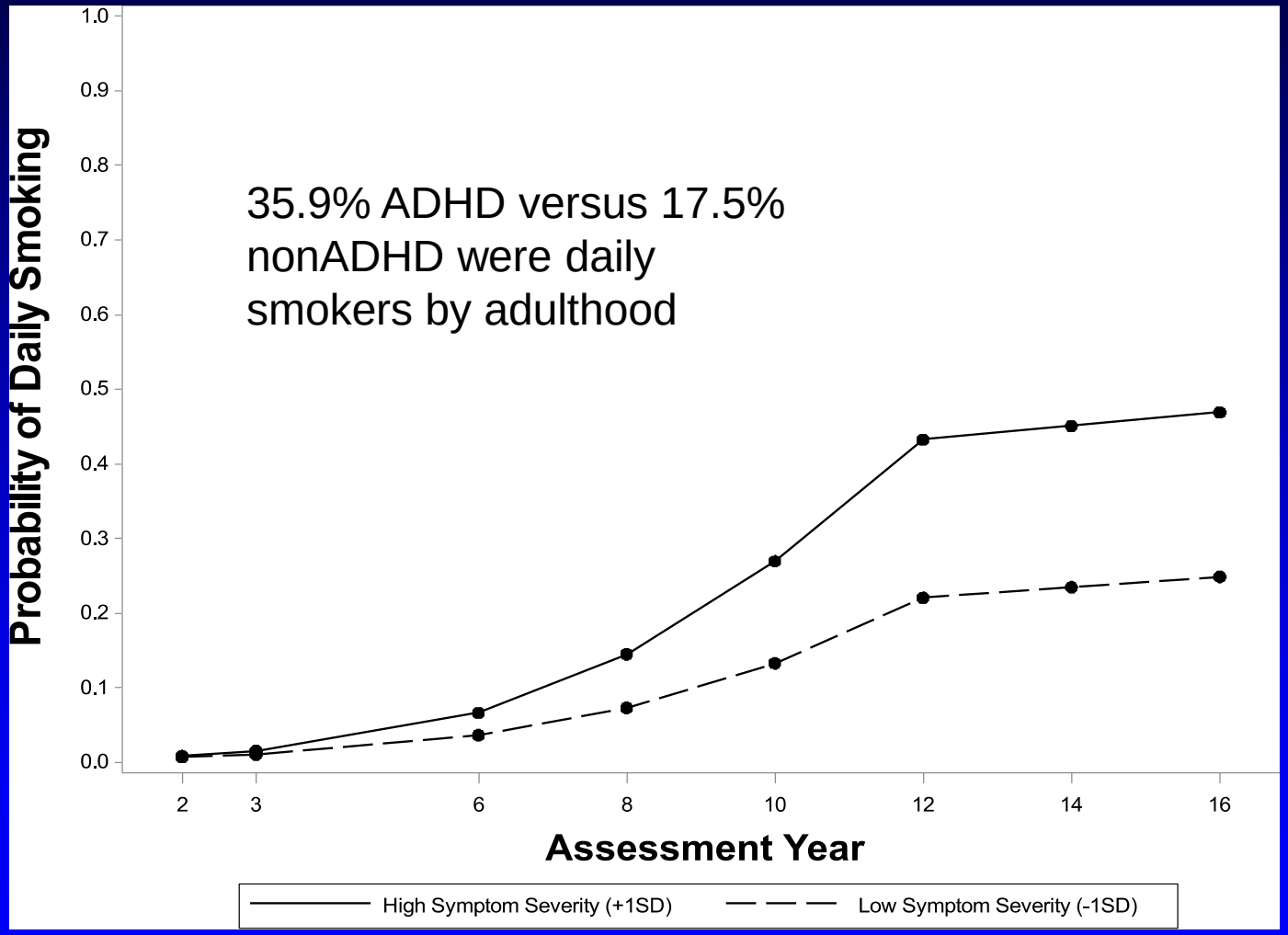
(e.g., alcohol before age 15, binged or drunk before age 16)

Molina et al., MTA, JCPP, 2018

MTA: Childhood ADHD Predicts Early Substance Use; Early Substance Use Strongly Predicts Faster Progression and More Use by Adulthood



MTA Children to Mean Age 25
Probability of Daily Smoking by ADHD Symptom Severity



Daily Smoking:
40% Persistent ADHD
31% Desistent ADHD
17.5% LNCG

Mitchell et al., 2018, NTR

NIAAA; NIDA; NIMH

PALS

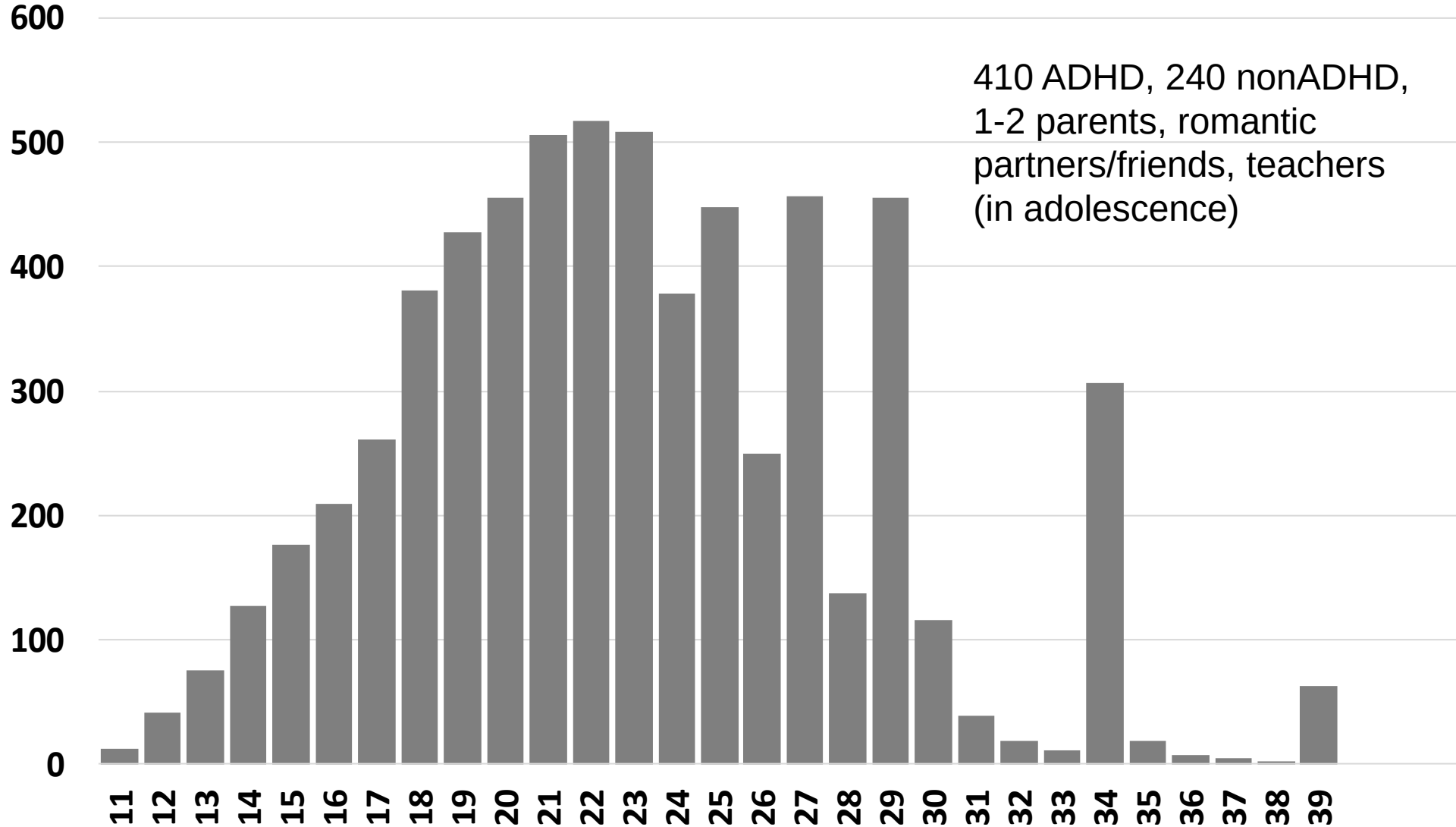
The Pittsburgh ADHD Longitudinal Study

Studying the onset, course, and causes of alcoholism, cigarette smoking, and other drug abuse

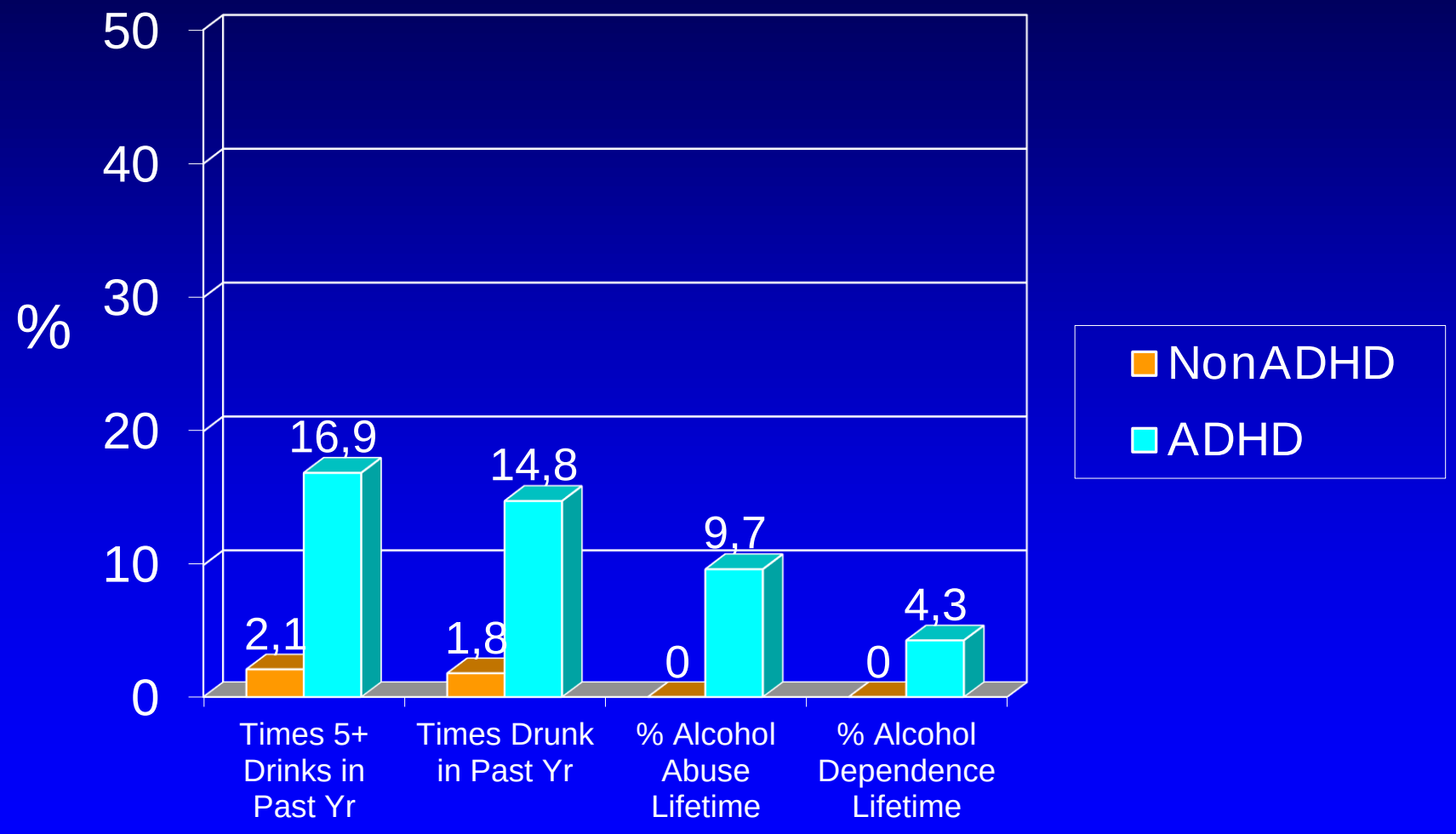
- 410 children with ADHD being interviewed into their 30s
  - diagnosed with DSMIIIR or DSMIV ADHD, between 1987 and 1996
  - 8 week summer treatment program developed by Bill Pelham
  - 90% male, 82% White, average parent education 2-yr degree
  - but more single parent households and lower parent incomes
- 240 without ADHD, demographically similar
- Annual followed by age-specific interviews
  - Annual to age 23, followed by 25, 27, 29, 35+ in progress
  - Final 29 year old interviews this summer (n < 20)
  - Retention: 365 ADHD (89%), 227 nonADHD (95%)

PALS Interviews by February 2018

14,587 interviews to date



PALS: Childhood ADHD → Heavy Drinking and Alcohol Abuse/Dependence in Late Adolescence



Ages 15-17

Molina, Pelham et al, 2007, ACER

Number of Alcohol Problems Greater in ADHD, late 20s *(Pedersen et al., 2016)*

PALS participants at mean age 29

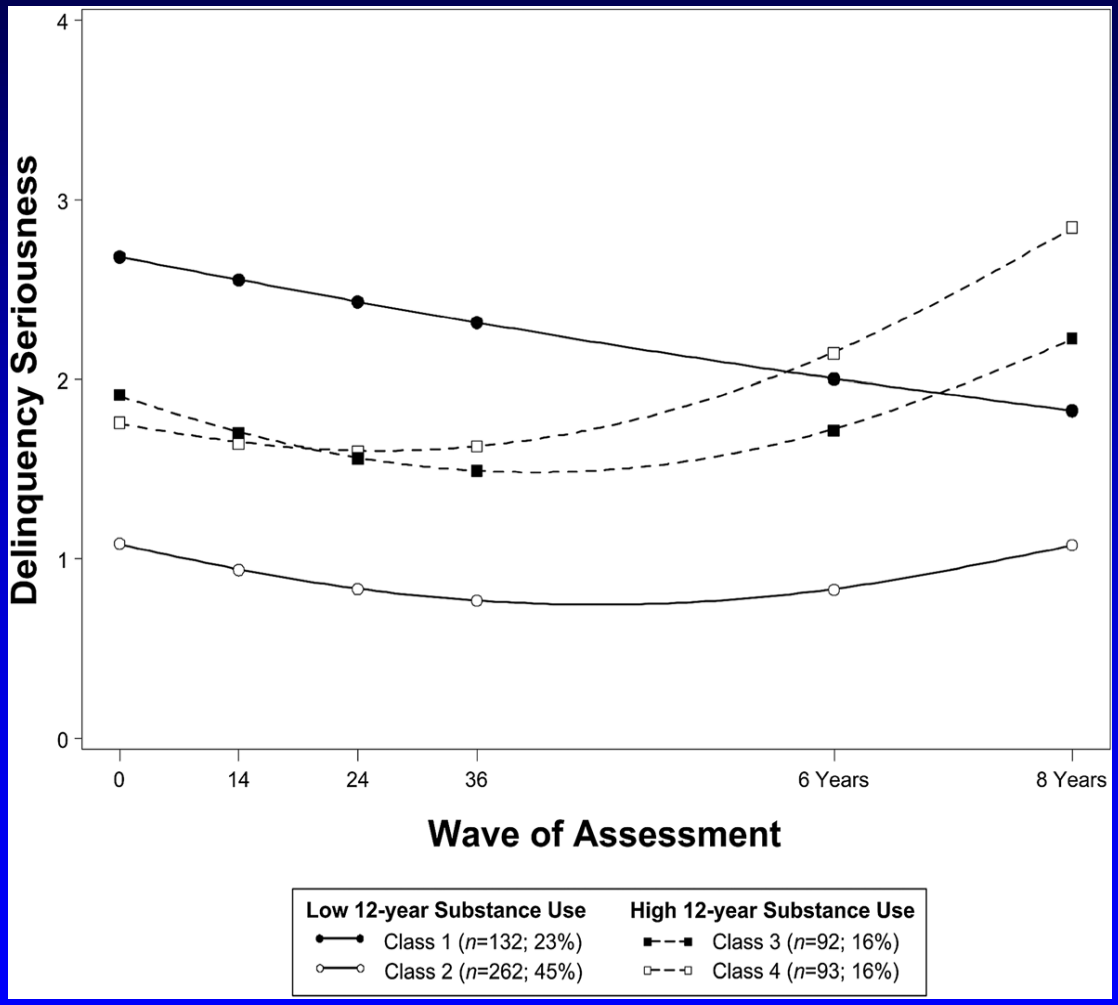
- Childhood ADHD predicted more (number of unique) alcohol problems in adulthood *but not the likelihood of reporting any vs. no alcohol problem.*
- *Any alcohol problem, not significantly different.*
  - *M = 2.71 (SD = 3.30) problems, nonADHD*
  - *M = 2.35 (SD = 4.38) problems, ADHD*
- ***Number of alcohol problems, $p < .05$ (significantly different).***
  - ***M = 4.17 problems (SD = 3.27) problems, nonADHD***
  - ***M = 4.82 problems (SD = 5.24) problems, ADHD***

What is the Role of Conduct Disorder (CD)?

- Studies initially controlled for CD, and still often do, often finding loss of an ADHD effect. For example,
  - Gittelman et al., 1985
  - Barkley et al., 1990
  - Lynskey & Fergusson, 1995
- Although not always…*particularly when treated as a mediator. For example,*
  - Sibley et al., 2014
  - Brook & colleages, 2008
  - Molina et al., 2012
- By and large, studies are of adolescents and young adults when substance use and problem behaviors co-occur (large literature supporting co-occurrence; Jessor, Jessor, Donovan, *Problem Behavior Theory*).

Consider the Development of Conduct Over Time

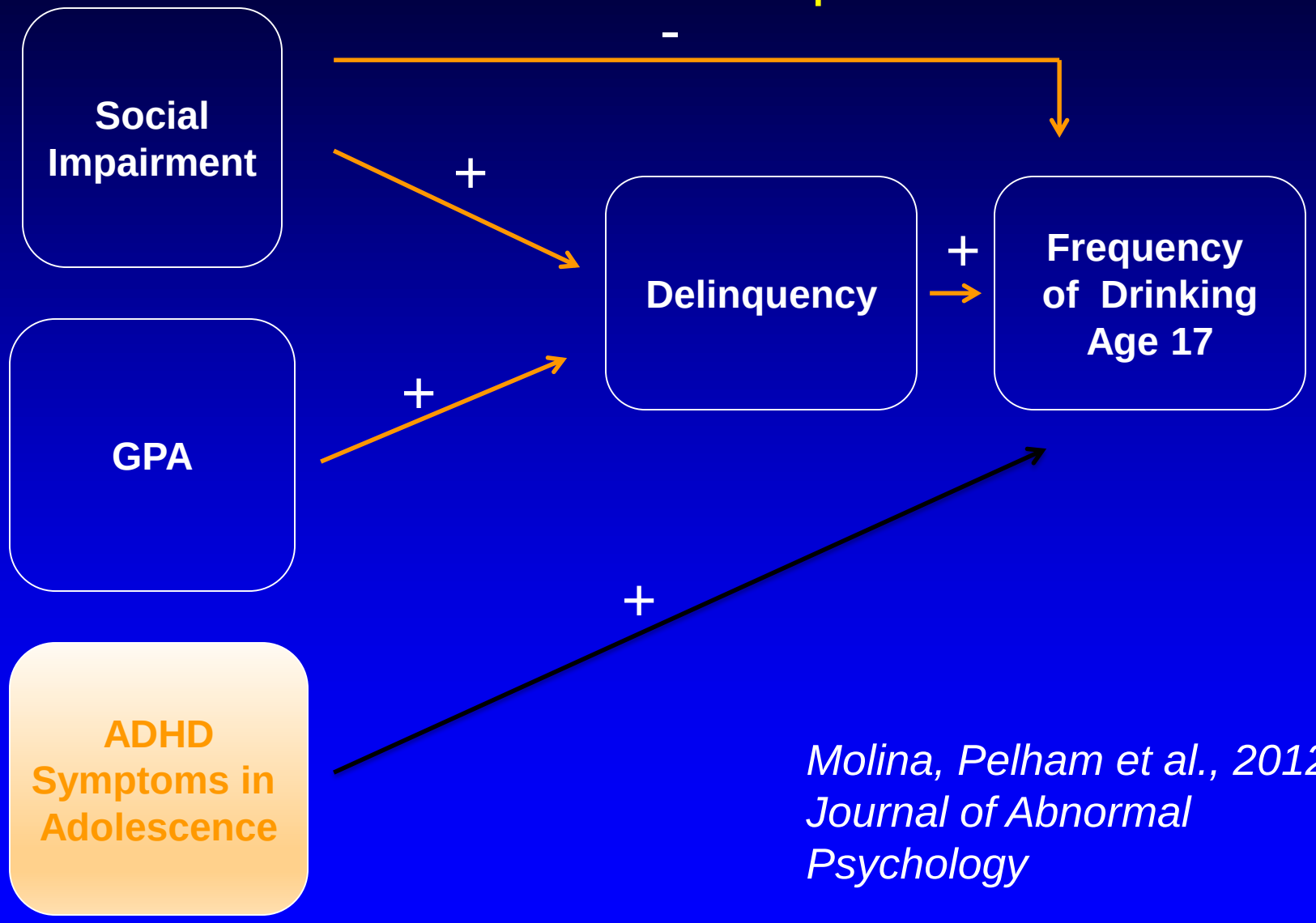
- Children with ADHD do not necessarily start with CD
  - New York study; no serious conduct problems at baseline; Gittelman et al., 1985; Mannuzza, Klein et al., 1991-
- Delinquent behavior can emerge with age to predict later substance use
  - MTA sample; Howard et al., 2015



Is it just all due to bad behavior (CD -- “Conduct Disorder”?)

- DeAlwis et al. 2014
  - Late 30s and early 40s: ADHD related to substance use even after controlling for lifetime CD
- Dalsgaard et al., 2014
  - Mean age 31: Child ADHD predicted SUD, alcohol abuse. CD predicted but not reported as responsible for risk.
- Klein, Mannuzza et al., 2012
  - Mean age 41: SUD and nicotine, but not alcohol disorder, *mediated* by CD and ASPD

Delinquency as a MEDIATOR but Other Factors Are Important



Molina, Pelham et al., 2012, Journal of Abnormal Psychology

Women, ADHD, and Substance Use

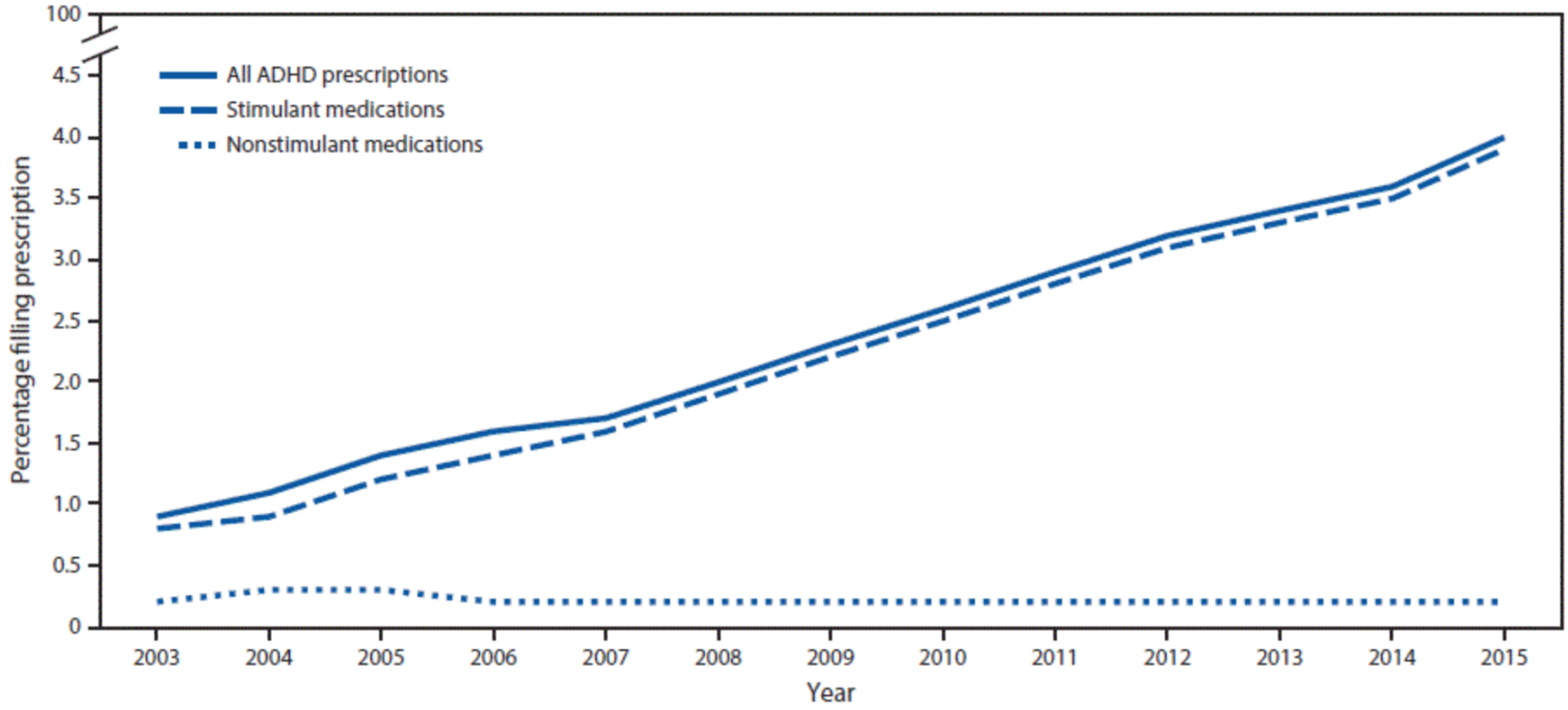
- Gender ratio for ADHD shifts from childhood and adolescence into adulthood as prevalence shifts
- For example, recent large national Canadian survey (n=16,957)
  - 2.9% 20-64 yr olds reported having been diagnosed with ADHD
  - 1.43:1 male:female ratio
  - Alcohol, cannabis dx higher for men
  - MDD, GAD higher for women

Hesson & Fowler, 2018, J of Attention Disorders

Women, ADHD, and Substance Use

- 344% increase in stimulant prescriptions for women aged 15-44 between 2003-2015 in USA

FIGURE. Percentage of women aged 15–44 years with private employer-sponsored insurance who filled one or more prescriptions for an attention-deficit/hyperactivity disorder (ADHD) medication, by medication class — United States, 2003–2015



Anderson et al. (2018). Morbidity and Mortality Weekly Report.

Women, ADHD, and Substance Use

- Some data suggest increased risk for substance abuse among women with ADHD
  - Dalsgaard et al (2014) 208 Danish case records of children stimulant-treated for ADHD (25 females) reviewed to M age 31; 12% F vs 4% M w SUD
- Other studies no increased risk or slight increased risk
  - Molina et al., MTA (2007)
  - Disney et al., Minnesota Twins, age 17 (1999)
  - Babinski et al., PALS (2011)
  - Hinshaw et al., no increased risk for adolescent females with ADHD histories (2006)
- More research attention needed as girls age

Addiction

A chronically relapsing disorder that is characterized by a compulsion to seek and take drug or stimulus, loss of control in limiting intake, and emergence of a negative emotional state (e.g., dysphoria, anxiety, irritability) when access to the drug or stimulus is prevented (**the "dark side" of addiction**).

-- Dr. George F. Koob, Neurocircuitry of Addiction

Future Directions

- Treat ADHD risk for SUD from a developmental psychopathology perspective
- Consider age-specific windows of vulnerability, the sources of research participants, and how substance use is measured
- Consider carefully that ADHD-related SUD risk begins at a young age; prevention may be as important as treatment
- Future research: Consider the possibility of differential response to substances of abuse, following from inherited liability and early exposure; lab-based studies; gender differences.
- Test implications of affect-vulnerable drinking into mid-adulthood *(consider evolution of the addiction cycle)*

The End

Substance Abuse and ADHD Among Adolescents

Clinically Relevant Mechanisms and Implications for Intervention

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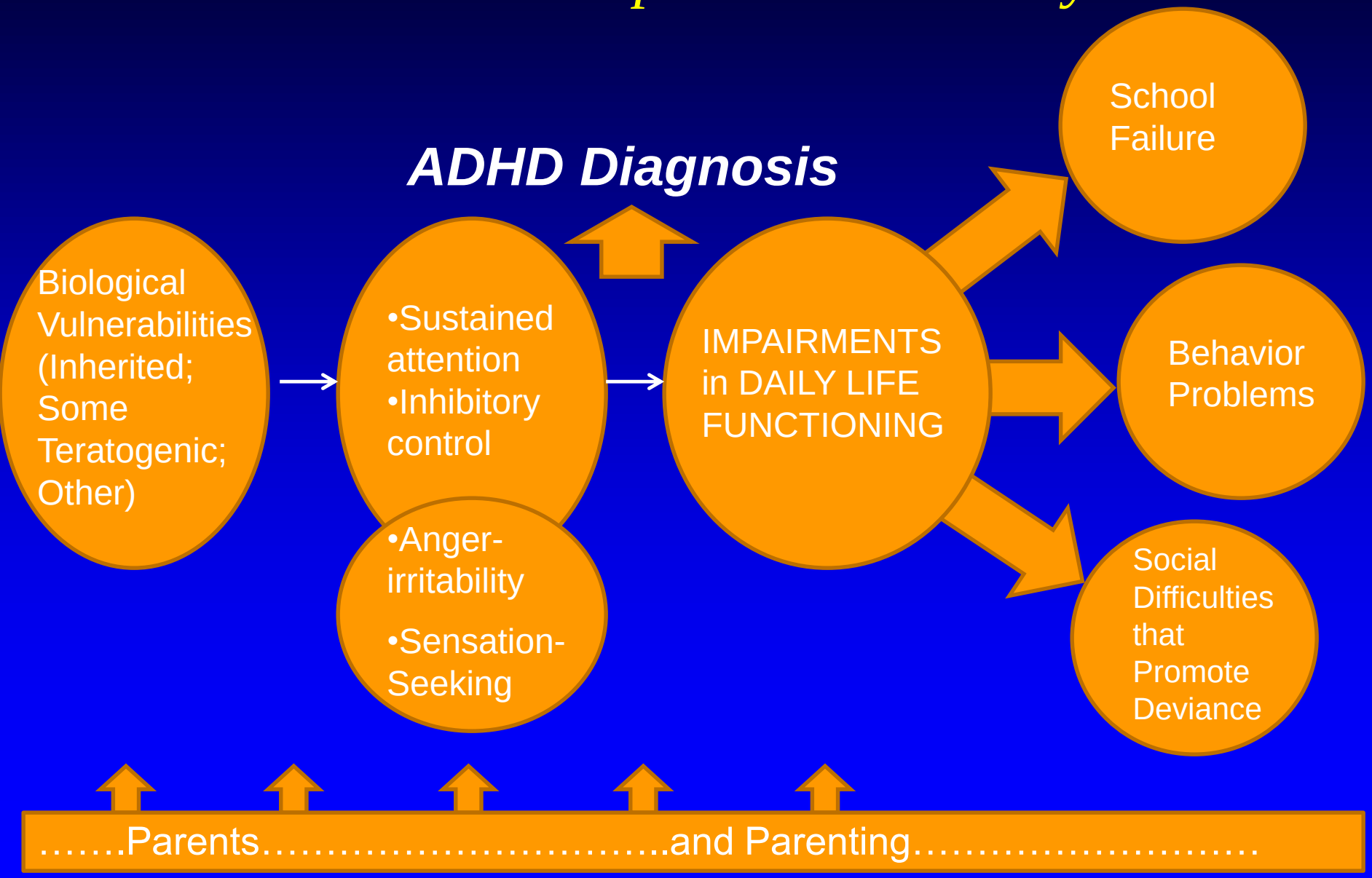
ADHD, Substance Use, Adolescence

Common Impairment Pathway



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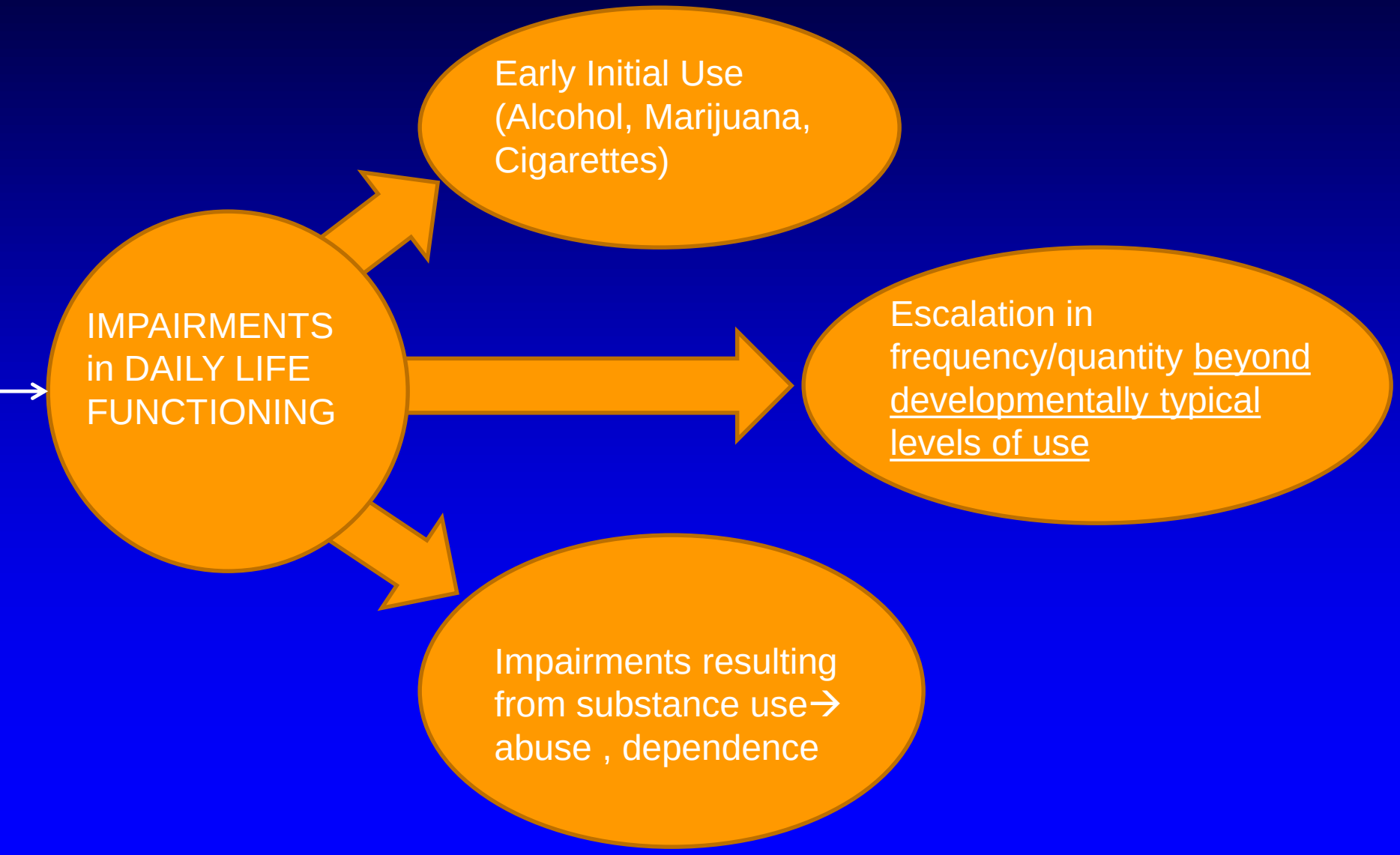
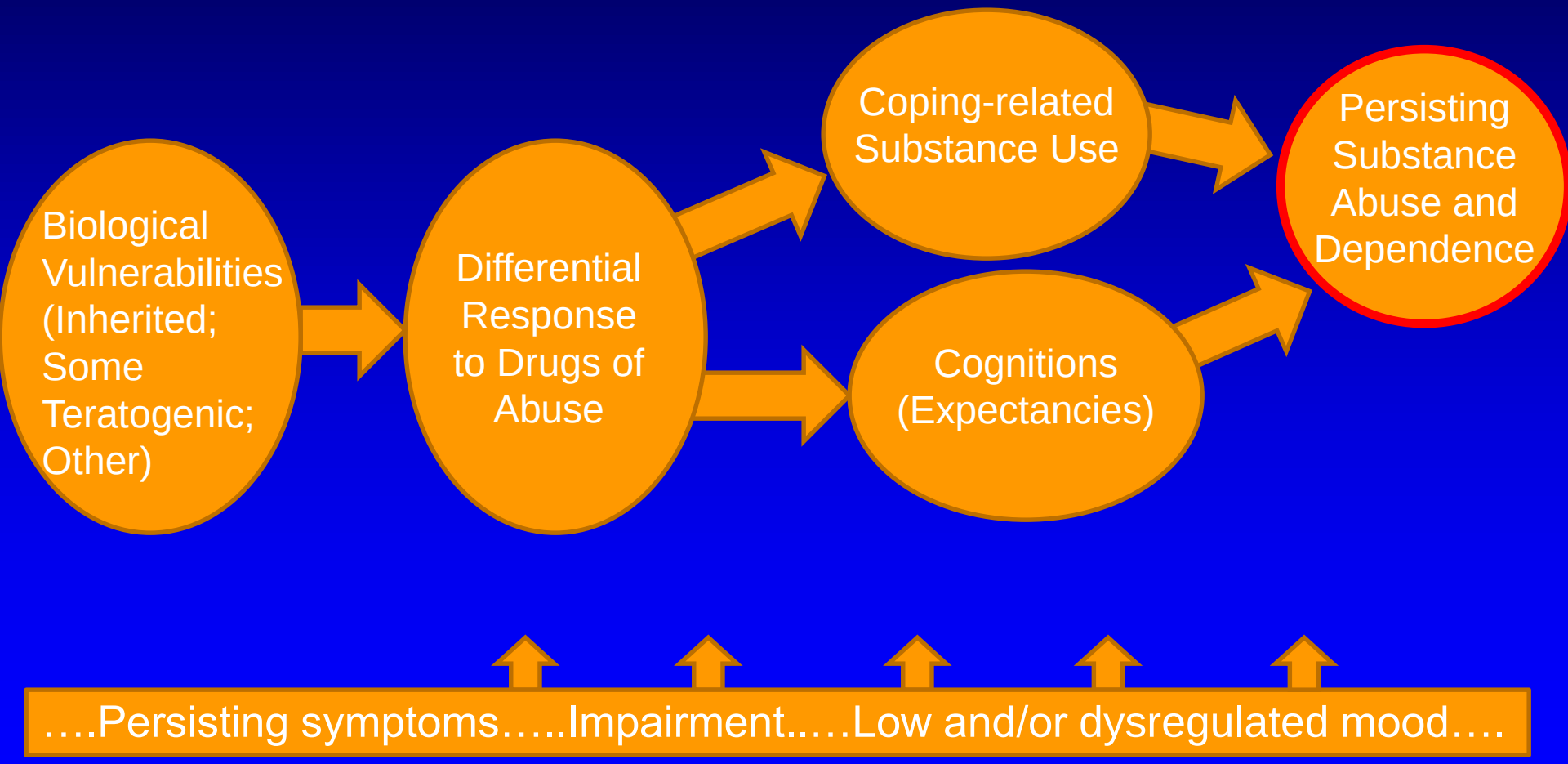


ADHD, Substance Use, Adolescence to Adulthood

Differential Responsivity Pathway



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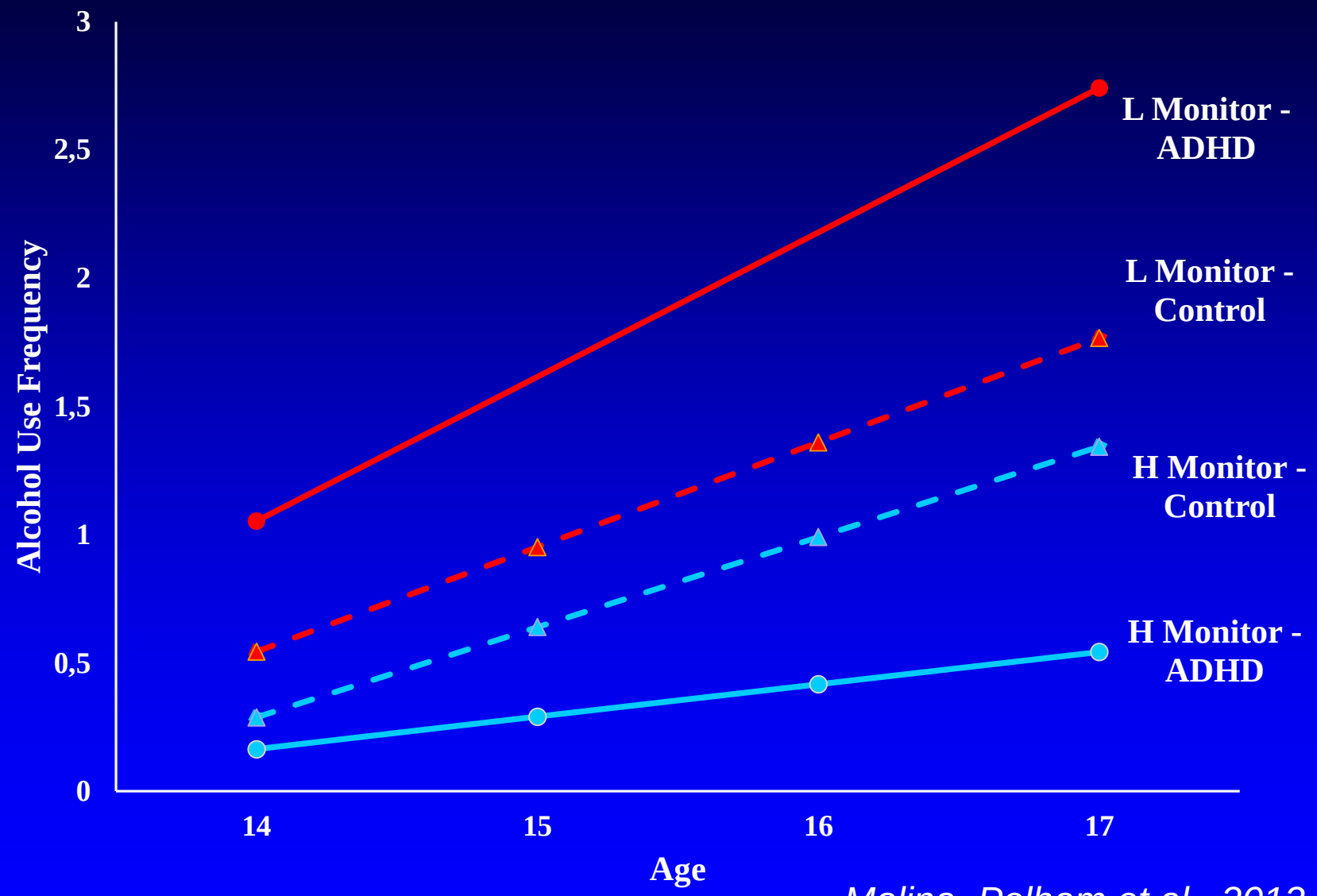
  - Retention: 365 ADHD (89%), 227 nonADHD (95%)

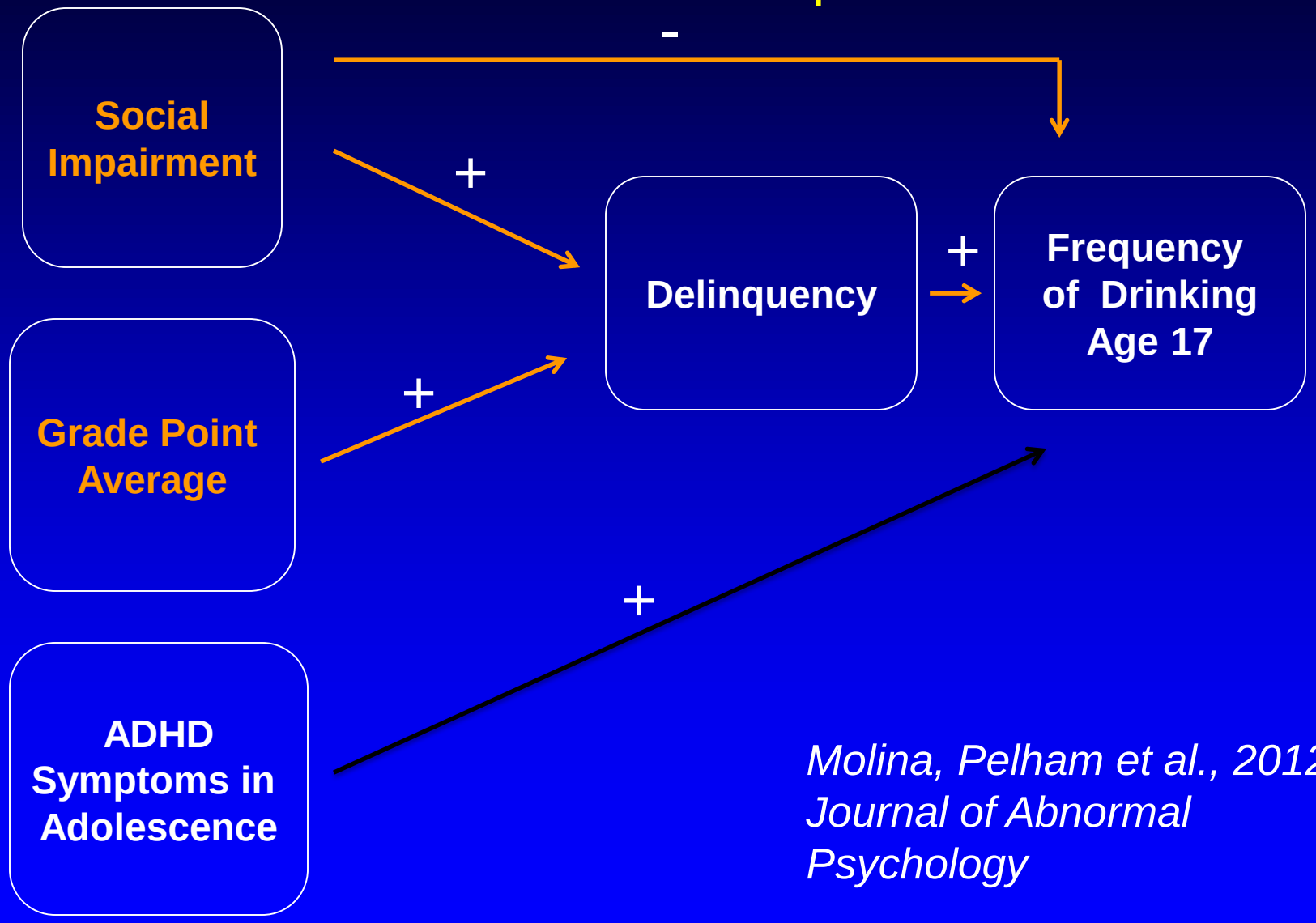
Parenting: Childhood ADHD predicts drinking frequency among less effectively monitored youths



PALS

Molina, Pelham et al., 2012, Journal of Abnormal Psychology

Delinquency as a MEDIATOR but Other Factors Are Important



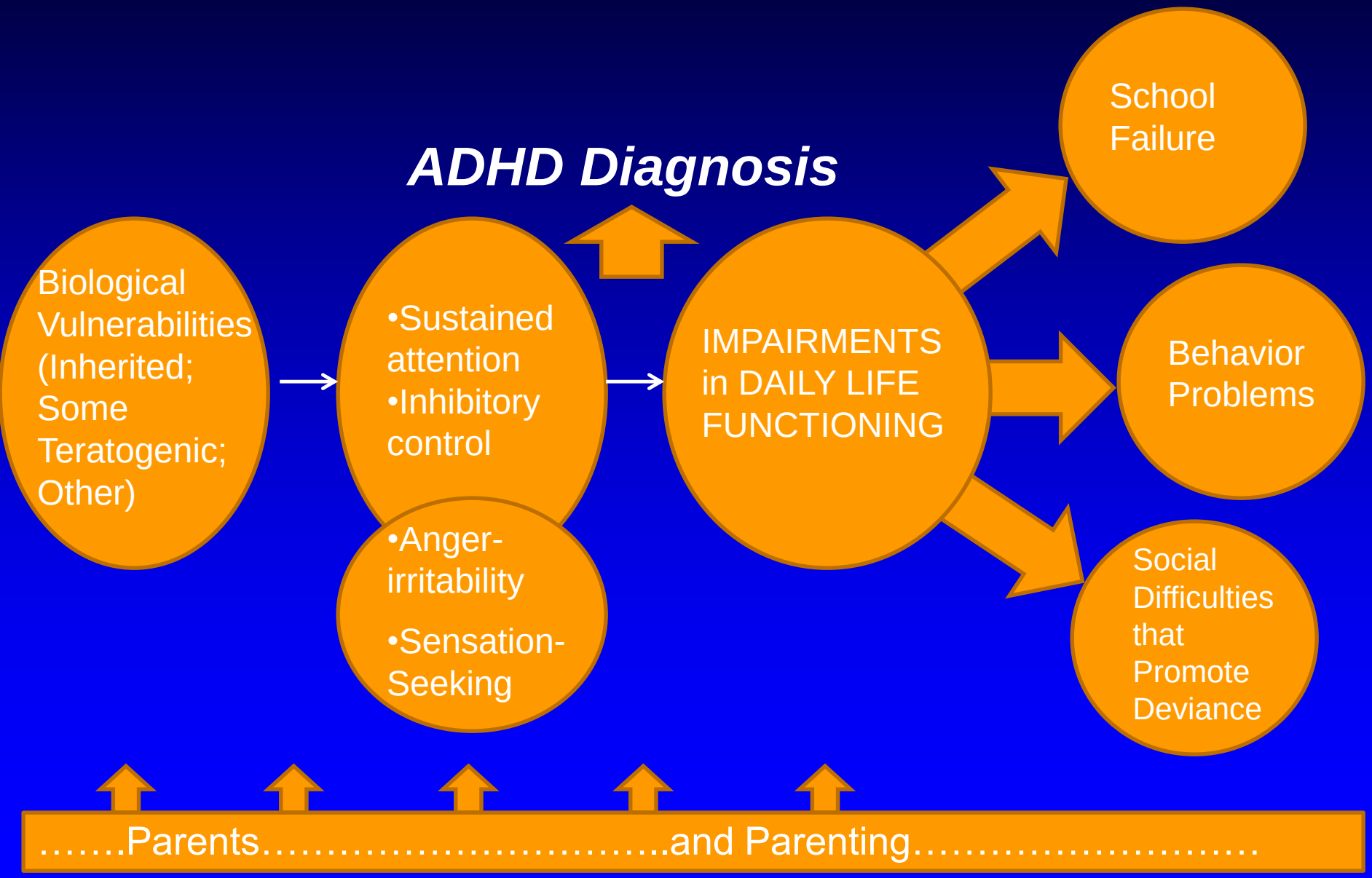
Molina, Pelham et al., 2012, Journal of Abnormal Psychology

PALS

ADHD, Peers, and Substance Use

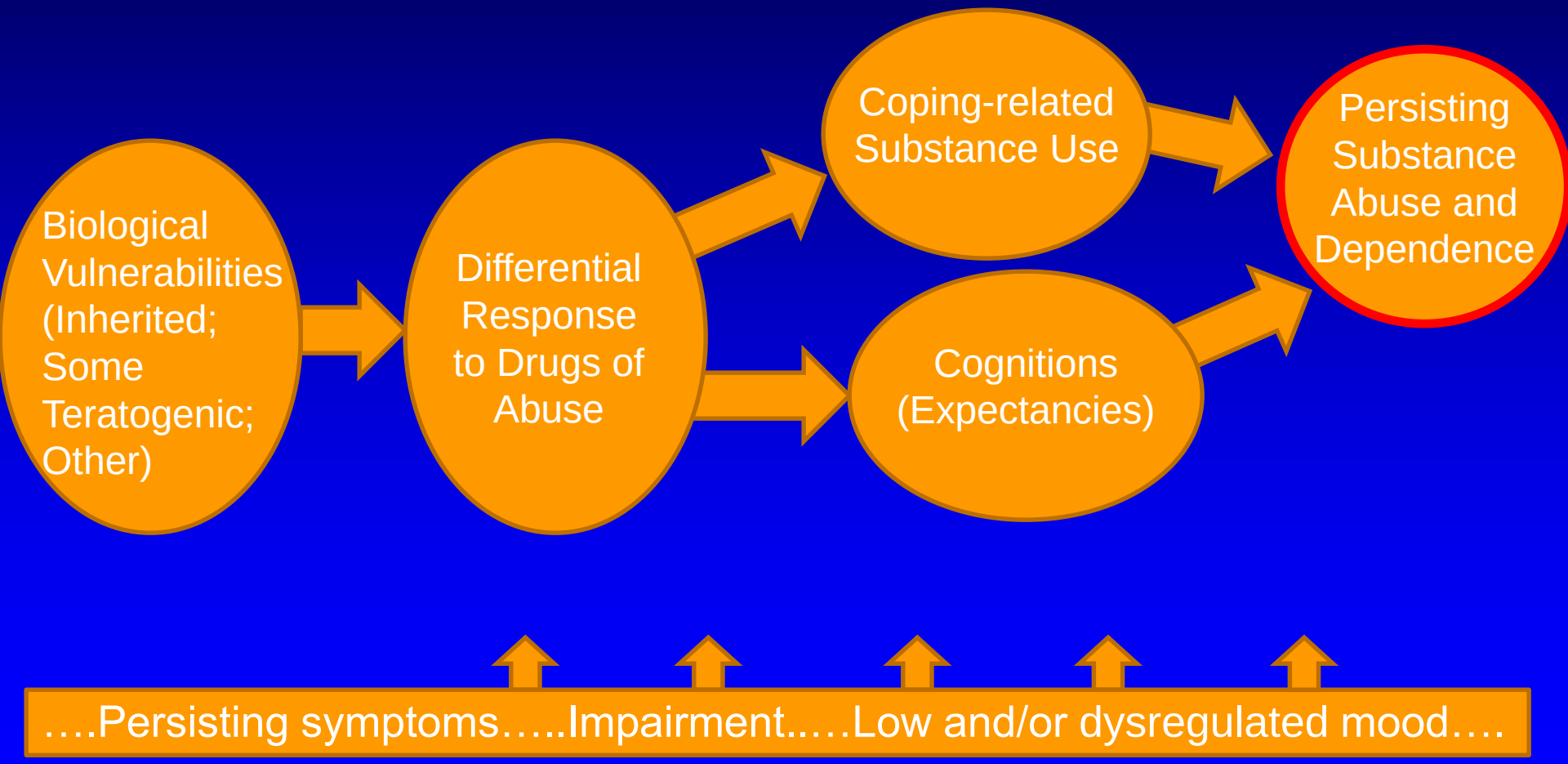
- Among adolescents with childhood ADHD
  - The association between substance-using peers and own substance use is stronger for adolescents with ADHD, concurrently (Marshal et al., 2003) and longitudinally (Belendiuk et al., 2015, *PAB*).

ADHD, Substance Use, Adolescence
Common Impairment Pathway



ADHD, Substance Use, Adolescence to Adulthood

Differential Responsivity Pathway

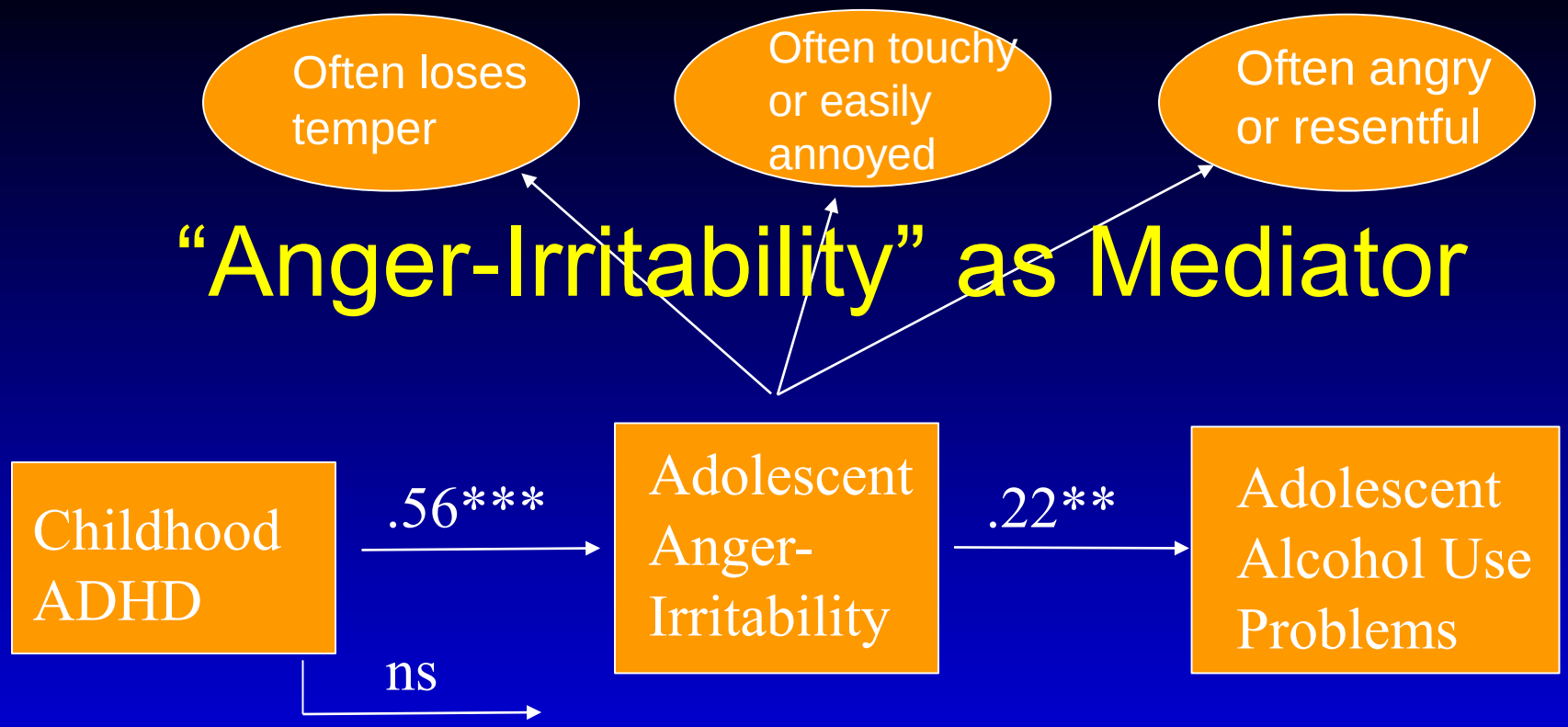


Differential Response to Drugs of Abuse

- ADHD associated with more impulsivity after drinking alcohol (increased sensitivity to the disinhibiting effects of alcohol). (*Weafer et al., 2009, Experimental and Clinical Psychopharmacology)*

- Alcohol increases attention to alcohol pictures which is also more associated with alcohol consumption for adults with ADHD. Effects were found for mean age 22. *(Roberts, Fillmore, Milich, 2012, Experimental and Clinical Psychopharmacology)*

"Anger-Irritability" as Mediator



- 142 childhood ADHD, 100 nonADHD, adolescents (13-18 yrs old)
- Anger-irritability: parent report of 3 ODD items
- Alc use problems: Sum score responses to structured SCID
  - R^2=.15

Harty et al., 2016, Journal of Child Psychology & Psychiatry

Coping Skills Moderate

- Coping skills, mother-reported (e.g., my child gets information that is necessary to deal with the problem), *Wills et al (1986)*

Harty et al., 2016, Journal of Child Psychology & Psychiatry

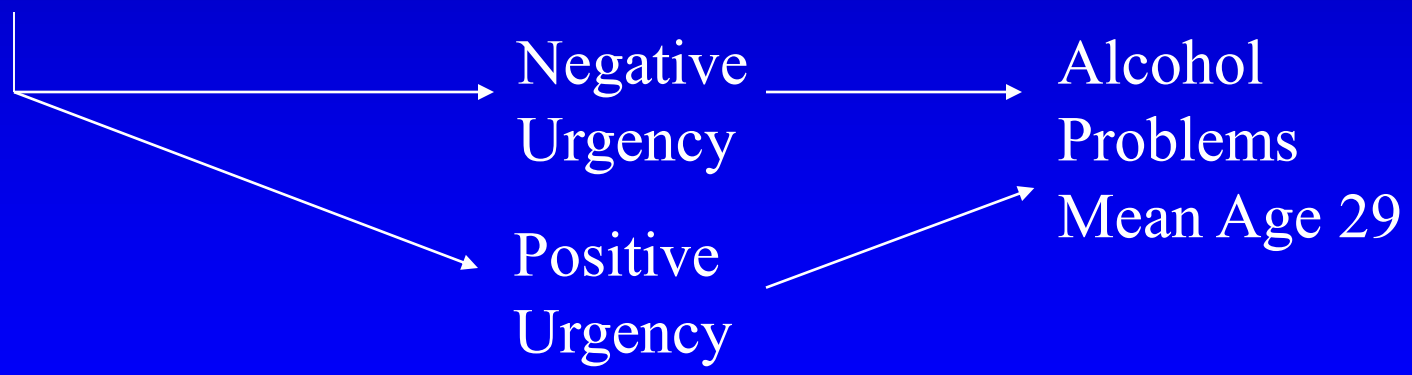
Impulsive Behavior in the Context of Negative or Positive Mood Potential Importance for Alcohol Use Disorder Risk in ADHD

- Five factor model of impulsivity: UPPS-P *(Cyders et al., 2007; Whiteside & Lynam, 2001)*
- Negative and positive urgency, sensation-seeking, lack of planning and perseverance
- Negative and positive urgency most strongly related to alcohol problems (meta-analysis; *Coskunpinar, Dir, Cyders, 2013, ACER*)
  - Negative urgency: "In the heat of an argument, I will often say things that I later regret."
  - Positive urgency: "When I am really excited, I tend not to think of the consequences of my actions."

Urgency and Alcohol Problems in Adulthood

- Tendency to act rashly when in a negative or positive mood *(Whiteside & Lynam, 2001; Cyders & Smith, 2007)*

- Childhood ADHD

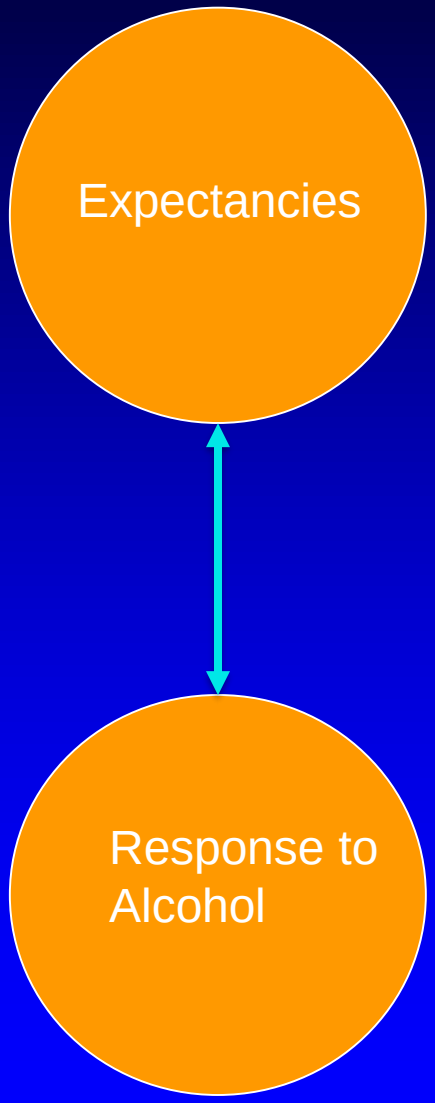


Pedersen et al., 2016; Addiction

Challenges of Assessing and Treating ADHD – Lack of Insight

- Sample PALS finding
  - Impairment reported by 15% of PALS young adults vs 56% of parents *(Sibley et al., 2012)*
- Sample MTA finding
  - At age 25, 16% diagnosable based on self-report while 36% diagnosable based on parent report using rating scale method
  - Across reports, 50% diagnosable *(Sibley et al., 2016)*
- *Conclusion: Obtain careful history and consider informant report and historical data.*

Expectancies



Expectancies are cognitions about the expected effects of using a substance (e.g., “I would be outgoing; I would feel calm; I wouldn’t be responsible; I would be aggressive”).

Expectancies and ADHD

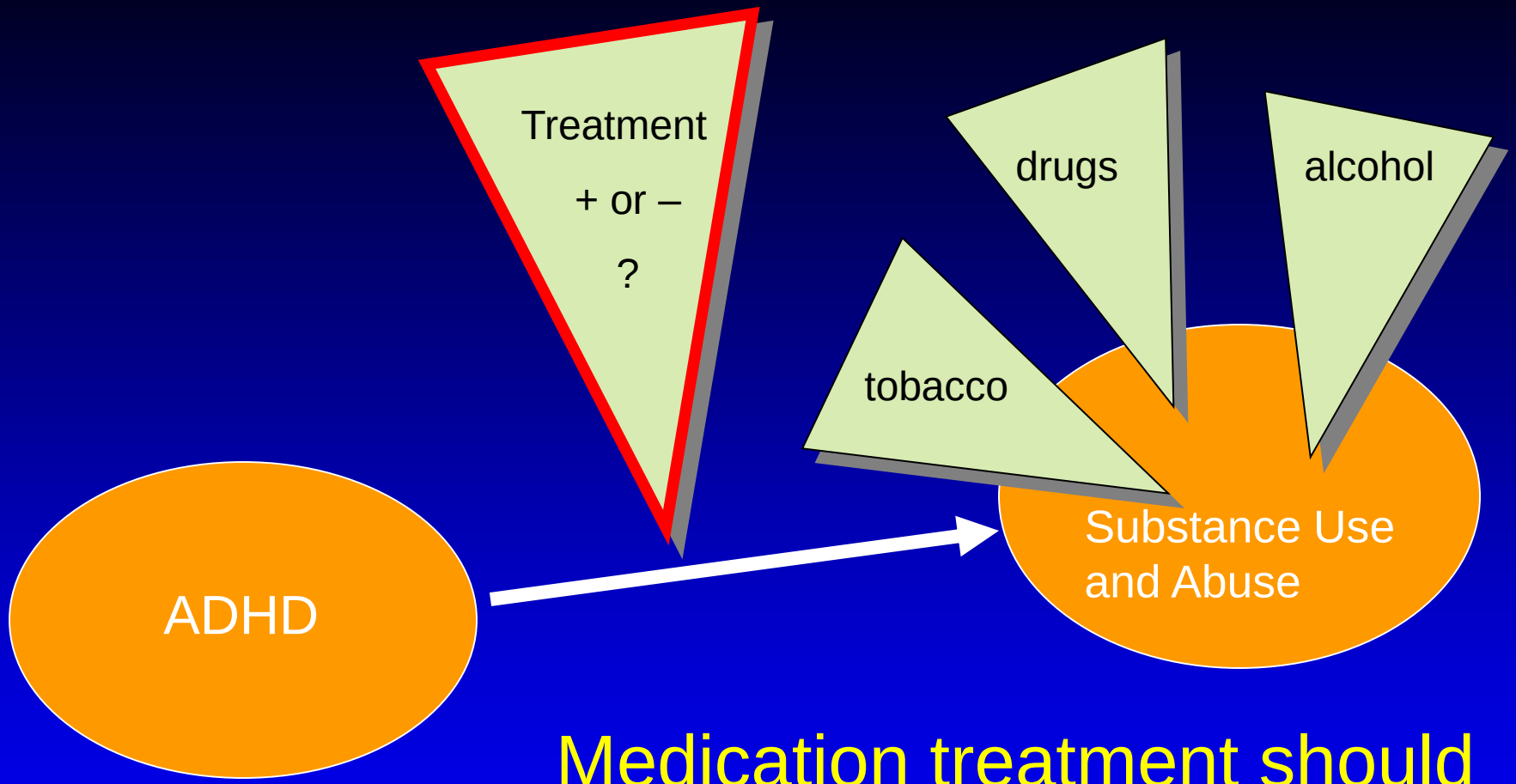
- Expectancies form in childhood before alcohol use and prospectively predict alcohol use
- Expectancies change with drinking experience
- Many studies on alcohol and other drug expectancies and their important role in the onset and development of substance use

Expectancies Do Not Operate Normally in ADHD

- Adolescents with ADHD histories had lower expectations of positive and negative effects of alcohol
- Negative expectancies predicted less alcohol use one year later for nonADHD but not for adolescents in the ADHD group *(Pedersen et al., JSAD, 2014)*
- Similar findings for marijuana expectancies in early adulthood *(Harty et al., Substance Use & Misuse, 2015)*
- Interventions must consider that either lack of insight, or inability to recognize and act upon substance-related thoughts in the moment, are important in ADHD

Clinical Implications

- ADHD symptoms partially predict, but other variables play a role in SUD risk (e.g., parental monitoring in adolescence; academic, behavioral, social impairments)
- Negative affect (anger; frustration) + impulsivity (anger-irritability; negative urgency) <u>may</u> be an important treatment target
- Coping skills may be a clinical target but additional evidence is needed
- Knowledge of negative consequences is likely insufficient; environmental supports may be crucial



Medication treatment should theoretically decrease risk

(e.g., Kennedy, McKone, Molina, in press)

Wilens et al (2003), protection

Molina et al (2013) no effect

Humphreys et al (2013), no effect

Schoenfelder et al (2014), protection for tobacco

More Studies Emerging Demonstrating Protective Effects

Large Health Registry Studies

- Chang et al. (2014), JCPP
- Dalsgaard et al (2014), Addictive Behs
- Quinn et al (2017), AJP

- Using chart and records reviews

Stimulant Treatment and Adolescent Substance Use in the MTA Study

Summary

- Treatment with stimulants between ages 7 and 9.9 did not predict later substance use.
- Treatment in the past year was not associated with substance use in adolescence.
- Total days treated from childhood into adolescence did not predict later substance use.

New Analyses into Adulthood in Progress…

Molina, MTA Group, 2013

Adolescent Substance Abuse Treatment

- Family-based and Cognitive Behavior Therapy (CBT) are evidence—based and effective *(Carr, 2009; Von Sydow et al., 2013; van der Pol et al., 2017; Waldron & Turner, 2008)*
- Multidimensional Family Therapy (MDFT) – a family—based approach (see mdft.org)
  - Manualized
  - Intensive assessment and treatment of
    - Adolescent substance use, problems, and mental health
    - Parent and family functioning environment
    - Key social systems (for example, school, friends)
  - Reflects perspective that adolescent development is shaped by multiple risk and protective factors in the adolescent's environment

Multidimensional Family Therapy (MDFT) for Adolescent Substance Abuse

van der Pol et al (2017; Leiden) JCPP

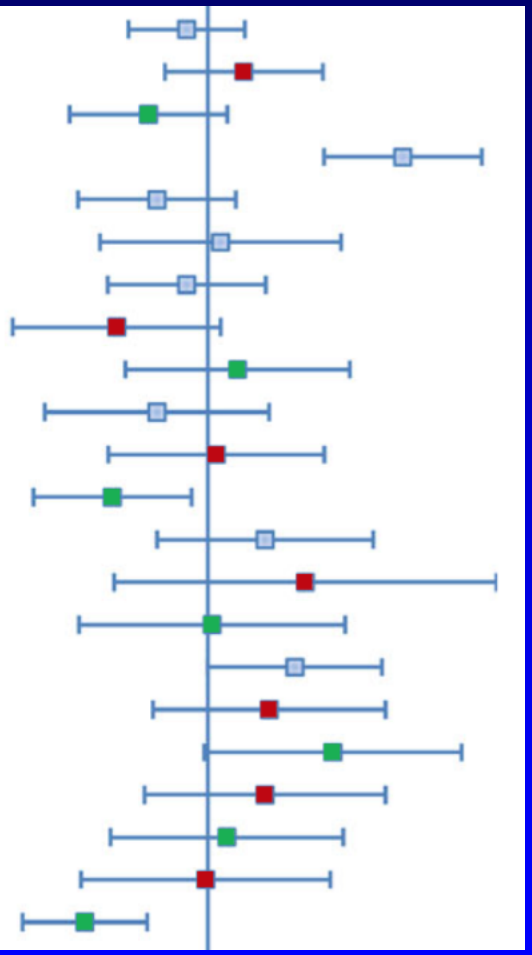
- Meta-analysis of MDFT, including 1,488 subjects
- Effects statistically significant but small (*d*=.24)
- Effects present across range of important outcomes
  - Substance abuse
  - Delinquency
  - Mood and anxiety
  - Family functioning

Review of MDFT for Adolescent Substance Abuse

*Effects **Stronger** When Studies Included More Teens with Severe Substance Abuse (used >64/90 days)*

van der Pol et al (2017) JCPP

21	Hendriks et al.	2011	0.14	–0.13	0.41
22	-	2011	0.41	0.04	0.78
23	-	2011	–0.04	–0.41	0.33
24	-	2011	1.16	0.79	1.53
25	-	2011	0.00	–0.37	0.37
26	Liddle et al.	2011	0.30	–0.27	0.87
27	Phan	2011	0.14	–0.23	0.51
28	-	2011	–0.19	–0.68	0.30
29	-	2011	0.38	–0.15	0.91
30	Grichting	2011	0.00	–0.53	0.53
31	-	2011	0.28	–0.23	0.79
32	-	2011	–0.21	–0.58	0.16
33	Tossmann	2010	0.51	0.00	1.02
34	-	2010	0.70	–0.20	1.60
35	-	2010	0.26	–0.37	0.89
36	Verbanck	2010	0.65	0.24	1.06
37	-	2010	0.53	–0.02	1.08
38	-	2010	0.83	0.22	1.44
39	Henderson et al. I	2010	0.51	–0.06	1.08
40	-	2010	0.33	–0.22	0.88
41	Henderson et al. II	2010	0.23	–0.36	0.82
42	-	2010	–0.34	–0.63	–0.05



d=.24

MDFT for Adolescent Substance Abuse

van der Pol et al (2017) JCPP

From the review…

- Effects also stronger when more teens had disruptive behavior disorders
  - Serious oppositionality and conduct problems
- Because the intervention is intensive, it may be best selected to match the severity of the clinical need
  - *(Risk-Need-Responsivity Model; Andrews et al., 2011)*
- However, there is some concern over the duration of effect beyond 6 months
  - (*Filges et al., 2015; Danish National Center for Social Research*)

INCANT (International Need for Cannabis Treatment Study)

- Comparing MDFT to Individual psychotherapy (IP)
  - Brussels, Berlin, Paris, The Hague, Geneva
  - Rigter et al., 2013, *Drug and Alcohol Dependence*
  - 6 months of treatment
  - 450 adolescents randomized, all with cannabis abuse or dependence (CUD), 85% boys, 40% alcohol use disorder
  - 82% with cannabis dependence; using marijuana on average 60 of last 90 days
- Results at 12 Months
  - *CUD: 71% MDFT, 74% IP*
    - *% with dependence: 385 MDFT; 52% IP*
  - *Days using marijuana in past 90 days: 34 MDFT; 42 IP*
- *Once entrenched, drug abuse hard to treat*

School-based Treatment for Adolescents with ADHD

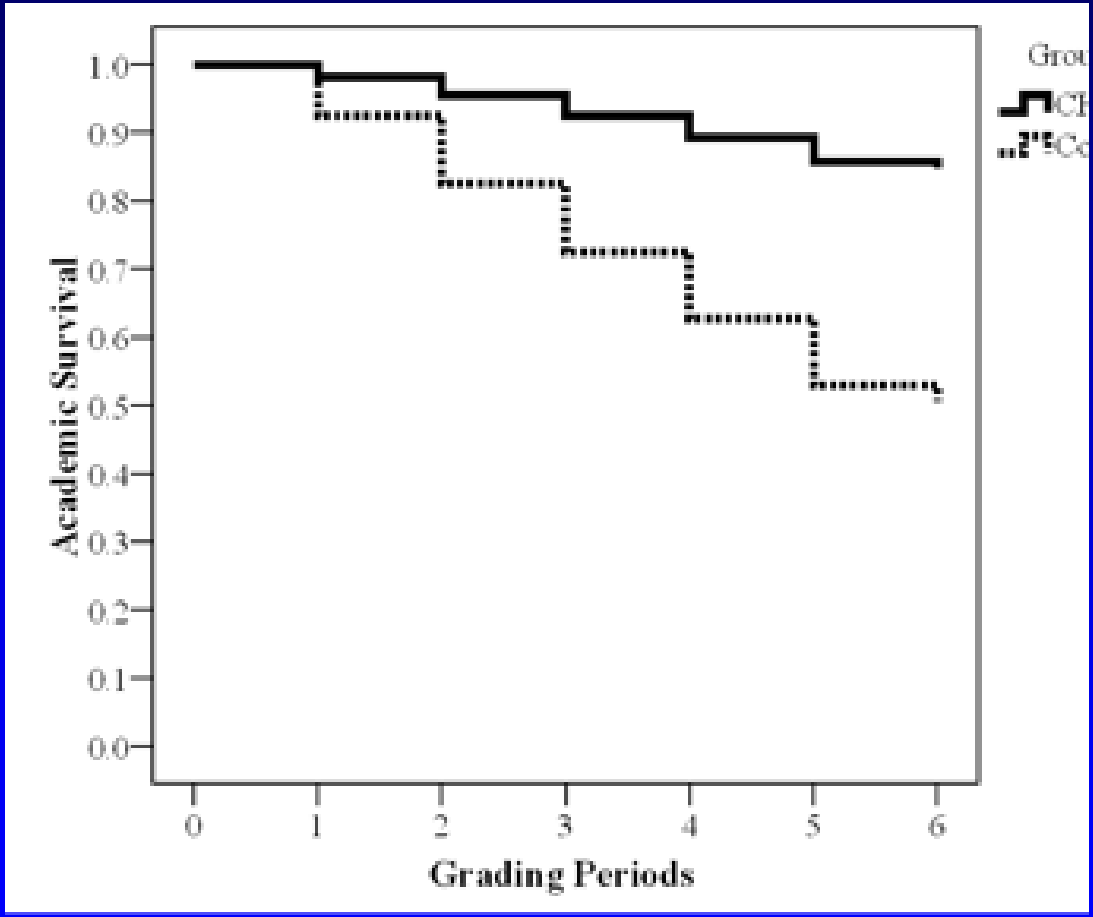
- Challenging Horizons Program
  - Middle and High Schools
  - Training model
    - Change is achieved by brief teaching of skills with extensive practice, repetition and performance feedback
    - Includes some minimal uses of behavioral approaches (not in classrooms)
  - Has been provided in after-school program, small group study hall, and resource rooms
  - Targets
    - Disorganization of materials & planning
    - Academic enablers (note taking, reading comprehension, study skills)
    - Interpersonal skills
  - Provided over entire school year

Steve Evans, Ohio University, Athens, OH

Challenging Horizons Program Results for School Grades

6th graders (age 11-12)

- Graph shows a significant difference in likelihood of earning passing grades in school over the school year



Evans and colleagues, Ohio University

Denmark and U.S. Grading Scales

Grade	Description[1]		Equivalents			
			13-scale	ECTS	U.S.	UK
12	*excellent*	high level of command of all aspects – no or only a few minor weaknesses[n 1]	11/13	A	A+, A	1st
10	*very good*	high level of command of most aspects – only minor weaknesses[n 2]	10	B	A-	2:1
7	*good*	good command – some weaknesses[n 3]	8/9	C	B+,B	2:2
4	*fair*	some command – some major weaknesses[n 4]	7	D	B-	3rd
02	*adequate*	the minimum requirements for acceptance[n 5]	6	E	C	Pass
00	*inadequate*	does not meet the minimum requirements for acceptance[n 6]	03/5	Fx	D	Fail
–3	*unacceptable*	unacceptable in all respects[n 7]	00	F	F	Fail

References [edit]

1. ^ Danish Ministry of Education. "Bekendtgørelse om karakterskala og anden bedømmelse". *retsinformation.dk* (in Danish). The Danish Department of Civil Affairs.

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7	*good*	good command – some weaknesses[n 3]	8/9	C	B+,B	2:2
4	*fair*	some command – some major weaknesses[n 4]	3	D	B-	3rd
02	*adequate*	the minimum requirements for acceptance[n 5]	2	E	C	Pass
00	*inadequate*	does not meet the minimum requirements for acceptance[n 6]	1	Fx	D	Fail
–3	*unacceptable*	unacceptable in all respects[n 7]	0	F	F	Fail

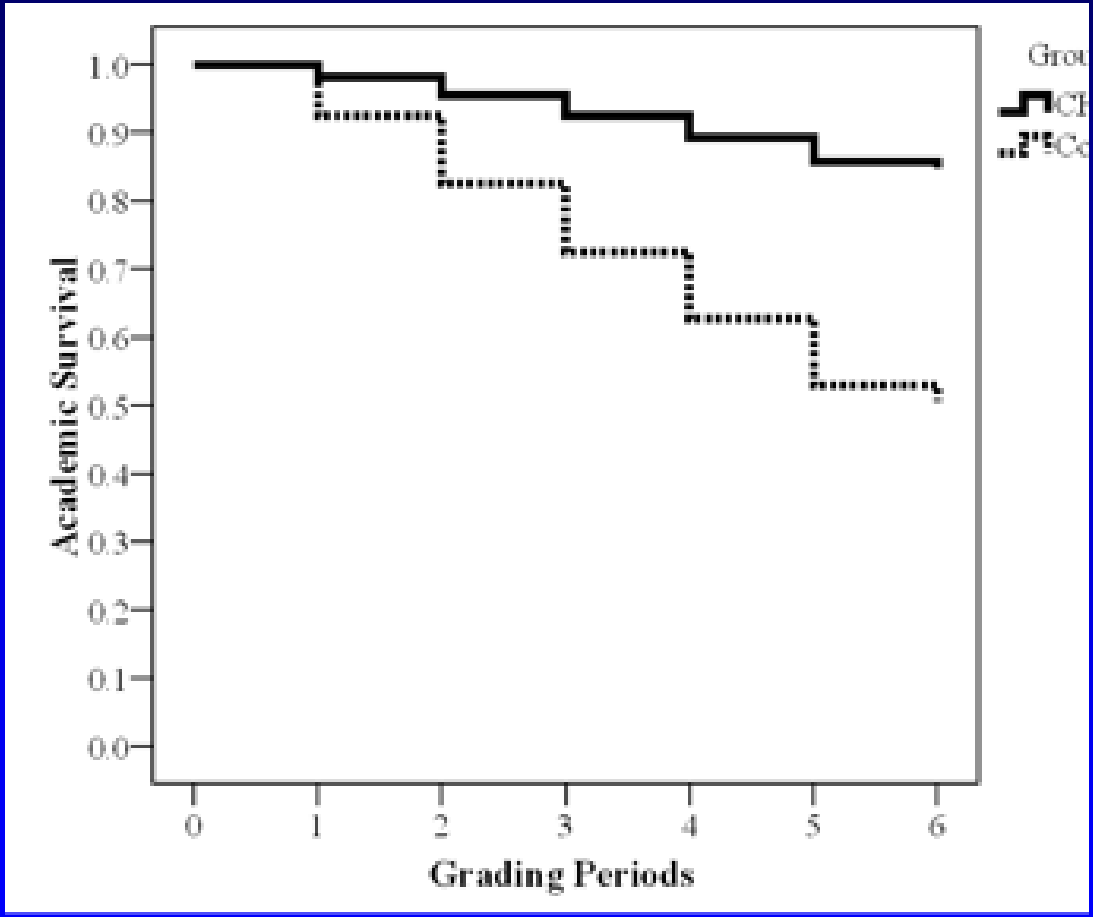
References [edit]

1. ^ Danish Ministry of Education. "Bekendtgørelse om karakterskala og anden bedømmelse". *retsinformation.dk* (in Danish). The Danish Department of Civil Affairs.

Challenging Horizons Program Results for School Grades

<u>At end of 6 six-week grading periods</u>

- Approximately 90% of those in CHP have GPA > 1.0
- Approximately half of those in control have GPA >1.0



Evans and colleagues, Ohio University

Challenging Horizons Program
Results after Treatment and at Follow-Up

Effects for those who attended at least 80% of sessions are large to very large after treatment

Effects at follow-up are larger than immediately after treatment

	End-of-Treatment		Six Month Follow-up	
	ITT	CACE	ITT	CACE
Measure/Subscale	*d*	*d*	*d*	*d*
Parent rated organization				
Total	0.39	0.71	0.63	1.15
Memory & Materials	0.36	0.79	0.66	1.13
Organized Action	0.47	0.61	0.36	0.79
Task Planning	0.30	0.93	0.58	1.24
Parent rated symptoms				
Inattention	0.45	2.00	0.45	0.99
Hyper/Imp	0.12	0.94	0.35	0.92
Grades	0.16	0.61	0.25	0.83
Parent rated homework habits				
Factor 1	0.33	1.16	0.76	1.90
Factor 2	0.51	0.86	0.54	1.32

d = .3 (small), d = .5 (medium), d = .8 (large)

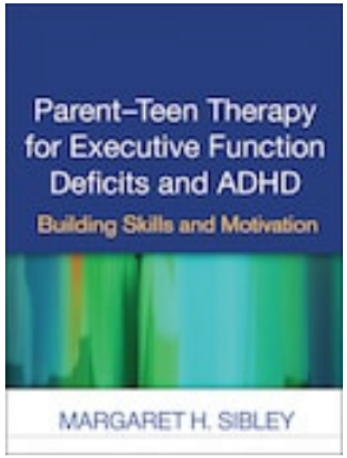
Challenging Horizons Program Summary

- The Challenging Horizons Program is an intensive school-based treatment for adolescents with ADHD
- The size of the effects on school behavior are larger than other medication and psychosocial treatments for adolescents
- The finding of persistent or larger effects on school behavior during the academic year after treatment has ended, is larger than any other reported follow-up treatment effects for children or adolescents with ADHD

Evans and colleagues, Ohio University

Family-Based Treatment

- Supporting Teens Autonomy Daily (STAND; *Sibley et al., 2013; 2016*)
  - margaretsibley.com
  - Weekly therapy with parents and teens who struggle with attention, motivation, and organization
- Pelham Research Group at FIU also testing prevention approach



Parent-Teen Therapy for Executive Function Deficits and ADHD Building Skills and Motivation

This user-friendly manual presents an innovative, tested approach to helping teens overcome the frustrating organizational and motivation problems associated with executive function deficits and attention-deficit/hyperactivity disorder (ADHD). The Supporting Teens' Autonomy Daily (STAND) approach uses motivational interviewing (MI) to engage teens and their parents in building key compensatory skills in organization, time management, and planning. Parent training components ease family conflict and equip parents to support kids' independence. Ready-to-use worksheets and rating scales are provided; the print book has a large-size format for easy photocopying. Purchasers get access to a Web page where they can download and print all 45 reproducible tools.

Conclusions

- ADHD reflects a moderate but statistically significant risk group for substance abuse (large risk for tobacco).
- Developmental approach is needed to appreciate both scope and reasons for risk as individuals mature to mid-adulthood.
- Stimulant treatment does not appear to be harmful, but protection in samples where we expect to see it is elusive. Are there conditions under which treatment is protective or harmful (early vs. late, sustained, family factors)?
- Current treatment models may need expansion to incorporate both ADHD-related and substance-specific risk processes and innovation with attention to developmental issues for adolescents and adults.

The End