# SELF-MEDICATION AMONG ADOLESCENTS WHO USE SUBSTANCES: WHAT THE DATA CAN TELL US ABOUT TRAUMA AND EMOTIONAL DYSREGULATION

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# OBJECTIVES

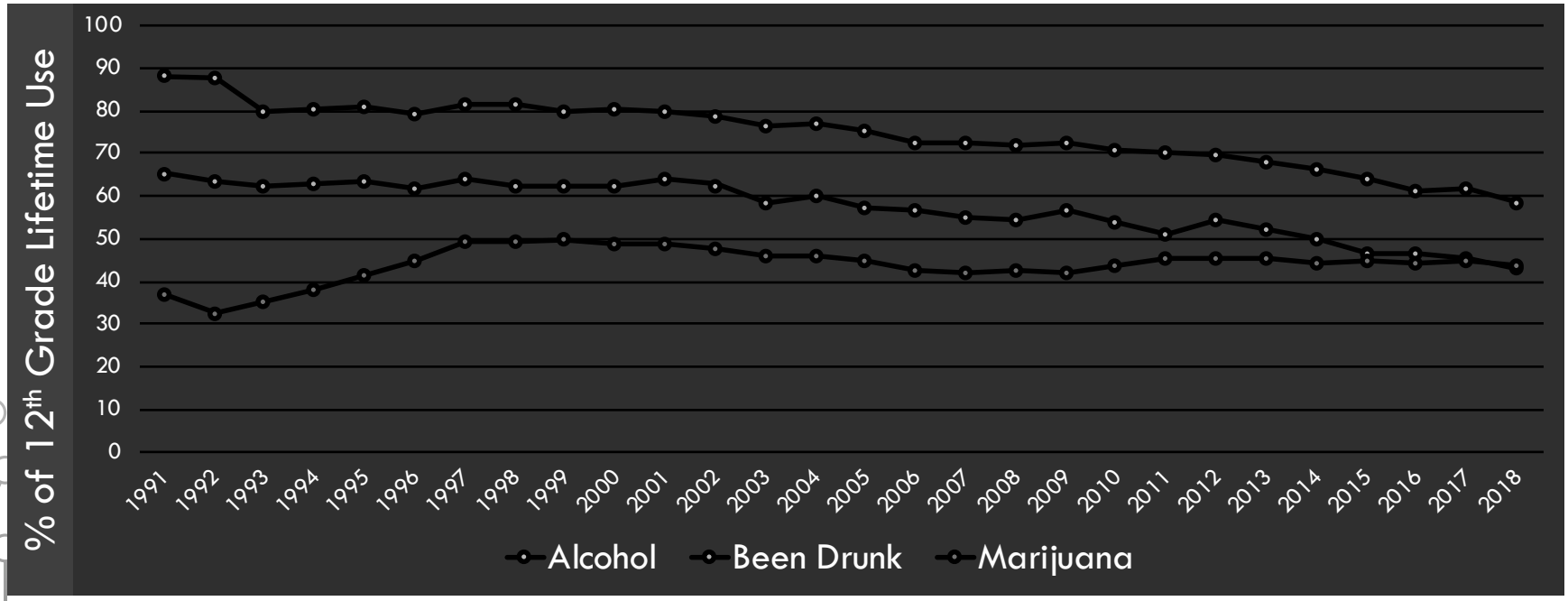
1. Understand recent patterns in adolescent substance use and addictions treatment, as well as how these patterns relate to recovery trends.
2. Define, differentiate, and describe the importance of key terms, including: trauma, PTSD, emotional dysregulation, distress intolerance, and substance craving as regards adolescent addictions.
3. Understand the existing research that supports links between distress intolerance, childhood trauma, and addictions, and limits to this research.

# WHAT SUBSTANCES ARE TEENS USING? WHAT'S GETTING THEM INTO TREATMENT?

# TRENDS IN ADOLESCENT SUBSTANCE USE 1991-2018

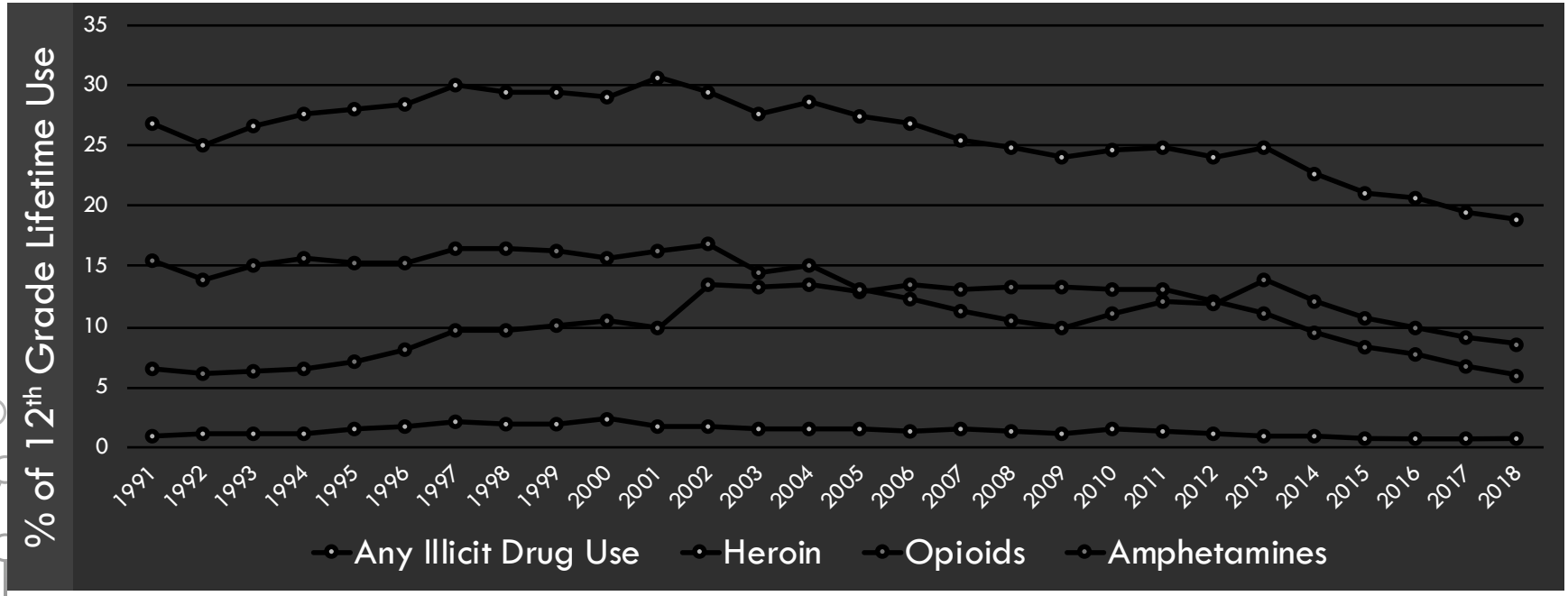
- Monitoring the Future (MTF)
  - Annual US Sample of ~15,000 per grade since 1975
  - 8th, 10th, and 12th graders
  - Alcohol, tobacco, & drug use
  - http://www.monitoringthefuture.org/
  - **Miech, Schulenberg, Johnston, Bachman, O'Malley, & Patrick (2018)**

# TRENDS IN ADOLESCENT ALCOHOL & MARIJUANA LIFETIME USE 1991-2018 (12TH GRADERS)



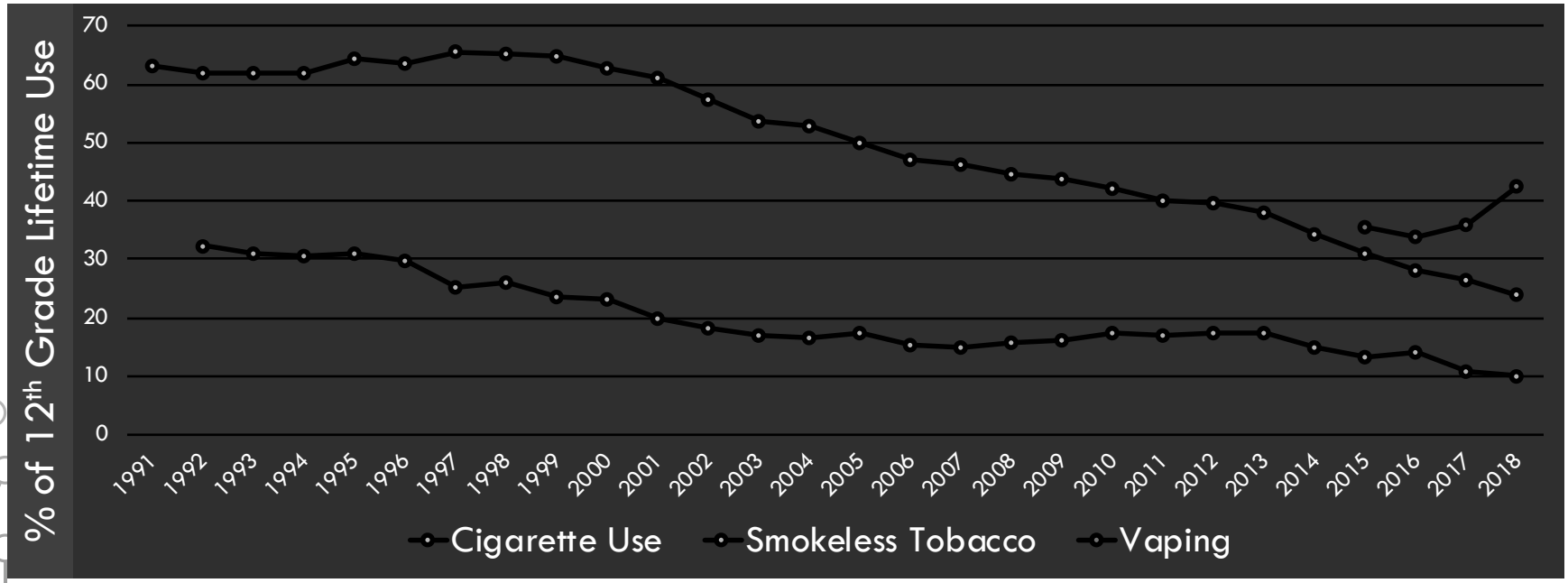

**Miech et al., 2018 (Monitoring the Future)**

# TRENDS IN ADOLESCENT LIFETIME OTHER ILLICIT DRUG USE 1991-2018 (12TH GRADERS)




**Miech et al., 2018 (Monitoring the Future)**

# TRENDS IN ADOLESCENT NICOTINE USE AND GENERAL VAPING 1991-2018



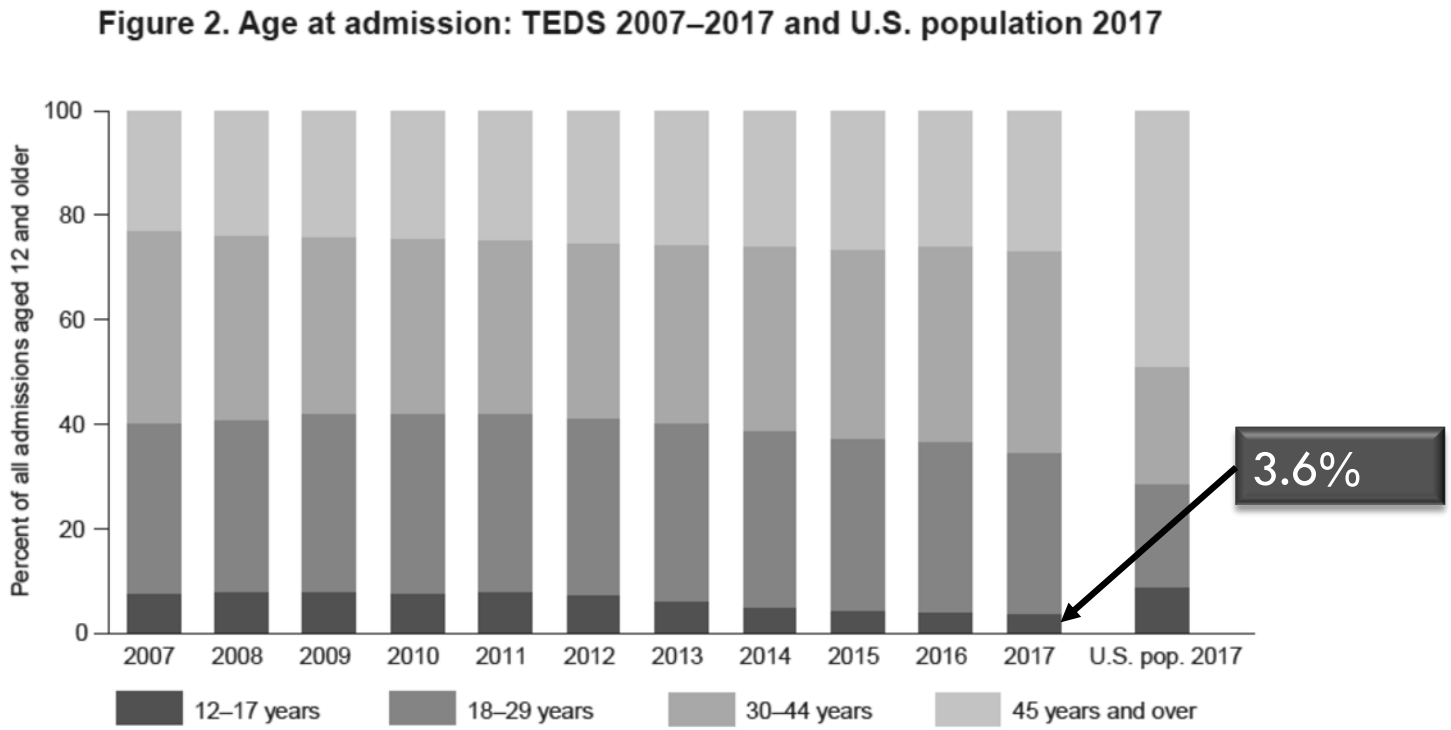

**Miech et al., 2018 (Monitoring the Future)**

# TRENDS IN ADOLESCENT AND SUBSTANCE USE 1991-2018

- General declines across substances since peak in the late 1990s/early 2000s
- Significant overall downturn in 2013 to present
- Marijuana and vaping as exceptions

# TRENDS IN ADOLESCENT SUBSTANCE USE TREATMENT

- Treatment Episode Data Set (TEDS)
  - Center for Behavioral Health Statistics and Quality & SAMHSA
  - Treatment admissions at facilities licensed or certified to provide alcohol and/or drug treatment services
  - Those that receive state alcohol and/or drug agency funds (including federal block grants) for providing alcohol and/or drug treatment
  - https://wwwdasis.samhsa.gov/



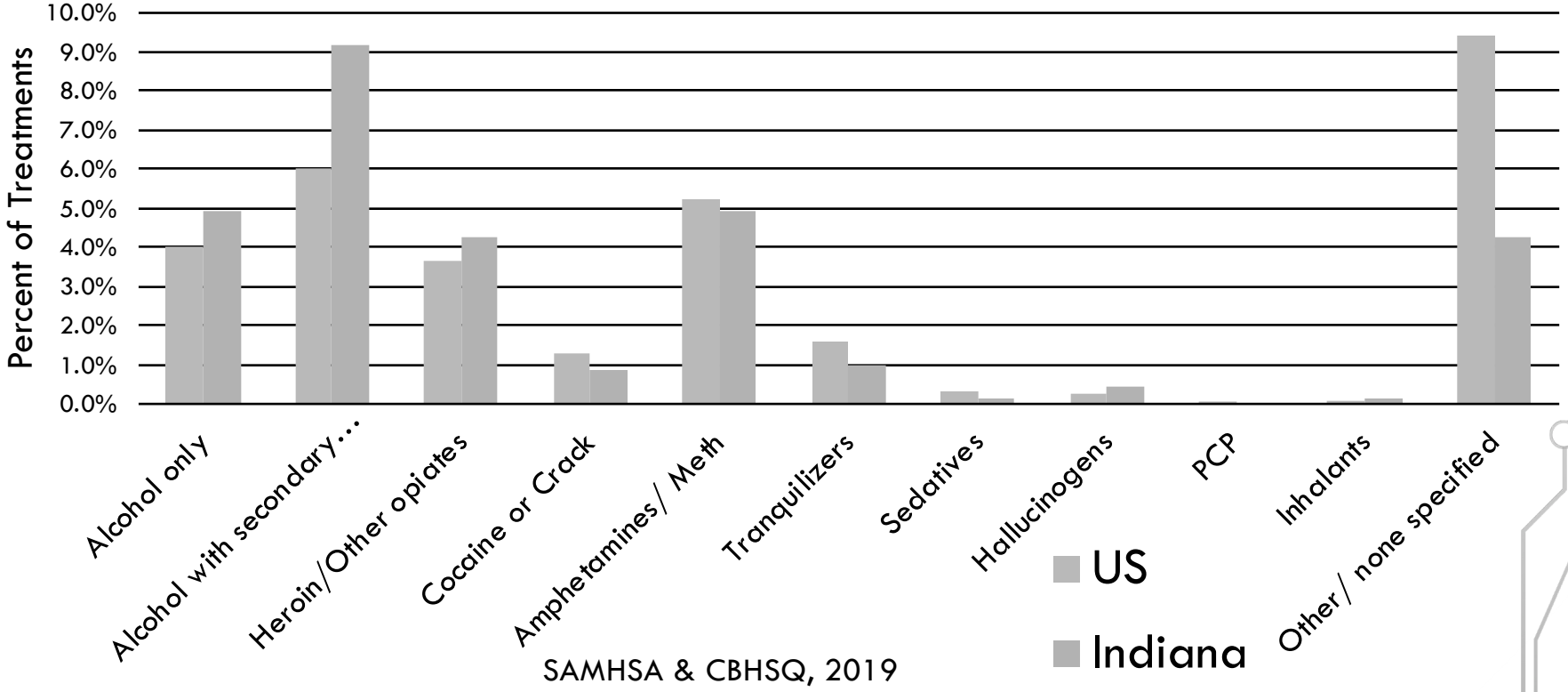

SOURCES: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration, Treatment Episode Data Set (TEDS). Data received through 11.21.18. Population: U.S. Census Bureau, NC-EST2017-ALLDATA: Monthly Population Estimates by Age, Sex, Race, and Hispanic Origin for the United States: April 1, 2010 to July 1, 2017.

# TRENDS IN REASONS FOR ADOLESCENT SUBSTANCE USE TREATMENT IN 2017

- Among adolescents 12-17
  - 68% of treatments for marijuana use (US)
  - 70% of treatments for marijuana use (Indiana)

SAMHSA & CBHSQ, 2019

# TEDS REASONS FOR ADOLESCENT SUBSTANCE TREATMENT IN 2017




SAMHSA & CBHSQ, 2019

# TAKE AWAY

- General declines across substances since peak in the late 1990s/early 2000s
  - Marijuana somewhat steadier in past 5-10 years following an increase
  - Majority of Indiana treatments are for Marijuana Use
  - Alcohol, Meth, Heroin/Opioids, and “Other” next largest groups
  - Vaping increasing
- Declines in number of treatments track decreased use

# IF MOST RATES OF USE ARE DECLINING AND THE PROPORTION TREATED IS SO SMALL, WHY SHOULD WE CARE ABOUT THIS?

# WHY SHOULD WE CARE ABOUT THIS?

- A leading cause of injury, disability, and death (CDC, 2013; NIAAA, 2003; Leute et al., 2015)
- Less than 50% of adolescents maintain treatment gains over 1 year (Hser et al., 2001; White, 2012)
- Initiation before age 15 ←→ high lifetime need for treatment & relapse rate (SAMHSA, 2013; 2014)
- Serious use without recovery that starts in teen years ~ lifetime cost per adolescent $\leq$ $1million (Cohen, 2002)
  - 2019 Inflation adjusted = $1.4 million
  - In Indiana ~ 600 admits in 2017
    - If half of this cohort has significant lifetime substance misuse
    - Estimated ~$417,200,000 for this cohort alone

# HOW CAN PSYCHOLOGY HELP?

- Functional analysis
  - Are we understanding the function of the behavior?
  - What's missing?
- Traditional Understanding: Externalizing Pathways
  - Substance use/misuse in teens often co-labeled with "Externalizing" behaviors
  - Oppositional, defiant, aggressive, lying, stealing, cheating, impulsive acting out
  - BUT
    - Only 2-10% of youth have lifetime oppositional/defiant or conduct disorder diagnoses
    - Only 9.4% ever diagnosed with ADHD
- Other explanations?

# OTHER POSSIBLE EXPLANATIONS

- Trauma / PTSD
- Emotional Dysregulation
- Poor Distress Tolerance
- Using to Cope

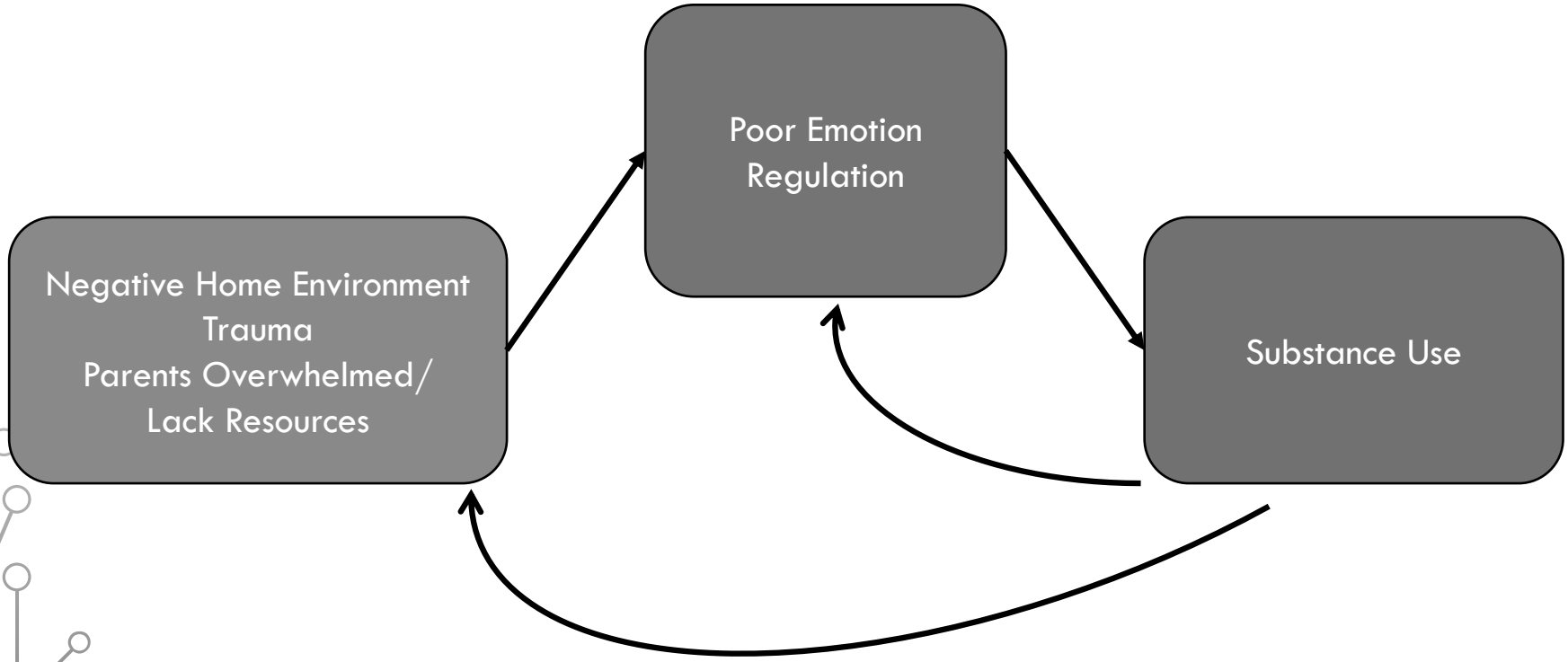
# KEY TERMS

- Traumatic Event:
  - DSM-5 Criterion A (2013)
  - Exposed to event(s) that involved death, belief of imminent death, and/or threatened death; actual or threatened serious injury; actual or threatened sexual violation
  - Overwhelming sense of horror and/or helplessness
- PTSD:
  - At least one traumatic stressor
  - Intrusive thoughts/memories/nightmares/flashbacks
  - Avoidance of trauma reminders, thoughts, or feelings
  - Negative alterations in memory/cognition/mood
  - Alterations in arousal/reactivity

# KEY TERMS

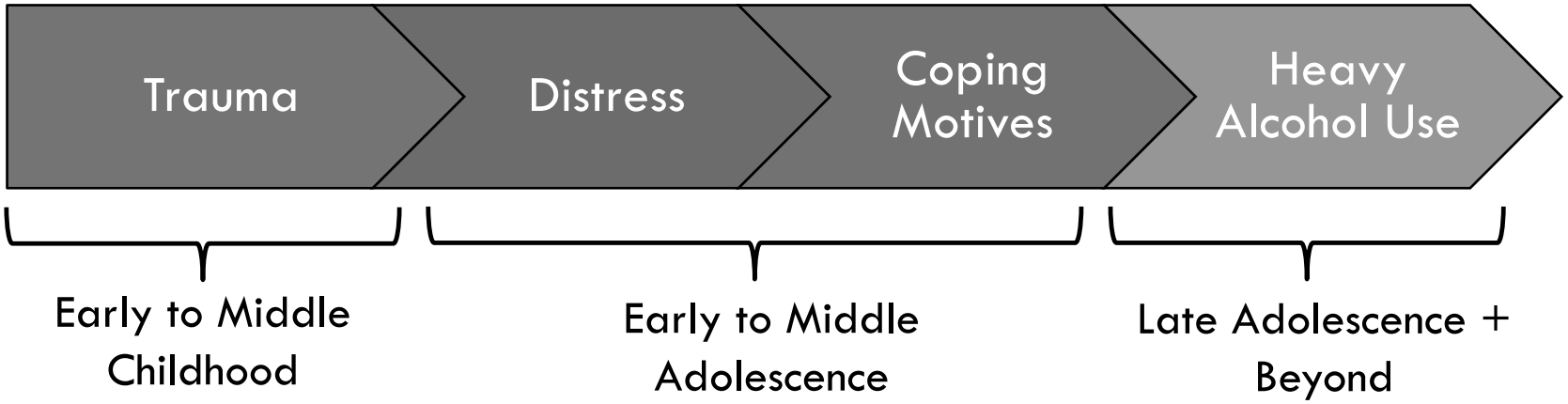
- **Emotion Regulation:**
  - The ability to feel, express, and inhibit your feelings in a manner adaptive to your environment, for example:
    - Relax, smile, and laugh when you're having fun
    - Feel and show sadness and anger non-destructively
    - Inhibit emotional reactions that could get you kicked out of school, fired from work, or arrested
  - Having strategies and skills that help with above
- **Distress Tolerance:**
  - The <u>belief</u> in your ability OR your <u>actual ability</u> to survive negative emotions
- Underlying mechanisms explaining links between negative affect and substance use (Daughters et al., 2009; McHugh & Otto, 2011; Miller, Rathus, & Linehan, 2006)

# CLINICAL INSPIRATION FOR PRESENT RESEARCH



# THE DISTRESS COPING MODEL FOR ALCOHOL USE

(JESTER ET AL., 2015)



# TRAUMA, PTSD SYMPTOMS, & THE BRAIN

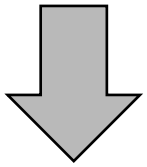
- Traumatic event(s) vs. stressors/difficulties:
  - Exposed to event(s) that involved death, belief of imminent death, and/or threatened death; actual or threatened serious injury; actual or threatened sexual violation
  - Overwhelming sense of horror and/or helplessness
- Traumatic events may disrupt Executive Functions
  - Thinking – I have some control of my own mind vs. flashbacks/nightmares or rumination
  - Planning – Using the past to predict the future vs. impulsivity
  - Judgment – Can I trust myself or others? How do I know?
  - Memory – Sense of time, lost time, lost memory
  - Perceptual-sensory-motor Processing / Integration – Can I trust my senses? Where is my body? Who's in charge of my body?
  - Emotional – Shame/Guilt/Self-Blame, Flooded, Numb

# TRAUMA, EXECUTIVE FUNCTION (EF), & EMOTION REGULATION

- Executive Functions (EF) still developing until age 18-25
- Trauma during developmental period interrupts development of EF
- Emotion regulation and distress tolerance are an outcome of "good enough" EF + supportive social/emotional environment
  - Trauma & PTSD interrupt what's needed to develop Emotion Regulation/Distress Tolerance
  - Trauma & PTSD create more negative emotional experiences
- Differences in baseline functioning compared to some adults with trauma/PTSD

# SUBJECTIVE EXPERIENCE OF TRAUMA AND EMOTIONAL DYSREGULATION

- I feel horrified and helpless
- I can't escape negative thoughts and feelings OR I can't feel anything
- Sometimes I'm fine, and other times I'm overwhelmed by fear / rage
- I can't organize my mind and behavior to adapt to my surroundings some or all of the time



- Is there something that can make this all go away?
- Substance-based coping (Haller & Chassin, 2014; Jester, Steinberg, Heitzeg, & Zucker, 2015)

WHY DO TEENS REPORT USING WHAT THEY'RE USING?
(WHAT IS THE FUNCTION OF THE BEHAVIOR?)

# TOP 3 SELF-REPORTED MOTIVES FOR TEEN SUBSTANCE USE

- Enhancement: Feeling good/drunk/high
- Socialization: Making a social event more enjoyable
- Coping: Improve negative feelings, forget about problems, or increase confidence

Kuntsche & Cooper, 2010; Kuntsche et al., 2014; Lannoy et al., 2019; Schelleman-Offermans, Kuntsche, & Knibbe, 2011

“KIDS DON’T USE TO COPE. THEY DON’T SELF-MEDICATE.”

# CONSEQUENCES OF TEENS USING TO COPE

- Heavier use, more frequent use, and more substance-related problems during adolescence (Blevins et al., 2016; Bresin & Mekawi, 2019; Colder et al., 2019; Cooper et al., 1995; Daughters et al., 2009; Mann et al., 1987; Fox et al., 2011; Patrick et al., 2011; White et al.; 2016)
- Future problematic patterns of use, substance use disorders, and depressive symptoms (Anderson, Sitney, & White, 2015; Chalder, Elgar, & Bennett, 2005; Colder et al., 2019; Patrick et al., 2011)
- Most likely to need treatment and have higher risk of relapse (Cooper et al., 1995; Daughters et al., 2009; Fox et al., 2011; Patrick et al., 2011)
- As coping motives are reported at earlier ages (e.g., < 15), greater chances of heavy drinking into early 20's (Cooper et al., 2008)
  - Especially among African American youth

# REASONS SELF-MEDICATION WITH ALCOHOL & MARIJUANA AMONG ADOLESCENTS AND YOUNG ADULTS

- Stress transitioning to HS (Gottfredson & Hussong, 2011; Reimuller, Shadur, & Hussong, 2010)
- Parents not meeting emotional needs of teen (Hersh & Hussong, 2009)
- Depression / Social anxiety (Colder et al., 2019; Hersh & Hussong, 2009)
- Strong negative mood / Swings (Gottfredson & Hussong, 2013; (Shrier, Ross, & Blood, 2014)
- 21% higher rates of self-medication for depression/anxiety in states with medical marijuana than without (Sarvet et al., 2018).
- Traumatized adolescents report substance use as a means of coping with negative affect (Haller & Chassin, 2014; Jester, Steinberg, Heitzeg, & Zucker, 2015)

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- Strong negative mood / Swings (Gottfredson & Hussong, 2013; (Shrier, Ross, & Blood, 2014)
- 21% higher rates of self-medication for depression/anxiety in states with medical marijuana than without (Sarvet et al., 2018)
- Traumatized adolescents report main reason for substance use was to cope with negative affect (Haller & Chassin, 2014; Jester, Steinberg, Heitzeg, & Zucker, 2015)

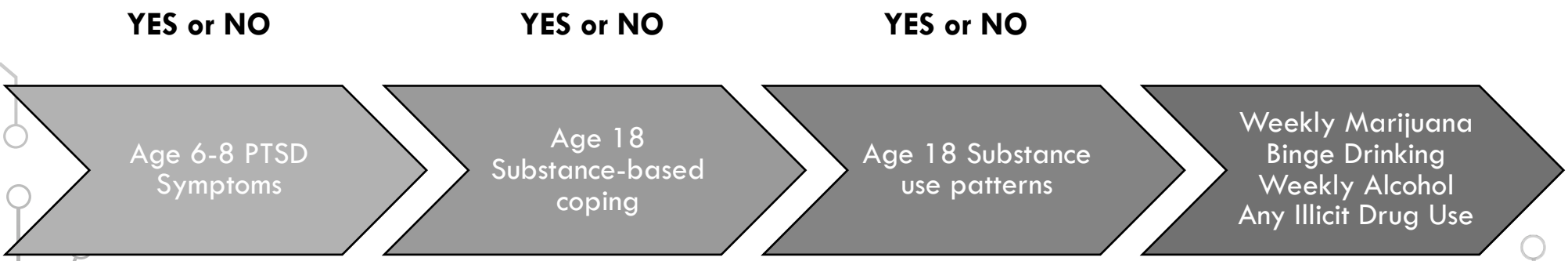
# GAPS IN RESEARCH

- Trauma + Marijuana use
- Trauma + Other illicit drug use
- Representative adolescent samples

# FINDINGS FROM OUR RESEARCH

TRAUMA, COPING MOTIVES, & SUBSTANCE USE IN AT-RISK YOUTH

# LARGE NATIONAL SAMPLE OF HIGH-RISK YOUTH: FOLLOWED FROM EARLY CHILDHOOD TO AGE 18 (LONGSCAN)




**N = 513 Youth identified as "At Risk" at birth/early childhood**

**3 Regions of the US:** Southwest, Northwest, and East

# TAKE AWAY FROM LONGSCAN STUDY (OHLSTROM, 2018)

- Early PTSD predicted age 18 Using to Cope ($\chi^2$=16.38***) and Substance Use
  - Weekly Marijuana Use and Binge Drinking ($\chi^2$=6.91** for each)
- Early Externalizing did not
- Using to Cope was an important predictor of all use regardless of early childhood symptoms
  - ($\chi^2$=5.31* - 10.54**)
- **Suggests lack of skills and strategies for managing intense negative affect**
- Future Directions
  - Externalizing may have a stronger impact during later childhood/early adolescence (Hussong, 2011)
  - Early depression, anxiety, and/or trauma symptoms may <u>lead to</u> later Externalizing symptoms (e.g., Pinna & Gerwitz, 2013)
  - Does coping explain links from early symptoms to substance use?

# WHY ARE RECOVERY OUTCOMES SO POOR?

# NEGATIVE AFFECT, CRAVING, AND RELAPSE

- High stress and negative affect increase odds of adolescent relapse (Cornelius et al., 2003; McCarthy et al., 2005; White et al., 2004)
- Adults who returned to marijuana after a quit attempt - 58% to alleviate a negative emotions (Copersino et al., 2006)
- Craving: a strong urge to use a substance during a period of relative abstinence
  - Biological: due to the chemical impact / withdrawal from a drug
  - Psychological: emotional dependence / coping mechanism
- Craving an important reason for relapse and treatment dropout (Bottlender & Soyka, 2004; Kranzler, et al., 1999)
- The ability to tolerate distress is needed to survive negative impacts of craving:
  - Among adults in treatment for SUDs, low DT increased the odds of early treatment dropout (Daughters et al., 2005)

# GAPS IN RESEARCH

- Very limited research on adolescents with **severe use**
- **Risk factors** and **reasons for use**
  - Trauma
  - Using to Cope
  - Distress Tolerance
  - Emotion Regulation
  - Adolescent Craving

# FINDINGS FROM OUR RESEARCH

RISK AND RESILIENCE FACTORS AMONG ADOLESCENTS IN SUD TREATMENT

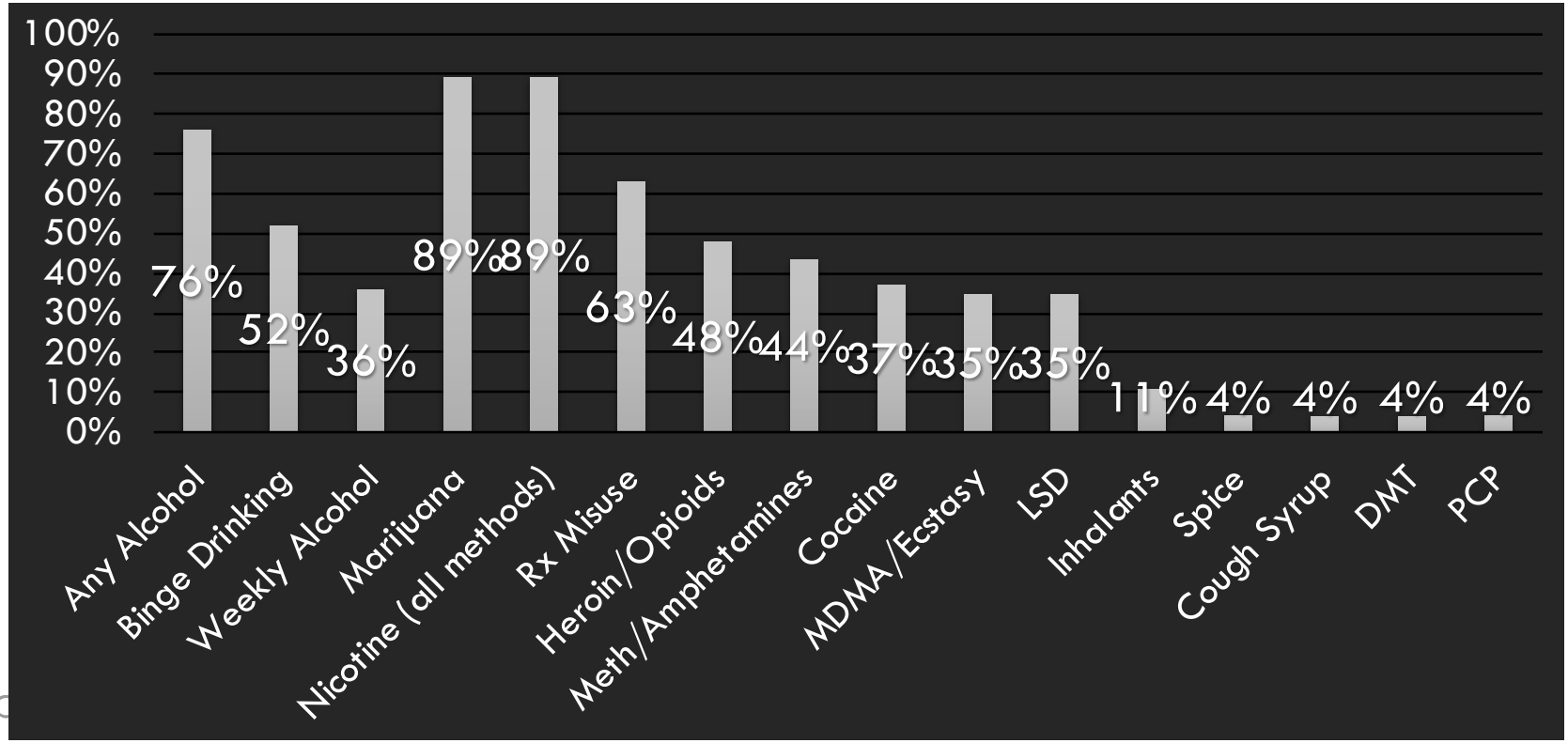
# LOCAL SAMPLE OF ADOLESCENTS IN TREATMENT FOR SUBSTANCE USE (NIDA-FUNDED R15 GRANT)

- Intensive Consent/Assent Process
- Multiple on-unit assessments:
  - Survey
  - Task-based
  - About 2 hours total on the unit
- Retail gift card for participation
- Approved by University of Indianapolis IRB

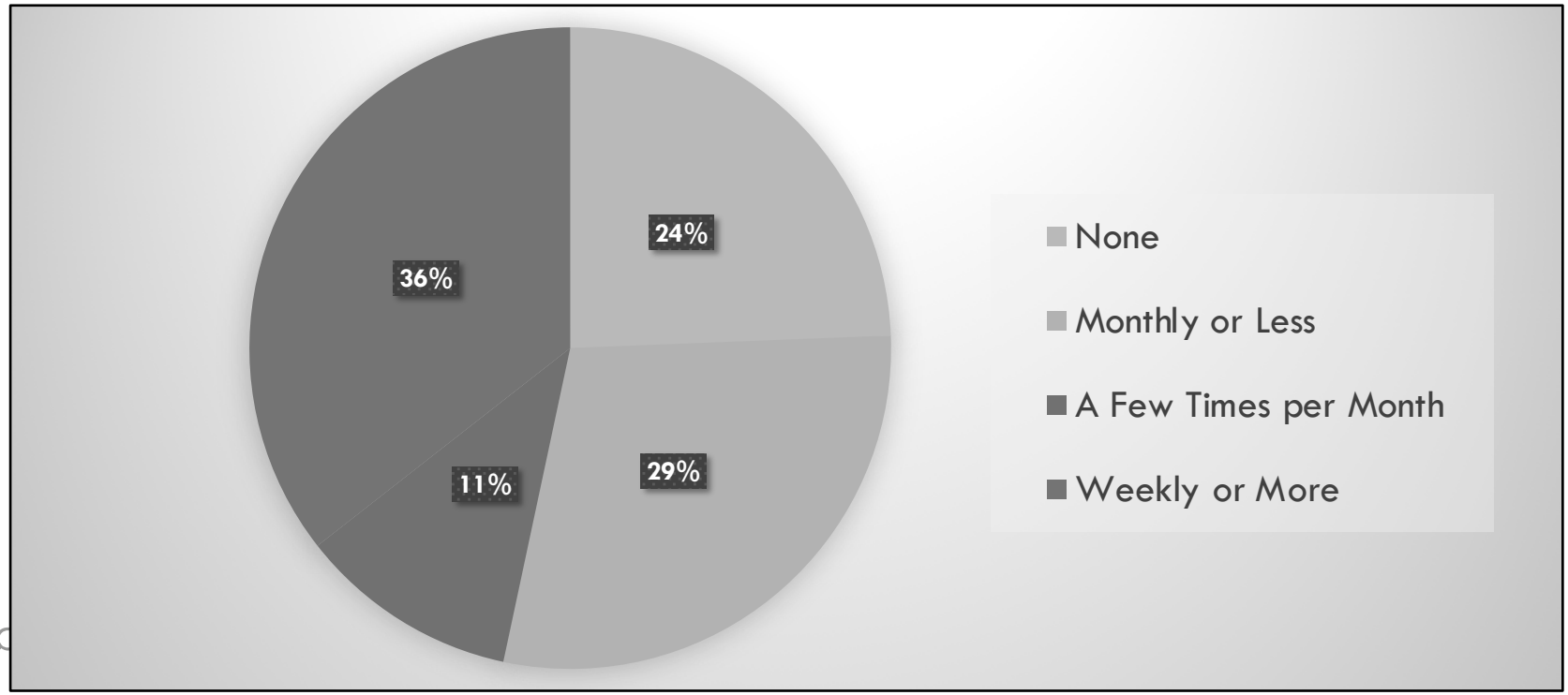
# LOCAL SAMPLE OF ADOLESCENTS IN TREATMENT FOR SUBSTANCE MISUSE

- N =46 adolescents and one parent/caregiver
- Ages 13-18
  - Average age = 16.7 (SD = 1.3)
- Mostly male (70%)
- Mostly White (89.4%)
  - Non-white spanned all categories but Asian/Pacific Islander
- Mostly non-Hispanic (93.6%)

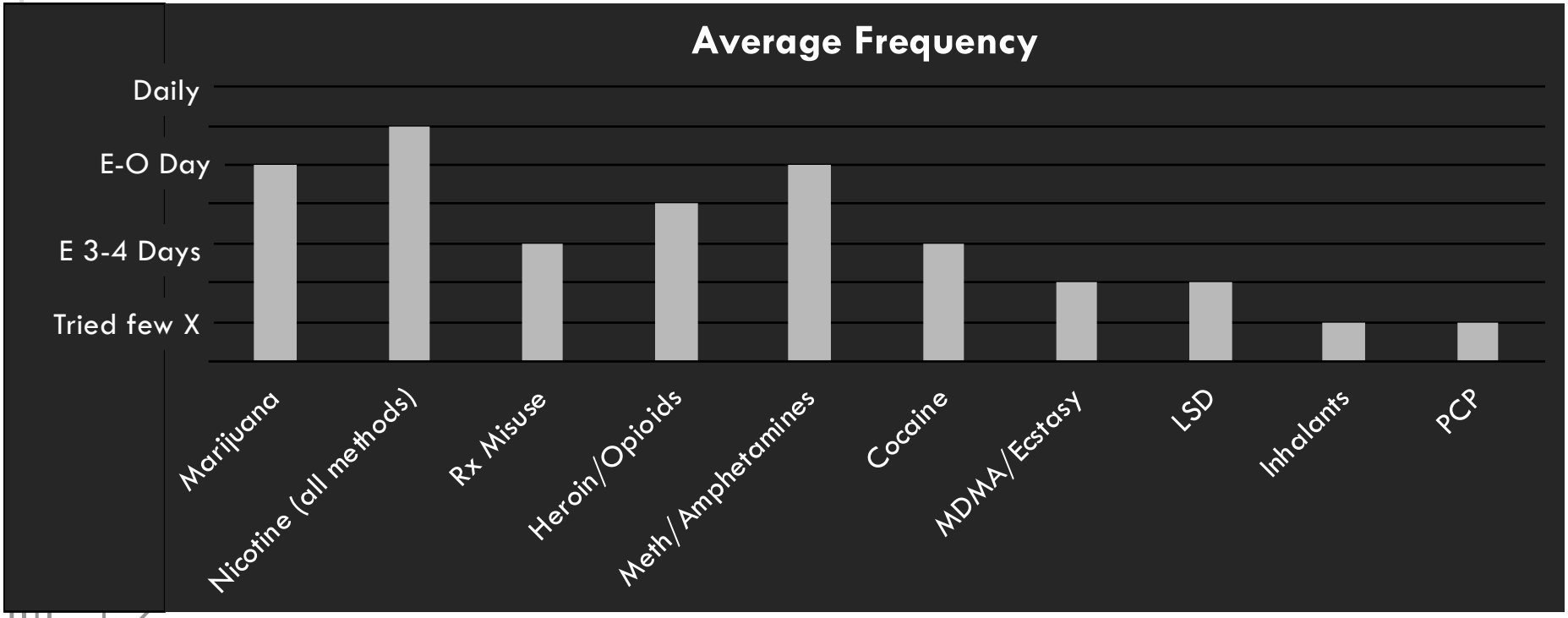
# ALCOHOL & DRUG USE PAST 3 MONTHS: % OF SAMPLE



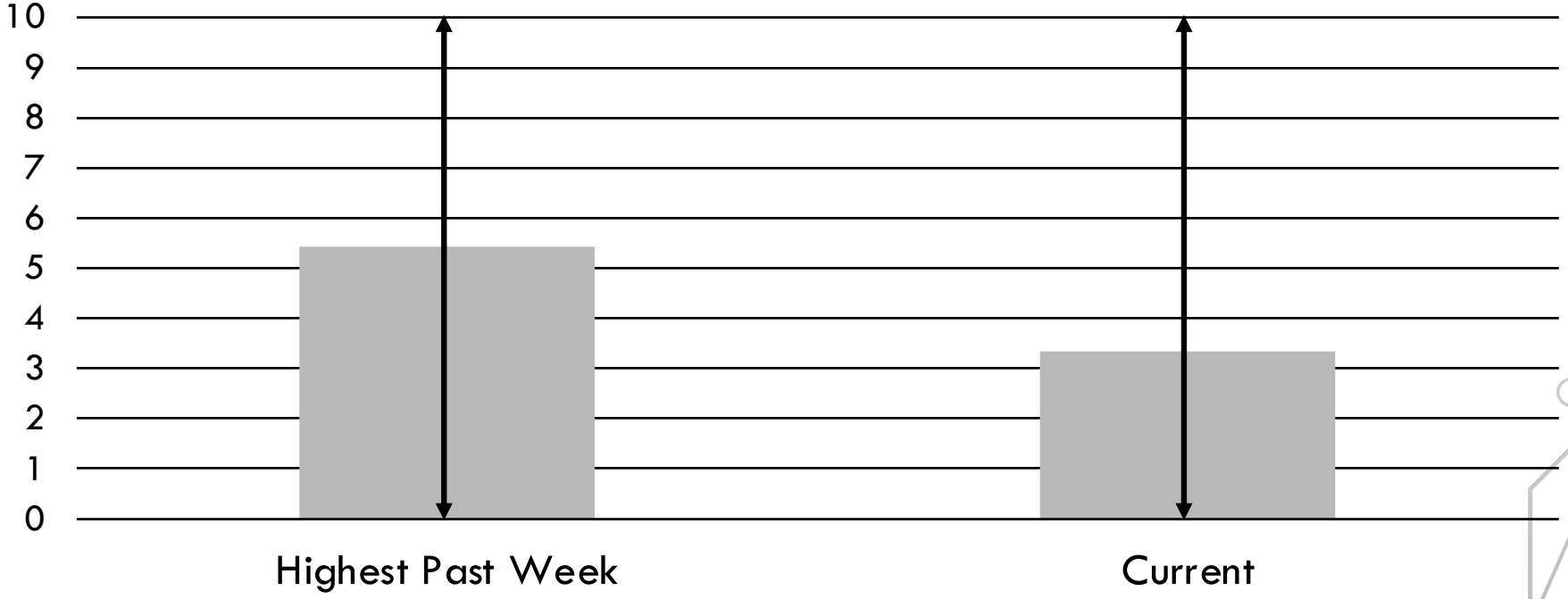
# ALCOHOL USE FREQUENCY PAST 3 MONTHS



# FREQUENCY OF DRUG USE PAST 3 MONTHS (MEAN)



# AVERAGE CRAVING



# USING TO COPE AS MOTIVATION FOR USE

- Alcohol - “sometimes” to “about half of the time”
  - (2.5 on 1-5 scale)
- Marijuana - “about half of the time”
  - (3.1 on 1-5 scale)
- Other Drug of Choice - “about half of the time” to “most of the time”
  - (3.5 on 1-5 scale)

# TRAUMA SYMPTOMS

- 87% reported at least one Criterion A Traumatic Event
- On average, PTSD symptoms 1-2 days per week

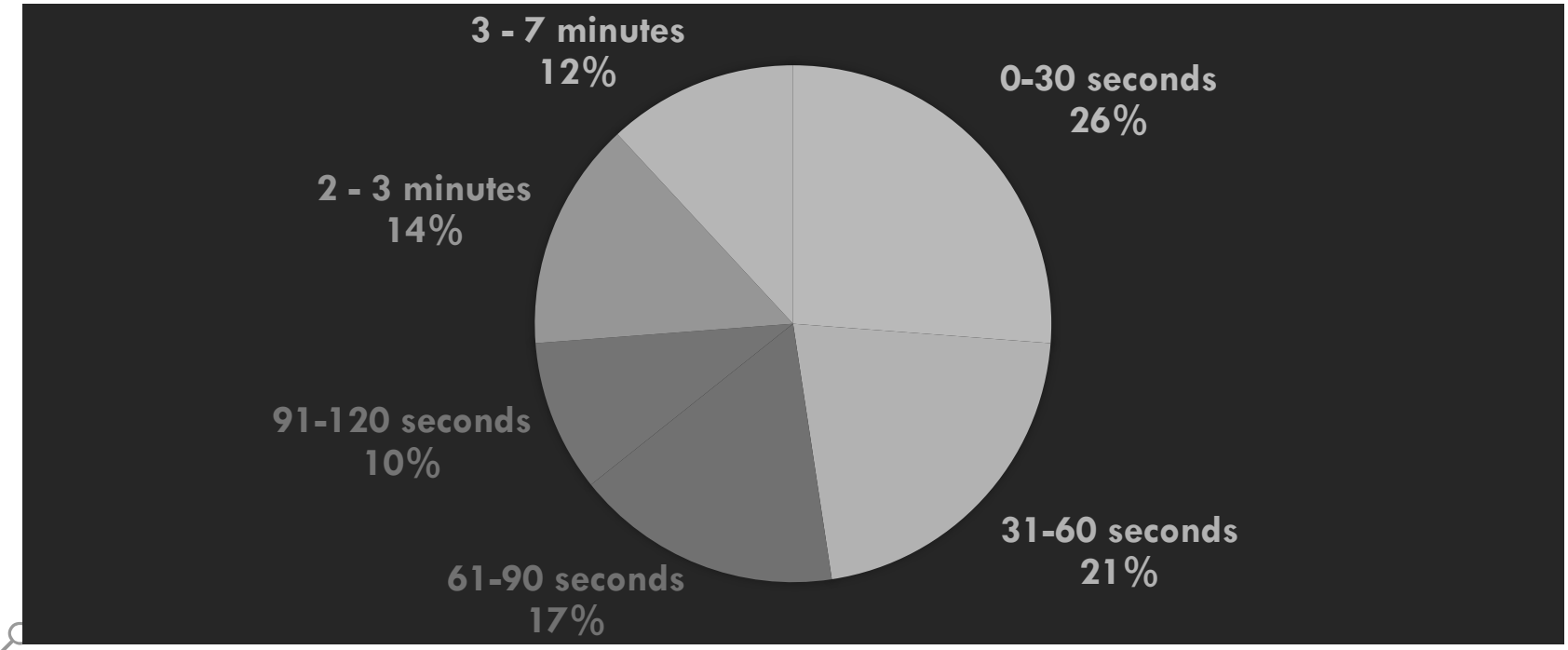
# EMOTION REGULATION DIFFICULTIES: THE DIFFICULTIES IN EMOTION REGULATION SCALE (DERS)

- Overall Emotion Regulation Difficulties
  - Average Score in "Concern Range"
    - (M = 100.9, SD = 21.5)
    - > 99 Females
    - > 98 Males
  - 56.5% of Sample

# DISTRESS TOLERANCE TASK: MIRROR TRACING

- Mirror-Tracing Task (Simulates Cumulative Hassles, Stimulates Strong Frustration/Distress)
- Difficult
  - Almost 1 error per second on average
- Teens reported significantly increased anxiety, frustration, and irritability

# DISTRESS TOLERANCE TASK: MIRROR TRACING

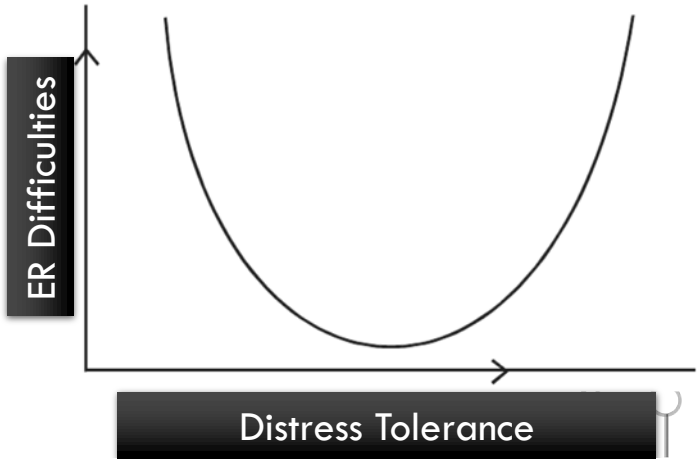


# SUMMARY OF FINDINGS – STUDY OF ADOLESCENTS IN TREATMENT IN INDIANA

- PTSD symptoms correlated with:
  - Poor ER
    - r=.48**
  - Higher cravings
    - .42*
  - Using to cope
    - r=.30* to .59**
  - Higher levels of substance use past 3 months
    - r=.27$^{+}$ to .46**

# SUMMARY OF FINDINGS – STUDY OF ADOLESCENTS IN TREATMENT IN INDIANA

- Poor ER correlated with
  - Higher cravings (r=.42*)
  - Using to cope (r=.24* to .52**)
  - Higher levels of substance use past 3 months (=.34$^{+}$ to .44**)
- Extreme distress tolerance task persistence
- Very low DT OR Very high DT associated with poorer ER compared to mid-range (30 s to 2 m)
  - $t(38)=-2.42$ *



# CONCLUSIONS & FUTURE DIRECTIONS

- Many teens ARE using to cope, especially illicit drugs other than marijuana
- Assess and monitor teens presenting with substance use for:
  - Trauma symptoms
  - Overall ER difficulties
  - Distress Tolerance – under-developed AND over-controlled
- Future Directions: Integrative Treatments
  - Reduce impact of trauma symptoms on ER, DT, and Craving
  - Personalized skill building for ER and DT
- Future Directions: Research
  - More data
  - Test ER/DT as factors that <u>explain</u> PTSD → Substance Use, Coping Motives, and Craving connection

# QUESTIONS & DISCUSSION

- Thank you!