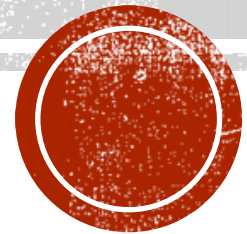


SENSATION SEEKING AND PROTECTIVE BEHAVIORAL STRATEGIES

Diana Doumas, PhD

Raissa Miller, PhD

Counselor Education, ISBHA, Boise State University



AGENDA

Part 1

- Define the construct of sensation seeking
- Discuss models of adolescent development related to sensation seeking and substance use



Part 2

- Define the concept of protective behavioral strategies (PBS)
- Discuss research related to PBS and sensation seeking adolescents
- Discuss implications for counselors and other prevention professionals



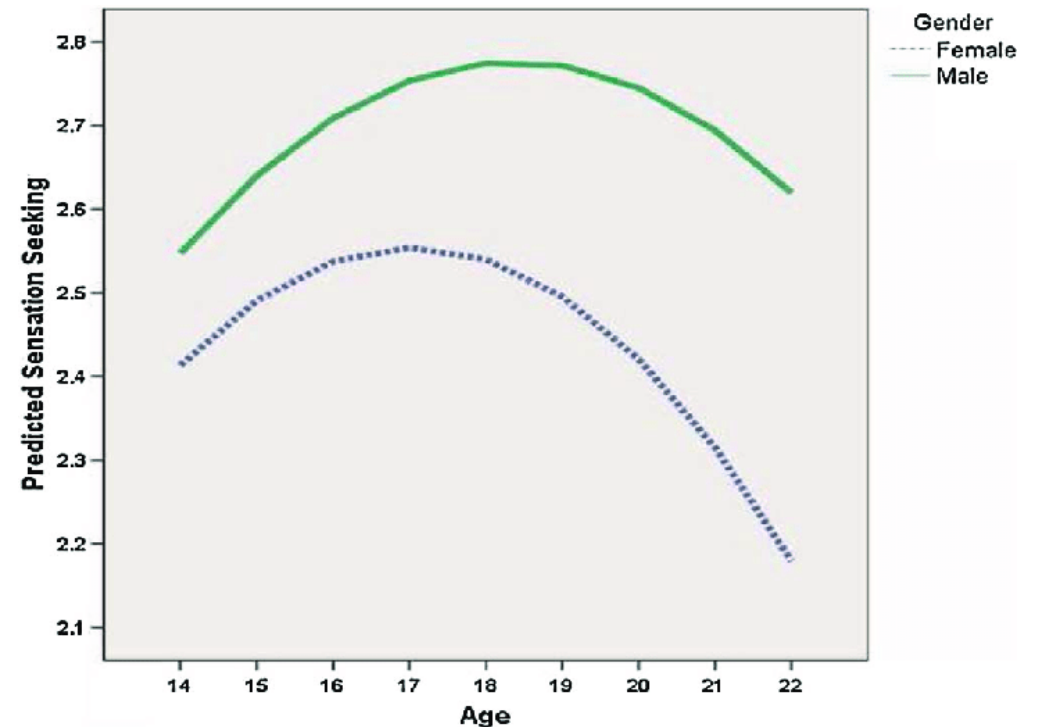
ADOLESCENCE

- Approximately age 10-21
- Have to learn how to
 - Set up an independent household
 - Become economically self-sufficient
 - Maintain emotional stability
 - Find their place in novel peer groups
 - Build their own identity
 - Establish a family unit of their own
- What biological processes help drive behaviors that will eventually support successful adulthood?



SENSATION SEEKING

- A behavioral marker of reward motivation/ reward sensitivity
- Adaptive desire to explore and try new things
- The biological drive of sensation seeking shows a universal peak during adolescence (19 for males; 16 for females)



(Romer et al., 2017)



SENSATION SEEKING

- Biologically based personality trait that is manifested in a tendency toward novelty seeking, including risk-taking behaviors (Zuckerman, 1979; 1994)

Thrill and
Adventure
Seeking

Experience
Seeking

Disinhibition

Boredom
Susceptibility

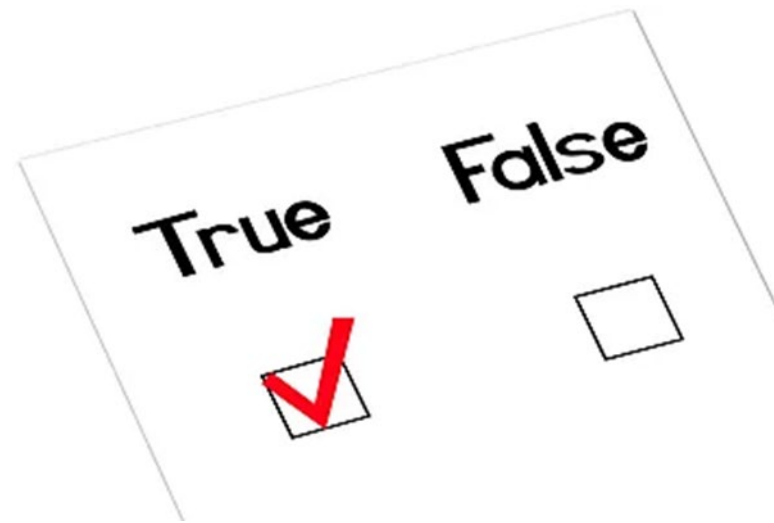
Very Little

A lot



SENSATION SEEKING SCALE

- The Zuckerman-Kuhlman Personality Questionnaire (ZKPQ)
 - 19-Item Impulsive Sensation Seeking (ImpSS) scale



True

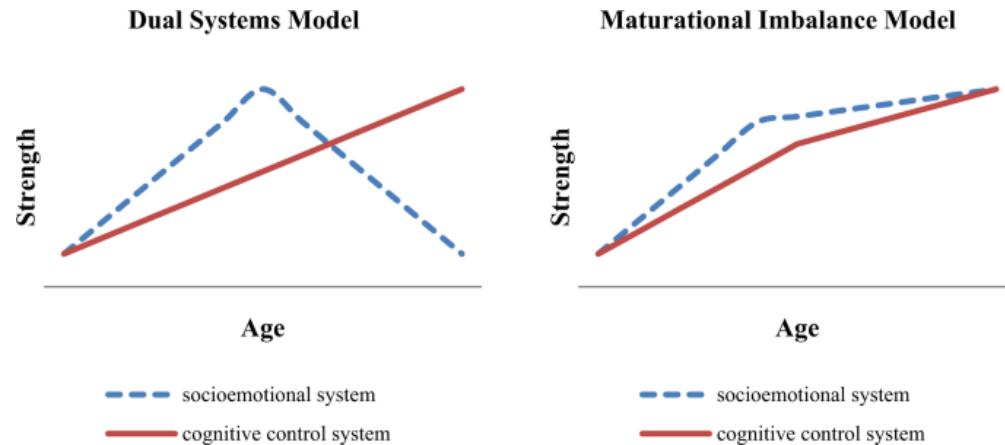
False



ADOLESCENT BRAIN DEVELOPMENT & SS

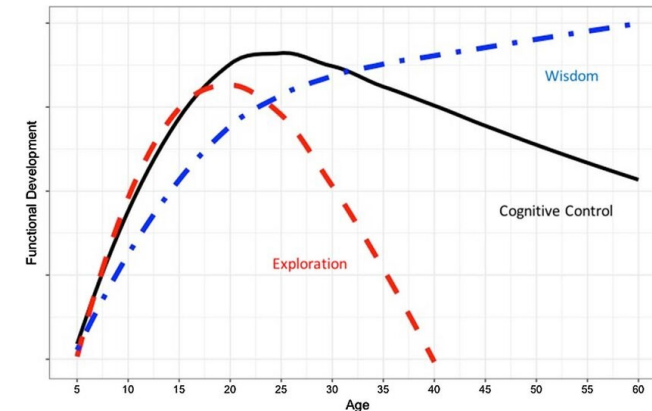


Maturational Imbalance & Dual Systems Models



An increase in risky behaviors during adolescence is attributed to a **universal** imbalance between early-maturing limbic motivational neurocircuitry and later-maturing cognitive control neurocircuitry (Steinberg et al., 2008; Casey et al., 2008)

Lifespan Wisdom Model

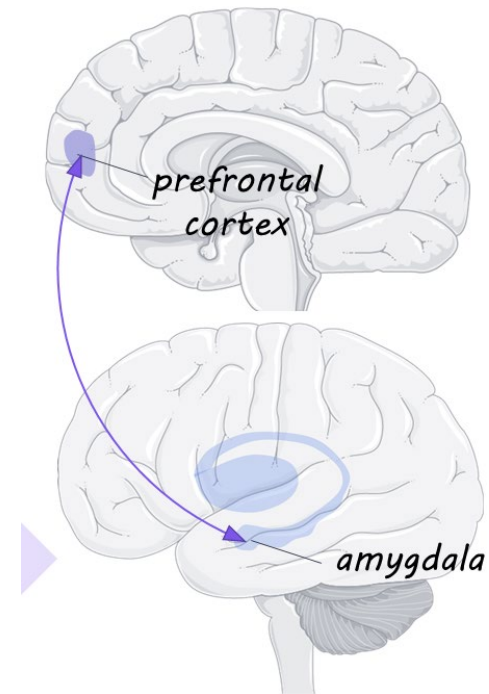


An increase in risky behaviors during adolescence characterized by heightened reward sensitivity and weak cognitive control is only true for a subset of adolescents (Khurana et al., 2018)



SS VS. IMPULSIVITY

- Impulsivity: a form of decision-making that is overly sensitive to immediate urges without adequate consideration of the consequences
 - **Acting without thinking**- motor impulsivity, acting without thinking about the consequences (*does peak during adolescence, along with SS)
 - Impulsive choice- tendency to choose smaller, immediate rewards over larger but delayed rewards (*does not peak during adolescence)
- SS is positively correlated with PFC activation, whereas impulsivity is not (it's the opposite)
 - All youth with high sensation gravitate toward potentially risky activities, but it is primarily the group of high sensation seeking adolescents with poor impulse control (esp. acting without thinking) that experience adverse health consequences, such as addiction
 - The poor cognitive control predates adolescence (i.e., these individuals struggled with impulse control as children too).



KHURANA ET AL. (2018)

- Recruited from Philadelphia Trajectory Study (PTS)
 - Followed 387 adolescence over 8 years (early adolescence to late adolescence)
 - 6 waves of data collection
 - Examined and modeled trajectories of sensation seeking, two dimensions of impulsivity (acting without thinking and delay discounting), cognitive control, and maladaptive risk outcome – specifically substance use disorders.
- Major findings
 - Sensation seeking showed an average curvilinear trend for all adolescents, with peak around mid-adolescence
 - Only some adolescents (44%) experienced peak or persistent high levels of impulsivity (acting without thinking, delay discounting) – and these adolescents had lower cognitive control measures at baseline and higher rates of substance use at follow-up
 - Although sensation seeking can be positively associated with risk taking, it tends not to lead to maladaptive outcomes like substance use progression or dependence apart from its association with acting without thinking (a dimension of impulsivity)



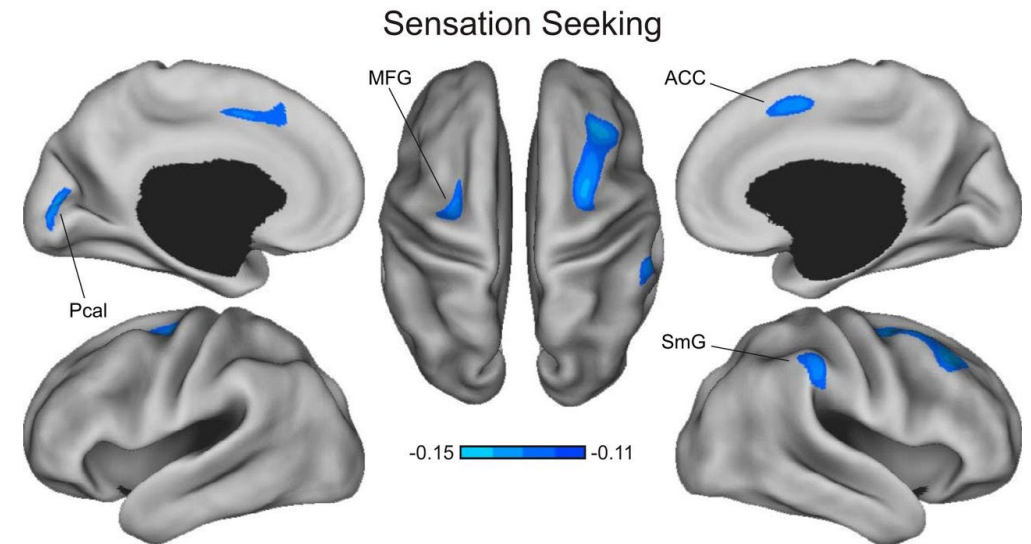
MEEUS ET AL., 2021

- Recruited from the National Longitudinal Study of Youth 79 Children and Young Adults Study
 - Used subset of 3,833 participants from a 7,558 sample
 - Looked at impulse control and sensation seeking and substance use
- Major findings
 - No support for the Dual Systems or Maturational Imbalance Model (i.e., there was no universal trajectory of developmental trend of higher sensation seeking and lower impulse control during adolescence)
 - High sensation seeking paired with poor impulse control predicted the highest levels of substance use – only about 40% of the sample (not insignificant, but also not ALL adolescents)
 - Take-away: There are significant individual differences in sensation seeking and impulse control



SENSATION SEEKING VS. ADHD

- SS is a temperamental preference for seeking out experiences that are novel, varied, complex and intense.
- ADHD is a neurodevelopmental disorder characterized by symptoms of inattention and hyperactivity/impulsivity.
- SS and ADHD are interrelated
 - Individuals with ADHD are more likely to have sensation seeking tendencies
 - Novelty seeking – hyperactive/impulse (vs. inattentive) symptoms
 - SS tendencies mediate ADHD and risk behavior (Graziano et al., 2014)



*Impairments in cognitive control circuitry underlie extreme forms of sensation seeking, impulsivity, and substance use in patient populations (Holmes et al., 2016).



SENSATION SEEKING AND ALCOHOL USE

- Sensation seeking is one of the most significant risk factors for adolescent alcohol use (Strautz & Cooper, 2013)
- Sensation seeking in adolescence is associated with
 - Early initiation of alcohol use (Doumas et al., 2019; Malmberg et al., 2012)
 - Early initiation of binge drinking (Sargent et al., 2010)
 - Alcohol use (Doumas et al., 2017; 2019; 2022; Sznitman & Engel-Yeger, 2018)
 - Binge drinking (Doumas et al., 2017; 2019; 2022)
 - Pre-partying and gaming (Doumas et al., 2022)
 - Alcohol-related consequences (Doumas et al., 2017; 2022)
 - DUI convictions (Curran et al., 2010)



ADOLESCENT ALCOHOL USE IMPACT

Brain Development

- Increased vulnerability to negative effects of alcohol
- Alcohol consumption disrupts healthy adolescent brain development by way of inhibiting neurogenesis, varying grey and white matter volumes, altering connections between frontal and limbic brain regions, inducing neuroinflammation, and initiating whole-brain changes in electroencephalogram (EEG) activity (Spear, 2018)

Consequences

- Academic problems
- Poor school attendance
- Being the target of violence, including school bullying and dating violence
- Unwanted sexual activity
- Increased depression and suicidality
- Interpersonal problems



HARM REDUCTION

Harm reduction can be described as a strategy that aims to reduce the harms associated with certain behaviors

When applied to youth alcohol use, harm reduction recognizes that many youth will drink at some point during adolescence

Harm reduction acknowledges that many adolescents are not willing to choose abstinence

The primary goal of harm reduction is the **prevention or reduction** of negative consequences associated with drinking



PROTECTIVE BEHAVIORAL STRATEGIES

Researchers have identified protective behavioral strategies (PBS) as one way to buffer adolescents from alcohol-related consequences (Martens et al., 2005)



PBS include strategies that occur before, during, or after drinking



PROTECTIVE BEHAVIORAL STRATEGIES

Limit/Stopping Drinking

Creating plans to stop or slow down drinking

- Determine not to exceed a set number of drinks
- Have a friend let you know when you have had enough to drink
- Drink water while drinking alcohol
- Alternate alcoholic and non-alcoholic drinking
- Put extra ice in your drink
- Leave the party at a predetermined time
- Stop drinking at a pre-determined time



PROTECTIVE BEHAVIORAL STRATEGIES

Manner of Drinking

Changing how one drinks, including how to avoid rapid alcohol consumption

- Avoid drinking games
- Avoid mixing different types of alcohol
- Drink slowly, rather than gulping or chugging
- Avoid trying to keep up or “out-drink” others
- Avoid “pre-gaming” or “pre-partying”



PROTECTIVE BEHAVIORAL STRATEGIES

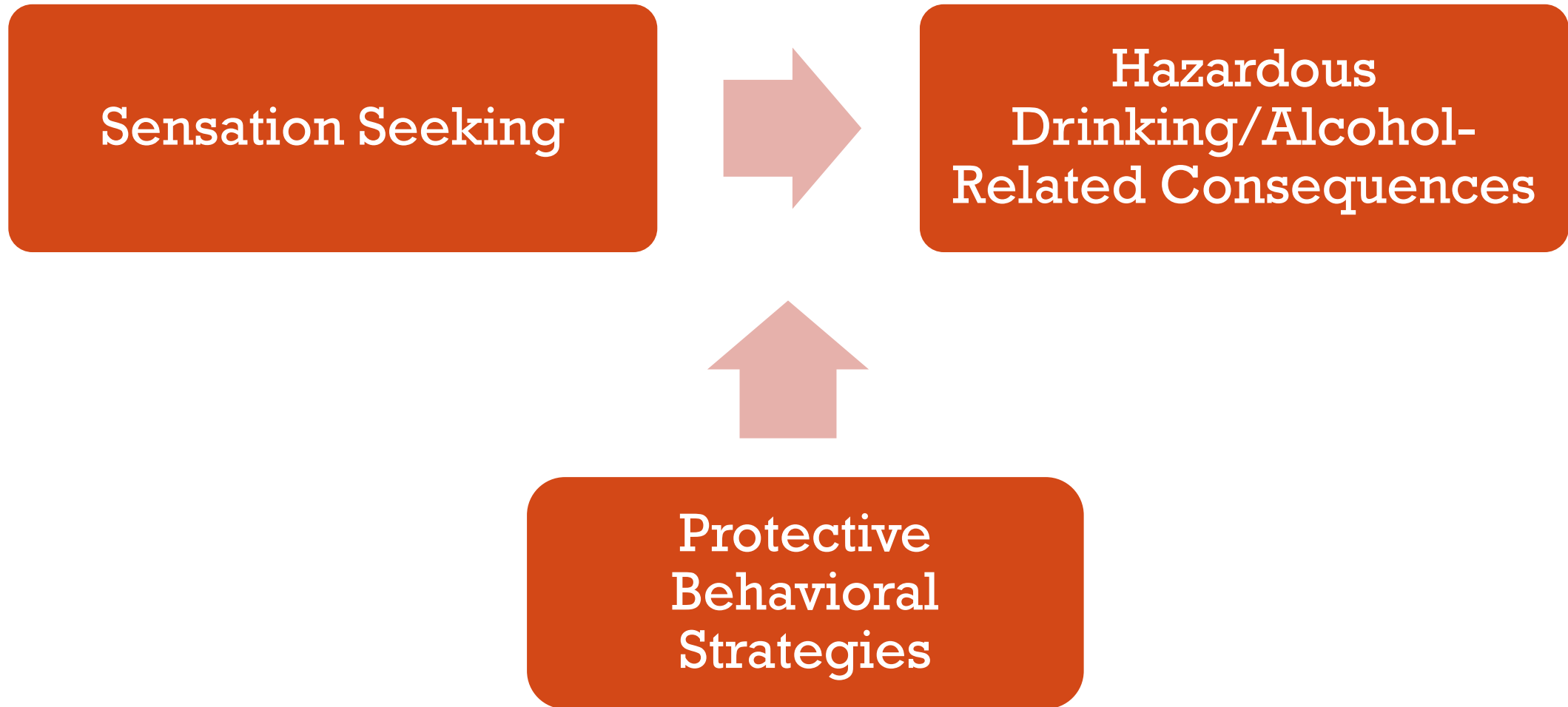
Serious Harm Reduction

Behaving in ways that decrease dangerous consequences and promote harm reduction

- Drink with people who can take care of you if you have too much to drink
- Only go out with people you know and trust
- Go home with a friend
- Refuse to ride in a car with someone who has been drinking
- Use a designated driver
- Eat before and during drinking
- Know where your drink has been at all times
- Avoid combining alcohol with marijuana or other drugs



PREVENTION MODEL



RESEARCH STUDIES

- Two studies with high school seniors
- Does using PBS moderate the relationship between sensation seeking and hazardous drinking/alcohol-related consequences?



RESEARCH ON SENSATION SEEKING AND PBS AMONG HIGH SCHOOL STUDENTS

Study 1

Doumas, D. M., Russo, M., Miller, R., Esp, S., Mastroleo, N., & Turrisi, R. (2022). Sensation seeking and adolescent drinking: Do protective behavioral strategies lower risk? *Journal of Counseling & Development, 100*(4), 352-363.

- $N = 212$ high school seniors recruited from two high schools
- Age ranged from 15 to 18 ($M = 17.15, SD = 0.47$)
- Participants were primarily White (85.8%), with 4.7% Hispanic, 3.8% Asian, 1.4% Black, 1.9% American Indian/Alaskan Native, and 2.4% other



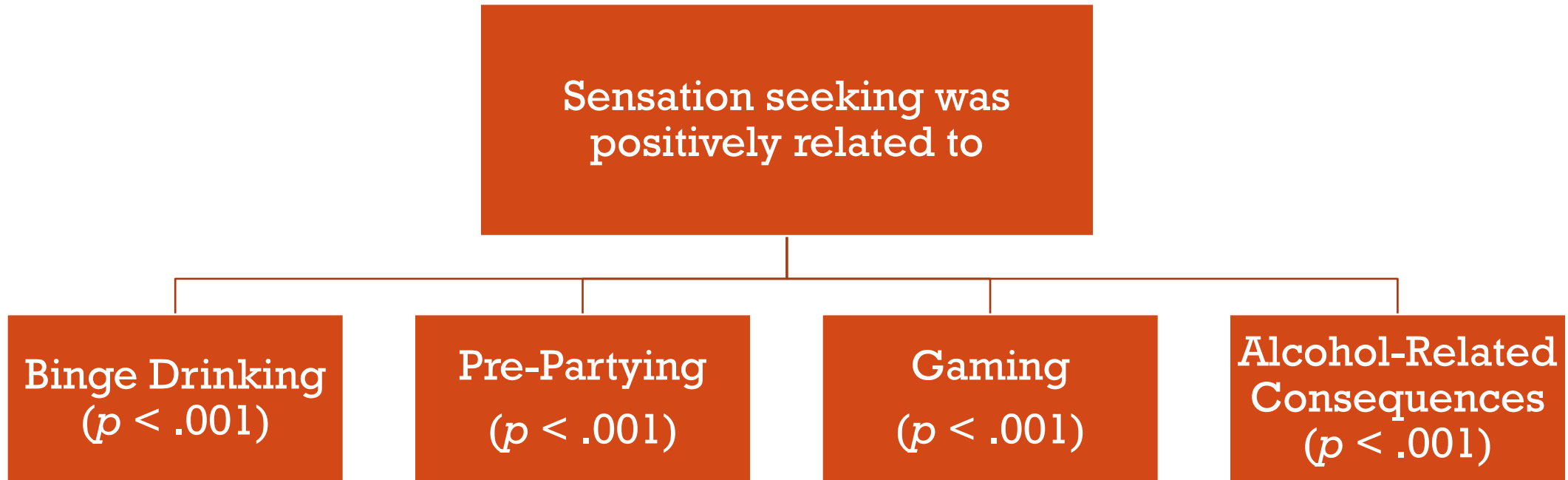
STUDY 1

Measures

- ***Binge Drinking Frequency***
 - Defined as 5+ drinks in a row for males and 3+ for females in a 2 hour period during the last 2 weeks (Donovan, 2009)
- ***Pre-Partying - # of drinks consumed***
 - Defined as “drinking before you go out to your planned destination (e.g., party) at which more alcohol may or may not be consumed.” (Kenny et al., 2010)
- ***Gaming - # of drinks consumed***
 - Defined as “playing games where drinking is part of the known rules, or where chugging is involved. The object of the game is either to avoid drinking or to show that you can drink a lot. A secondary aim is to get others to drink a lot.” (Kenny et al., 2010)
- ***Alcohol-Related Consequences***
 - Rutgers Alcohol Problem Index (RAPI; White & Labouvie, 1989)
- ***Sensation Seeking***
 - Zuckerman–Kuhlman Personality Questionnaire (ZKPO; Zuckerman et al., 1993) – Sensation Seeking subscale (SS)
- ***Protective Behavioral Strategies***
 - Protective Behavioral Strategies Scale (PBSS; Treloar et al., 2015) – LD, MD, SHR



STUDY 1 - RESULTS



STUDY 1 - RESULTS

Hazardous Drinking

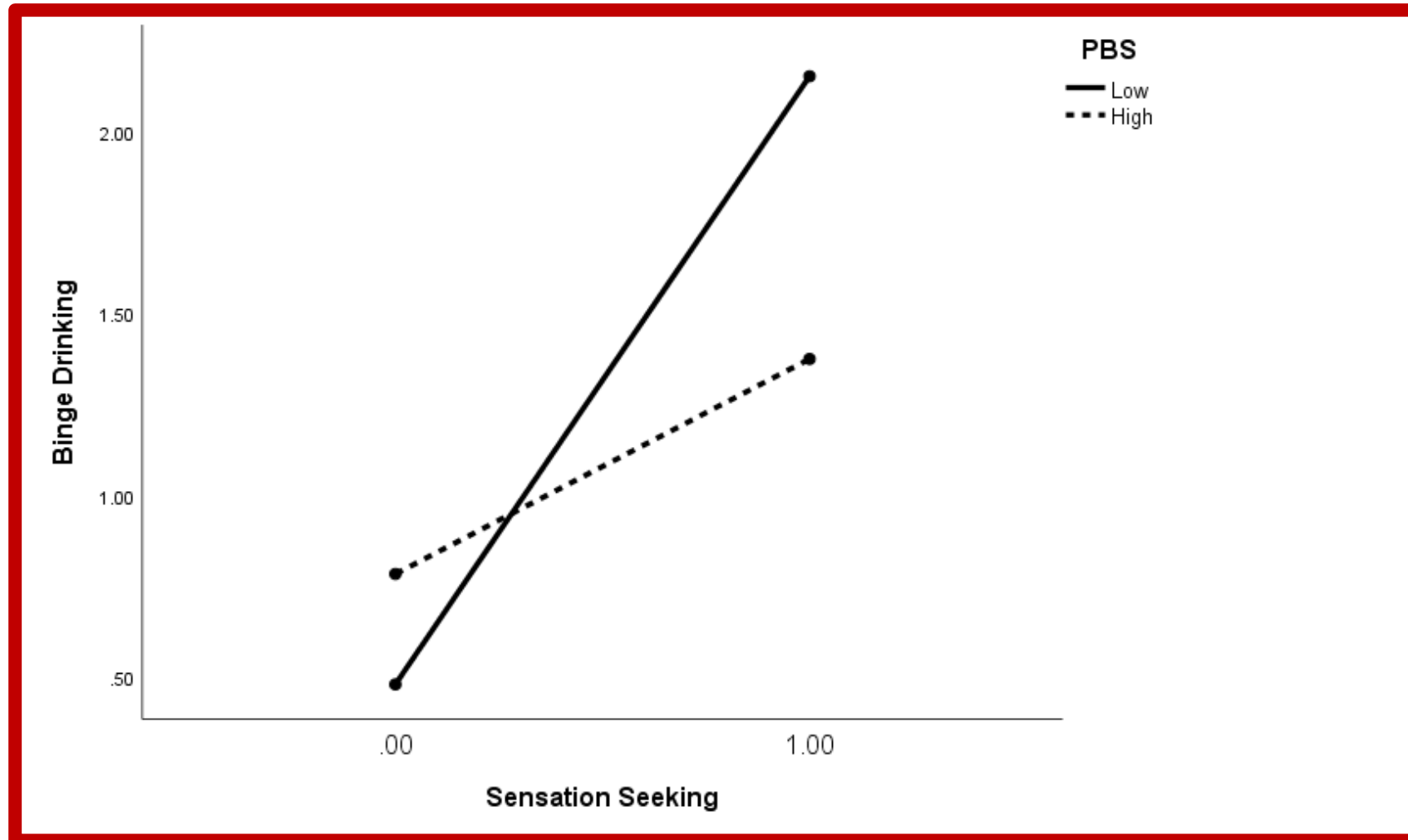
High sensation seeking students who use PBS report lower levels of binge drinking, pre-partying, and gaming than those who do not use PBS strategies

Alcohol-Related Consequences

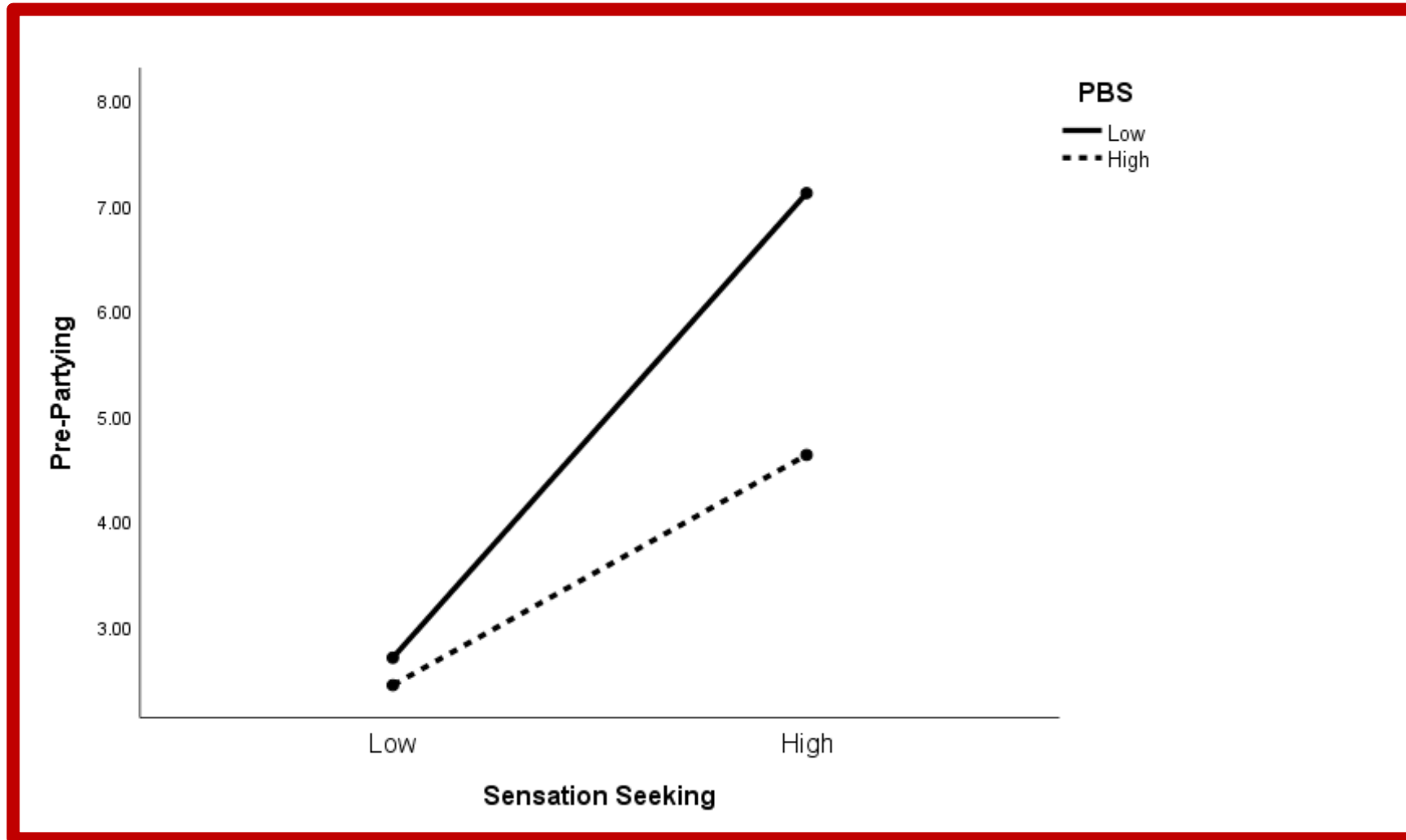
High sensation seeking students who use PBS report fewer alcohol-related consequences than those who do not use PBS strategies



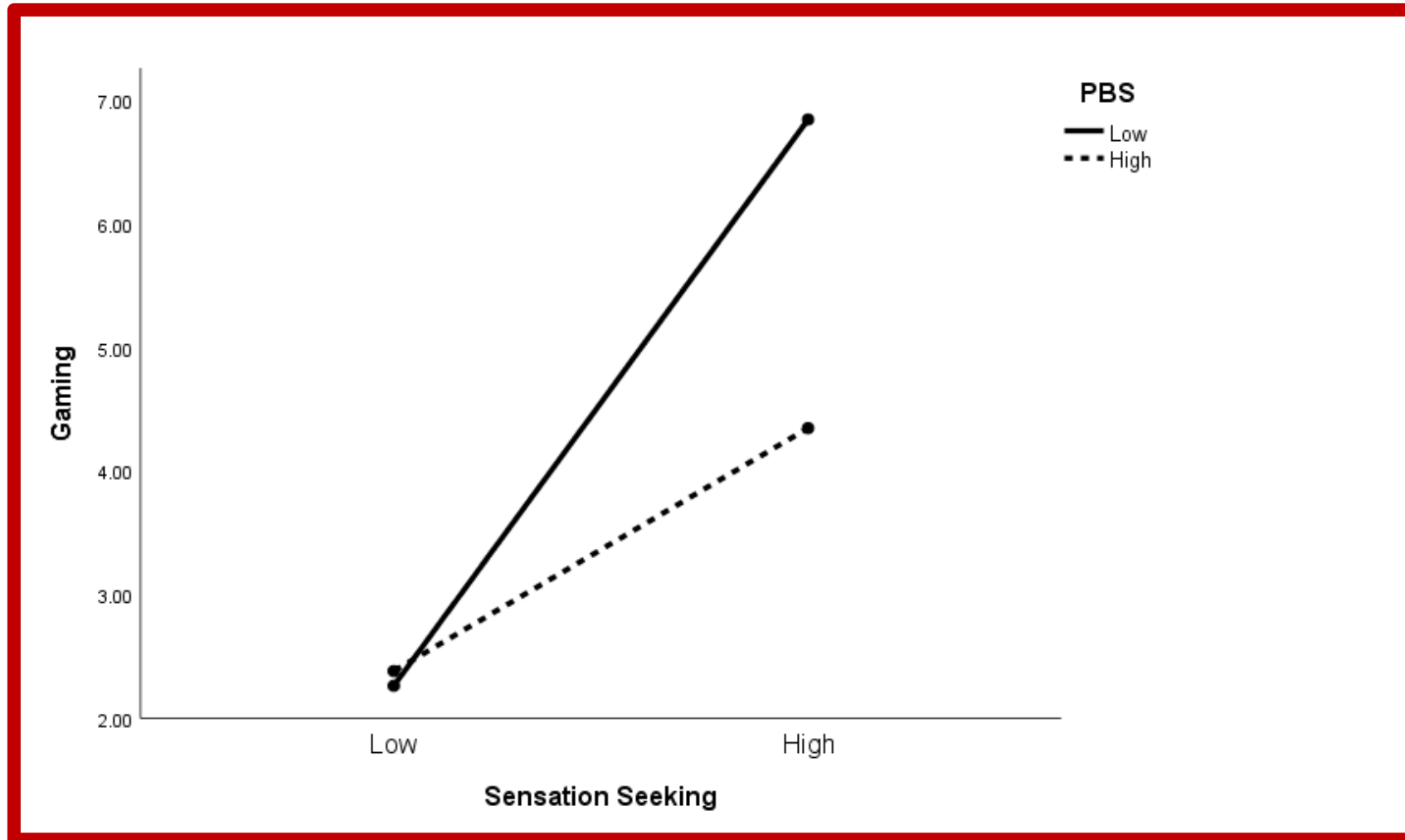
STUDY 1 - RESULTS



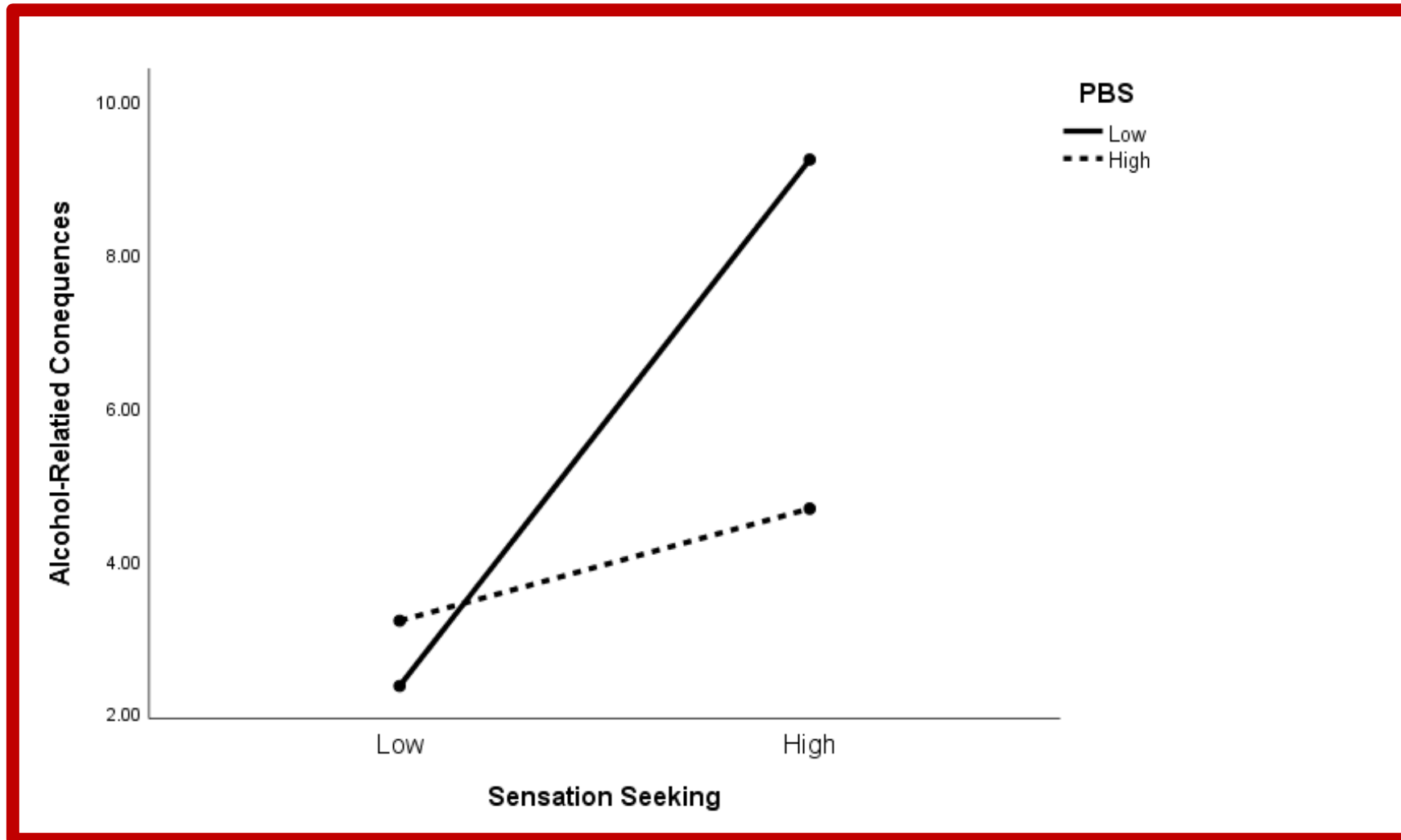
STUDY 1 - RESULTS



STUDY 1 - RESULTS



STUDY 1 - RESULTS



STUDY 1 - RESULTS

Sensation seeking was positively related to hazardous drinking and alcohol-related consequences

High sensation seeking students who use PBS report less hazardous drinking and fewer alcohol-related consequences than those who do not use PBS

Teaching high sensation seeking students PBS is a promising approach to reducing harm associated with alcohol use

Unclear which PBS – LD, MD, or SHR – are most effective for this high risk group of students



RESEARCH ON SENSATION SEEKING AND PBS AMONG HIGH SCHOOL STUDENTS

Study 2

Doumas, D. M., Miller, R., & Esp, S. (2017). Impulsive sensation seeking, binge drinking, and alcohol-related consequences: Do protective behavioral strategies help high risk adolescents? *Addictive Behaviors*, 64, 6-12.

- $N = 346$ high school seniors recruited from two high schools
- Age ranged from 15 to 18 ($M = 17.16$, $SD = 0.45$)
- Participants were primarily White (82.2%), with 5.8% Hispanic, 1.5% Asian, 1.5% Black, 1.2% American Indian/Alaskan Native, and 4.1% other



STUDY 2

Measures

- ***Binge Drinking Frequency***
 - Defined as 5+ drinks in a row for males and 3+ for females in a 2 hour period during the last 2 weeks (Donovan, 2009)
- ***Alcohol-Related Consequences***
 - Rutgers Alcohol Problem Index (RAPI; White & Labouvie, 1989)
- ***Sensation Seeking***
 - Zuckerman–Kuhlman Personality Questionnaire (ZKPQ; Zuckerman et al., 1993) – Sensation Seeking subscale (SS)
- ***Protective Behavioral Strategies***
 - Protective Behavioral Strategies Scale (PBSS; Treloar et al., 2015) – LD, MD, SHR



STUDY 2 - RESULTS

Sensation seeking was positively related to

Binge Drinking
($p < .05$)

Alcohol-Related
Consequences
($p < .01$)



STUDY 2 - RESULTS

Limit Drinking

Not related to binge drinking or alcohol-related consequences for high sensation seeking students

Manner of Drinking

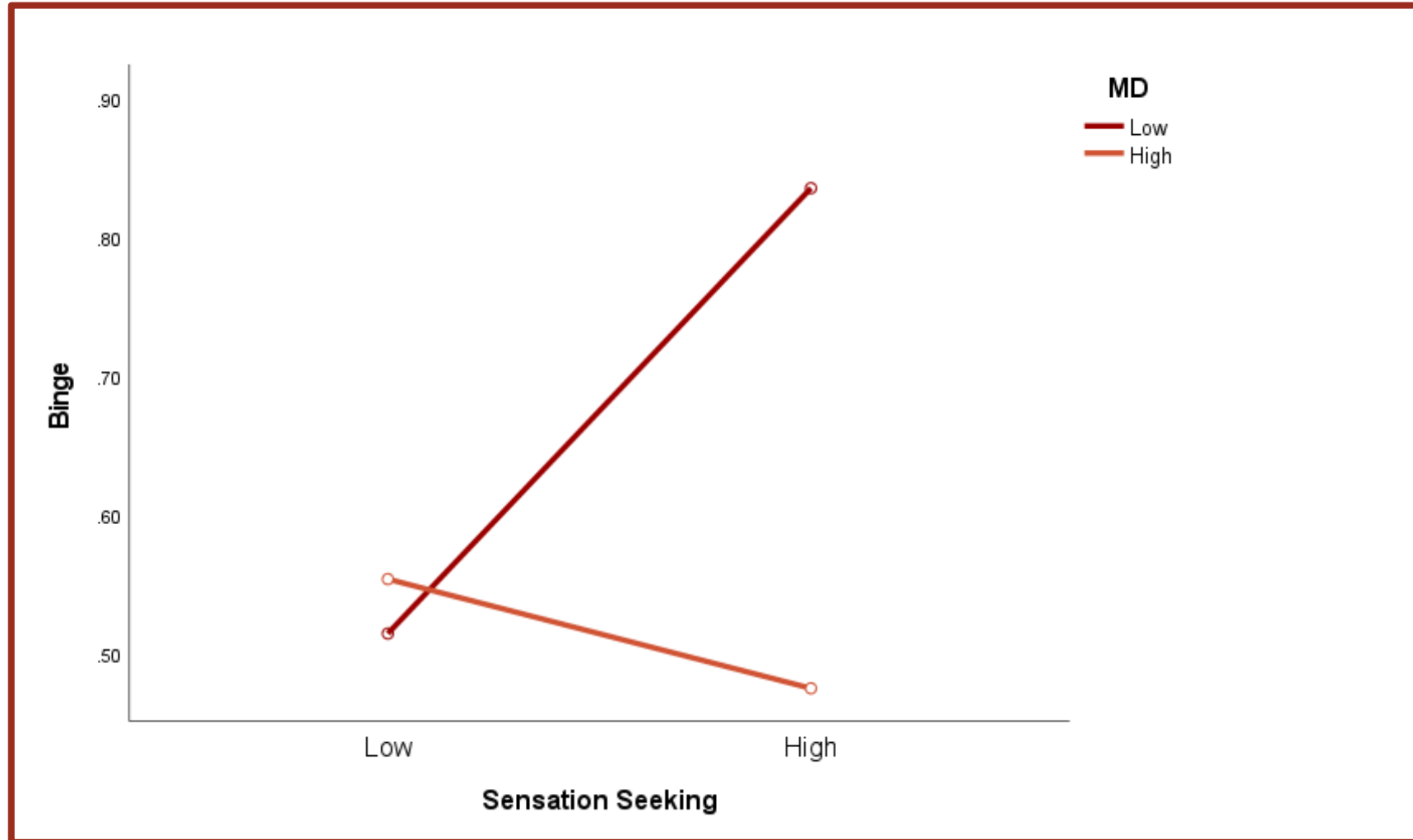
High sensation seeking students who use MD report lower levels of binge drinking and fewer alcohol-related consequences than those who do not use MD strategies

Serious Harm Reduction

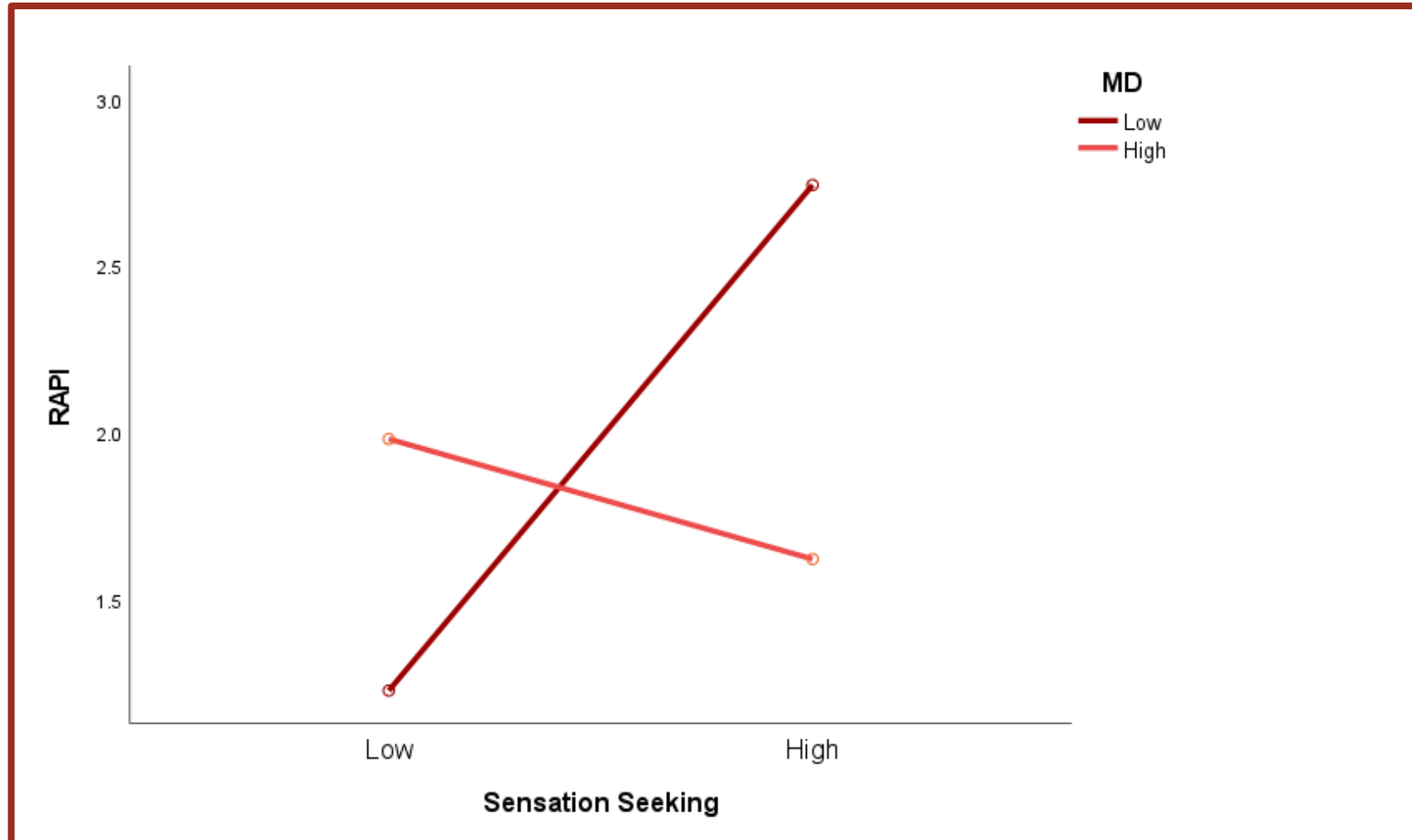
High sensation seeking students who use SHR report lower levels of binge drinking and fewer alcohol-related consequences than those who do not use SHR strategies



STUDY 2 - RESULTS

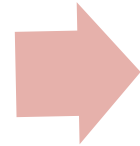


STUDY 2 - RESULTS



STUDY 2 - RESULTS

High sensation seeking students report more frequent binge drinking and more alcohol-related consequences than low sensation seeking students



For high sensation seeking students, using MD and SHR, but not LD, strategies were associated with less binge drinking and fewer alcohol-related consequences

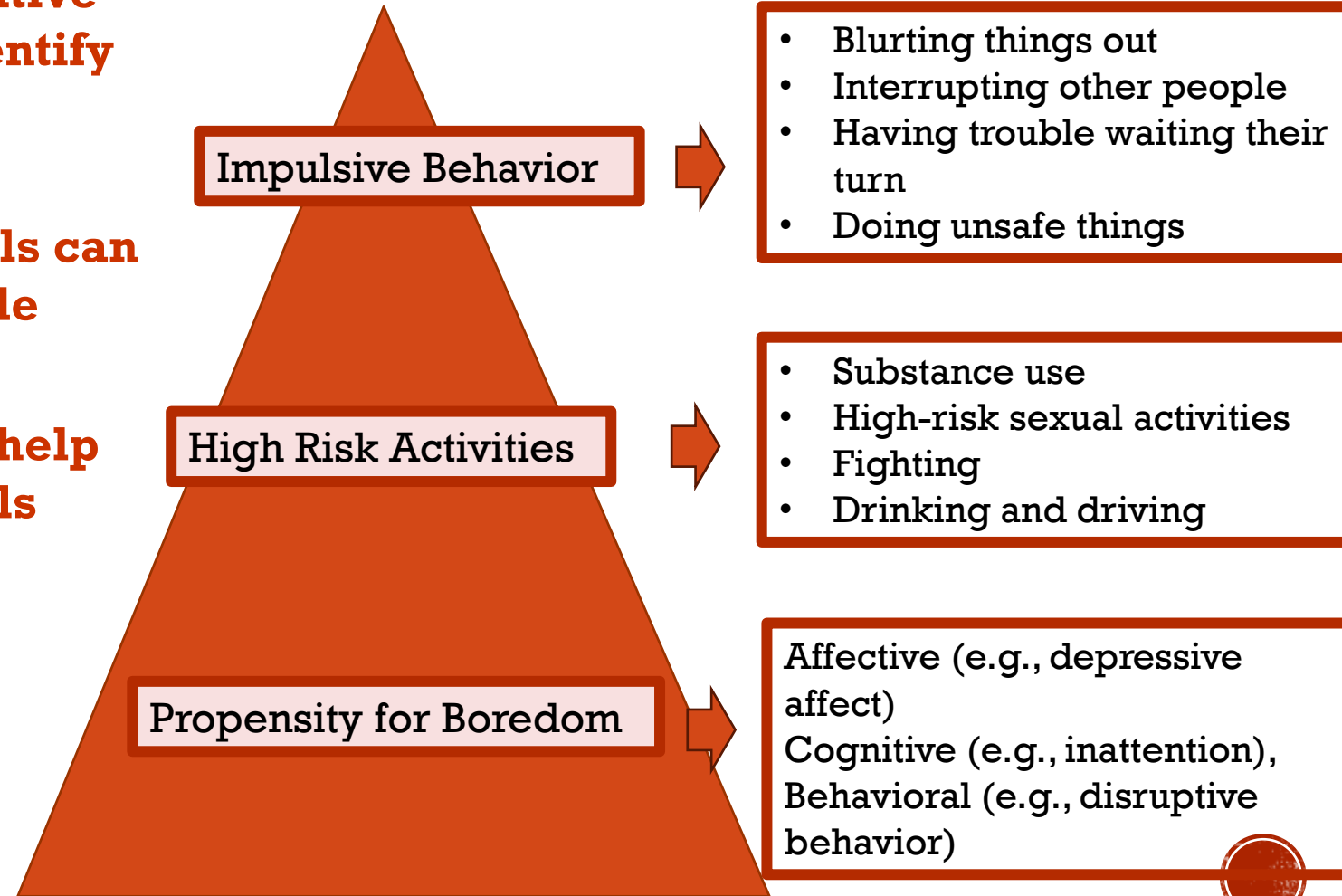


Teaching high sensation seeking students MD and SHR strategies is a promising harm reduction approach



IMPLICATIONS FOR HIGH SS ADOLESCENTS

- **Because high SS is related to hazardous alcohol use and the associated negative consequences, it is important to identify adolescents with high SS traits**
- **Counselors/prevention professionals can screen using the Zuckerman SS Scale**
- **High sensation seeking is also associated with behaviors that can help counselors/prevention professionals identify high risk students**
- **Counselors/prevention professionals can work with high SS adolescents to identify and use PBS to reduce harm associated with alcohol use**



SPECIFIC PBS FOR HIGH SS ADOLESCENTS

Limit Drinking (Less Effective)

- Drink water while drinking alcohol*
- Alternate alcoholic and non-alcoholic drinking
- Have a friend let you know when you have had enough to drink
- Determine not to exceed a set number of drinks
- Leave the party at a predetermined time
- Put extra ice in your drink
- Stop drinking at a pre-determined time

Manner Drinking (More Effective)

- Avoid trying to keep up or “out-drink” others*
- Avoid mixing different types of alcohol
- Avoid drinking games*
- Avoid “pre-gaming” or “pre-partying”*
- Drink slowly, rather than gulping or chugging

Legend

-- **Used Very Frequently**

-- **Used Frequently**

-- **Used Infrequently**

-- **Used Rarely**

* = significantly related to high risk drinking/consequences reduction

Serious Harm Reduction (More Effective)

- Use a designated driver*
- Refuse to ride in a car with someone who has been drinking*
- Only go out with people you know and trust*
- Drink with people who can take care of you if you have too much to drink*
- Know where your drink has been at all times*
- Go home with a friend*
- Eat before and during drinking
- Avoid combining alcohol with marijuana or other drugs



QUESTIONS?



SELECT REFERENCES

- Casey, B. J., Getz, S., & Galvan, A. (2008). The adolescent brain. *Developmental Review, 28*(1), 62–77. doi:10.1016/j.dr.2007.08.003
- Claus, E. D., Ewing, S. W. F., Magnan, R. E., Montanaro, E., Hutchison, K. E., & Bryan, A. D. (2018). Neural mechanisms of risky decision making in adolescents reporting frequent alcohol and/or marijuana use. *Brain Imaging and Behavior, 12*, 564-576. <https://doi.org/10.1007/s11682-017-9723-x>
- Dumas, D. M., Miller, R., & Esp, S. (2017). Impulsive sensation seeking, binge drinking, and alcohol-related consequences: Do protective behavioral strategies help high risk adolescents? *Addictive Behaviors, 64*, 6-12. <https://doi.org/10.1016/j.addbeh.2016.08.003>
- Dumas, D. M., Russo, M., Miller, R., Esp, S., Mastroleo, N., & Turrisi, R. (2022). Sensation seeking and adolescent drinking: Do protective behavioral strategies lower risk? *Journal of Counseling & Development, 100*(4), 352-363. <https://doi.org/10.1002/jcad.12430>
- Khurana, A., Romer, D., Betancourt, L. M., & Hurt, H. (2018). Modeling trajectories of sensation seeking and impulsivity dimensions from early to late adolescence: Universal trends of distinct sub-groups? *Journal of Youth and Adolescence, 47*, 1992-2005. <https://doi.org/10.1007/s10964-018-0891-9>
- Martens, M. P., Ferrier, A. G., Sheehy, M. J., Corbett, K., Anderson, D. A., & Simmons, A. (2005). Development of the Protective Behavioral Strategies Survey. *Journal of Studies on Alcohol, 66*(5), 698-705.
- Meeus, W., Vollebergh, W., Branje, S., Crocetti, E., Ormel, J., van de Schoot, R., Crone, E. A., & Becht, A. (2021). On imbalance of impulse control and sensation seeking and adolescent risk: An intra-individual developmental test of the dual systems and maturational imbalance models. *Journal of Youth and Adolescence, 50*, 827-840. <https://doi.org/10.1007/s10964-021-01419-x>
- Steinberg, L. (2008). A social neuroscience perspective on adolescent risk-taking. *Developmental Review, 28*(1), 78–106. doi:10.1016/j.dr.2007.08.002
- Treloar, H., Martens, M. P., & McCarthy, D. M. (2015). The Protective Behavioral Strategies Scale-20: improved content validity of the Serious Harm Reduction subscale. *Psychological Assessment, 27*(1), 340.
- Zuckerman, M. (1979). *Sensation seeking: Beyond the optimal level of arousal*. Lawrence Erlbaum.
- Zuckerman, M. (1994). *Behavioral expression and biosocial bases of sensation seeking*. Cambridge University Press.

