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Decision Making in Students Differing in Binge Drinking Patterns



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Introduction

- ❖ Alcohol and substance dependent persons perform less well on behavioral decision making tasks, like the Iowa Gambling Task (IGT; Bechara et al., 1999).
- ❖ Heavy social drinking has been associated with diminished attention and visuospatial skills, especially for heavy social drinkers (>21 drinks/week; Parsons and Nixon, 1998).
- ❖ Little is known regarding the relation between heavy social drinking or binge drinking and decision making skills among young adults.
- ❖ The goal of this study was to determine whether levels of alcohol use and binge drinking are related to differential decision making, as measured by the IGT.
- ❖ We also investigated the relation between decision making and self-report measures of impulsivity, real life negative consequences of alcohol use, and a more general heavy drinking measure.

Method

- ❖ Participants were selected from a cohort of 2866 individuals taking part in a longitudinal study of student health (IMPACTS), assessing alcohol and substance related behaviors every six months, from precollege (Wave 0) through Fall of the third college year (Wave 4).
- ❖ Latent Class Growth Analysis (LCGA) was used to classify students into one of four groups, based on their binge drinking across 5 time points:
 - Non-binge drinking at any time point (36%)
 - Moderate binge drinking at any time point (30%)
 - Increasing binge drinking across time (10%)
 - Heavy binge drinking at all time points (24%)
- ❖ 50 participants were selected from each binge drinking group

Measures

Decision Making Task:

Iowa Gambling Task – computerized (Bechara et al. 1999)
The task required 100 choices from one of four card decks:

- 2 disadvantageous decks: high rewards, but even higher losses
- 2 advantageous decks: lower rewards but also lower losses

Subjects had to discover which decks were advantageous and learn to select cards accordingly.

Diagnostic Interview Schedule (DIS; Robins et al., 1998)

Axis-1 Diagnoses established based on this structured clinical interview

Impulsivity: Barratt Impulsivity Scale (BIS)

Zuckerman Impulsivity/Sensation Seeking Scale (ImpSS)

Negative Alcohol Consequences:

Composite of a 5-item inventory, e.g.: Drunk driving, not showing up at class or work, being drunk at school/work, continuing drinking despite physical/psychological problems that get worse with drinking.

Data Analysis

❖ The **LCGM** resulted in a four class solution, with a probability of categorization in the correct class (frequent binge drinking class: see left Figure) of:

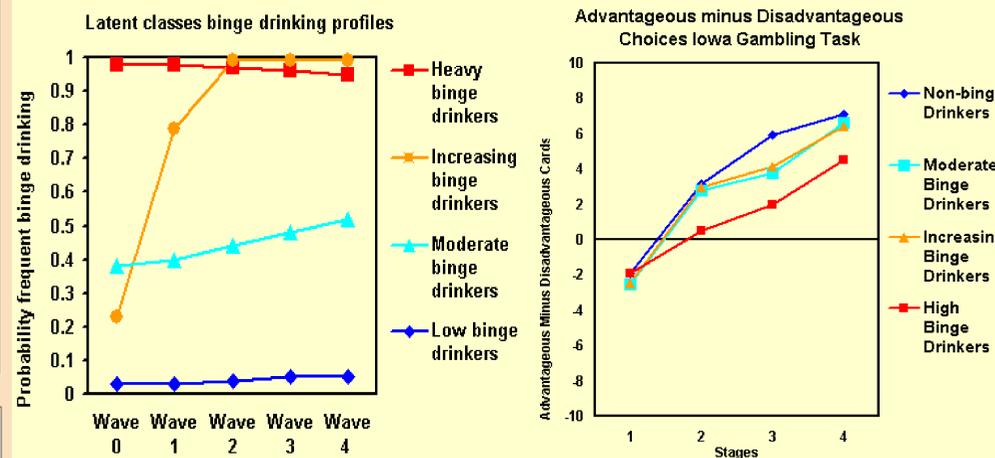
- ❖ 88 % for the Non binge drinkers
- ❖ 71 % for the Moderate binge drinkers
- ❖ 71% for the Increasing binge drinkers
- ❖ 82 % for the High binge drinkers

Results

❖ **MANCOVAs** Iowa Gambling Task:

Although all four groups learned to choose the advantageous decks (positive slope over 4 learning stages: see Figure on the right):

- ❖ A Group by Advantageous choice interaction was present, $F(3,184)=5.40, p<.01, \eta^2=.08$.
- ❖ Posthoc analyses showed that the high binge drinking group performed worse than the non-binge drinking group ($p<.01$, Bonferroni corrected).



	Age (SD)	% Caucasian	ACT composite Score (SD)	Family History for Alcoholism 0/1/2 lineage	Drinks/Week Fall Freshman Year – Wave 1 (SD)	Age at First Full Drink	Barratt Impulsivity Scale (SD)	Impulsivity /Sensation Seeking Scale (SD)
Non binge drinkers	19.9 (0.40)	94%	27.2 (3.7)	68/30/2	1.24 (2.14)	15.6 (2.13)	23.6 (7.35)	7.62 (3.52)
Moderate binge drinkers	19.9 (0.30)	94%	26.6 (3.3)	75/21/4	4.74 (6.39)	14.9 (1.96)	28.2 (6.94)	9.70 (3.80)
Increasing binge drinkers	20.0 (0.30)	98%	26.7 (3.4)	62/30/8	14.00 (11.40)	15.0 (2.07)	26.9 (10.9)	9.65 (4.10)
High binge drinkers	20.0 (0.40)	96%	26.9 (2.9)	62/28/10	17.96 (13.77)	13.8 (1.45)	28.3 (8.64)	9.04 (3.86)

❖ Correlations

- ❖ IGT Advantageous Choices (Stage 2 + 3 + 4) and Impulsivity: No significant correlations.
- ❖ IGT Advantageous Choices correlates negatively with Negative Alcohol Consequences at Wave 0 through Wave 4 ($r=-.28$ to $-.19$), but was non-significant for Wave 5 and Wave 6.
- ❖ IGT Advantageous Choices correlates negatively with a composite score of heavy drinking (binge drinking, getting high, and getting drunk), but only at wave 0 ($r=-.28$) and wave 2 ($r=-.24$).

❖ Effects of Alcohol Use Disorders

- ❖ Mancovas with the AUD group (n=68) and non-AUD group (n=124), did not reveal significant effects.
- ❖ Decision making was not affected by lifetime presence of alcohol abuse or dependence.

Conclusions

- ❖ Chronic binge drinking students, who consume high amounts of alcohol, perform worse on a decision making task than non-binge drinking students.
- ❖ Less advantageous decision making is associated with higher levels of real life disadvantageous decisions related to alcohol use (Negative Alcohol Consequences).
- ❖ Decision making strategies are not related to impulsivity or sensation seeking.
- ❖ The results imply that in young adults, the *amount* of alcohol used, and *pattern* of alcohol use (binge drinking) may have a stronger relation to diminished neurocognitive functions, than alcohol use diagnoses *per se*.

References

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