Project 2 : T-tests

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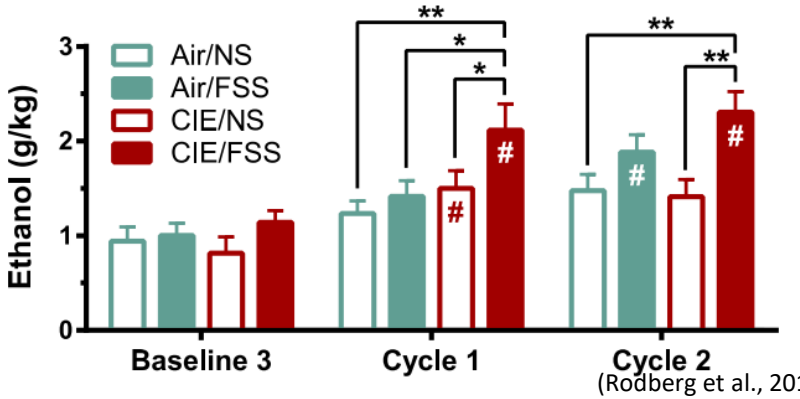
Background



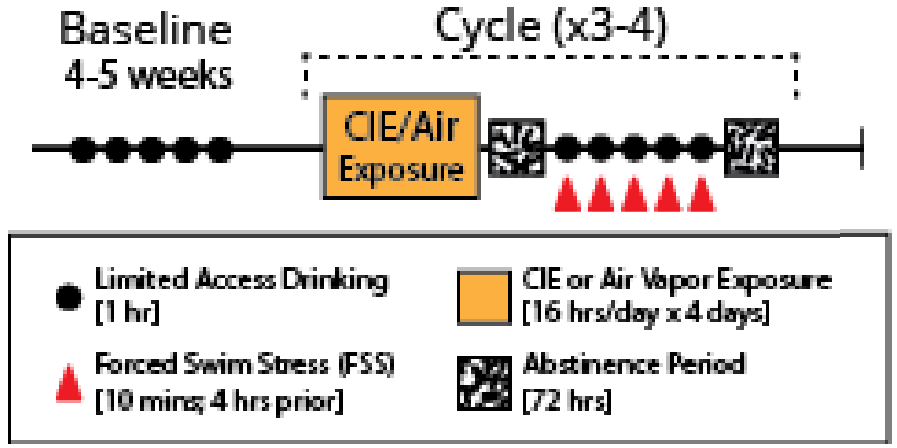
(Rodberg et al., 2017)

- Alcohol consumption patterns vary by individuals
- Chronic stress and alcohol exposure has been shown to increase volitional alcohol consumption (Becker et al., 2011; Sinha and O'Malley, 1999)
- Previously, in our lab we have found that forced swim stress significantly increases alcohol consumption after 2 weeks (Rodberg et al., 2017)
- This pilot study aimed to investigate if baseline cognitive performance can predict future alcohol consumption and if stress and alcohol exposure alters volitional consumption
- This presentation will focus on investigating if we can validate our previous findings that stress increases ethanol(EtOH) consumption in mice.

Does exposure to chronic stress increase volitional ethanol consumption?

Methods

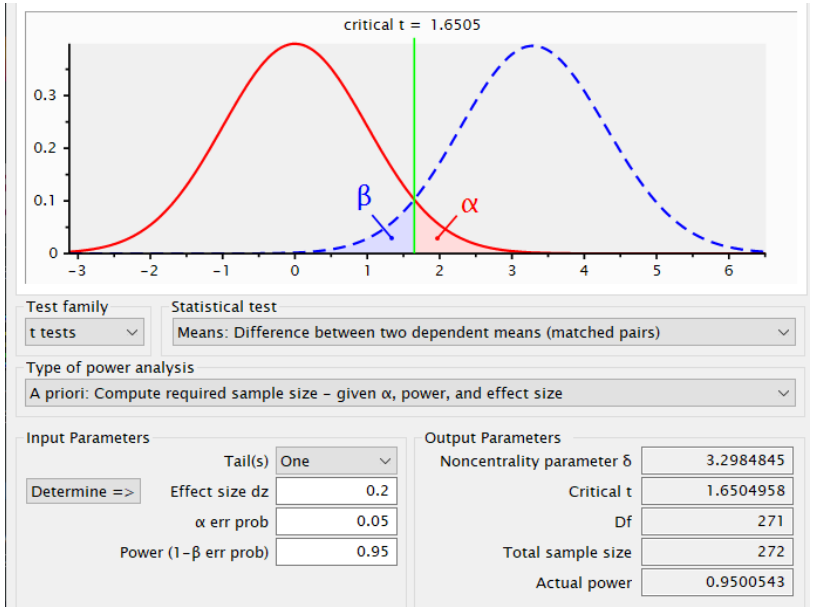
- 10 mice (5 female, 5 male)
- Attentional set shifting
- Baseline drinking (1hr, 15%)
- Stress and alcohol exposure (we will ignore alcohol)
- Test drinking (1hr, 15%)
- Drinking was calculated as grams EtOH/kg of bodyweight
  - to address differences in male and female size
- Drinking comparisons were made by averaging daily EtOH consumption for the last 2 weeks of baseline and test drinking per animal
- On-tailed correlated t-test were performed

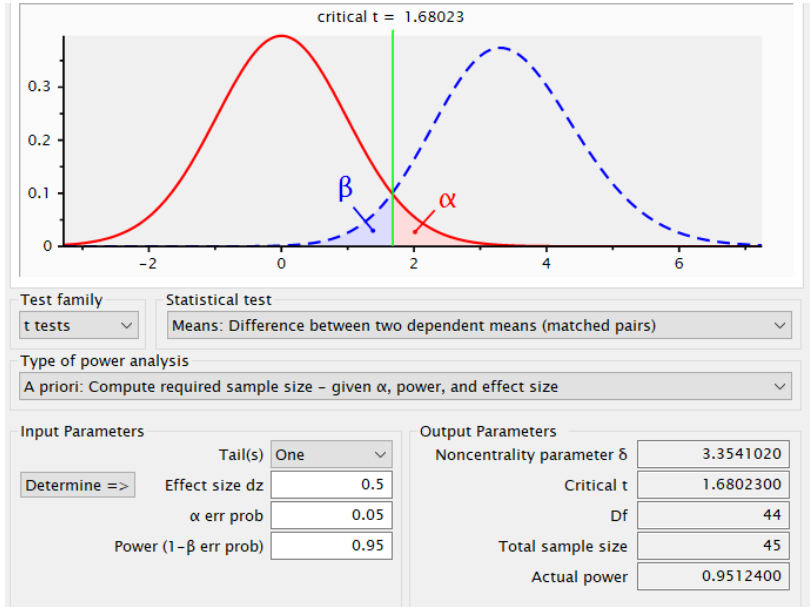


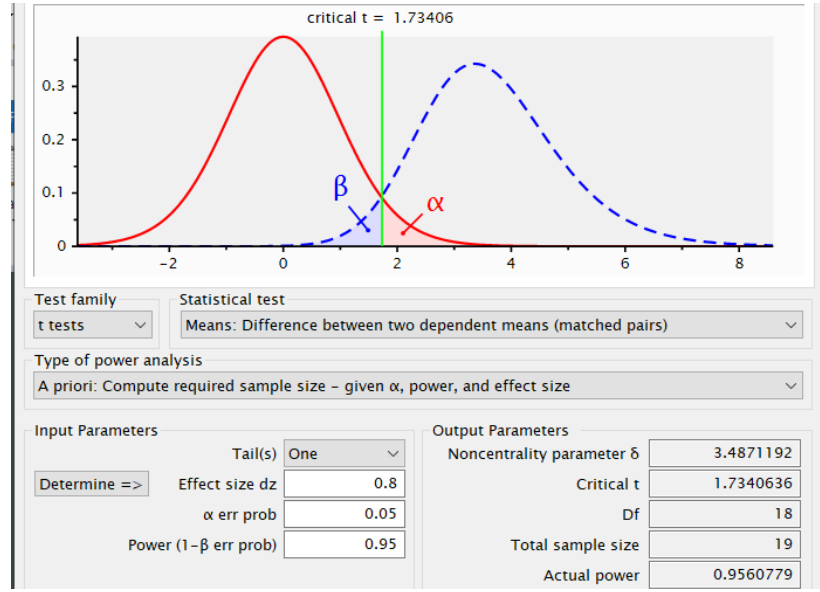
Treatment Groups	No Stress	Stress
No Chronic EtOH	Air/NS	Air/FSS
Chronic EtOH	CIE/NS	CIE/FSS

Independent variables: pre/post stress exposure
Dependent variables: average g/kg EtOH consumed in 1 hour
Nuisance variables: chronic ethanol exposure, sex differences,

A priori power: Insufficient





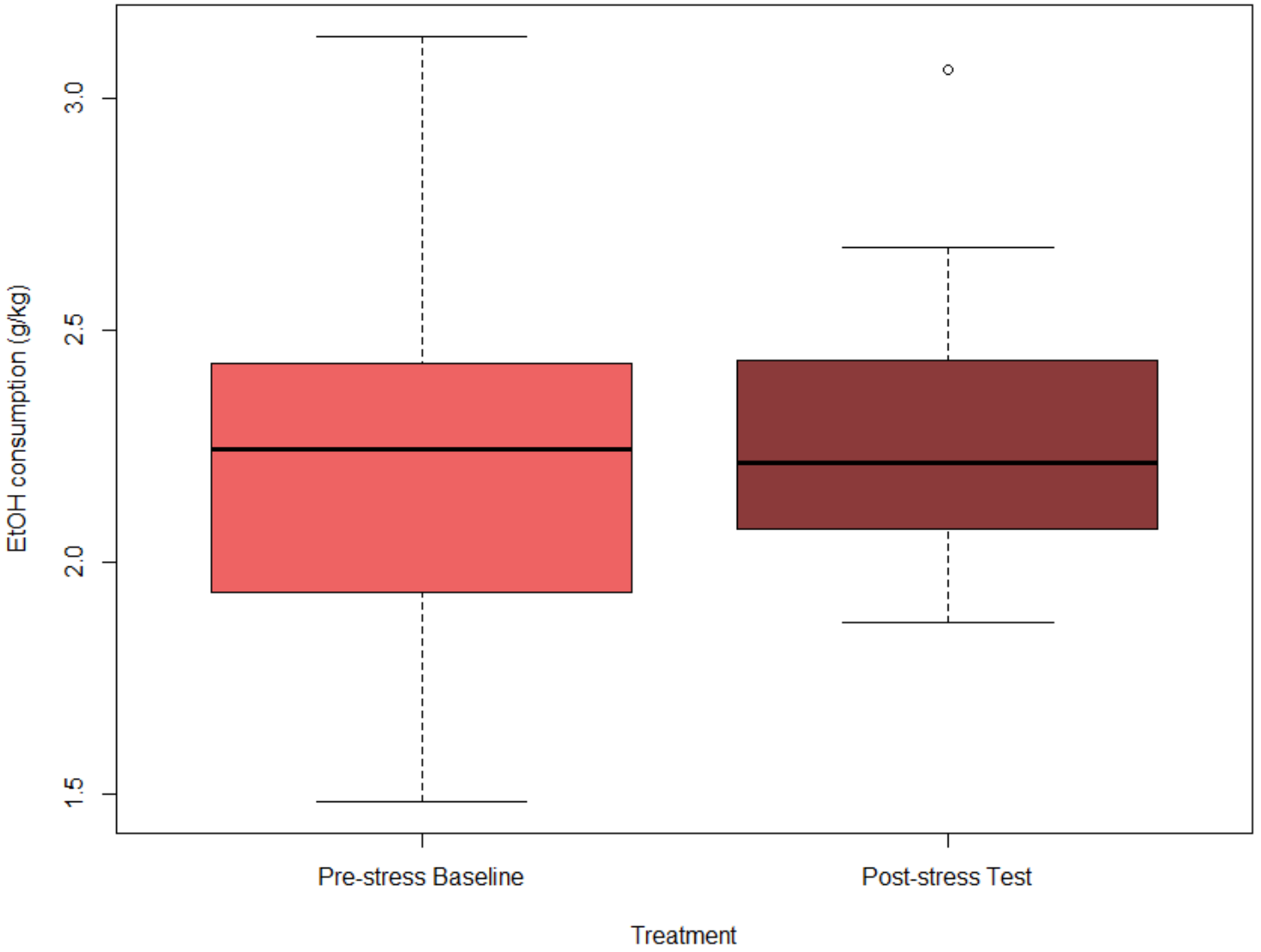


Small effect = 0.2
n=272

Medium effect = 0.5
n=45

Large effect = 0.8
n=19

Average EtOH consumption



<u>Pre-stress</u>
Mean: 2.253636
SD: 0.4746612
Median: 2.242703
IQR: 0.4185632

<u>Stress</u>
Mean: 2.3078
SD: 0.350736
Median: 2.214
IQR: 0.329

Assumptions for inferential statistics:
Independent – no, correlation design
HOV – yes

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Levene's Test for Homogeneity of Variance (center = "mean")
      Df F value Pr(>F)
group  1  0.4148 0.5276
      18
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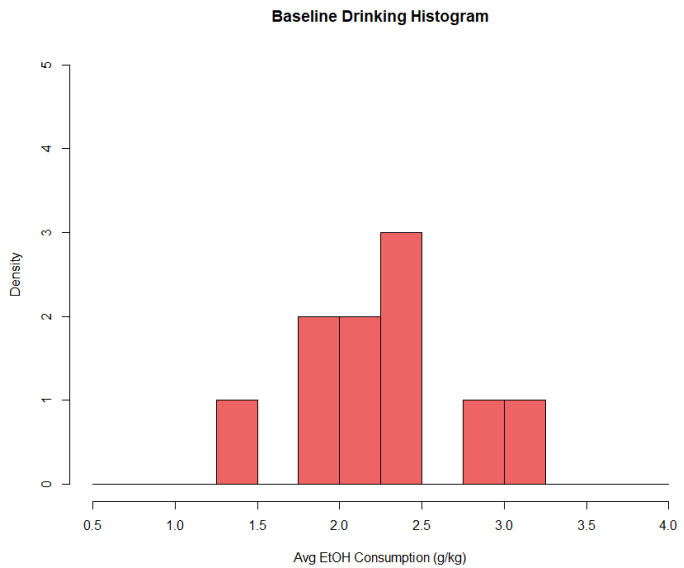
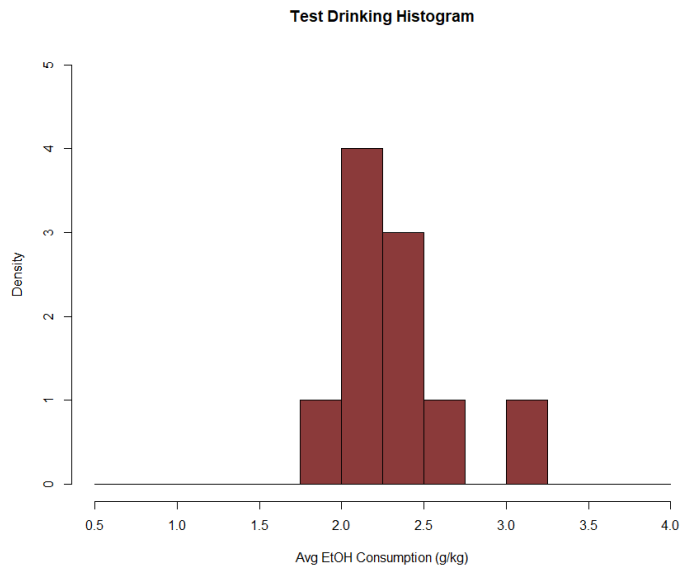
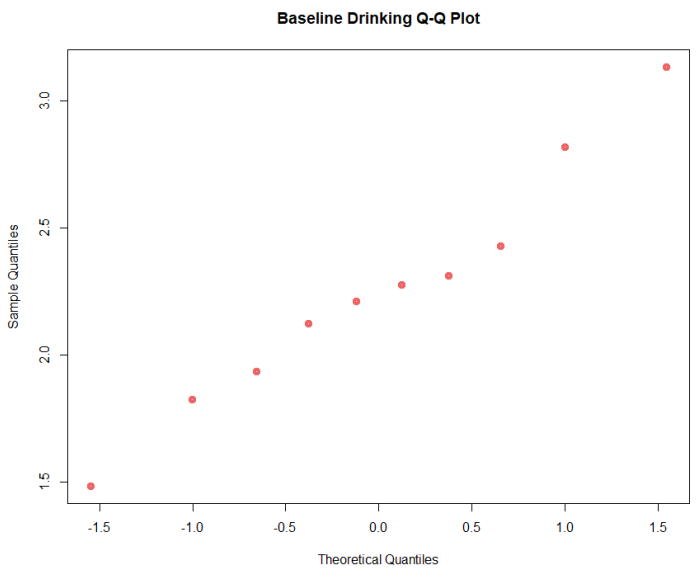
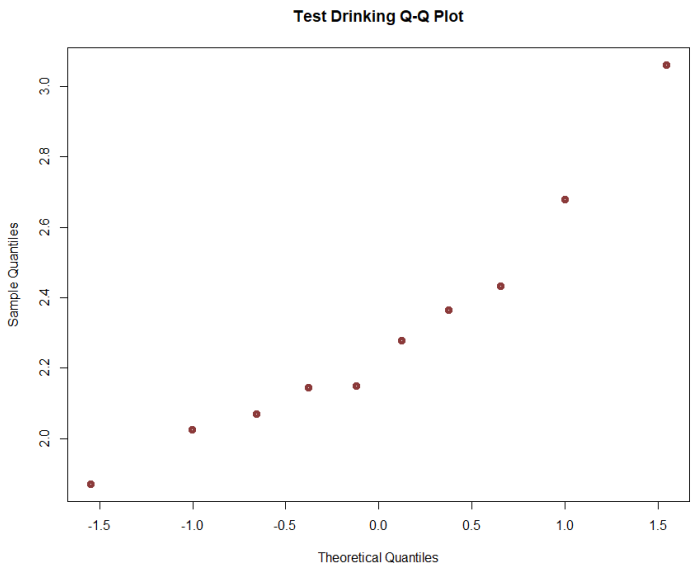
Normality – yes, next slide









Pre-stress

Kstest: p=0.7004

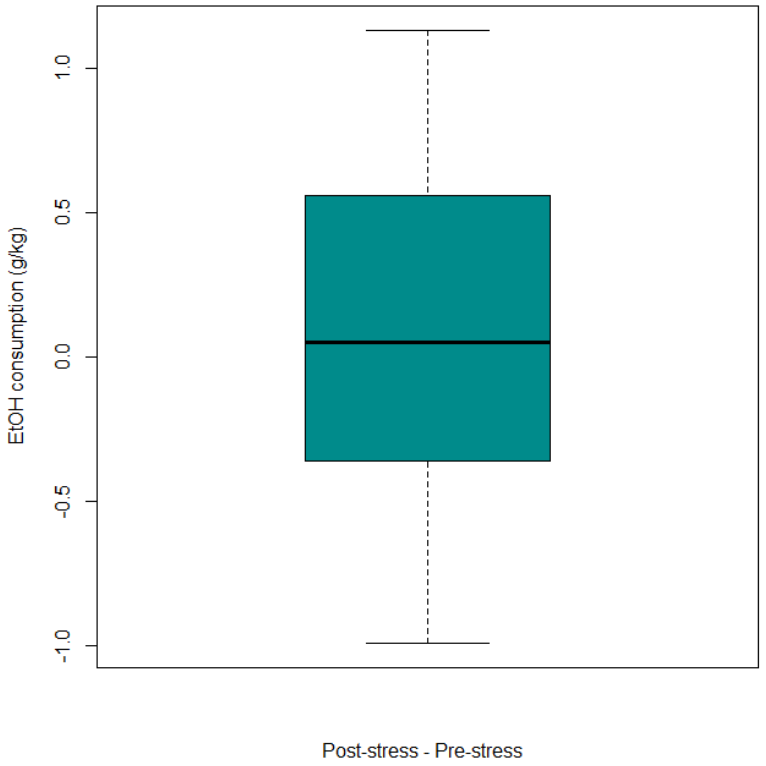
Kurtosis: -0.8311265

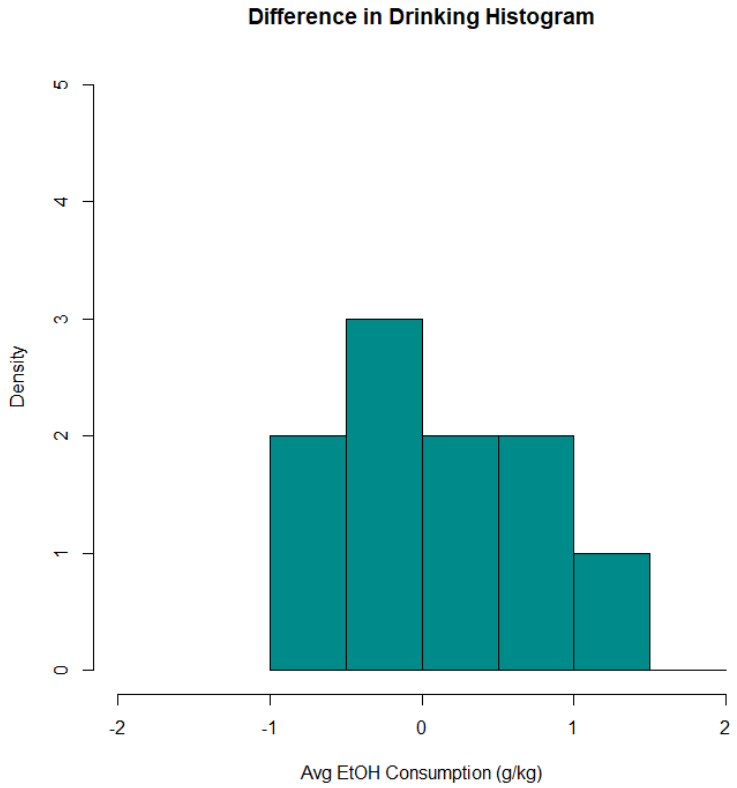
Stress

Kstest: p=0.5241

Kurtosis: -0.4193356

Change in Drinking





Test drinking – baseline drinking
Mean: 0.05416401
SD: 0.7192607
Median: 0.04879728
IQR: 0.8730485

95% confidence interval :
(- 0.4603641 to 0.5686921)

t(9)=0.23814, p=0.4086

Effect size:
dhat: 0.1297888
dzhat: 0.07530512

Conclusions

- Failed to reject the null hypothesis that the difference in post-stress drinking and pre-stress drinking is equal to 0

- Important to note:
  - this pilot study was severely underpowered
  - other treatment factor was collapsed for this presentation (chronic ethanol exposure)

Citations

Becker HC, Lopez MF, Doremus-Fitzwater TL (2011) Effects of stress on alcohol drinking: a review of animal studies. Psychopharmacology 218:131–156

Rodberg EM, den Hartog CR, Anderson RI, Becker HC, Moorman DE, Vazey EM (2017) Stress Facilitates the Development of Cognitive Dysfunction After Chronic Ethanol Exposure. Alcohol Clin Exp Res.

Sinha R, O'Malley SS (1999) Craving for alcohol: findings from the clinic and the laboratory. Alcohol Alcohol 34:223–230.