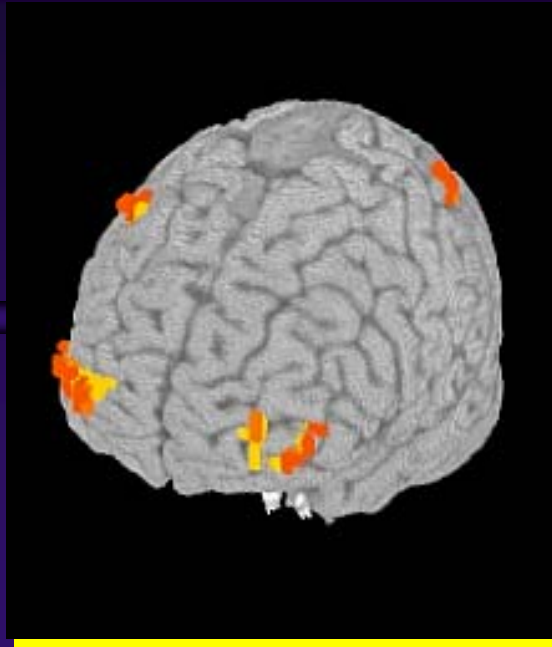


Alcohol and the Adolescent Brain



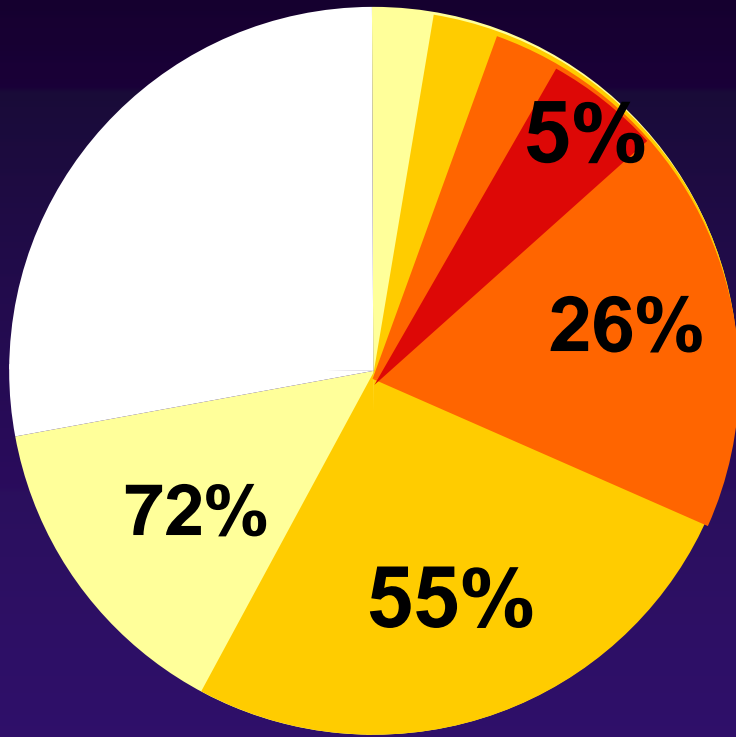
Susan Tapert, Ph.D.
University of California, San Diego, United States

Overview

- Prevalence
- Adolescent brain development
- Effects of drinking
- Conclusions

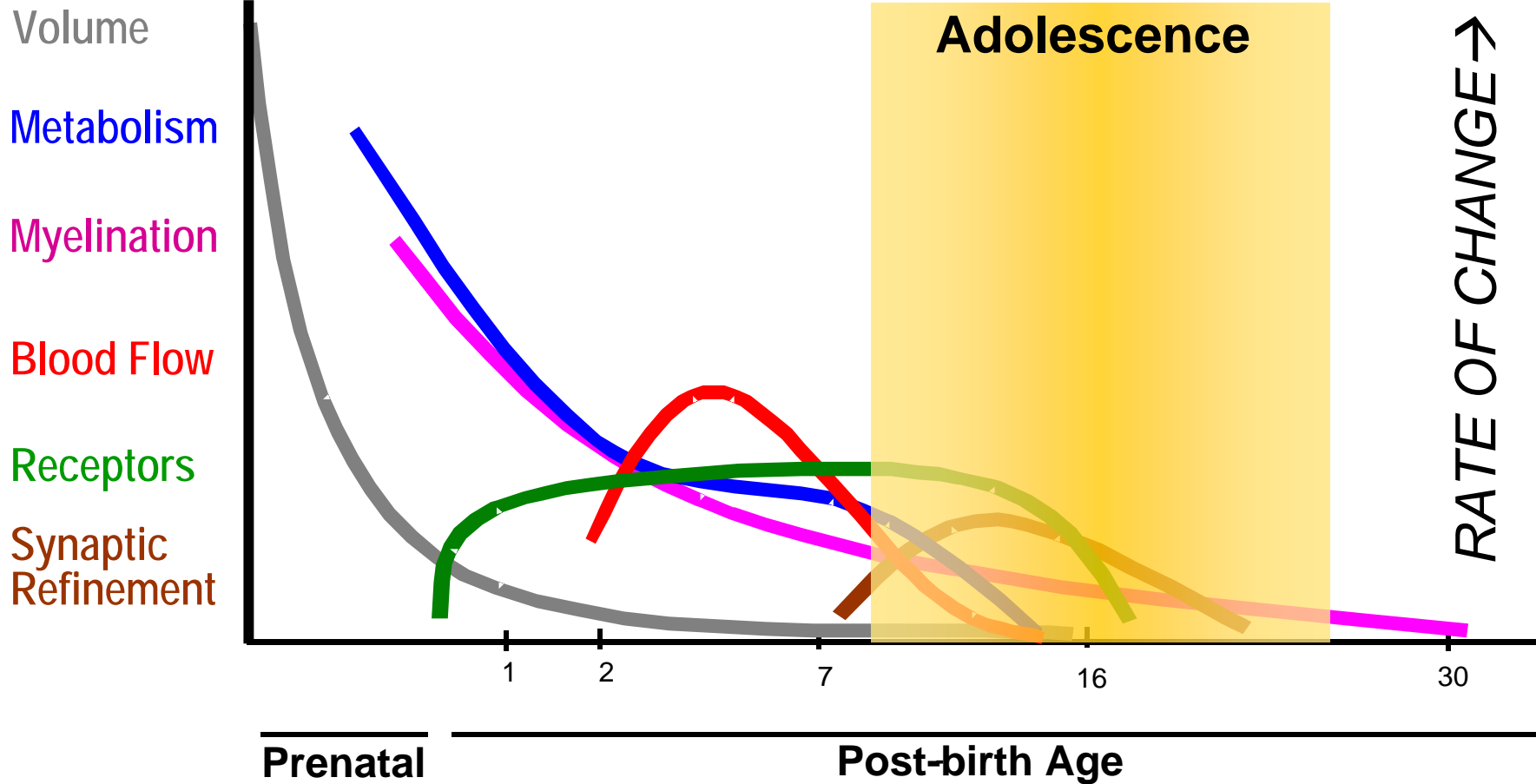


Teen Drinking Rates



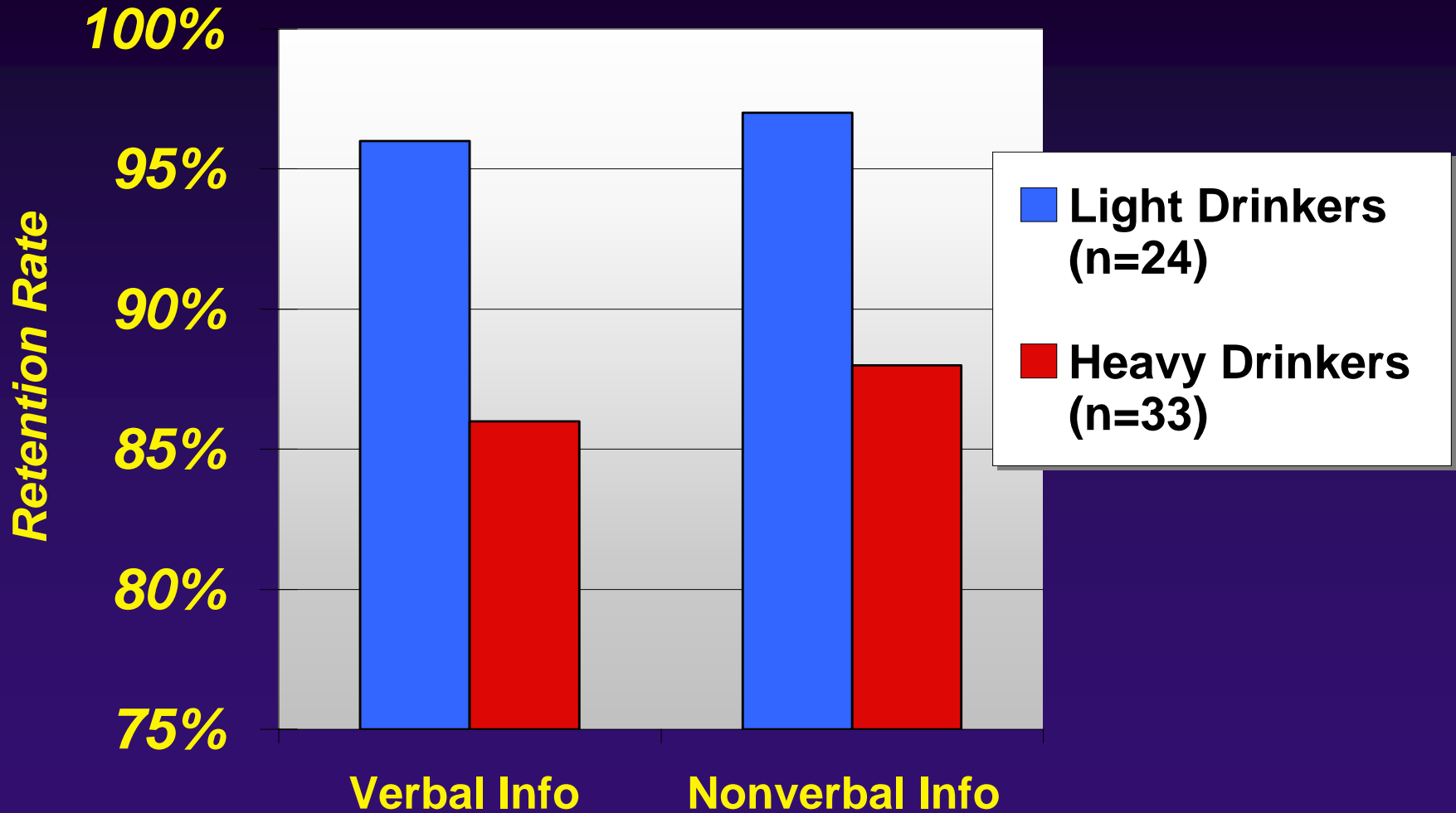
- Alcohol use disorder (AUD)
- Binge, past 2 weeks
- Ever got drunk
- Any alcohol use ever

Adolescent Brain Development



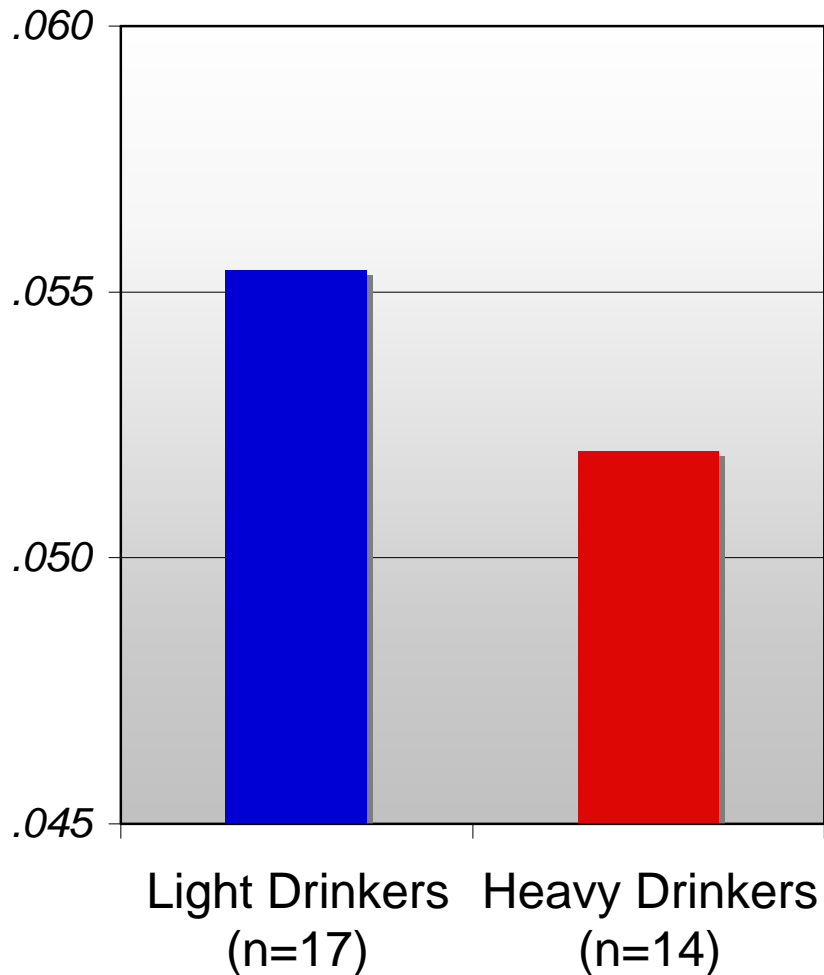
Memory

- *The difference between an “A” and a “B”:*

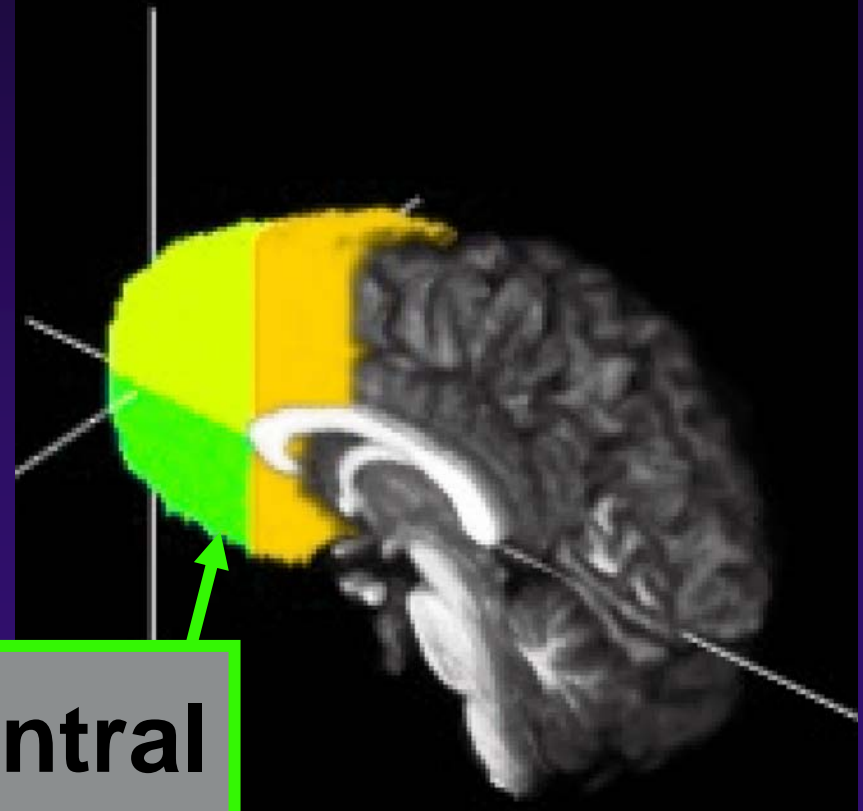


Frontal Lobes

Ventral Prefrontal Volume%



Prefrontal cortex:



Brain Function

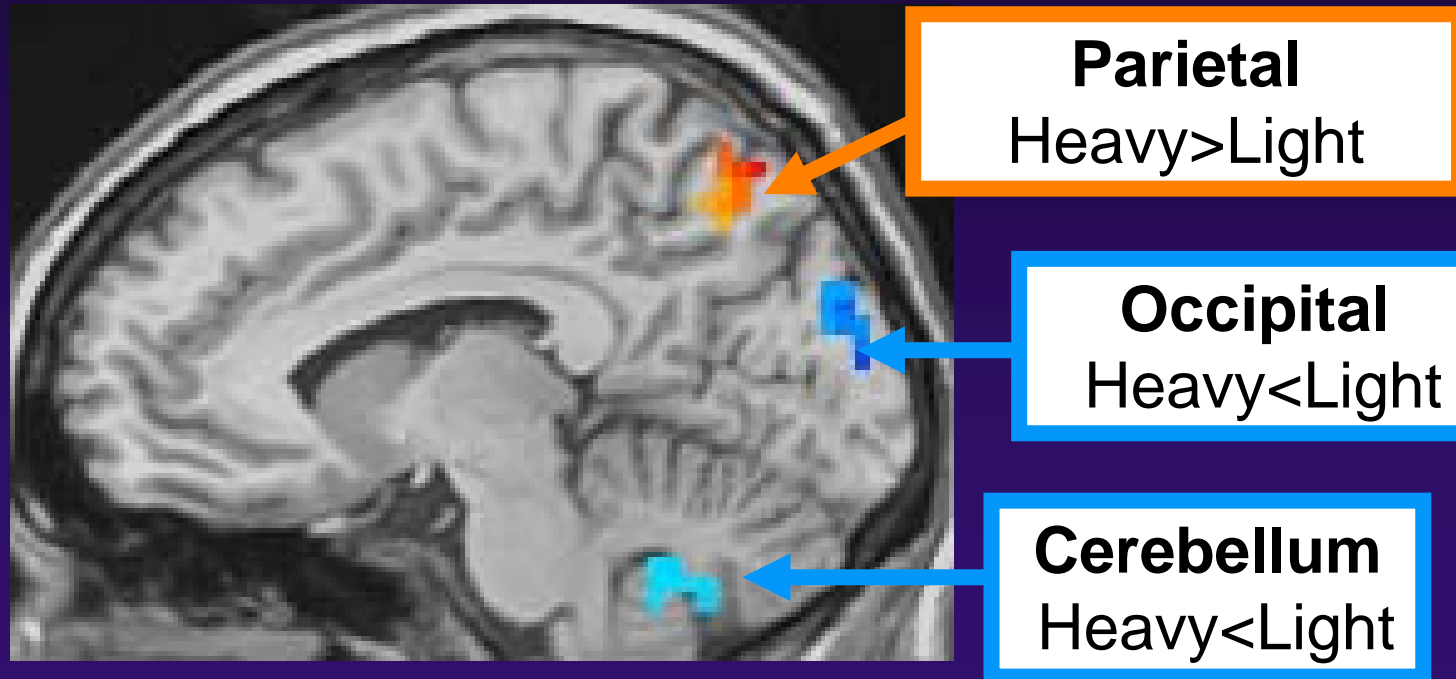
Spatial Memory Task

19 Light Drinkers

15 Heavy Drinkers

88% accurate

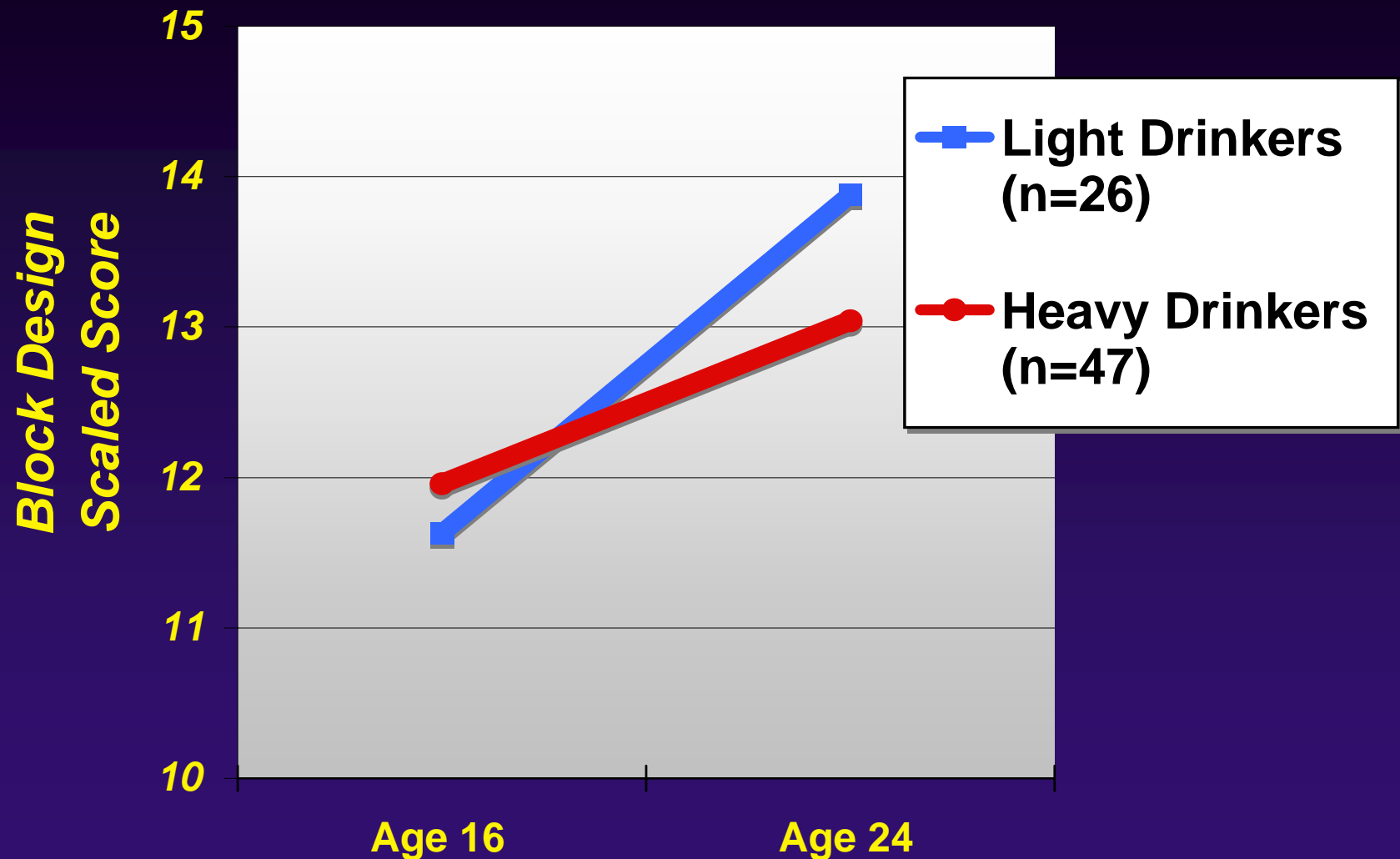
90% accurate



$t = +4.4$

$t = -4.2$

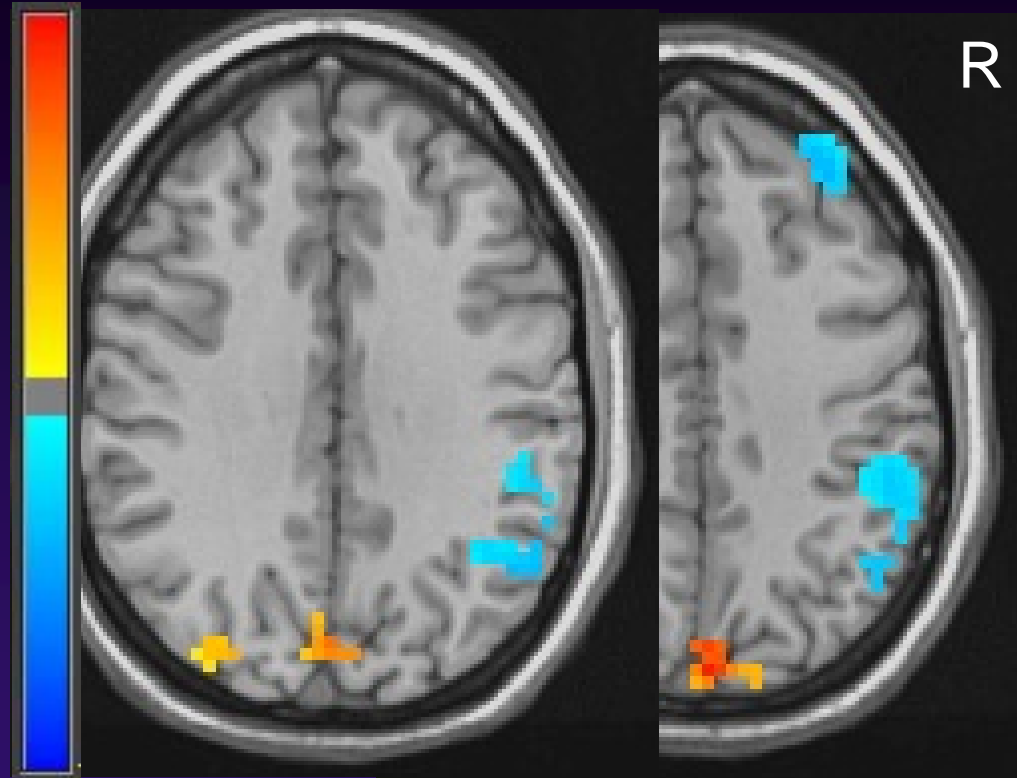
Continued Drinking



Verbal Memory in Bingers

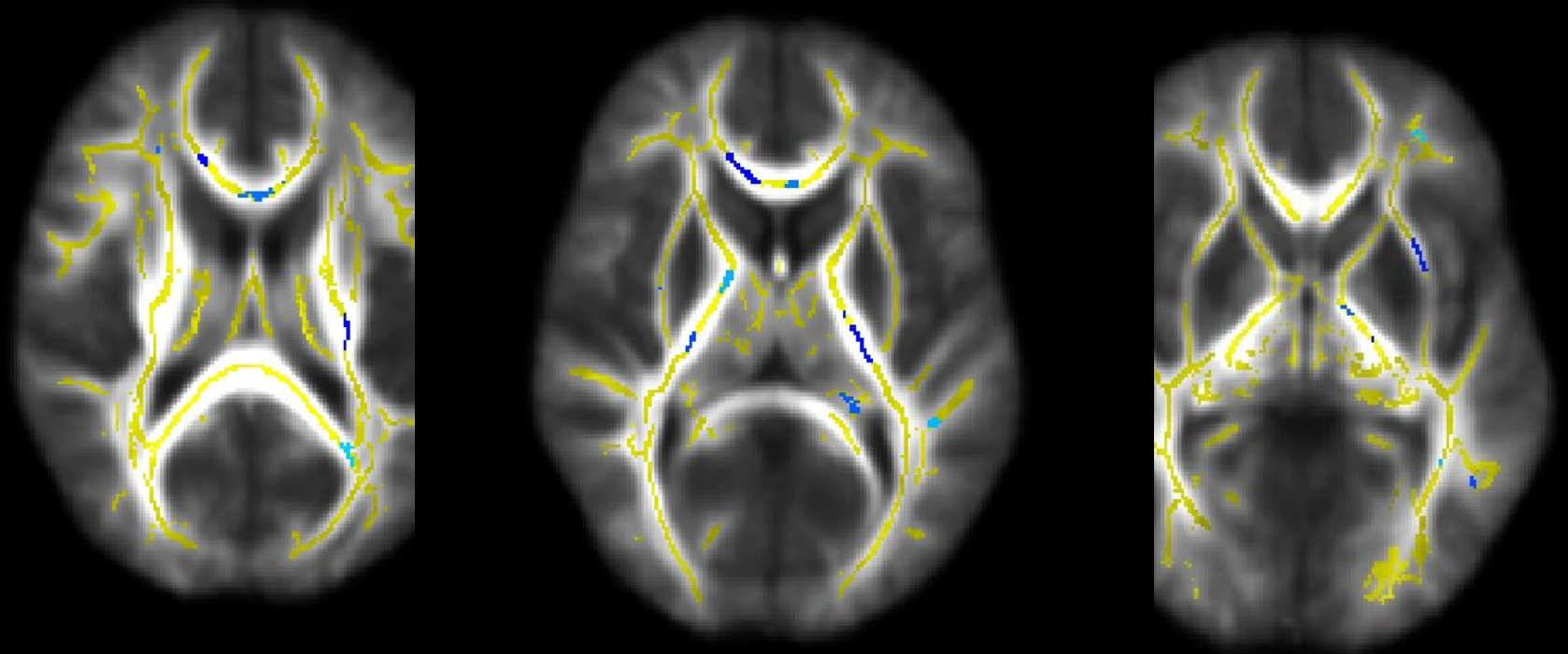
Drinkers showed:

1. ↓frontal and parietal response
2. ↑occipital response
3. no differential activation to novelty
4. poorer recall



White Matter in Binge Drinkers

- ↓ Quality of brain white matter



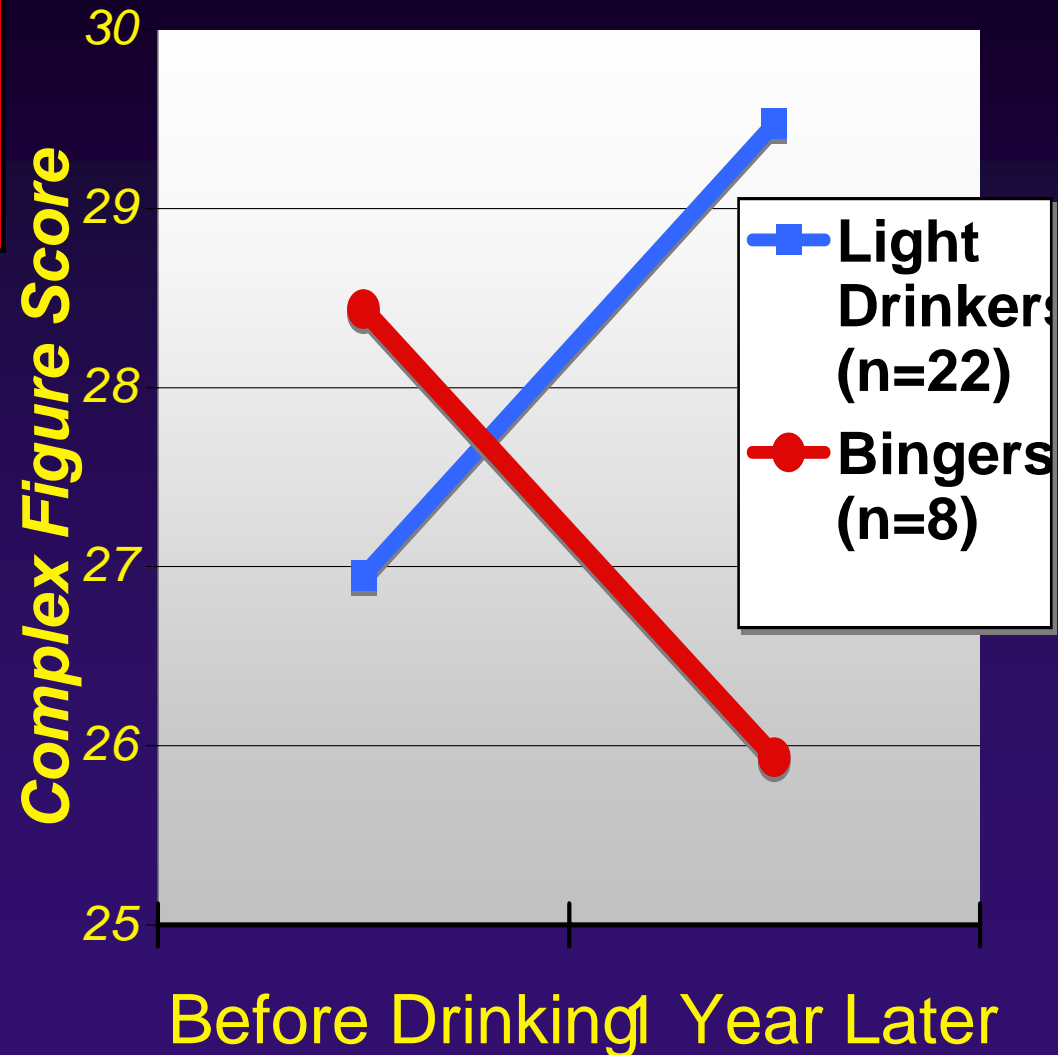
- Transient, subtle insults → neurodevelopment

Starting to Binge

**Bingers' scores
got worse:**

"Copy this figure"

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.



Advertisement Task

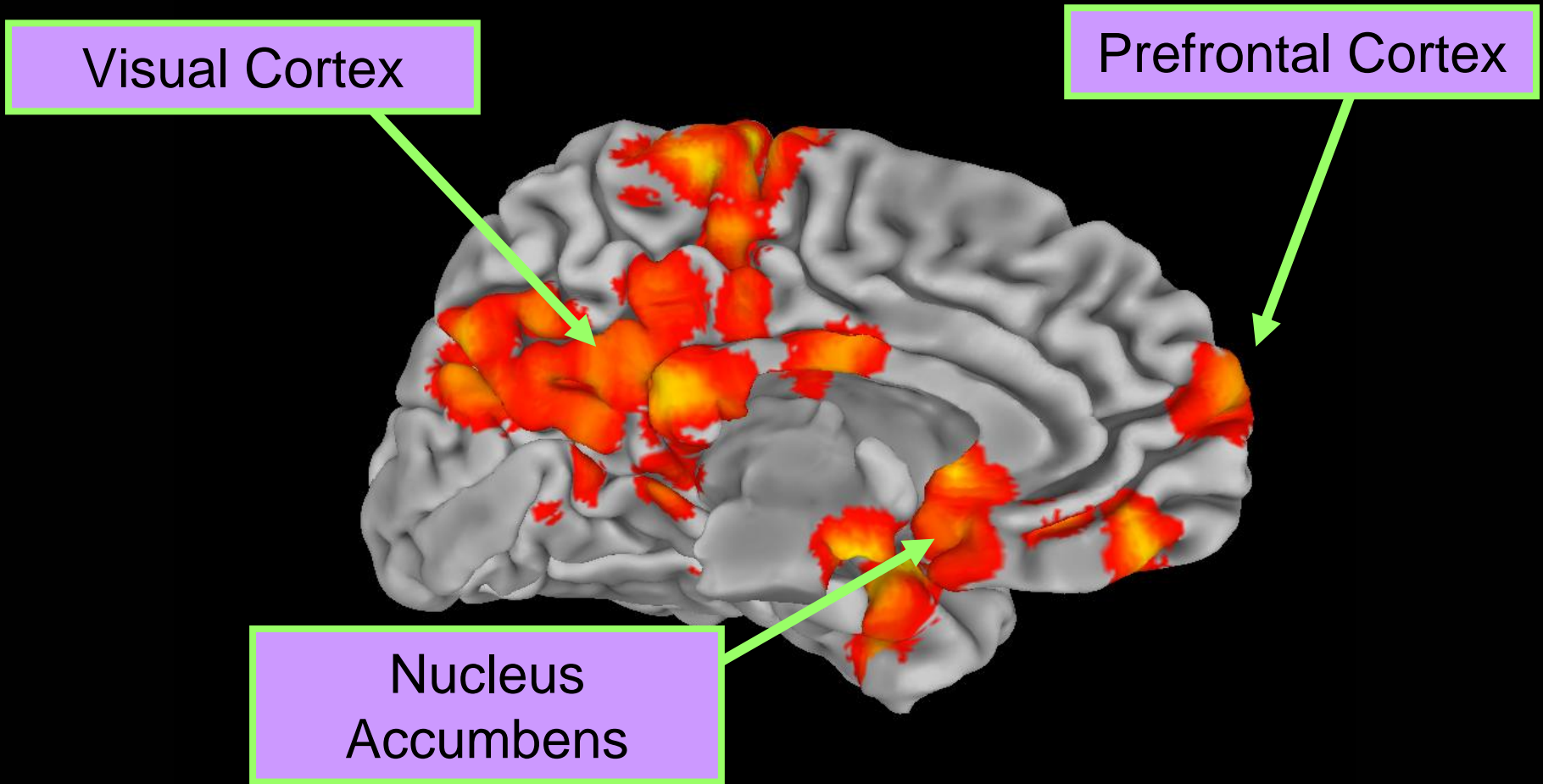
Alcohol Pictures



Non-Alcohol Pictures



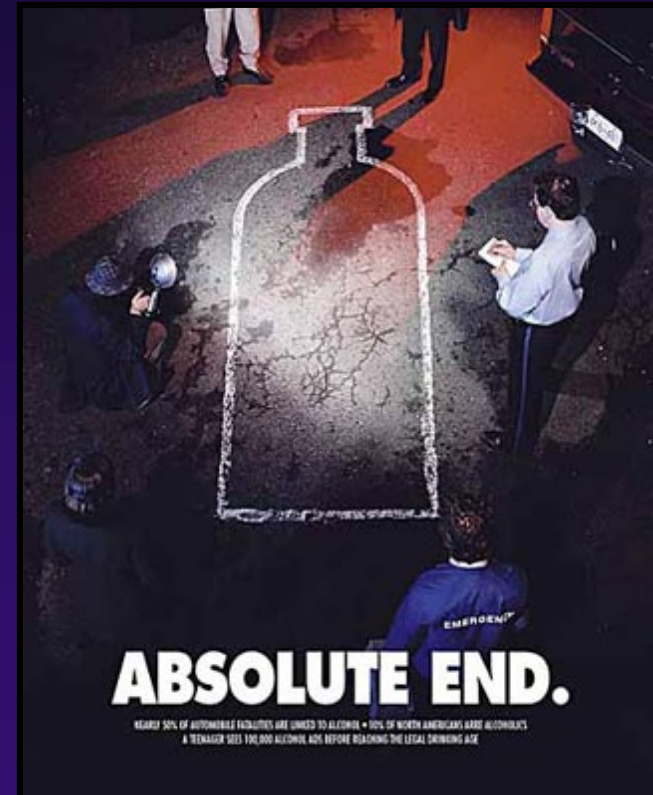
Youth Response to Alcohol Ads



Orange = Heavy Drinkers > Light Drinkers to alcohol ads

What Can Be Done?

- Counter ads:



Conclusions

1. Adolescent brains are developing
2. Binge drinkers show abnormalities
 - Even if don't meet for AUD
3. Risk: drank enough to get hangover



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