



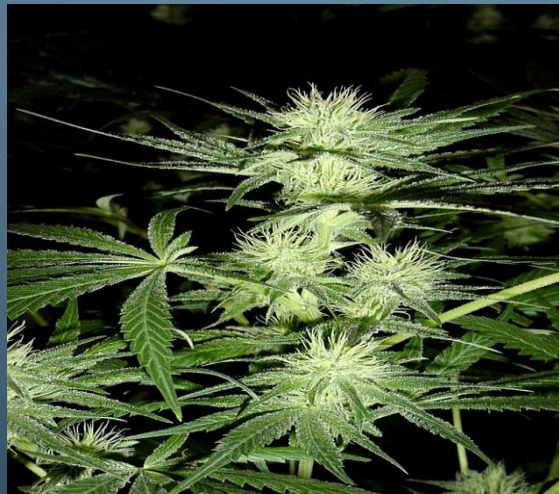
Purple haze, northern lights.....
Do different strains of Cannabis have
different effects on mental health?

Val Curran

ECAD, Killarney 2012

Outline

- Cannabis & mental health
- What makes some individuals vulnerable to negative mental health effects?
- Cannabis strains
- Acute and chronic effects of different strains
- Conclusions



Cannabis and mental health

psychosis

dependence

cognitive impairment

Psychosis

- Cannabis & THC induce psychosis-like effects
(e.g. *d'Souza et al, 2009*)
- Long-term use: increased risk for psychotic symptoms or psychotic diagnosis by ~40%.
- 'Heavy use' increases risk ~ 200% and leads to earlier onset.

(*Moore et al, 2007*).

Cognitive impairment

- Cannabis/THC impairs memory (Curran et al, 2002; Gonzalez, 2007).
- THC disrupts LTP
- High density of CB1 receptors in hippocampus
- Long-term effects – findings inconsistent (Gonzalez, 2007).

Dependence

- ~ 10% users develop cannabis dependence
(e.g. Fergusson & Harwood, 2000; Hall & Degenhardt, 2007; Linszen & van Amelsvoort, 2007).
- EU: 1% of all adults and nearly 2% of 14-17 year olds addicted to cannabis ECNP (2011)
- Primary reason for new referral to drug services in 28% cases– second only to heroin EMCDDA (2011)

- Epidemiology: 50% of 16-24 year olds have used cannabis
 - Cognitive impairment
 - Dependence
 - Psychosis

Cannabis – ex-users



So, what determines whether an individual is vulnerable to harmful effects of cannabis?

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- Level of cannabis use
- Age of first cannabis use
- Genetic factors
- Psychosis-proneness

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What about the type of cannabis used?

Purple haze, northern lights, Afghan gold.....



© Talk to FRANK

Cannabis: marked variation

~ 70 different cannabinoids

THC / CBD

THC – produces the effects that users seek; acutely induces anxiety and psychotic-like effects.

- Curran et al, 2002; Zuardi et al, 2006; D'Souza et al, 2004; 2008; *Pertwee, 2008*; Zuardi et al. 2006; Hermann et al. 2007.

THC and CBD

THC – produces the effects that users seek; acutely induces anxiety and psychotic-like effects.

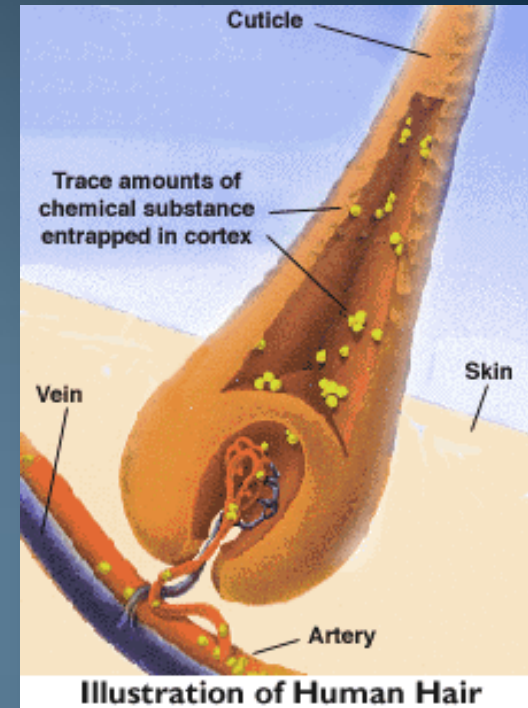
Cannabidiol (CBD) – anti-anxiety; may have anti-psychotic properties (Leweke et al 2012).

- Curran et al, 2002; Zuardi et al, 2006; D'Souza et al, 2004; 2008; *Pertwee, 2008*; Zuardi et al. 2006; Hermann et al. 2007.

Can CBD protect cannabis users against
the harmful effects of THC?

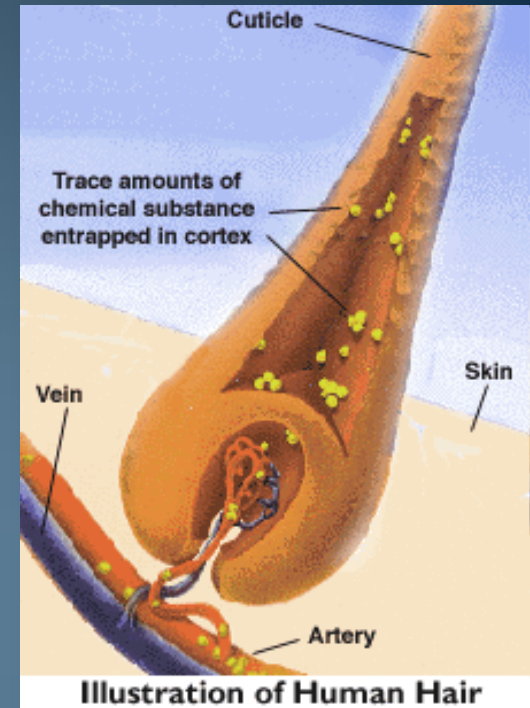
Study 1. THC/CBD in hair

- Hair analysis
- 140 people, average age 27 years



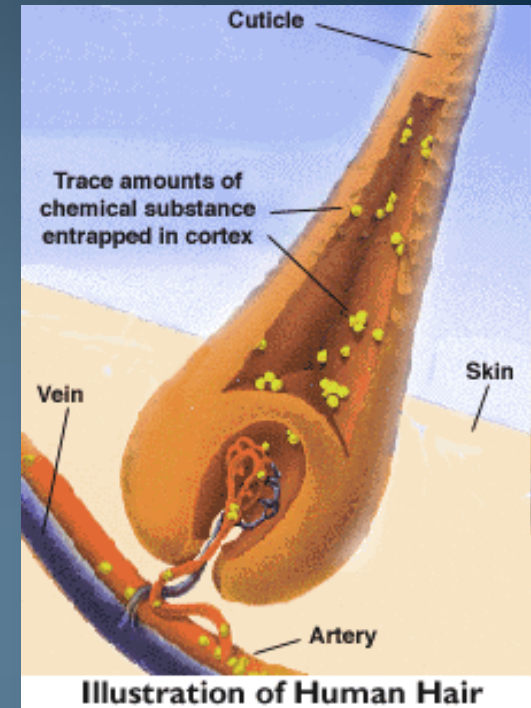
Study 1. THC/CBD in hair

- 3cm hair samples ~ 3 months



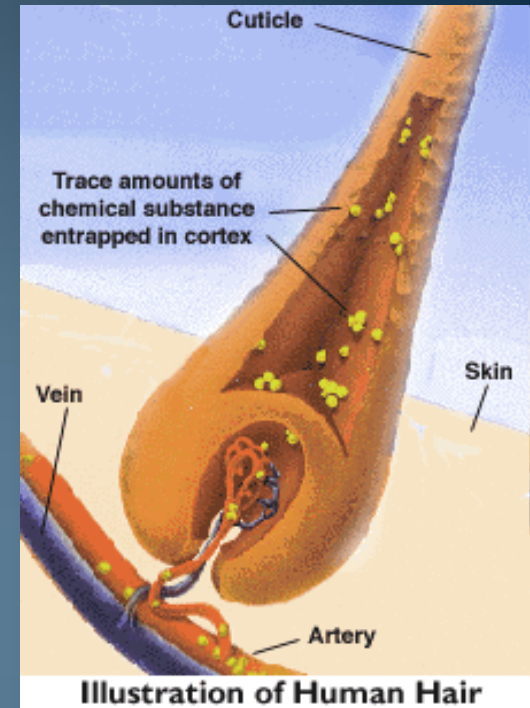
Study 1. THC/CBD in hair

- 3cm hair samples ~ 3 months



3-6months

Study 1. THC/CBD in hair



Study 1. THC/CBD in hair

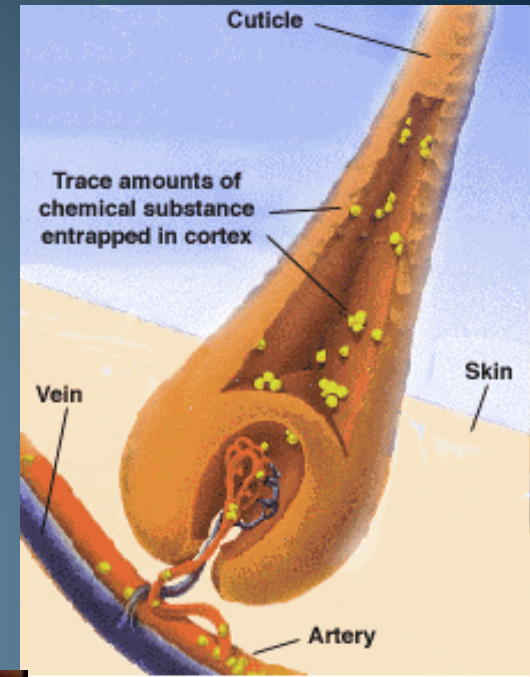
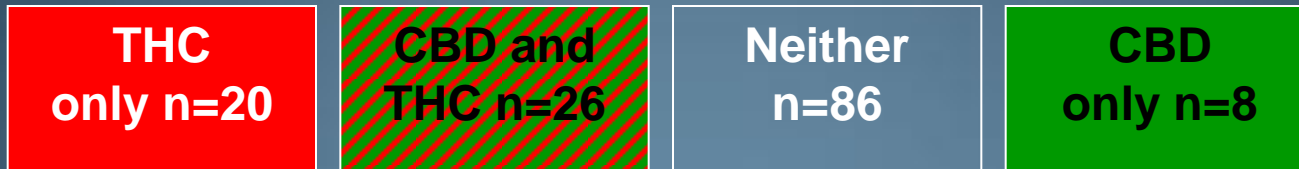
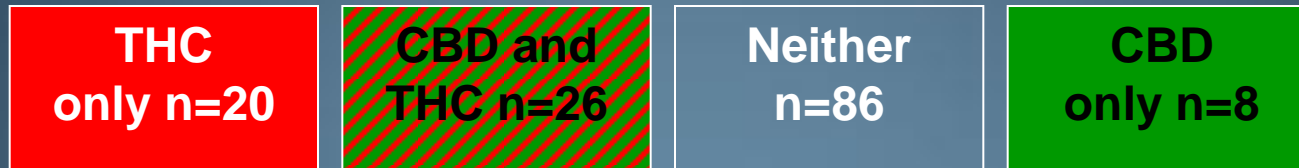


Illustration of Human Hair

THC / CBD



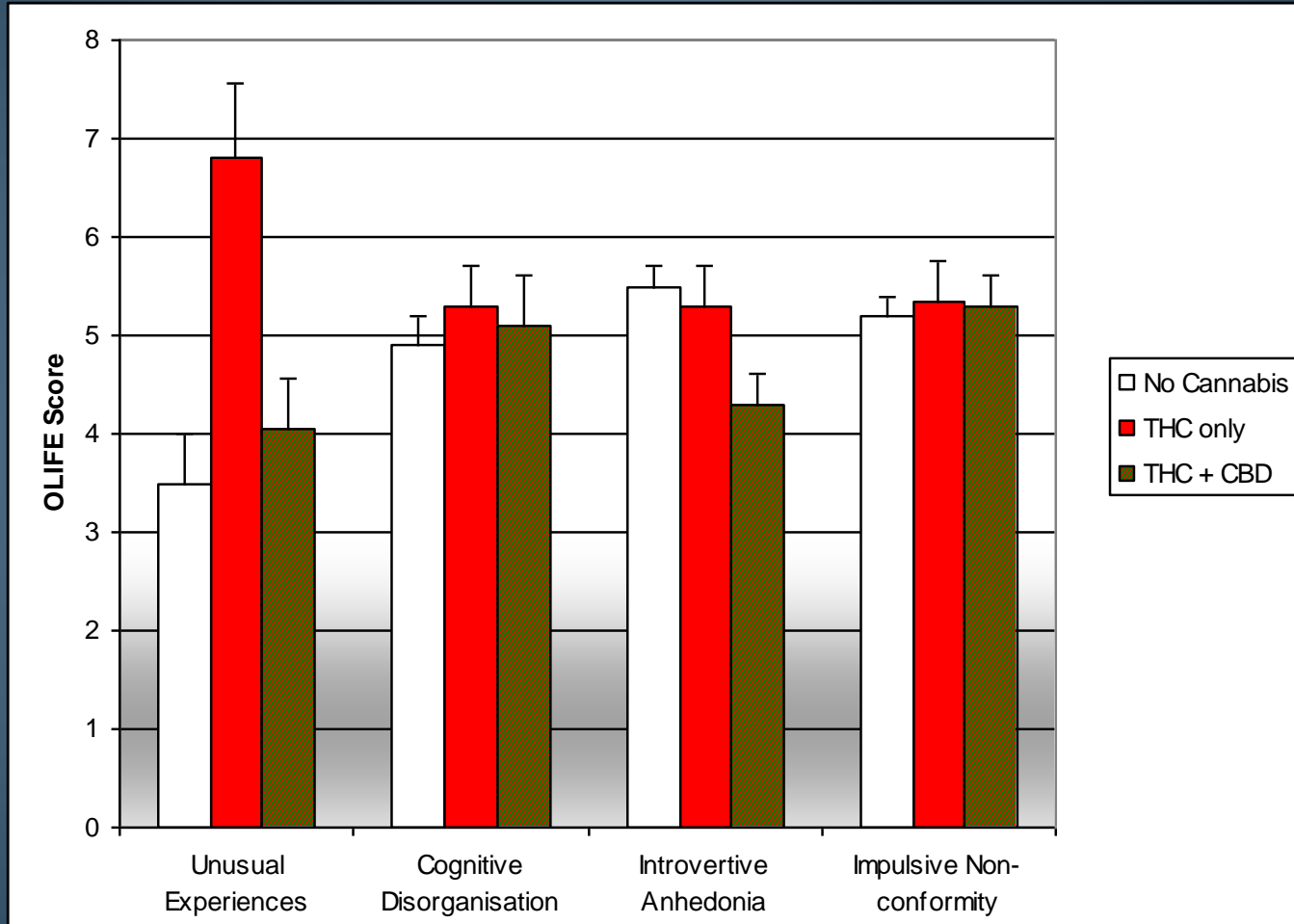
THC / CBD



Psychotic-like experiences: O-LIFE (*Mason et al, 2005*)

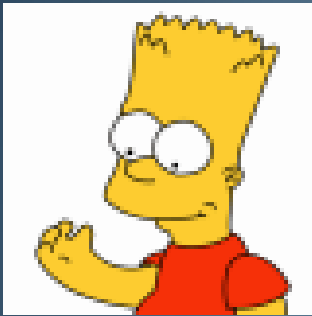
- Unusual Experiences ~ Hallucinations & Delusions
- Cognitive Disorganisation ~ Thought Disorder
- Social Withdrawal
- Impulsivity

THC / CBD



THC only also had higher delusion scores (PDI) than the no cannabinoid group.

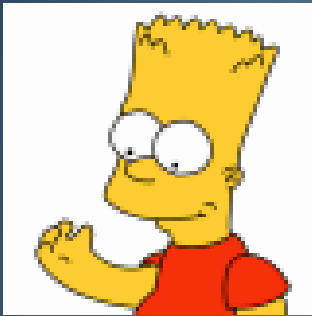
NONE



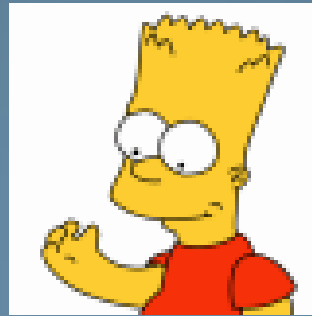
THC only



NONE



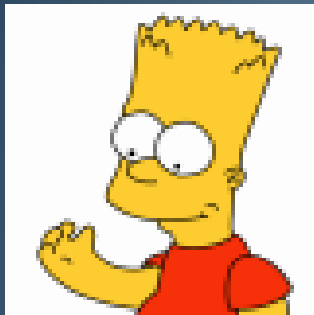
THC + CBD



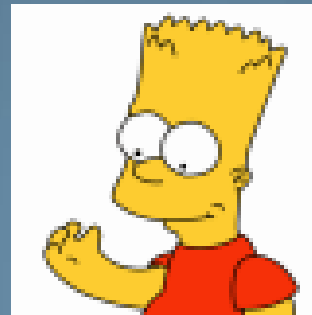
THC only



NONE



THC + CBD



THC only

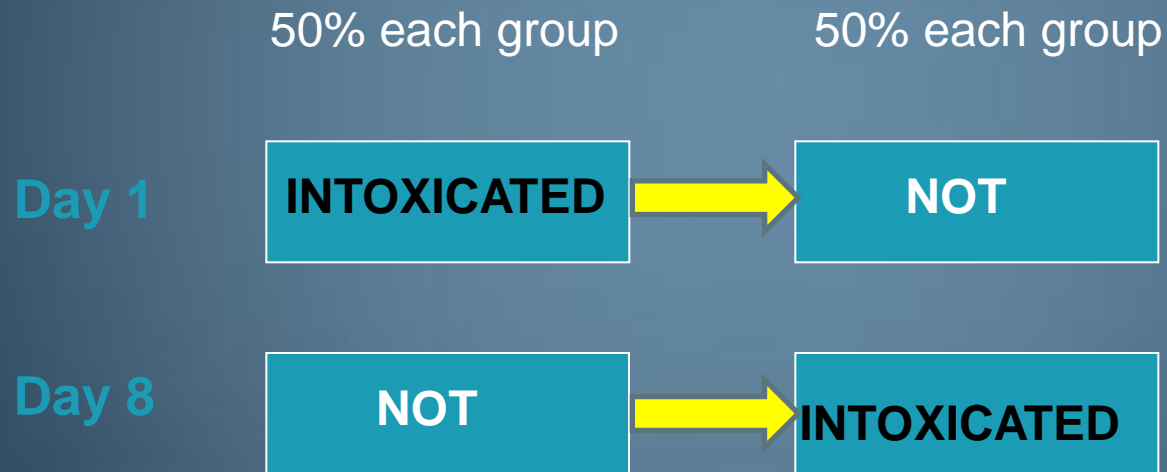


- Pre-existing group differences?
- CBD protects against psychotic-like effects of THC?

Study 2: Naturalistic study of the effects of cannabinoids

- 600 individuals; 16-23 year olds
- Use for >1 year
- 200 Daily (>25 days/month); 200 recreational (≥ 1 /month); 100 ex-users; 100 non-users.

Design



Assessments

Psychosis-like

Dependence

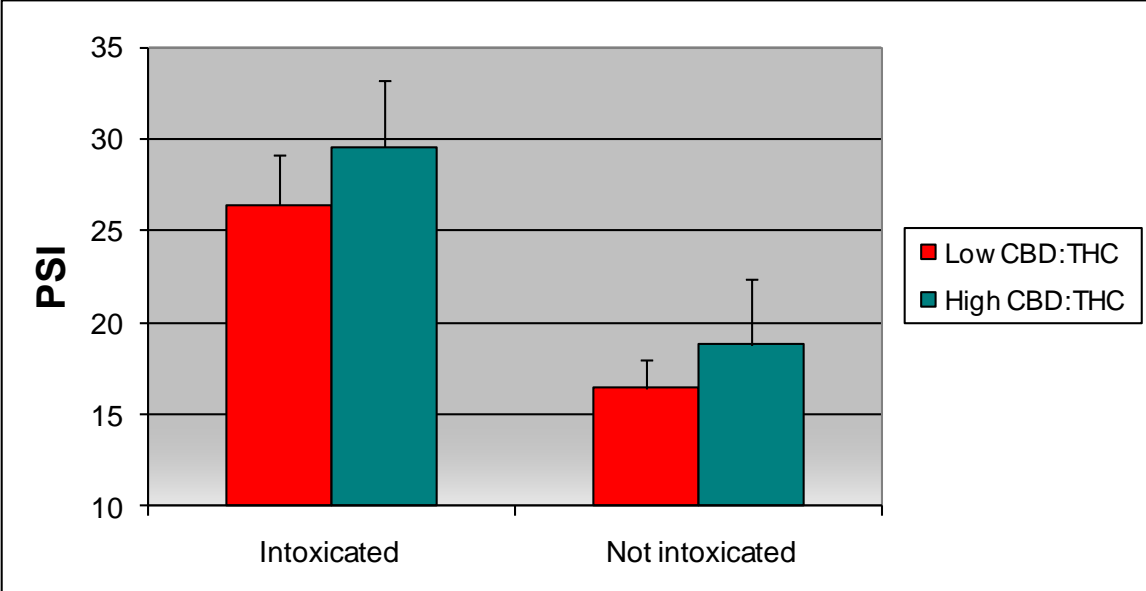
Cognitive function

- Cannabis sample
- Hair, saliva and urine
- Cannabis Use
- Genetic data

Acute effects of cannabinoids in cannabis smokers

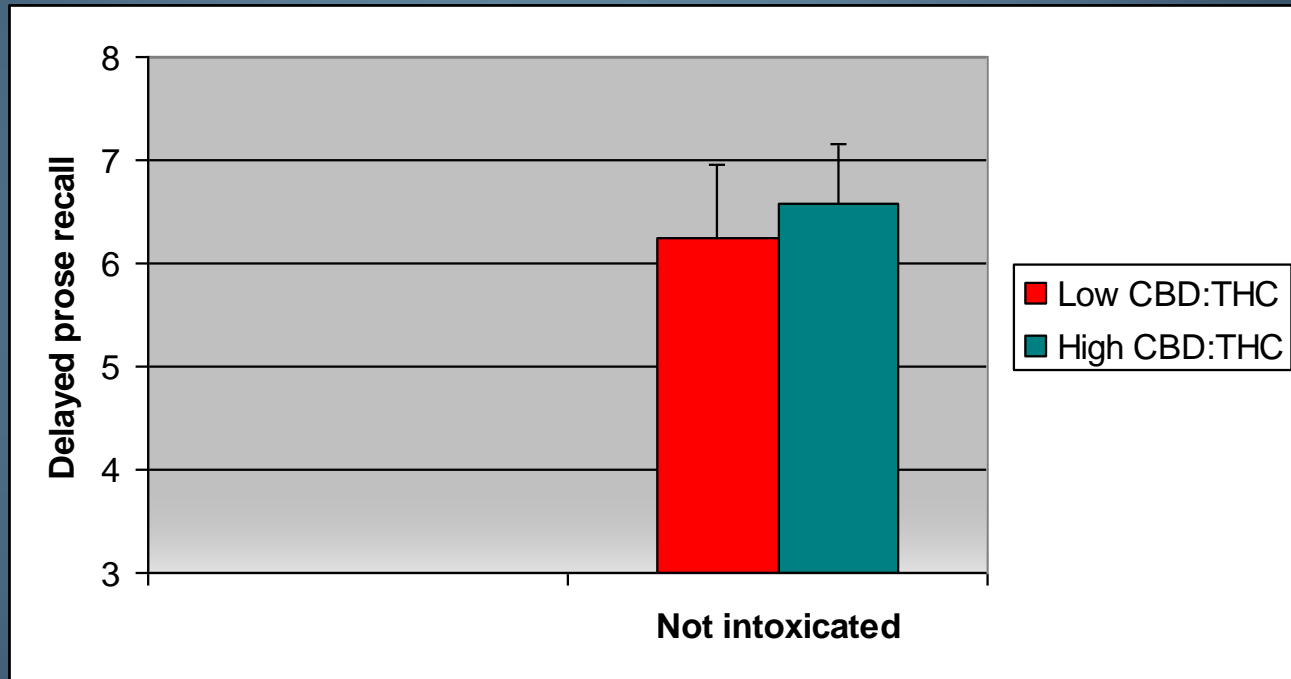
- Analysis: compared sub-groups with lowest and highest CBD content .
- Low CBD: 0.08% 6.9% THC
- High CBD: 4.61% 8.4% THC

Psychosis-like effects

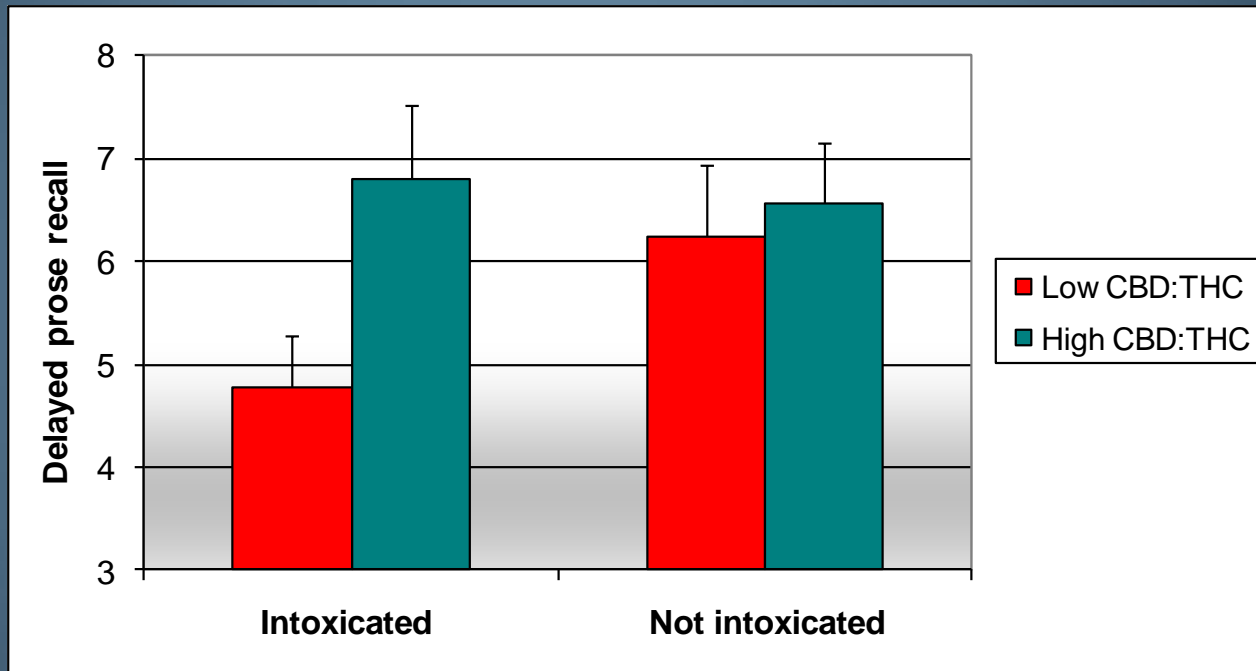


No group differences found in acute psychotic-like effects

Cognitive function



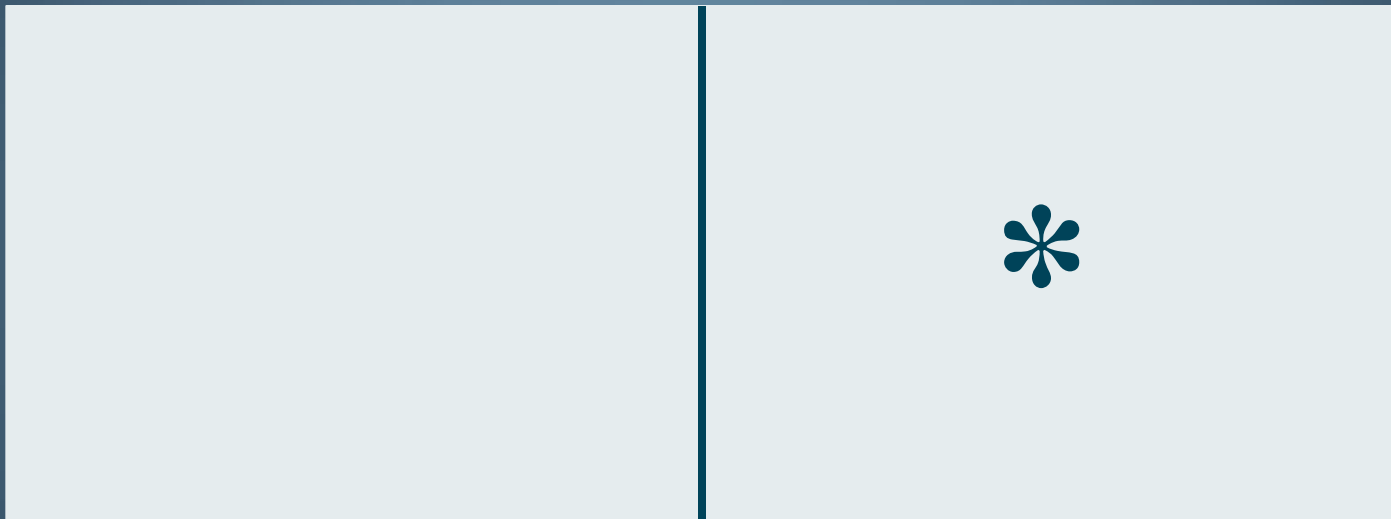
Cognitive function



group x day $p=0.047$

Dependence

- Attentional bias to drug stimuli
- A predictor of dependence ...and relapse
- Assess with a dot probe task

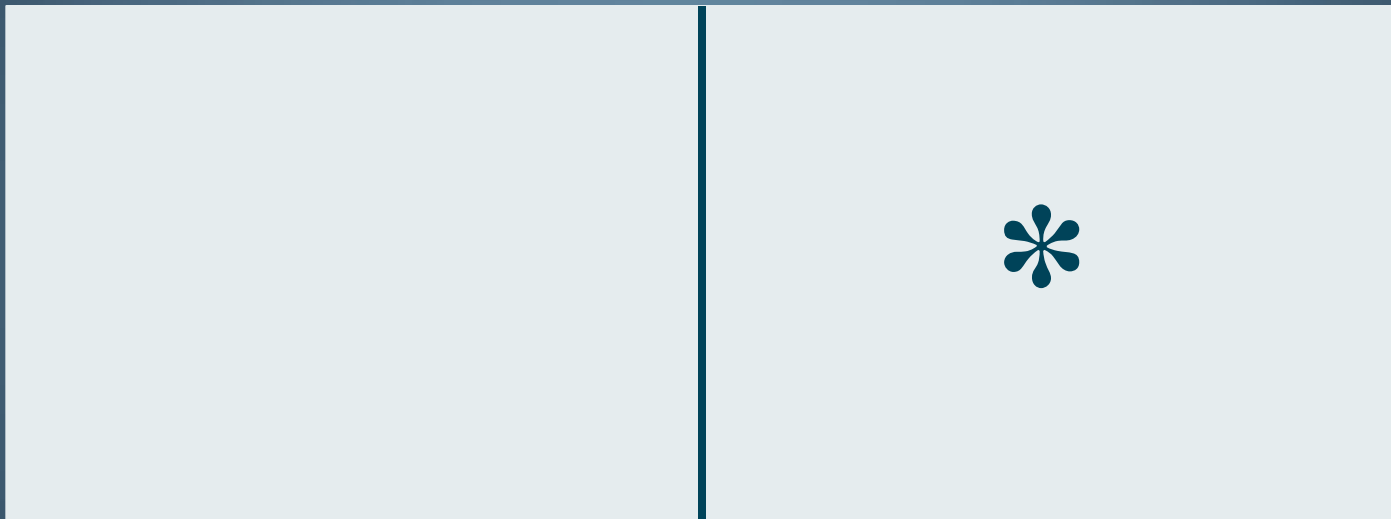






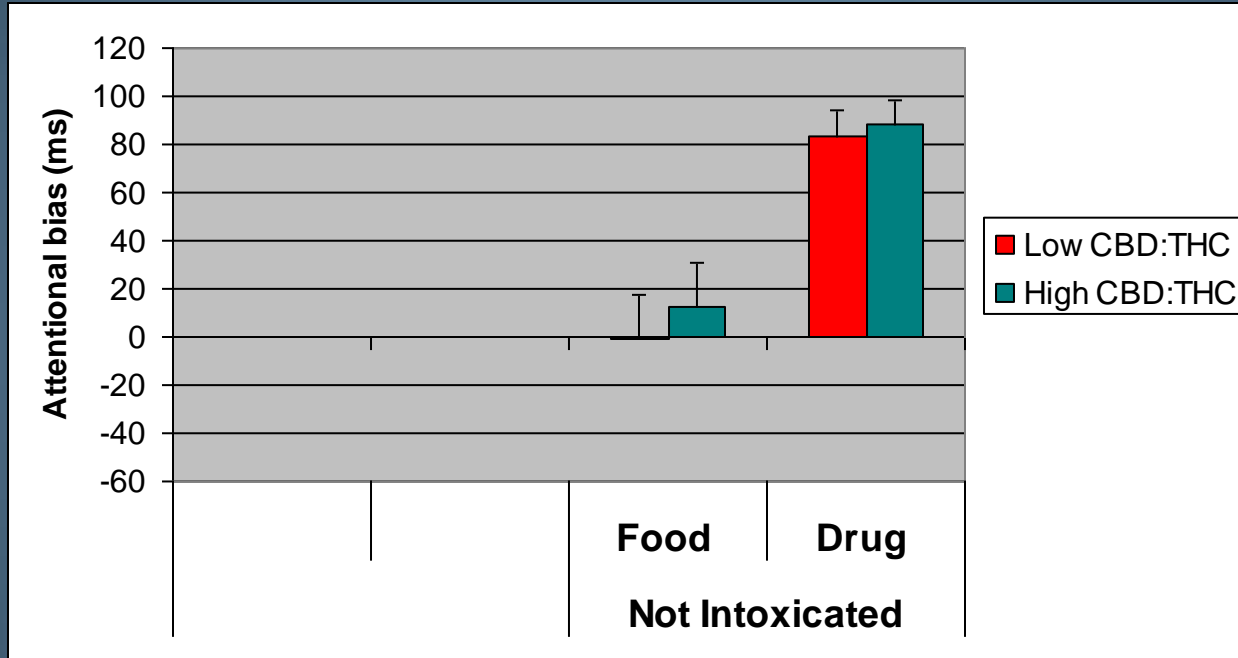




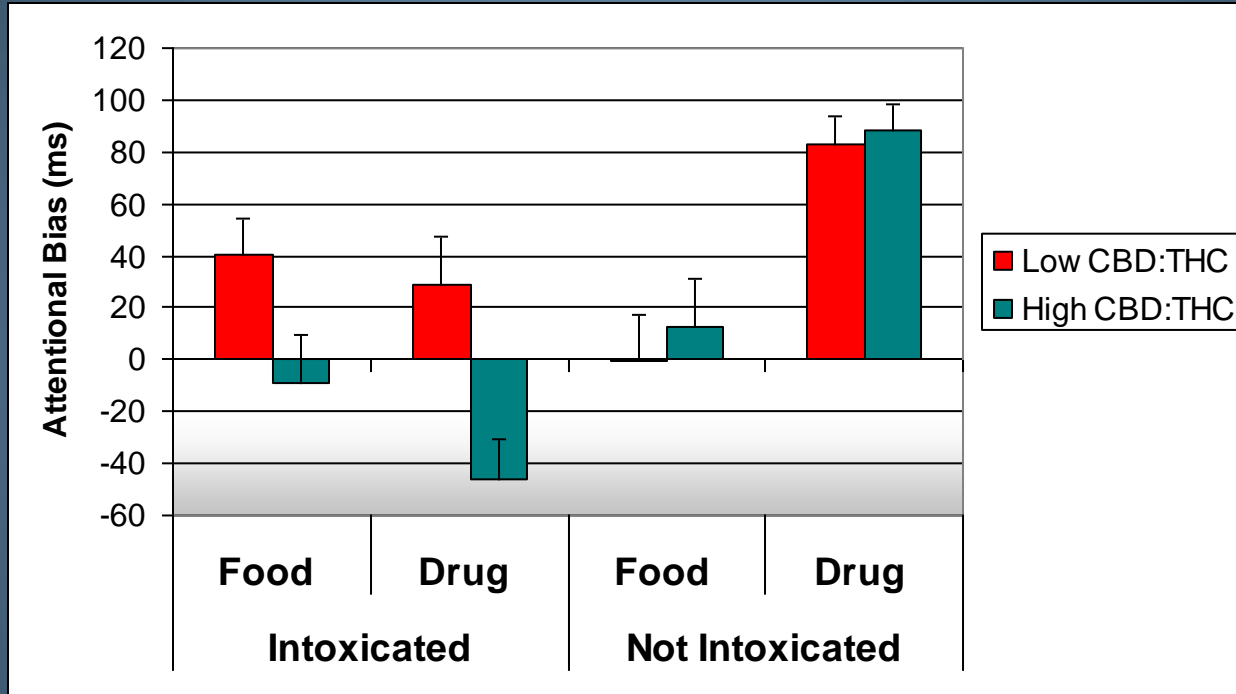




Attentional bias task



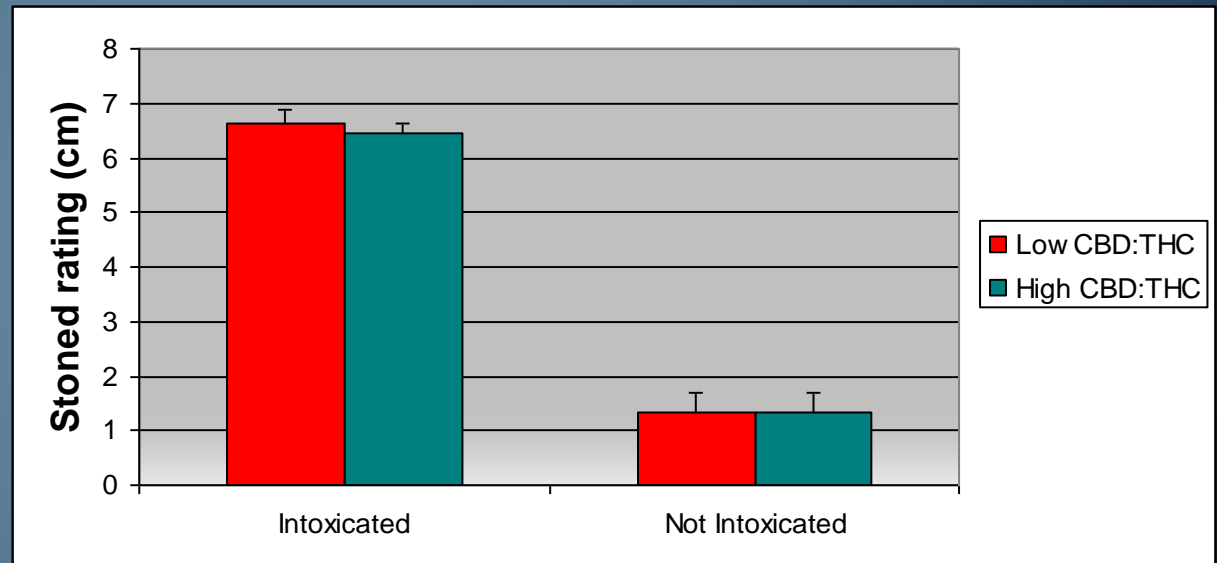
Attentional bias task



Does CBD affect how 'stoned' you get?

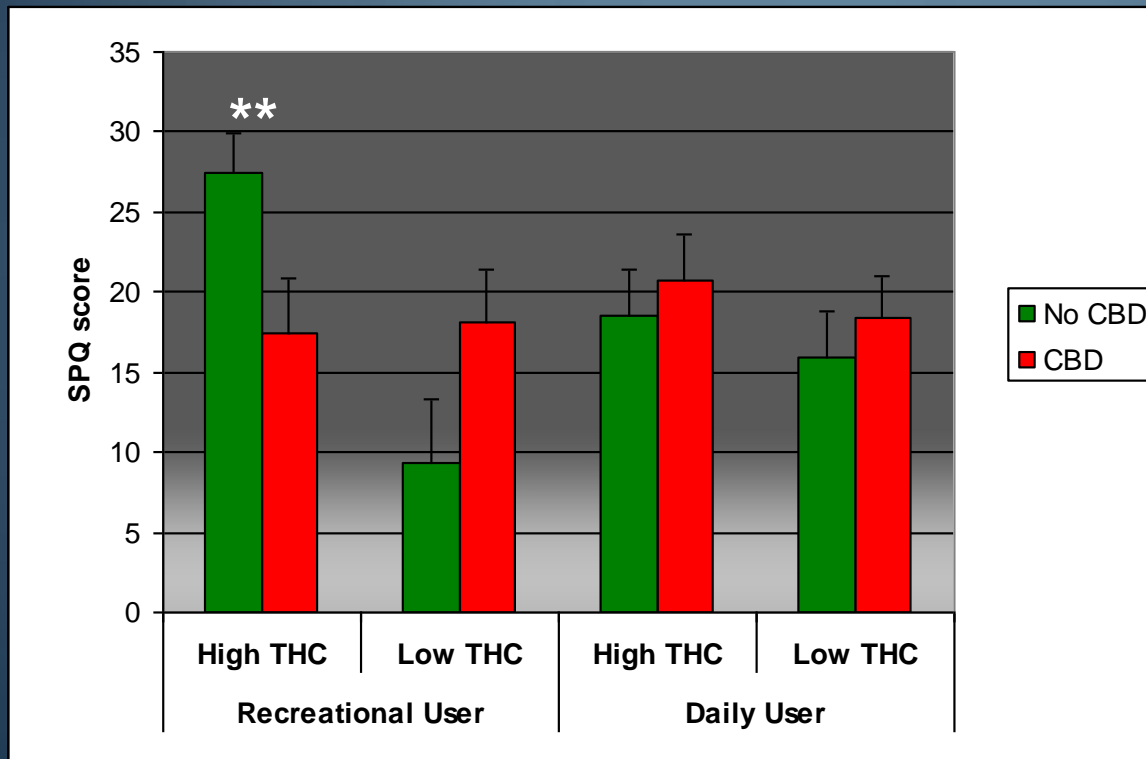
Does CBD affect how 'stoned' you get?

- No



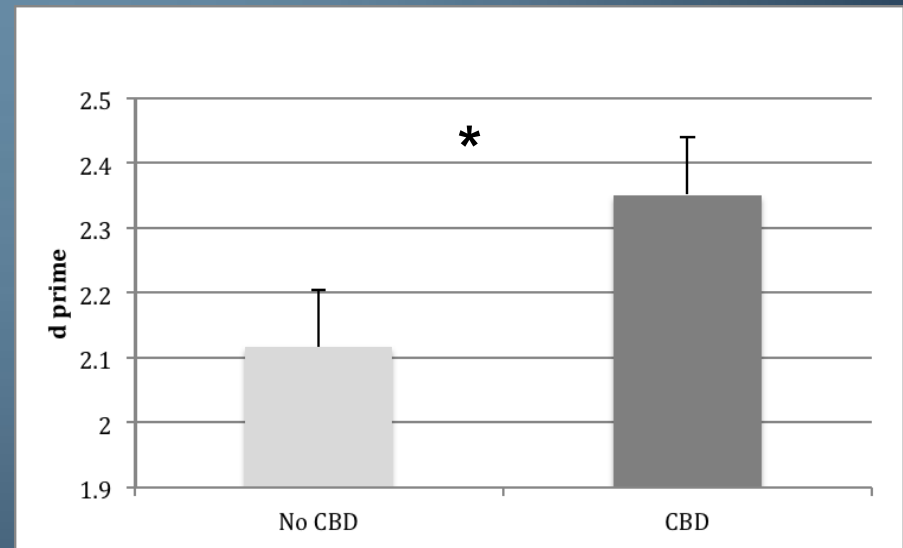
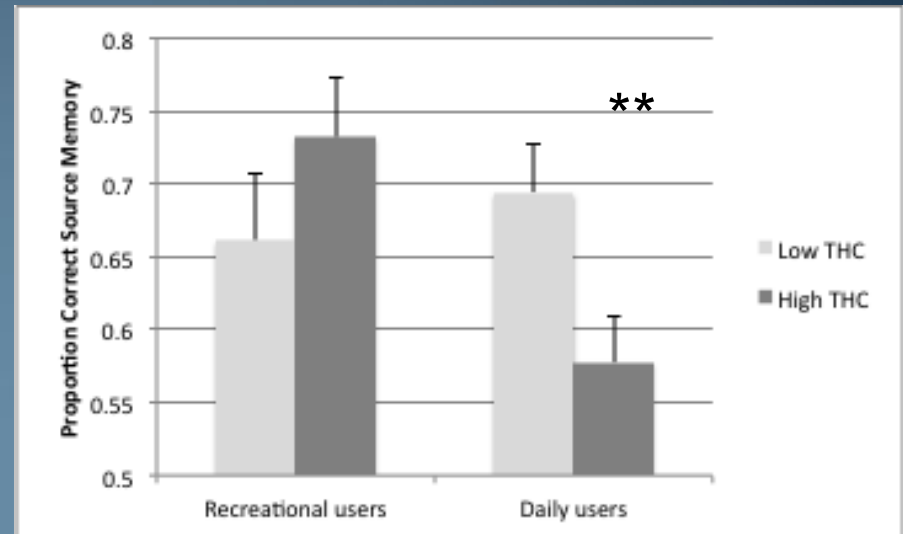
‘Chronic’ effects of cannabinoids

Chronic effects: psychosis-like



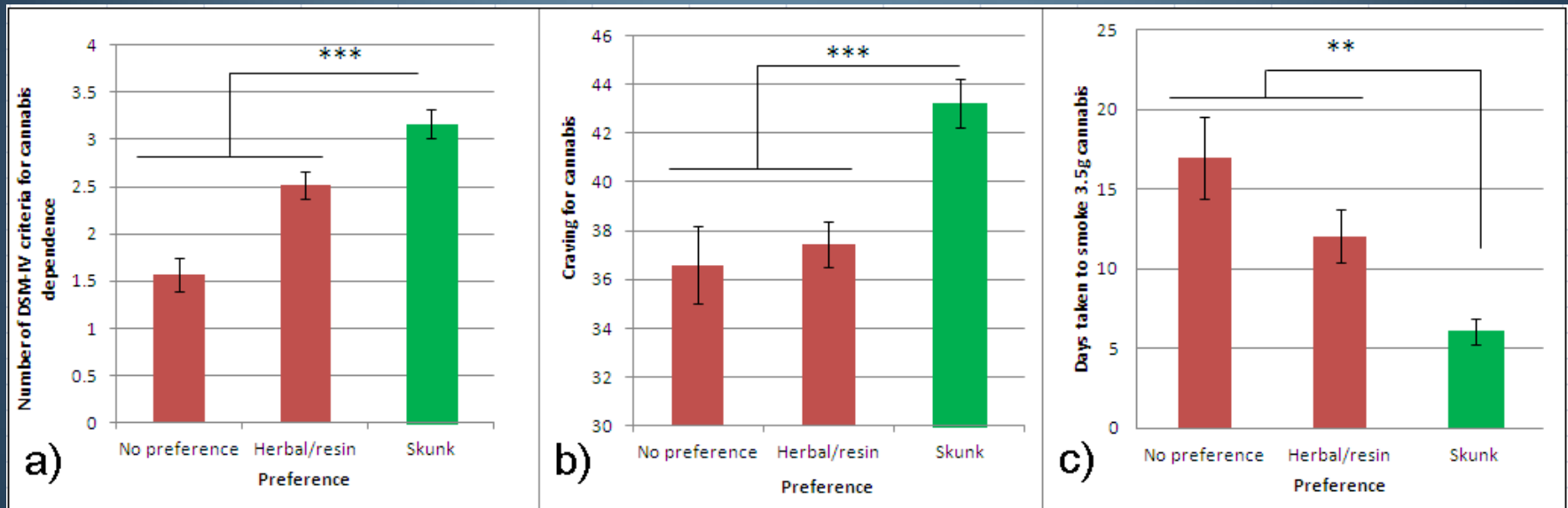
SPQ: Schizotypal Personality Questionnaire

Chronic effects: Memory



Morgan et al (2012) Psychological
Medicine

Chronic effects: cannabis dependence

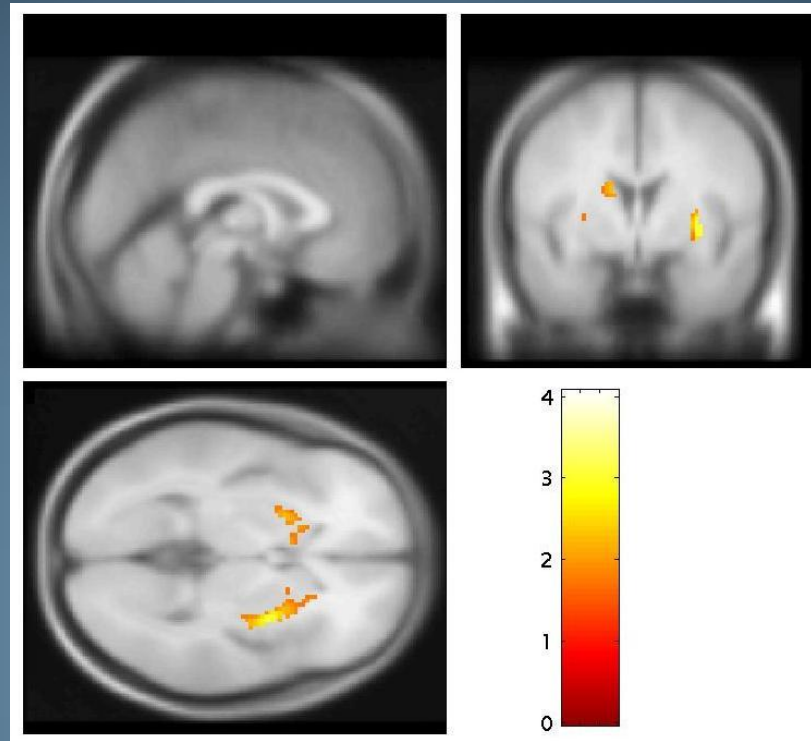


a) DSM subs. dependence

b) craving when sober

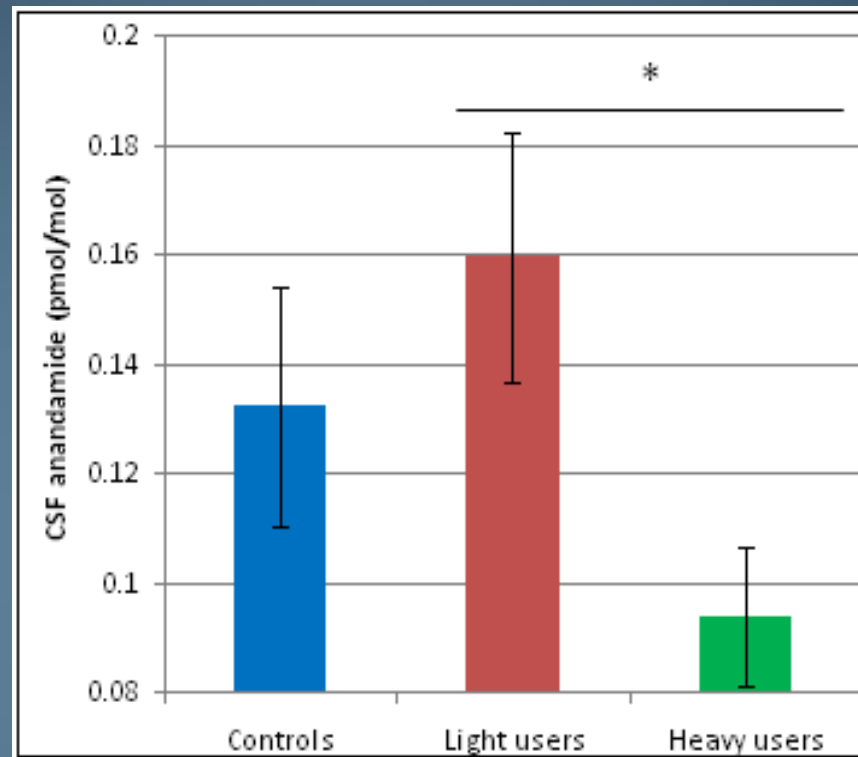
c) time to smoke 1/8th oz

Chronic effects: neurobiological changes



Daily cannabis users showed reduced capacity to synthesise Dopamine in the striatum.

Bloomfield et al, submitted.



Long-term disruption of the endocannabinoid system in cannabis dependence.

Heavy cannabis users (22.6+7.2 days/month) show depleted levels of the endocannabinoid anandamide in cerebrospinal fluid compared to light users (4.3+3.4days; $t_{29}=2.243$, $p=0.033$).

Where has all the CBD gone?

Where has all the CBD gone?

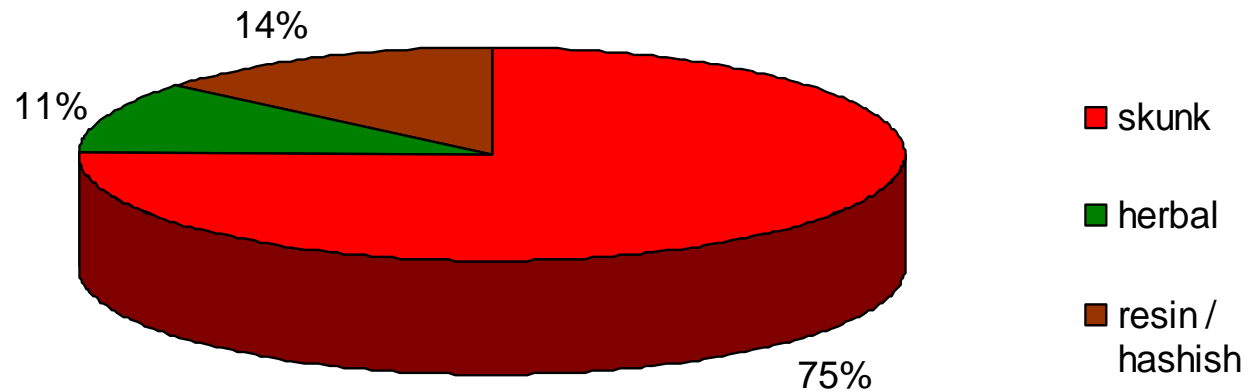
% of skunk in UK police seizures

- 2002 – 30% (King et al, 2005)
- 2004/5 – 55% (Potter et al, 2008)
- 2008 – 80% (Hardwick & King 2009)

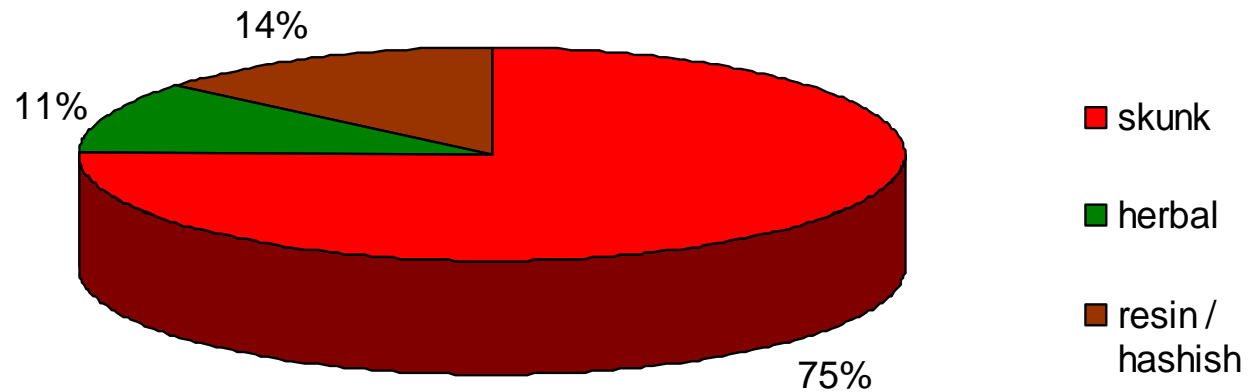
In those 80%, CBD levels <0.1%; THC 15%.

2010-2012

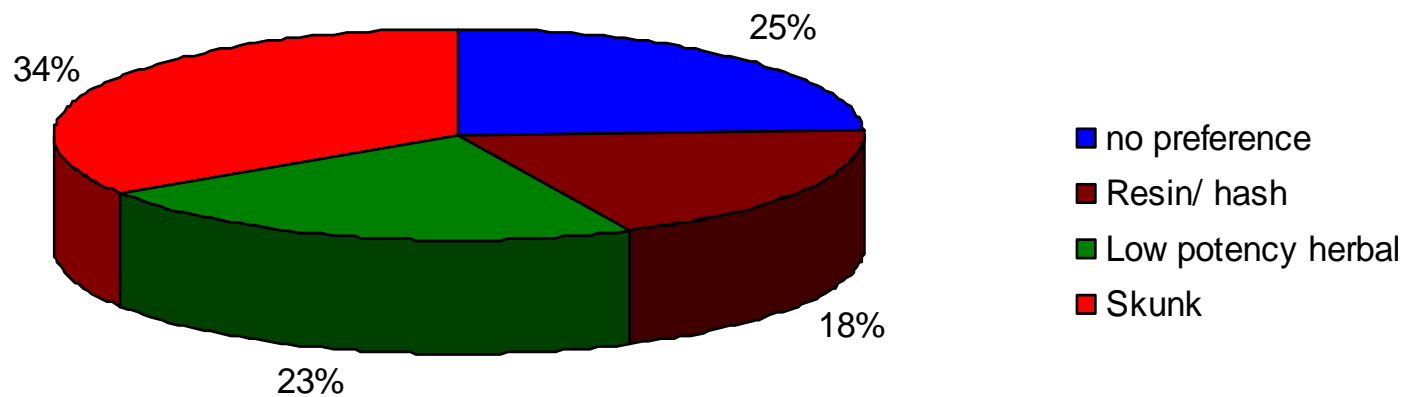
Types of cannabis collected



Types of cannabis collected



Preferred strain of cannabis



Where has all the CBD gone?

Where has all the CBD gone?



Where has all the CBD gone?

Potter (2010)

24 hour lighting
decreases levels of
CBD in trichomes

- Majority of UK consumed cannabis now grown intensively in illegal 'farms'



Hydroponic techniques

Intense 24 hour lighting

Breeding

Skunk



Purple haze, northern lights.....

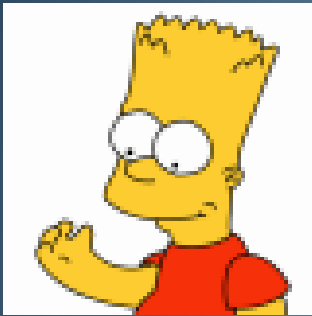
Do different strains of Cannabis have different effects on mental health?

- Acute
 - CBD blocks the memory impairing effects of THC
 - CBD blocks cannabis from grabbing the user's attention.

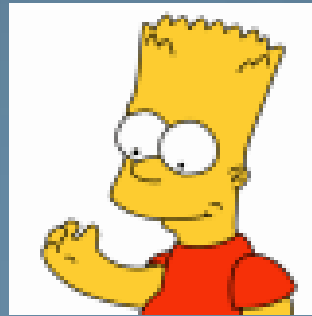
Conclusions

- Acute
 - CBD blocks the memory impairing effects of THC
 - CBD blocks cannabis from grabbing the user's attention.
- Chronic
 - Skunk more associated with addiction
 - CBD appears protective against psychosis-like symptoms.
 - Memory impairment – associated with THC levels.
 - Heavy cannabis use is associated with changes in the brain's endocannabinoid and dopamine systems.

NONE



THC + CBD



THC ONLY



Skunk

Acknowledgements



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