

CHALLENGES IN DEVELOPING A FIELD SOBRIETY TEST FOR CANNABIS

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NEED FOR A FIELD TEST

- **Safety:** Cannabis impairs performance
- **Biochemical measures:** No convenient breath or urine test
- **Awareness:** People are not always aware of their impairment

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CHALLENGES IN DEVELOPING A FIELD TEST

- Impairments are subtle
 - Difficult to assess in brief tasks
- Baseline variability in (drug free) task performance
 - People vary in performance even without the drug
- Variability in drug responses
 - People vary in sensitivity to THC
- Variability in cannabis products
 - Dose, other constituents, time since use

OUTLINE

- What is the evidence that cannabis impairs performance?
- Who is at risk?
- What is cannabis?
- Are the tasks brief, sensitive and selective, resistant to distraction?

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CANNABIS IMPAIRS PERFORMANCE

Clinical Chemistry 59:3
478–492 (2013)

Review

Cannabis Effects on Driving Skills

Rebecca L. Hartman^{1,2} and Marilyn A. Huestis^{1*}

“Recent cannabis use or blood THC concentrations 2–5 ng/mL are associated with substantial driving impairment, particularly in occasional smokers.”

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CANNABIS IMPAIRS PERFORMANCE

Journal of Analytical Toxicology 2015;39:251–261
doi:10.1093/jat/bkv012 Advance Access publication March 4, 2015

Smoked Cannabis' Psychomotor and Neurocognitive Effects in Occasional and Frequent Smokers

Nathalie A. Desrosiers^{1,2}, Johannes G. Ramaekers³, Emeline Chauchard^{1,4}, David A. Gorelick^{1,5} and Marilyn A. Huestis^{1*}

“Controlled cannabis smoking impaired psychomotor function (e.g., divided attention) especially in occasional smokers”

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IMPAIRMENTS DETECTED

- Attention & Tracking
- Reaction Time
- Cognition
- Psychomotor
- Judgment
- Memory

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WHAT KIND OF CANNABIS?

- Concentrations of THC vary from 0 to 15%
- Other constituents (metabolites, cannabidiol, terpenes)
- Route of administration (smoked, vaped, oral, hash oil)
- Presence of other drugs

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WHICH USERS?

- Inexperienced users most vulnerable
- What about other factors: older adults, interactions with other drugs (medications or recreational), sex, body weight, race?

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GOAL: TO DEVELOP A FIELD SOBRIETY “APP” FOR CANNABIS: “AM I STONED?”

- Compared phone-based “app” tasks to computer-based tasks
- Tested tasks with THC (0, 7.5 mg, 15 mg oral) in healthy adults
 - 18—35 years, no recent drug use, no psychiatric disorders, no medical problems
 - Double-blind administration of drug, within-subject design, 4-hour sessions
 - Phone-based and computer-based tasks

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STUDY 1 PARTICIPANTS

- 12 men, 12 women, early 20's, 3 years of college, most Caucasian
- Drug use:

Caffeine	1.5 cups per day (mean)
Tobacco	8 smokers (1.5 cigarettes per week)
Alcohol	4 drinks per week (mean)
Cannabis	8.6 times per month (mean)

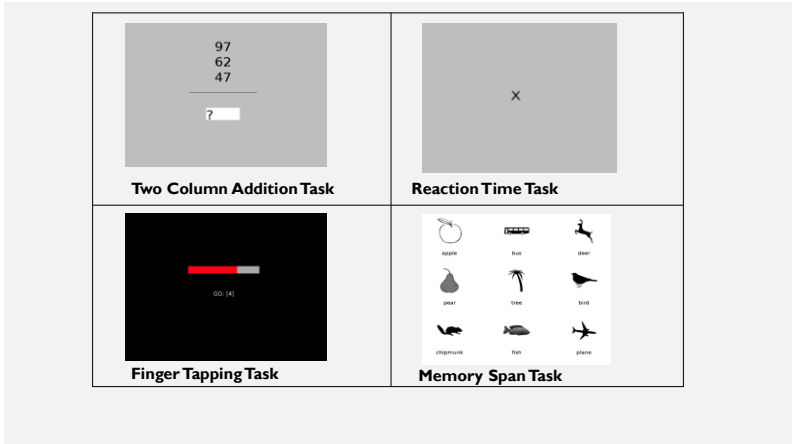
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Computer Tasks

1. Two Column Addition Task
2. Reaction Time Task
3. Finger Tapping Task
4. Memory Span Task

Psychology Experiment Building Languages (PEBL)

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Phone “App” Tasks:

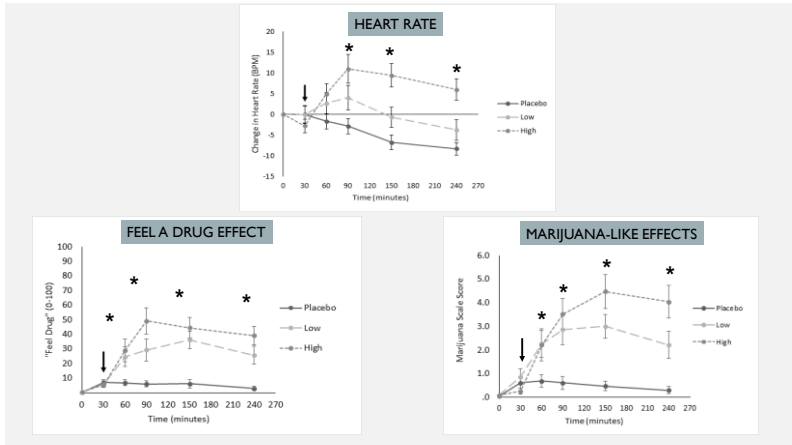
1. Paced Serial Addition Task (PSAT)
2. Reaction Time Task
3. Finger Tapping Task
4. Spatial Memory Task

ResearchKit - Apple Inc.

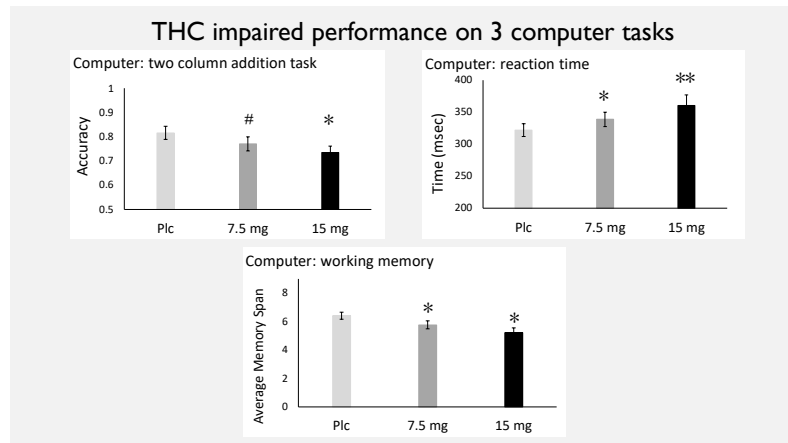
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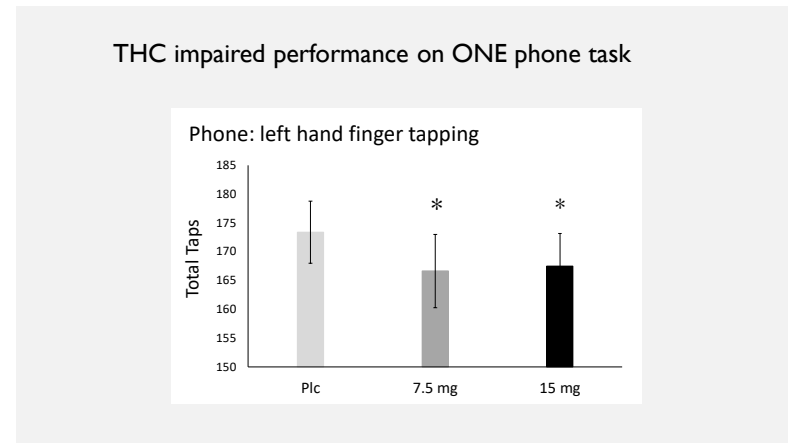
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DISCUSSION STUDY I

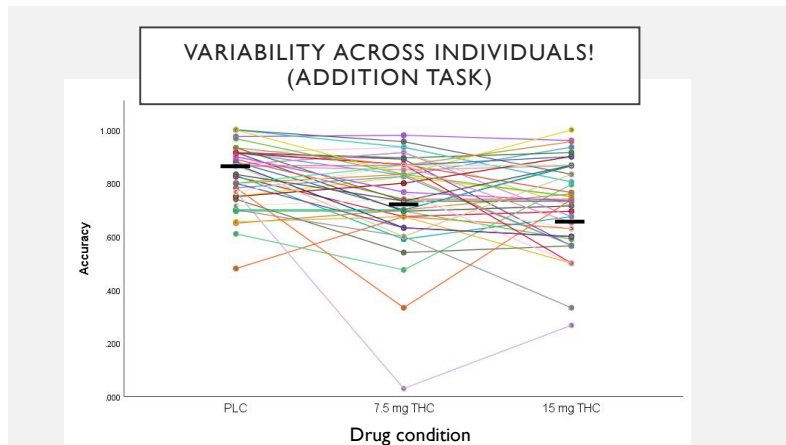
- Tasks too short, too easy?
- Impairments subtle?
- Second study:
 - Longer phone tasks
 - Additional measure time perception

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STUDY 2

- Subjects similar to those in Study 1.
- Results similar to those of Study 1:
 - THC impaired performance on 3 out of 4 computer tasks
 - THC impaired performance on only 1 of 4 phone tasks
 - THC did not affect time perception

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CONCLUSIONS

- It is difficult to develop a sensitive phone-based app to detect impairment from THC
- The tasks are brief, the drug-induced impairments are subtle
- Importantly, single administration of a test provides no information about the individual's drug-free (baseline) performance, making it difficult to recognize impairment
- Brief phone-based measures may not be suitable to detect cognitive or motor impairments

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