Use of Cannabis to Manage Negative Affect

- Cannabis is commonly used to treat negative affect
  - One of the most common motives for using cannabis is to cope with stress (Hyman & Sinha, 2009)

  - The three most frequently endorsed reasons for medical cannabis use are for pain, anxiety, and depression (Sexton, Cuttler, Finnell, & Mischley, 2016)
    - Over 58% report using it to manage anxiety (Sexton, et al., 2016) and 50% report using it for depression (Sexton et al., 2016; Webb & Webb, 2014)

Study 1: Research Questions

1. Does acute cannabis intoxication significantly reduce symptoms of depression, anxiety, and stress?

2. Does repeatedly using cannabis to manage these symptoms increase or decrease them in the long-term?
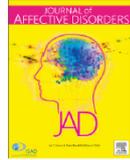
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Study 1: Method

- Analyzed data from Strainprint^{TM} which allows patients to:
  i) indicate the symptom, ii) rate its severity (0 to 10), iii) indicate the strain (THC and CBD content), iv) indicate method of administration, v) input dose, vi) re-rate symptom severity (push notification)
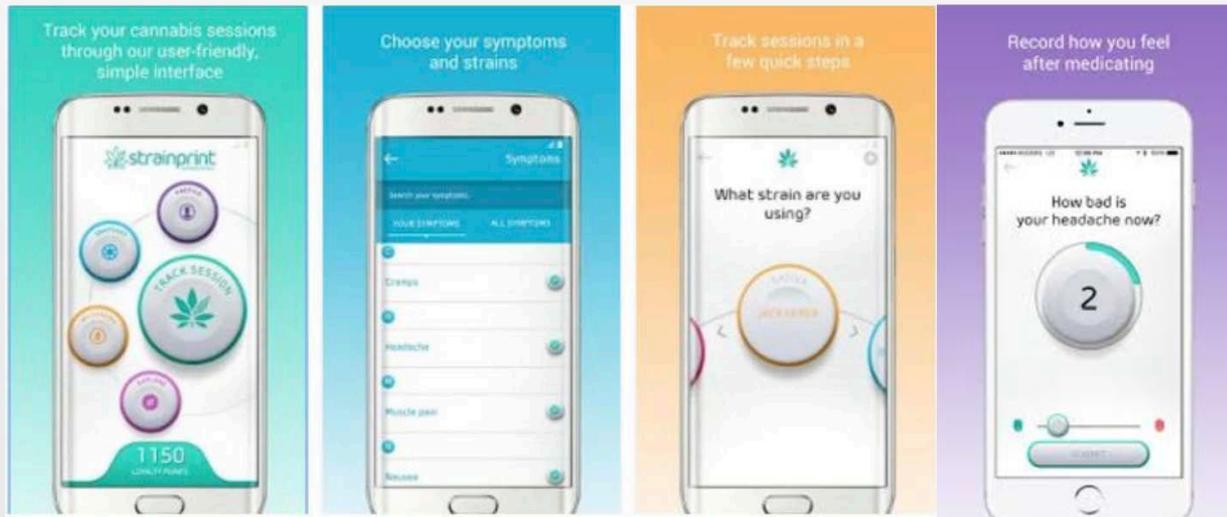
Short-Term Effects
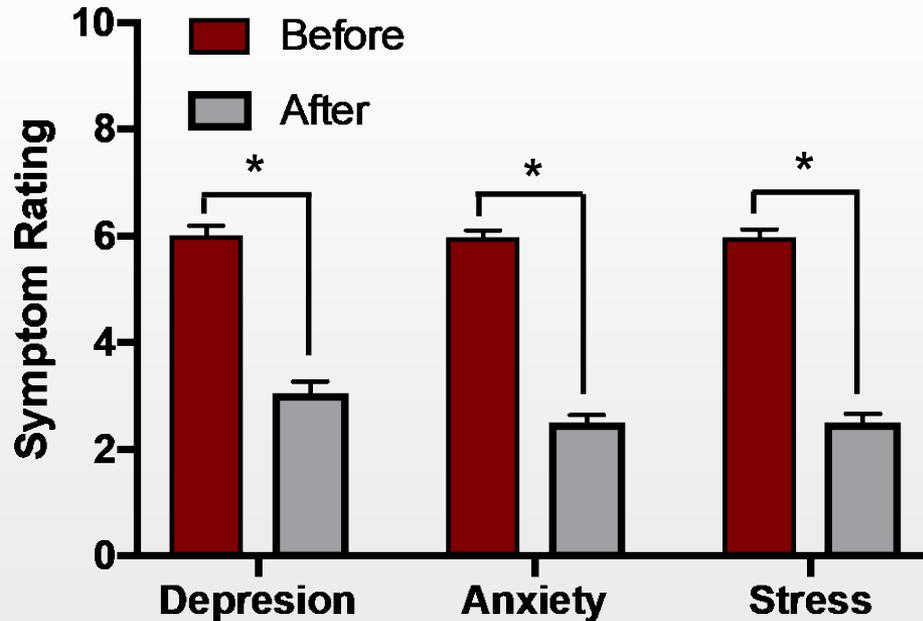
Depression
561 Patients
3,151 Sessions

Anxiety
770 Patients
5,085 Sessions

Stress
726 Patients
3,717 Sessions

Overall significant reductions in ratings of depression, anxiety, and stress

Long-Term Effects

- Baseline symptoms of anxiety and stress did not change across cannabis use sessions

- However, baseline symptoms of depression significantly increased across cannabis use treatment sessions

Study 2: Research Question

- Are cannabis users more or less responsive to stress *when they are sober*?

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ORIGINAL INVESTIGATION

Blunted stress reactivity in chronic cannabis users

Carrie Cuttler[1,2] · Alexander Spradlin[1] · Amy T. Nusbaum[1] · Paul Whitney[1] · John M. Hinson[1] · Ryan J. McLaughlin[1,2,3]

Study 2: Method

- 2x2 Factorial Design
  - Sober cannabis users and non-users were randomly assigned to complete a stress or no stress condition

	Non-Users	Cannabis Users
Stress	$n = 21$	$n = 19$
No Stress	$n = 21$	$n = 21$

- Subjective stress ratings were provided before, during, and after the stress manipulation
- Saliva was collected before and after the stress manipulation (cortisol extraction)

The Maastricht Acute Stress Test (MAST)

- **Stress Condition**
  - **Physiological Stress** – 5 trials of submerging hand in ice water for varying, unpredictable lengths of time
  - **Psychosocial Stress** – 5 trials of counting backwards from 2043 by 17s while being video recorded and given negative feedback (start again!)

- **No Stress Condition**
  - 5 trials of submerging hand in lukewarm water for same lengths of time
  - 5 trials of counting from 1 to 25 with no video recording or negative feedback

Subjective Stress and Cortisol
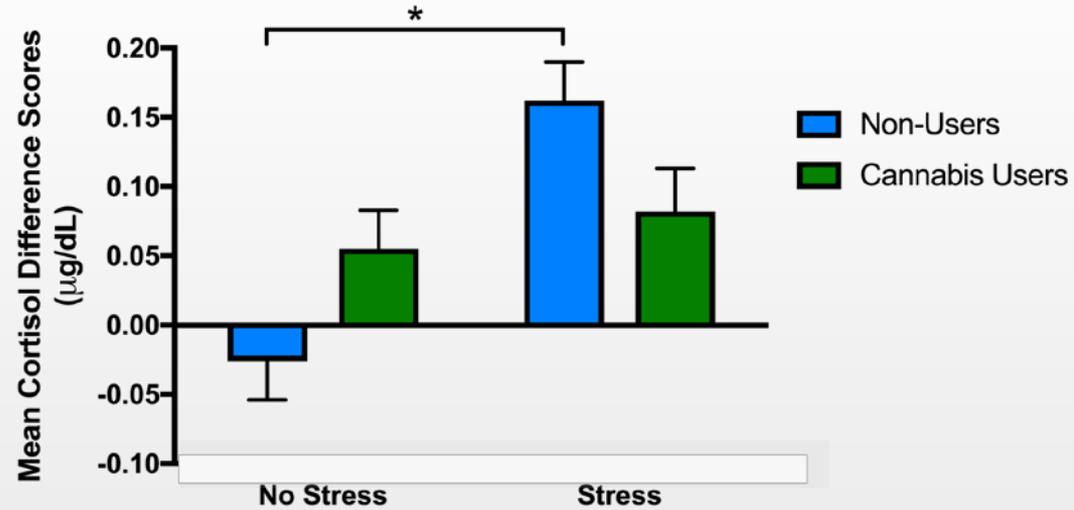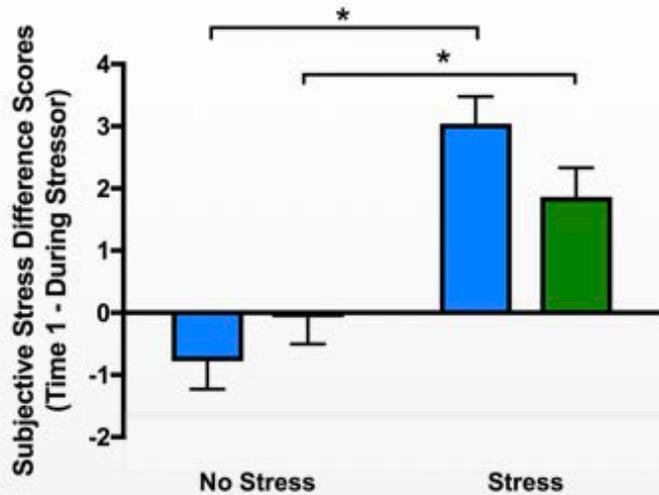
Chronic cannabis users demonstrate dampened subjective stress reactivity and blunted physiological stress reactivity

Study 3: Research Questions

1. Is frequency of cannabis use related to pain intensity, depression, and anxiety in patients with opioid use disorder?

2. Does frequency of cannabis use moderate the relationships between pain intensity and depression/anxiety in patients with opioid use disorder?

Cannabis use moderates the relationship between pain and negative affect in adults with opioid use disorder

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Marian Wilson[a,b,c,*], Hannah Y. Gogulski[d], Carrie Cuttler[c,d], Teresa L. Bigand[a,b], Oladunni Oluwoye[b,e], Celestina Barbosa-Leiker[a,b,c], MaryLee A. Roberts[a,b]

Study 3: Method

- 150 adults receiving Medication-Assisted Treatment for opioid addiction (attending a methadone treatment center)

- Completed a survey measuring:
  - Pain
  - Depression
  - Anxiety
  - Cannabis use
  - Self-efficacy

Sample Characteristics

- High rates of cannabis use
  - 93% used cannabis at some point in life
  - 53% used cannabis in past month
  - 27.5% used cannabis 20+ days in past month

- High rates of physical and emotional pain
  - 60% were experiencing major depression
  - 63% were experiencing anxiety
  - 58% had chronic pain diagnosis

- 60% reported using cannabis to manage aches/pains and 49% reported use for stress/anxiety

Correlations

	Cannabis Use	Pain	Depression	Anxiety
Cannabis Use				
Pain	-.04			
Depression	-.01	.30**		
Anxiety	-.05	.38**	.69**	
Emotional Self-Efficacy	-.20*	-.07	-.43**	-.35**

Cannabis use was unrelated to pain, depression, and anxiety in this sample
However cannabis use was associated with reduced confidence in one's ability to manage negative emotions

Correlations Between Pain and Negative Affect
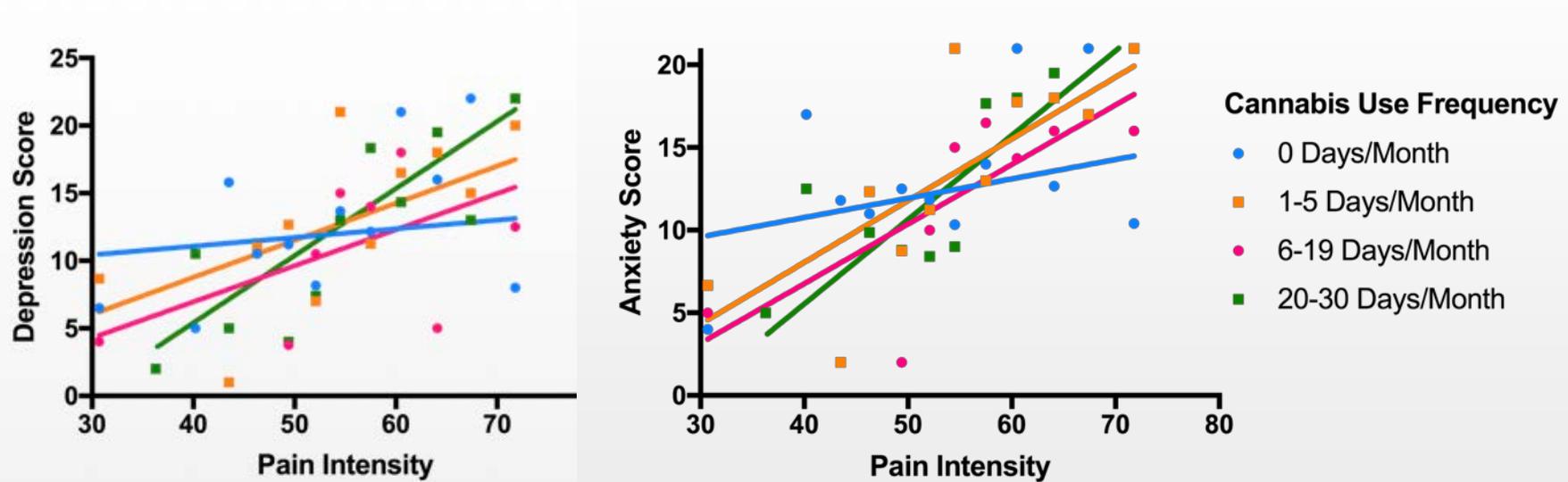
Frequency of cannabis use moderates the relationships between pain intensity and anxiety/depression (as frequency increases so does the strength of these relationships)

The Role of Self-Efficacy

- Cannabis use was associated with lower emotional self-efficacy

- Additional covariate analyses revealed that the decreased self-efficacy associated with cannabis use was driving these effects

- Relying on cannabis to manage symptoms may undermine their confidence in their ability to manage their symptoms on their own (independent of cannabis)
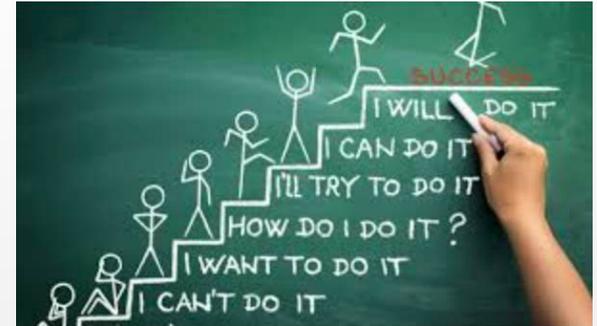
Summary

1. Acute cannabis intoxication provides significant and substantial reductions in depression, anxiety, and stress
   - However, symptoms are maintained in the long-term and depression may be exacerbated in the long-term

2. The stress alleviating properties of cannabis appear to extend beyond the period of intoxication
   - However, the long-term consequences of dysregulations in the normal stress response are unclear

3. Cannabis may potentiate links between pain & negative affect
   - However, this appears to be due to decreases in self-efficacy associated with cannabis use, rather than cannabis use per se

Why This Matters – Implications for Public Health

- Cannabis is serving as a Band-Aid
  - Acute cannabis intoxication effectively reduces symptoms of negative affect in the short-term

- In the long-term regular use of cannabis to manage these symptoms may maintain, exacerbate, or further entangle them

- As such, users may need to continue to rely on cannabis to cope with symptoms which may increase problematic cannabis use

Using Cannabis to Cope Increases Problematic Use

N = 578
Cannabis Users
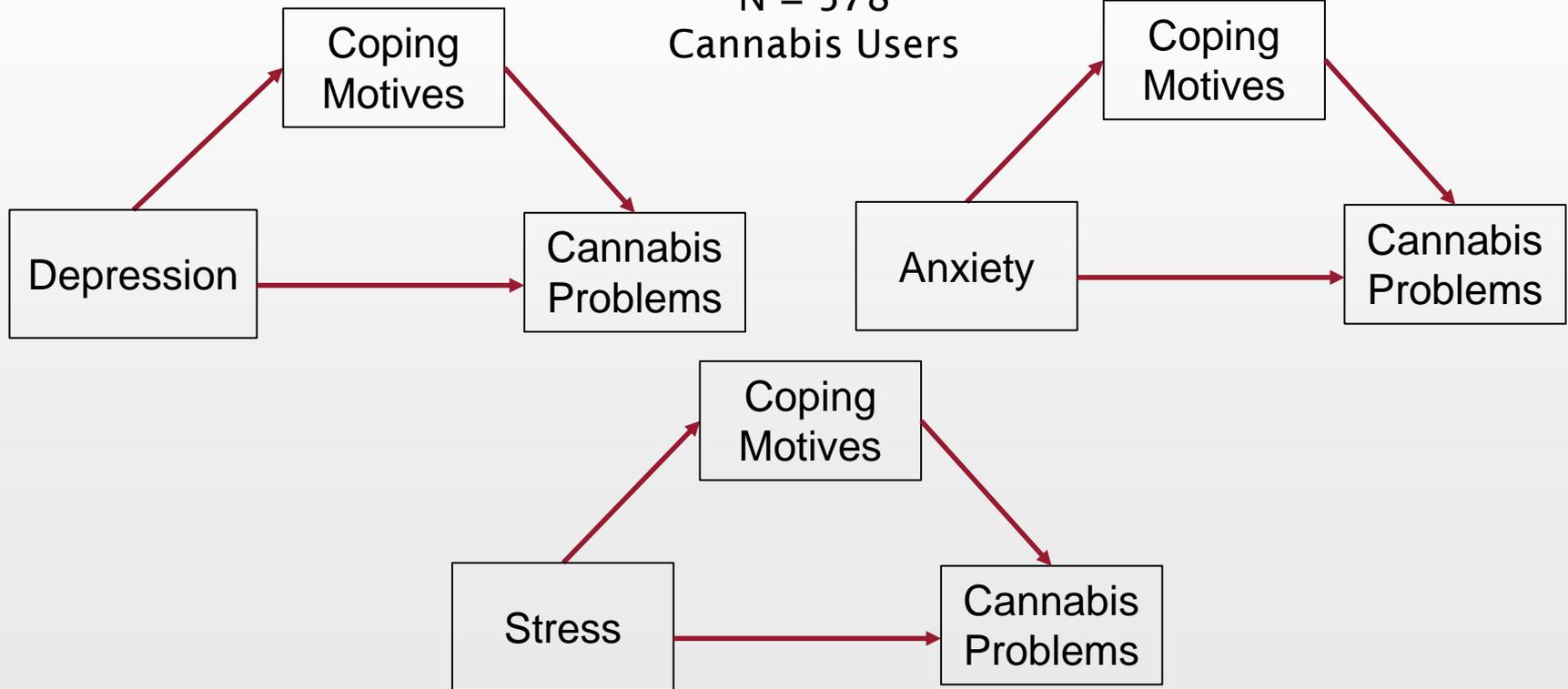
Depression → Coping Motives → Cannabis Problems
Depression → Cannabis Problems

Anxiety → Coping Motives → Cannabis Problems
Anxiety → Cannabis Problems

Stress → Coping Motives → Cannabis Problems
Stress → Cannabis Problems

Why This Matters – Implications for Public Health

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- In the long-term regular use of cannabis to manage these symptoms may maintain, exacerbate, or further entangle them

- As such, users may need to continue to rely on cannabis to cope with symptoms which may increase problematic cannabis use

- Patients should seek out cognitive-behavioral therapy to learn how to effectively reduce their symptoms in the long-term

Moving Forward

- We will examine the many other symptoms Strainprint™ tracks (e.g., pain) to examine short-term and long-term effects

- Since chronic cannabis use can't be manipulated in humans we plan conduct research using animal models of cannabis use and stress

- Future research is needed to better understand the long-term consequences of cannabis users' blunted stress response

  - Chronic cannabis use may confer a resiliency to stress and help protect against detrimental effects of excessive cortisol
  - However, mobilization of cortisol under conditions of stress serves an important adaptive function

Thank You!

Collaborators

- Alexander Spradlin
- Ryan McLaughlin
- Amy Nusbaum
- Paul Whitney
- John Hinson
- Marion Wilson
- Hannah Gogulsky
- Teresa Bigand
- Oladunni Oluwoye
- Celestina Barbosa-Leiker
- MaryLee Roberts

Data Provider

- Strainprint™

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- WSU's Dedicated Marijuana Account
- WSU's Marijuana Working Group