



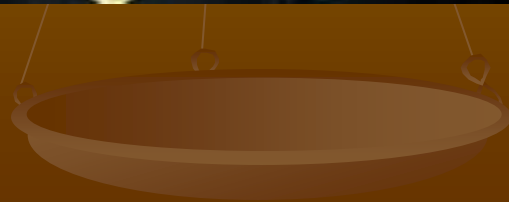
# The Development of a Cannabis Screening and Outcome Measure

Simon Adamson

National Addiction Centre Aotearoa New Zealand,







# Cannabis use: population prevalence



- Most widely used illicit drug globally
- Past year prevalence 2007-2010:
  - New Zealand 14.5%
  - Australia 10%
  - England and Wales 6.6%





# Cannabis use and mental health

## - AOD Settings -



- Use (past 6 months) 64%  
(median 3 joints 6 days a week)
- Abuse 5%
- Dependence 42%

For those with cannabis dependence:

- Current mood disorder 58%
- Current anxiety disorder 75%

# Cannabis use and mental health

## - clinical Impact -



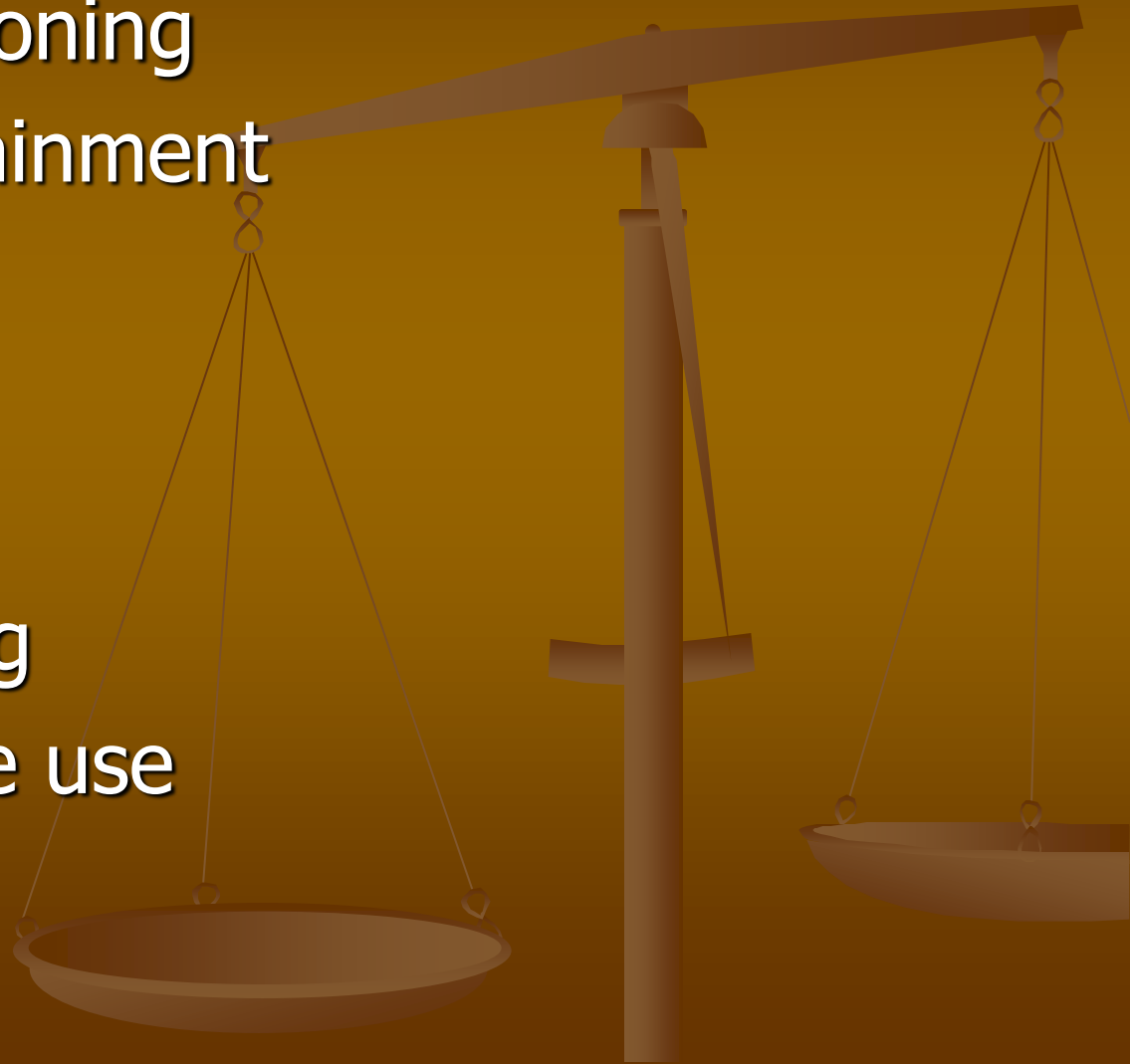
- Psychosis
  - RR  $\approx$  2 for development of schizophrenia/psychosis
- Depression
  - Modest association at best
- Anxiety?



# Cannabis Use and Other Adverse Outcomes



- Cognitive functioning
- Educational attainment
- Unemployment
- Crime
- Road accidents
- Lung functioning
- Other substance use





# Measurement of cannabis use



- Frequency
- Quantity
- Scales:
  - Screening: CAST, MSI-X
  - Symptoms: CPQ, MCQ



# Cannabis Use Disorders Identification Test (CUDIT)



- 10 items
- Modelled on the Alcohol Use Disorders Identification Test (AUDIT)
- Developed for RCT of MET for alcohol dependence (cannabis users, n=53)

# Findings



- Cronbach's alpha = 0.84
- Area under the curve = .846
- Cut-off of 8:
  - Sensitivity = 73%
  - Specificity = 95%
- Problems:
  - Small sample
  - All patients were substance dependent (alcohol)
  - Items not optimal



# Initial Uptake



- Contacted re use in a range of clinical settings: Youth/University clinics common
- Translated into French, German, Dutch, Italian
- Used in INCANT, a multisite family therapy trial in Belgium, France, Germany, the Netherlands and Switzerland
- Used in general population substance use surveys:
  - Switzerland: Swiss Cannabis Monitoring Study 2004, 2007
  - Canada: Canadian Alcohol and Drug Use Monitoring Survey 2008, 2009, 2010?

# Annaheim et al.



- 593 Swiss current cannabis users, aged 13-29
- Examined CUDIT score in relation to five areas of problematic use
- Measure showed some promise, ie good internal consistency, unidimensional, ability to distinguish between problematic and non-problematic users
- but problems with two items: Injury and hours stoned. Ideal cut-off 6-8.

# Annaheim et al.



- 558 Swiss current cannabis users, aged 13-32
- Examined alternative items. Found improved performance by replacing three items
- But noted for general population most items were still too “hard” and improvements only evident for heavier users

In J of Methods in Psychiatric Research 2010;19(3):142-155



# Thake & Davies



- 1179 cannabis users from CADUMS
- Compared CUDIT to ASSIST
- Utilised thresholds of 6 and 8
- Examined CUDIT score in relation to three areas of problematic use
- CUDIT had best specificity, ASSIST best sensitivity. On balance CUDIT best, and ASSIST did not outperform a single "daily use" question.
- Suggest a two step process of first screening out less frequent users (Q1)



# A Review of Cannabis Measures: Potniak et al 2008

- Compared four cannabis screening tools:
  - Severity of Dependence Scale (SDS)
  - CUDIT
  - Cannabis Abuse Screening Test (CAST)
  - Problematic Use of Marijuana (PUM)
- Limited research to date. All performed adequately
- Need to examine scales in a variety of clinical and population settings
- Noted problems with CUDIT item composition and the need to revise the instrument



# The SHADE Project:

**Randomised controlled trial of computerised cognitive behaviour therapy for depression and substance use comorbidity**

**Frances Kay-Lambkin<sup>1, 4</sup>, Amanda Baker<sup>1</sup>, Brian Kelly<sup>2</sup>, Terry Lewin<sup>1</sup>, Vaughan Carr<sup>1, 3</sup> Simon Adamson<sup>5</sup>**

<sup>1</sup> Centre for Brain and Mental Health Research, The University of Newcastle, Newcastle, Australia

<sup>2</sup> Centre for Rural and Remote Mental Health, Orange, Australia

<sup>3</sup> NISAD (Neuroscience Institute for Schizophrenia and Allied Disorders)

<sup>4</sup> National Drug and Alcohol Research Centre, University of NSW, Australia

<sup>5</sup> National Addiction Centre, University of Otago, New Zealand



# Inclusion



- Lifetime MDE and current symptoms (BDI-II 17+)

*plus*

- Harmful consumption of alcohol (above national guidelines) or using cannabis or amphetamine weekly or more

# SHADE Project - Sample

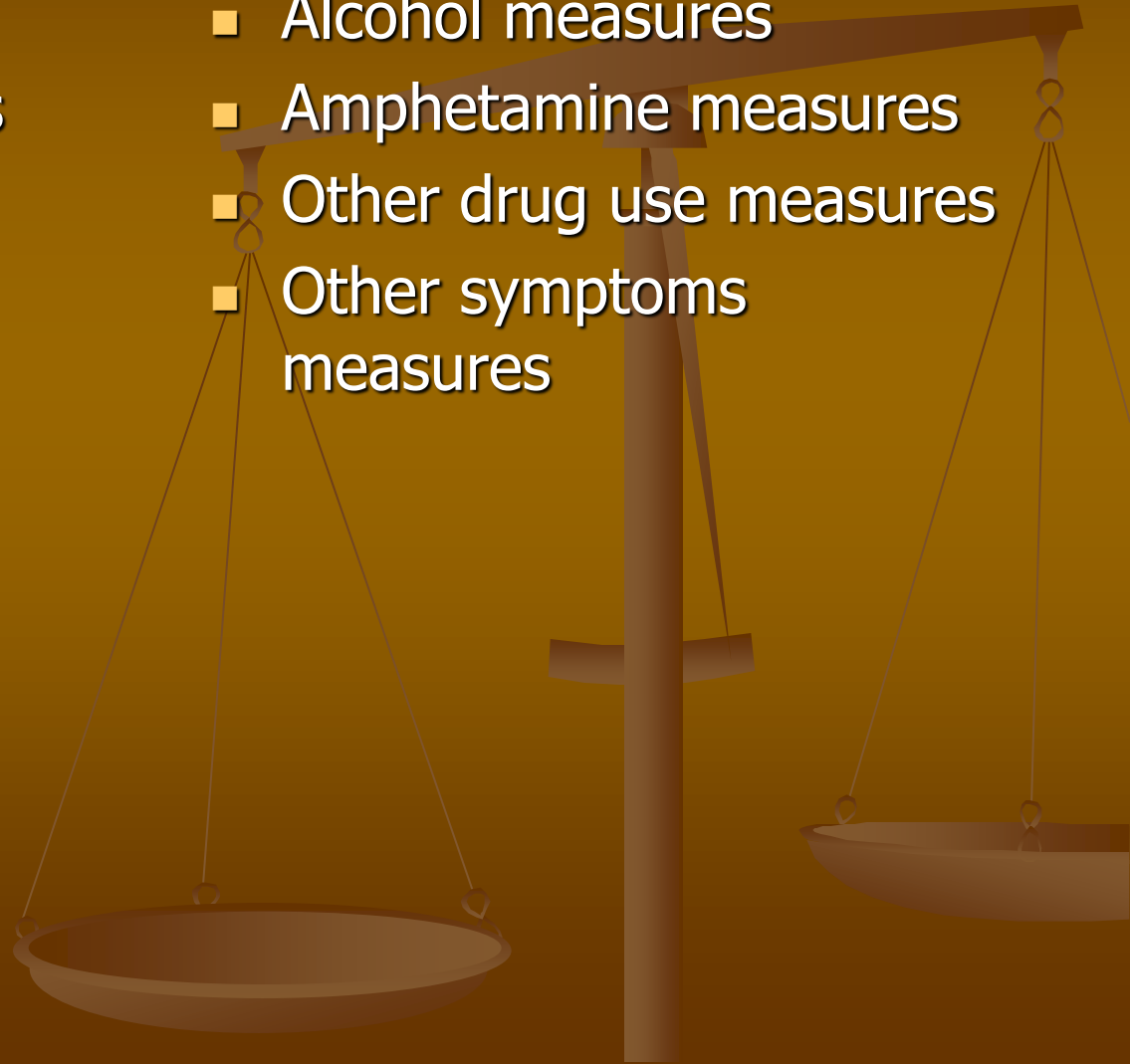


- Baseline n=250
- Cannabis use, SCID and CUDIT complete n=124
- Plus n=15 at six months and n=5 at 12 months
- Total n=144
  - No diagnosis n=40
  - Cannabis abuse n=17
  - Cannabis dependence n=87

# Measures



- Demographics
- Depression measures
- Cannabis measures:
  - 20-item T-CUDIT
  - SCID
  - OTI
  - Readiness to Change
- Alcohol measures
- Amphetamine measures
- Other drug use measures
- Other symptoms measures



# Measures



- Baseline
- One week test-retest (T-CUDIT only)
- Post-tx (3 months)
- 6 months
- 12 months
- 24 months
- 36 months





# CUDIT Items



1. How often do you use cannabis?
2. How many hours were you "stoned" on a typical day when you had been using cannabis?
3. How often were you "stoned" for 6 or more hours?
4. How often during the past 6 months did you find that you were not able to stop using cannabis once you had started?
5. How often during the past 6 months did you fail to do what was normally expected from you because of using cannabis?
6. How often during the past 6 months did you need to use cannabis in the morning to get yourself going after a heavy session?
7. How often during the past 6 months did you have a feeling of guilt or remorse after using cannabis?
8. How often in the past 6 months have you had a problem with your memory or concentration after using cannabis?
9. Have you or someone else been injured as a result of your use of cannabis over the past 6 months?
10. Has a relative, friend or a doctor or other health worker been concerned about your use of cannabis or suggested you cut down over the past 6 months?

# CUDIT Items



1. How often do you use cannabis?

2. How many hours were you "stoned" on a typical day when you had been using cannabis?

3.  
4. 1 or 2

3 or 4

5 or 6

7 to 9

10 or more

5.  
6.  
7.  
8. How often in the past 6 months have you had a problem with your memory or concentration after using cannabis?

9. Have you or someone else been injured as a result of your use of cannabis over the past 6 months?

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10 or more



4. <1

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3 or 4

5 or 6

7 or more

5. How often in the past 6 months have you had a problem with your memory or concentration after using cannabis?

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- 5.
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6. How often were you "stoned" for 3 or more hours?
7. How often during the past 6 months did you have a feeling of guilt or remorse after using cannabis?
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9. Have you or someone else been injured as a result of your use of cannabis over the past 6 months?
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3. How often were you "stoned" for 6 or more hours?
4. How often during the past 6 months did you find that you were not able to stop using cannabis once you had started?
5. How often in the past 6 months have you had a problem with your memory or concentration *when you were not stoned* that you think might be because of your cannabis use?
- 6.
- 7.
8. How often in the past 6 months have you had a problem with your memory or concentration after using cannabis?
9. Have you or someone else been injured as a result of your use of cannabis over the past 6 months?
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6. How often do you use cannabis in situations that could be physically hazardous, such as driving, operating machinery, or caring for children?
- 7.
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## Abuse Items

# CUDIT Items



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10. Has a relative, friend or a doctor or other health worker been concerned about your use of cannabis or suggested you cut down over the past 6 months?



## Abuse Items

# CUDIT Items



Have you ever been charged with a cannabis-related offence?

1. Has your cannabis use caused, or worsened, any problems in your social life or affected how you get on with other people

2. How often were you "stoned" for 6 or more hours?

3. How often during the past 6 months did you find that you were not able to stop using cannabis once you had started?

4. How often during the past 6 months did you fail to do what was normally expected from you because of using cannabis?

5. How often during the past 6 months did you need to use cannabis in the morning to get yourself going after a heavy session?

6. How often during the past 6 months did you have a feeling of guilt or remorse after using cannabis?

7. How often in the past 6 months have you had a problem with your memory or concentration after using cannabis?

8. Have you or someone else been injured as a result of your use of cannabis over the past 6 months?

9. Has a relative, friend or a doctor or other health worker been concerned about your use of cannabis or suggested you cut down over the past 6 months?

10.



## Dependence Items

## CUDIT Items



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## Dependence Items

## CUDIT Items



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5. How often during the past 6 months did you fail to do what was normally expected from you because of using cannabis?
6. How often during the past 6 months did you need to use cannabis in the morning to get yourself going after a heavy session?
7. How often during the past 6 months did you have a feeling of guilt or
8. How often in the past six months have you devoted a great deal of your time to getting, using, or recovering from cannabis?
9. Have you continued to use cannabis despite physical or psychological problems caused or made worse by your cannabis use?
10. Do you need to use more cannabis to get stoned than you used to?
- Have you given up or reduced important social, work, or recreational activities, like sports or hobbies, because of your cannabis use?

## Psychological Items

## CUDIT Items



1. How often do you use cannabis?
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3. How often were you "stoned" for 6 or more hours?
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10. Has a relative, friend or a doctor or other health worker been concerned about your use of cannabis or suggested you cut down over the past 6 months?



## Psychological Items

## CUDIT Items



1. Have you ever thought about cutting down, or stopping, your use of cannabis?

2. using cannabis?

3. How often were you "stoned" for 6 or more hours?

4. How often during the past 6 months did you find that you were not able to stop using cannabis once you had started?

5. How often during the past 6 months did you fail to do what was normally expected from you because of using cannabis?

6. How often during the past 6 months did you need to use cannabis in the morning to get yourself going after a heavy session?

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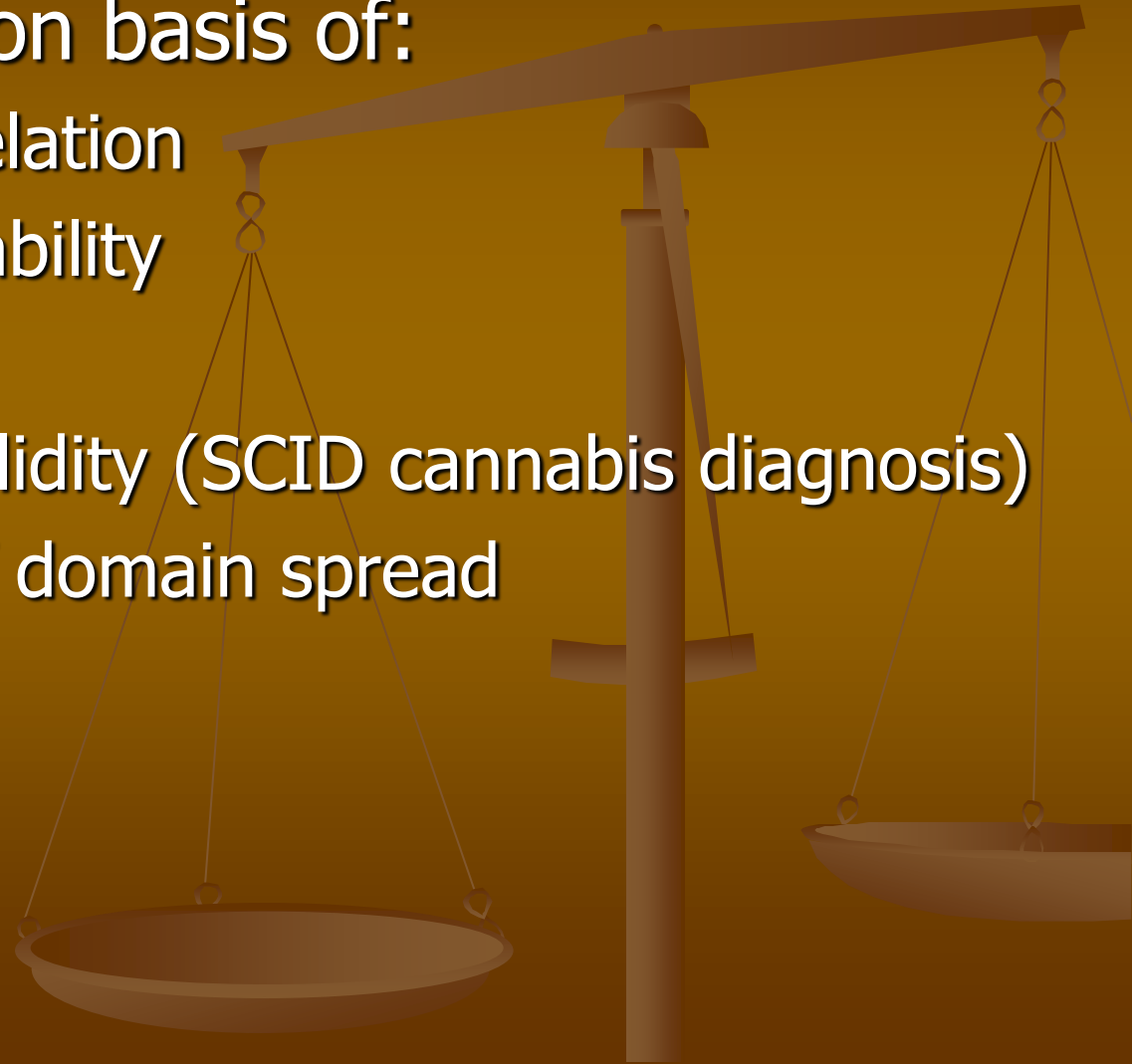
9. Have you or someone else been injured as a result of your use of cannabis over the past 6 months?

10. Has a relative, friend or a doctor or other health worker been concerned about your use of cannabis or suggested you cut down over the past 6 months?

# Revised CUDIT



- Items selected on basis of:
  - Item total correlation
  - Test-retest reliability
  - Variance
  - Discriminant validity (SCID cannabis diagnosis)
  - Maintenance of domain spread





# Revised CUDIT

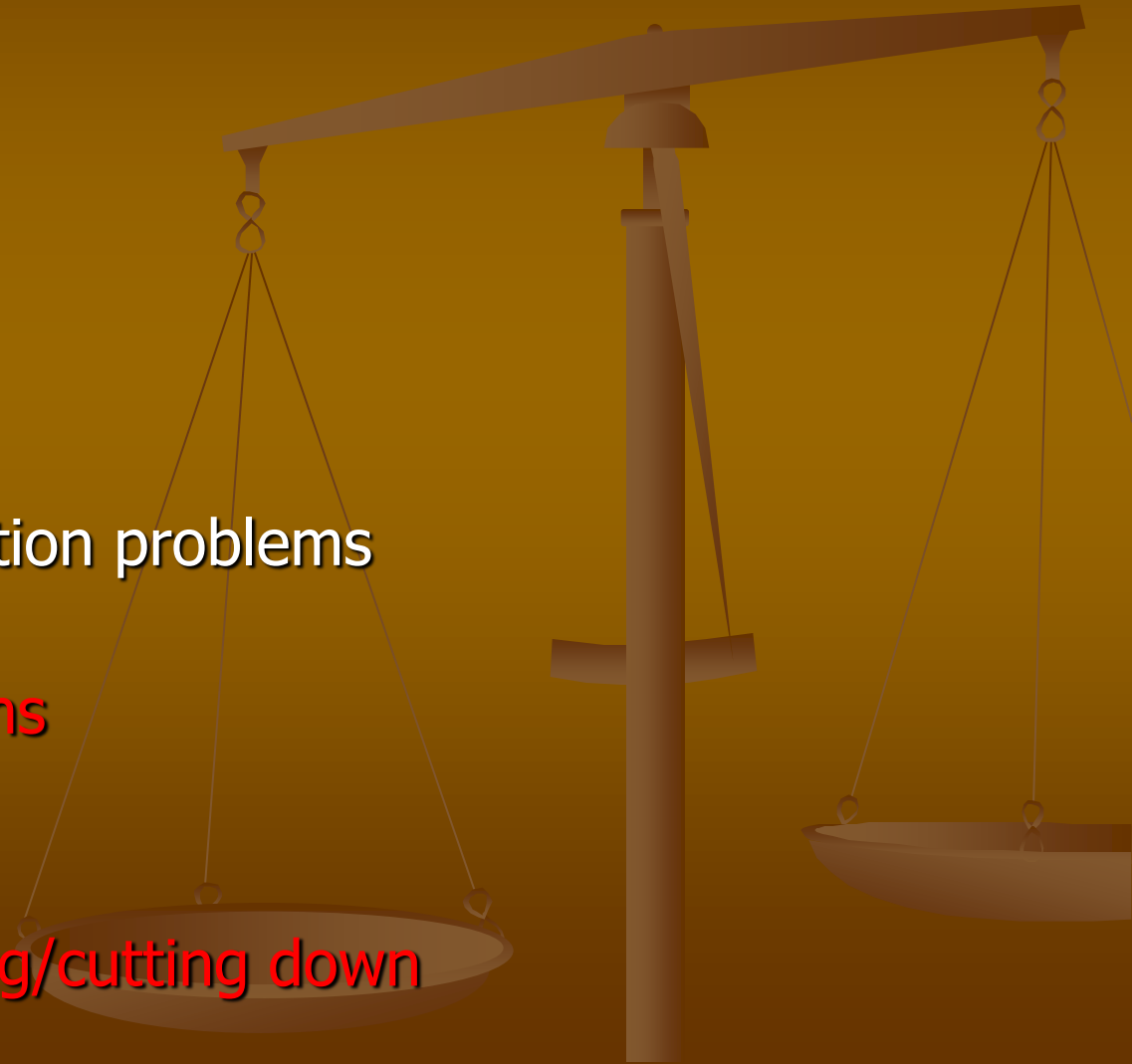


- Revised scale contrasted with original scale:
  - Internal consistency (Cronbach's alpha)
  - Test-retest reliability
  - Discriminant validity (SCID cannabis diagnosis)
  - Receiver operating characteristics
- Revised scale also examined for:
  - Predictive validity (motivation and cannabis use)
  - Sensitivity and specificity
  - Further discriminant validity (SCID abuse v dependence)

# CUDIT-R



1. Frequency
2. **Quantity (Revised)**  
~~Binge~~
3. Dyscontrol
4. Role interference
5. **Time ++**  
~~Guilty~~
6. Memory/concentration problems  
~~Injury~~
7. **Hazardous situations**  
~~Relief use~~  
~~Others concerned~~
8. **Thought of stopping/cutting down**





## The Cannabis Use Disorder Identification Test - Revised (CUDIT-R)

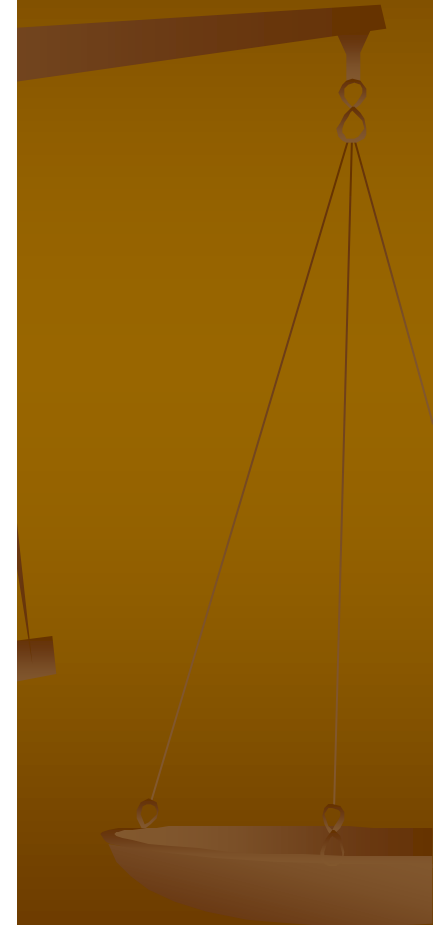
Have you used any cannabis over the past six months? YES / NO

If YES, please answer the following questions about your cannabis use. Circle the response that is most correct for you in relation to your cannabis use over the past six months

- |    |   |                  |   |                           |                                       |                                |
|----|---|------------------|---|---------------------------|---------------------------------------|--------------------------------|
| 1. | How often do you use cannabis?  | Never<br>0       | Monthly or less<br>1                      | 2-4 times<br>a month<br>2 | 2-3 times<br>a week<br>3              | 4 or more times<br>a week<br>4 |
| 2. | How many hours were you "stoned" on a typical day when you had been using cannabis?   | Less than 1<br>0 | 1 or 2<br>1                               | 3 or 4<br>2               | 5 or 6<br>3                           | 7 or more<br>4                 |
| 3. | How often during the past 6 months did you find that you were not able to stop using cannabis once you had started?                           | Never<br>0       | Less than monthly<br>1                    | Monthly<br>2              | Weekly<br>3                           | Daily or<br>almost daily<br>4  |
| 4. | How often during the past 6 months did you fail to do what was normally expected from you because of using cannabis?                          | Never<br>0       | Less than monthly<br>1                    | Monthly<br>2              | Weekly<br>3                           | Daily or<br>almost daily<br>4  |
| 5. | How often in the past 6 months have you devoted a great deal of your time to getting, using, or recovering from cannabis?                     | Never<br>0       | Less than monthly<br>1                    | Monthly<br>2              | Weekly<br>3                           | Daily or<br>almost daily<br>4  |
| 6. | How often in the past 6 months have you had a problem with your memory or concentration after using cannabis?                                 | Never<br>0       | Less than monthly<br>1                    | Monthly<br>2              | Weekly<br>3                           | Daily or<br>almost daily<br>4  |
| 7. | How often do you use cannabis in situations that could be physically hazardous, such as driving, operating machinery, or caring for children: | Never<br>0       | Less than monthly<br>1                    | Monthly<br>2              | Weekly<br>3                           | Daily or<br>almost daily<br>4  |
| 8. | Have you ever thought about cutting down, or stopping, your use of cannabis?  | Never<br>0       | Yes, but not in the past 6<br>months<br>2 |                           | Yes, during the past<br>6 months<br>4 |                                |

*This scale is in the public domain and is free to use with appropriate citation:*

Adamson SJ, Kay-Lambkin FJ, Baker AL, Lewin TJ, Thornton L, Kelly BJ, and Sellman JD. (2010). An Improved Brief Measure of Cannabis Misuse: The Cannabis Use Disorders Identification Test - Revised (CUDIT-R). *Drug and Alcohol Dependence* 110:137-143.



# CUDIT-R

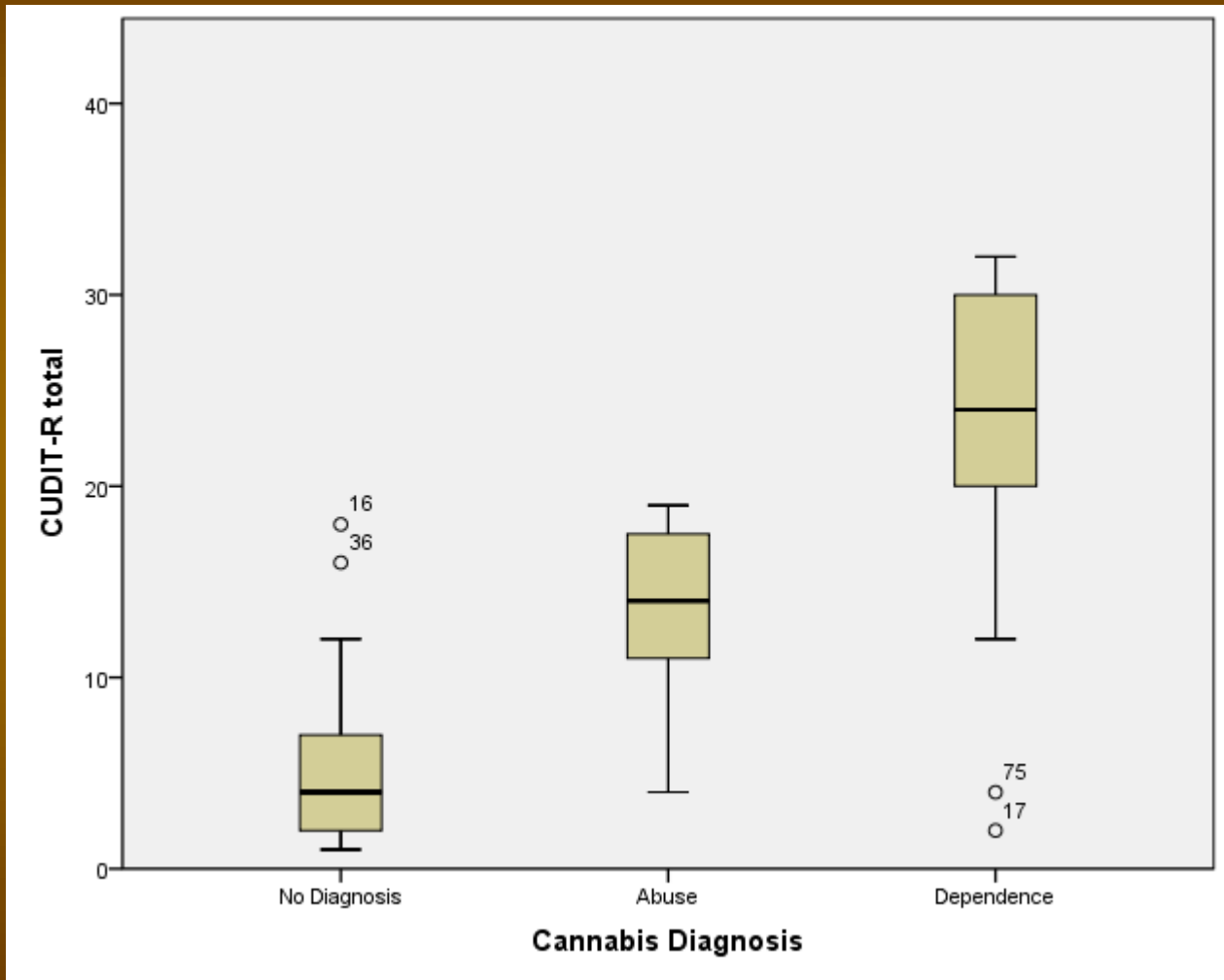


## CUDIT-R

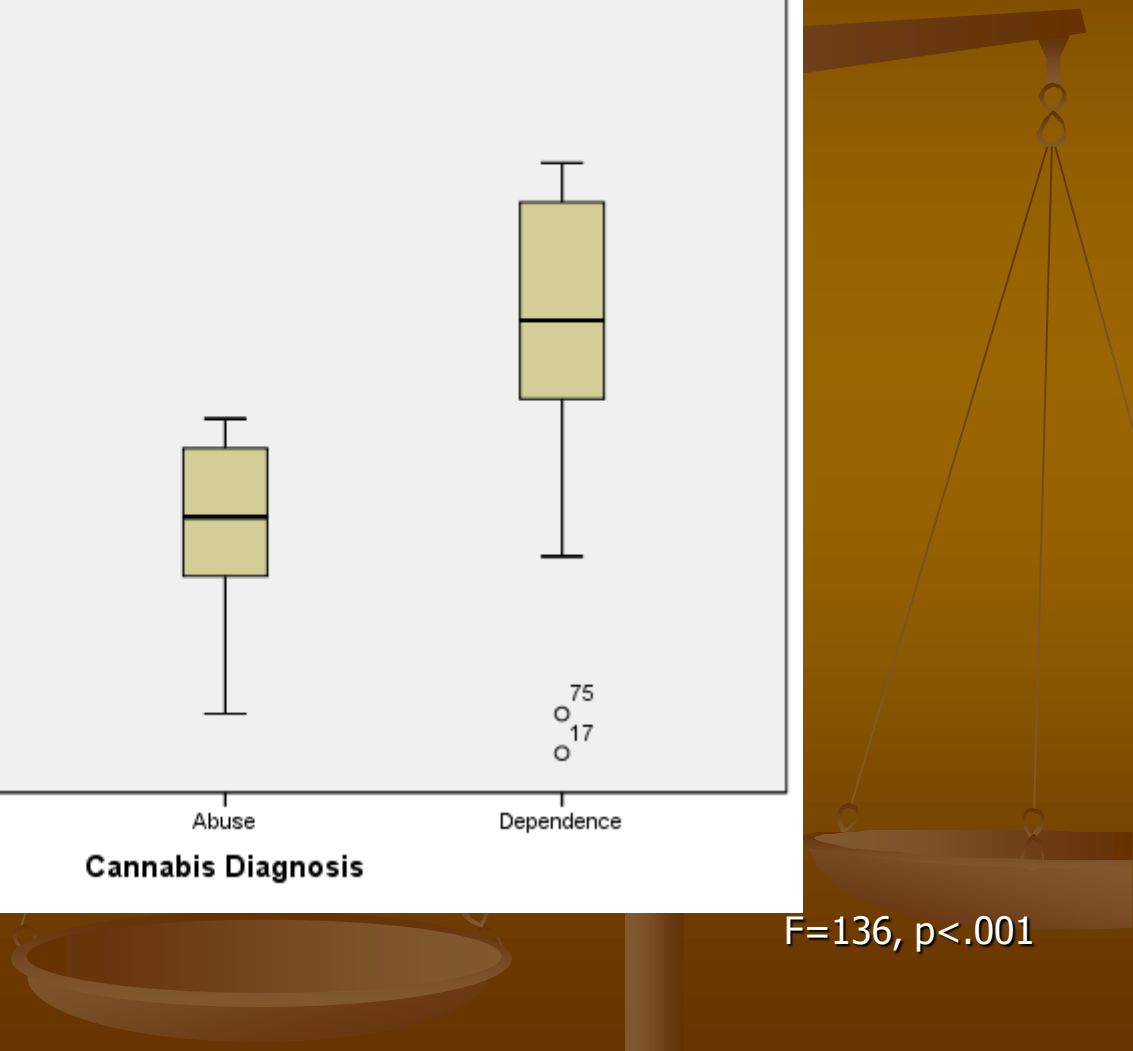
- Cronbach's alpha = 0.914
- Area under the curve = 0.960
- Test-retest (r) = 0.871
- Factor analysis 63.6%
- Cut-off of 13:
  - Sensitivity = 91.3%
  - Specificity = 90.0%
- 8 items

## CUDIT

- 0.907
- 0.934
- 0.849
- 56.0% & 10.4%
- Cut-off of 13:
  - 83.7%
  - 82.8%
- 10 items



F=136, p<.001





# Bruno et al.

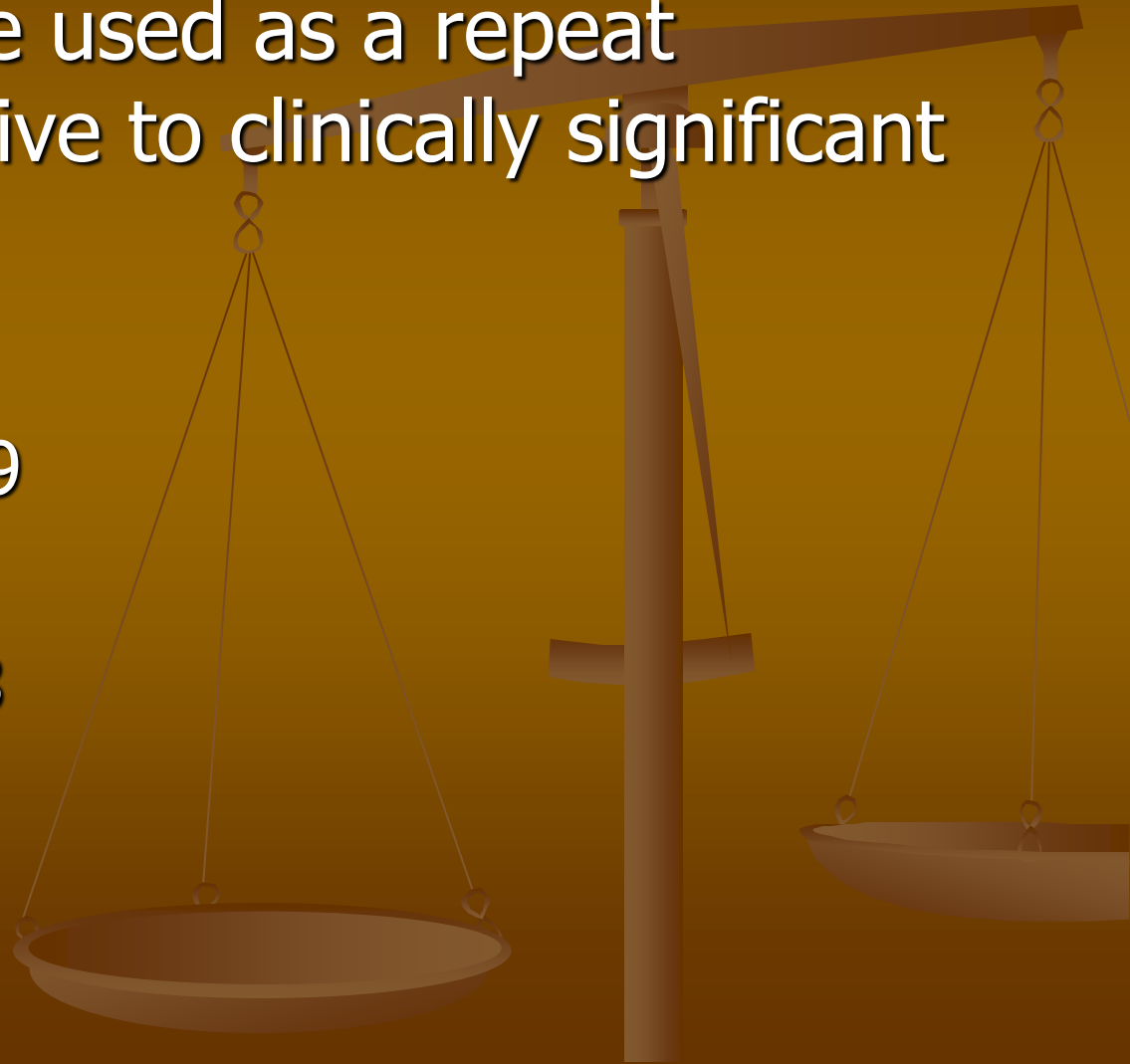


- 373 cannabis users from Tasmanian Illicit Drug and Ecstasy Reporting Systems
- Used 'T-CUDIT'
- Confirmed original CUDIT not unidimensional but CUDIT-R was
- Applied Item Response Theory, supporting inclusion of all CUDIT-R items
- Cronbach alpha = 0.907
- Good convergent and concurrent validity demonstrated

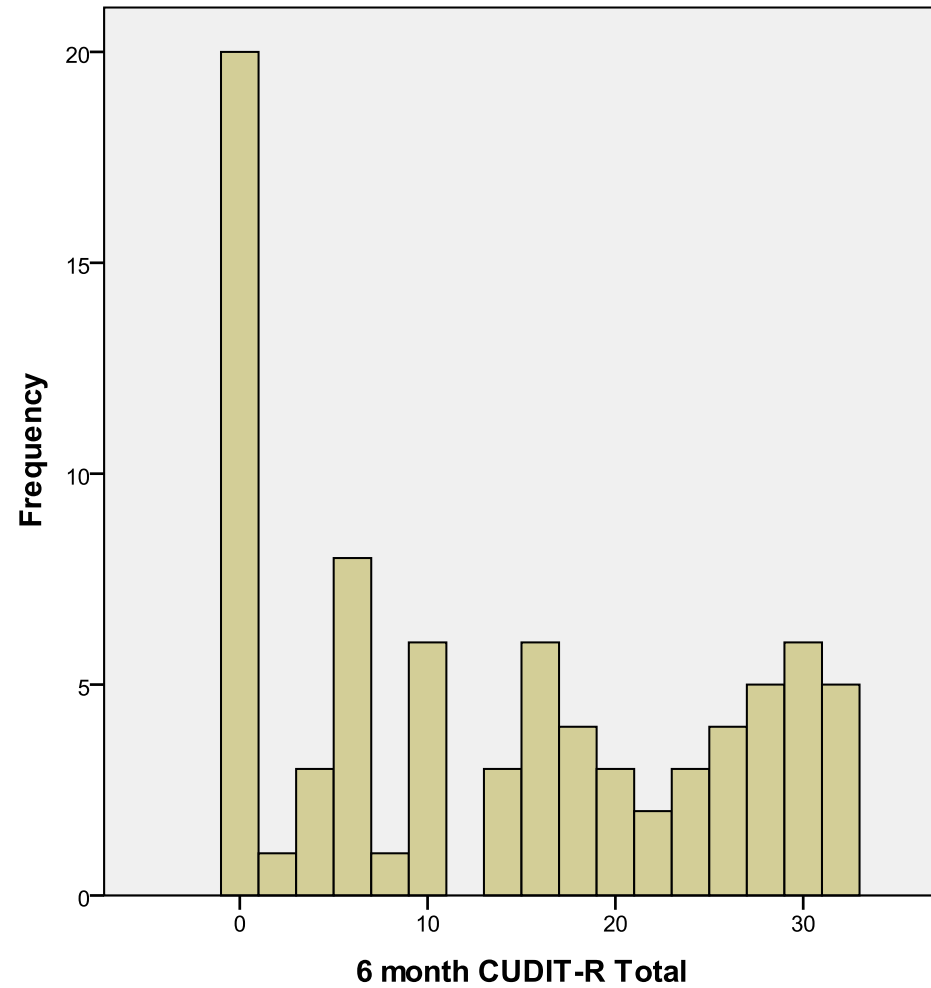
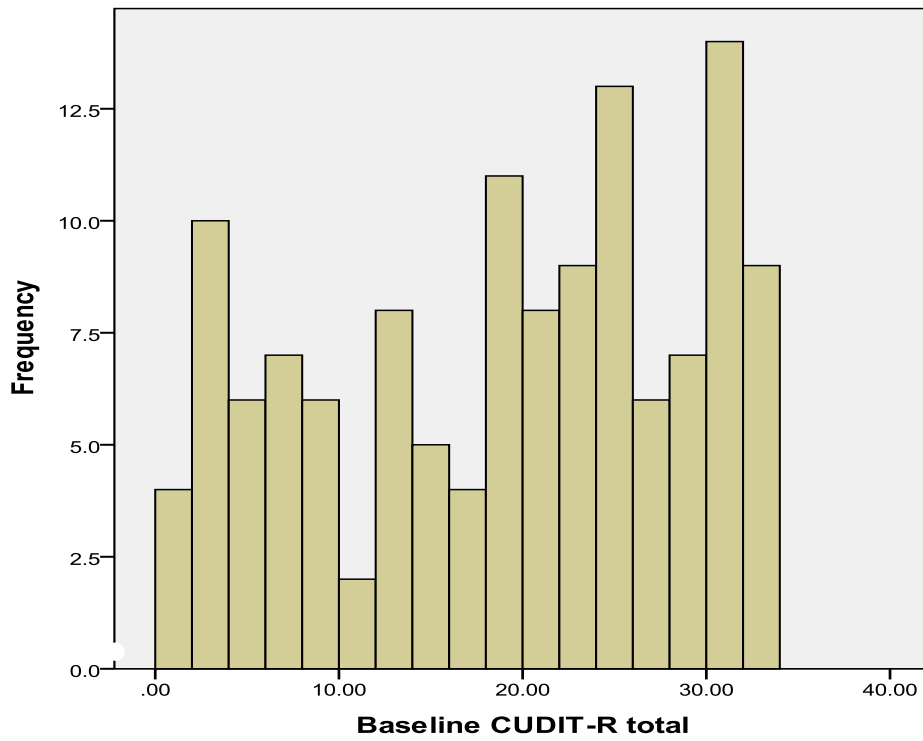
# Sensitivity to Change



- Can CUDIT-R be used as a repeat measure, sensitive to clinically significant change?
- SHADE Sample
  - Baseline, n=129
  - 6 month, n=80
  - 12 month n=78



# Score Distribution





- Change baseline to six and 12 months  $p < .001$

Still significant when abstainers removed

Change 6 to 12 months ns

- Effect Size:

Baseline – 6 months 0.47

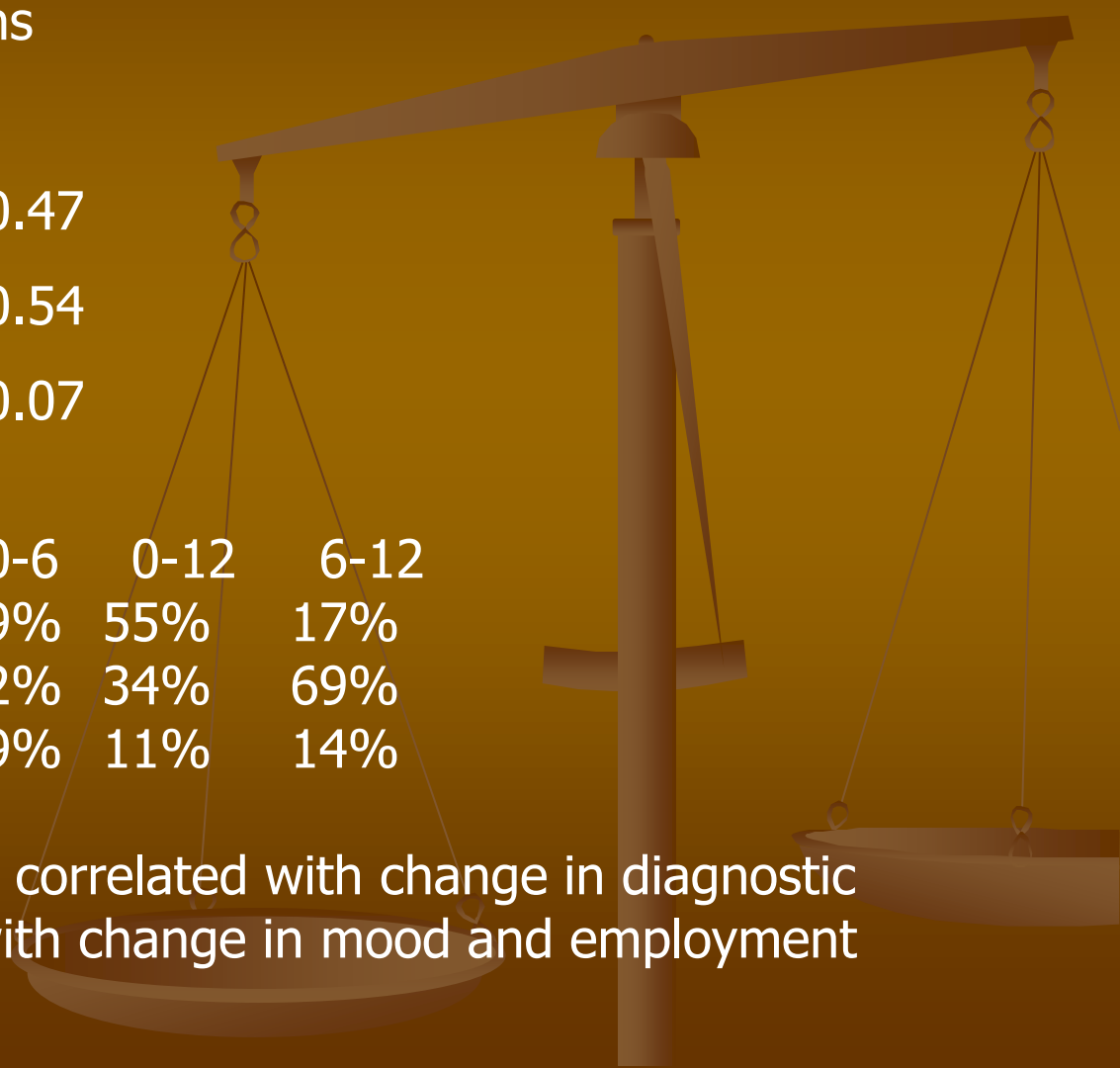
Baseline – 12 months 0.54

6 months – 12 months 0.07

- Reliable change =  $\pm 4$

	0-6	0-12	6-12
% improved	49%	55%	17%
% unchanged ( $\pm 3$ )	42%	34%	69%
% deteriorated	9%	11%	14%

- Change in CUDIT-R highly correlated with change in diagnostic category and correlated with change in mood and employment

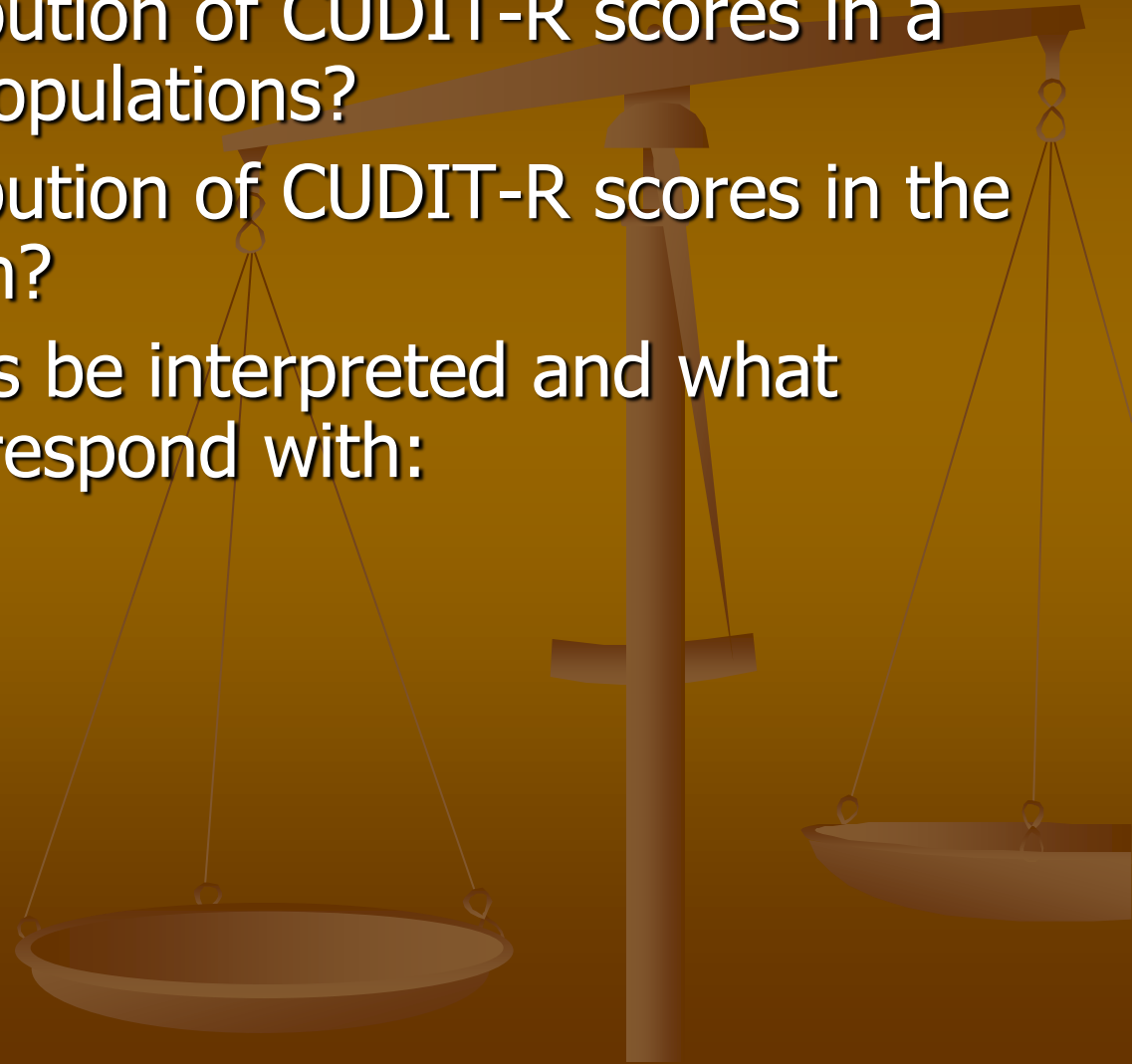


# Population Norms

Marshall, Bruno & Adamson



- What is the distribution of CUDIT-R scores in a range of clinical populations?
- What is the distribution of CUDIT-R scores in the general population?
- How should scores be interpreted and what scores should correspond with:
  - non-problem use
  - Mild
  - Moderate
  - Severe



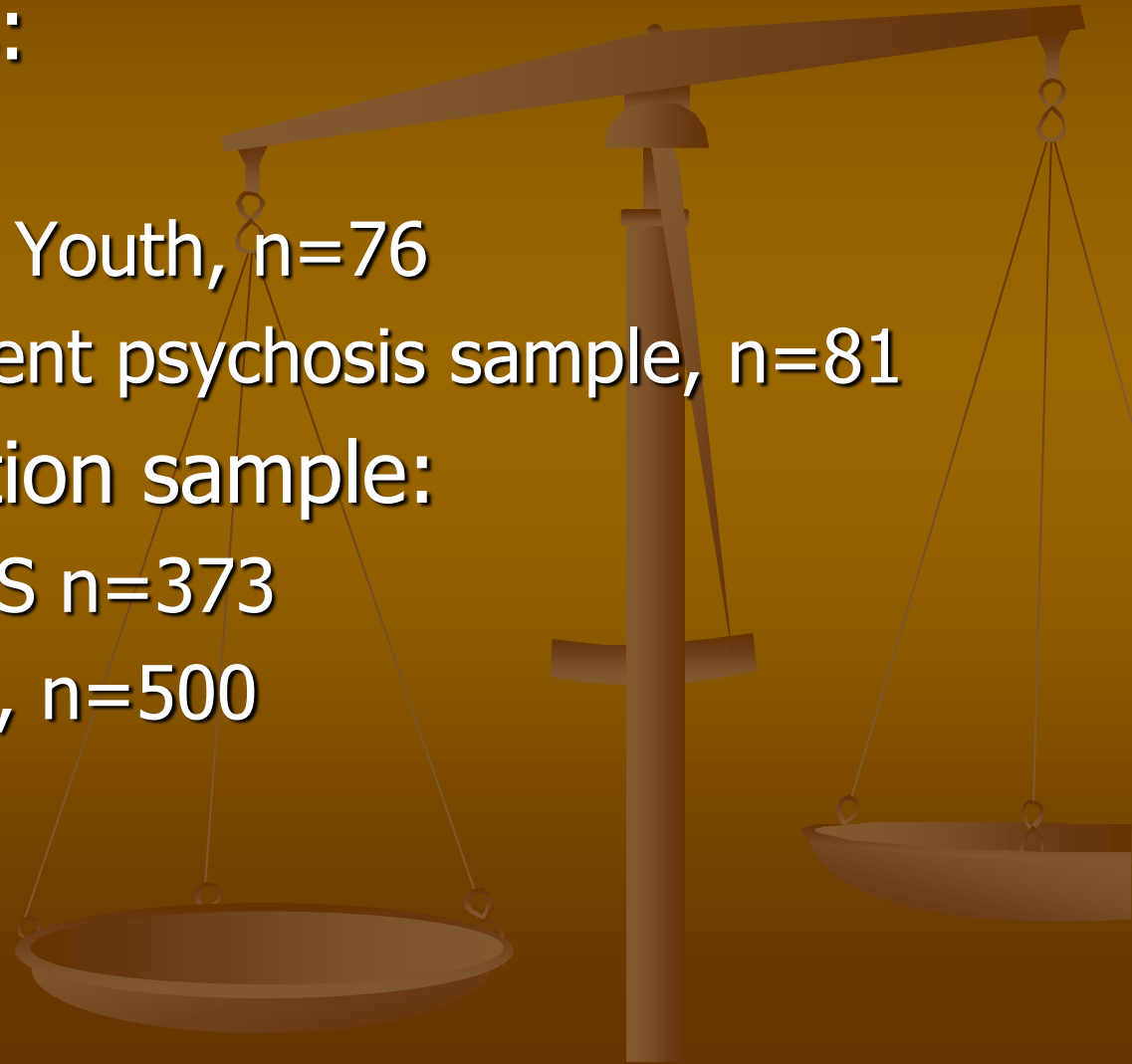


# Population Norms

Marshall, Bruno & Adamson



- Clinical samples:
  - SHADE, n=144
  - Odyssey House Youth, n=76
  - Hamilton inpatient psychosis sample, n=81
- General population sample:
  - Tasmanian IDRS n=373
  - Internet survey, n=500



# General reflections

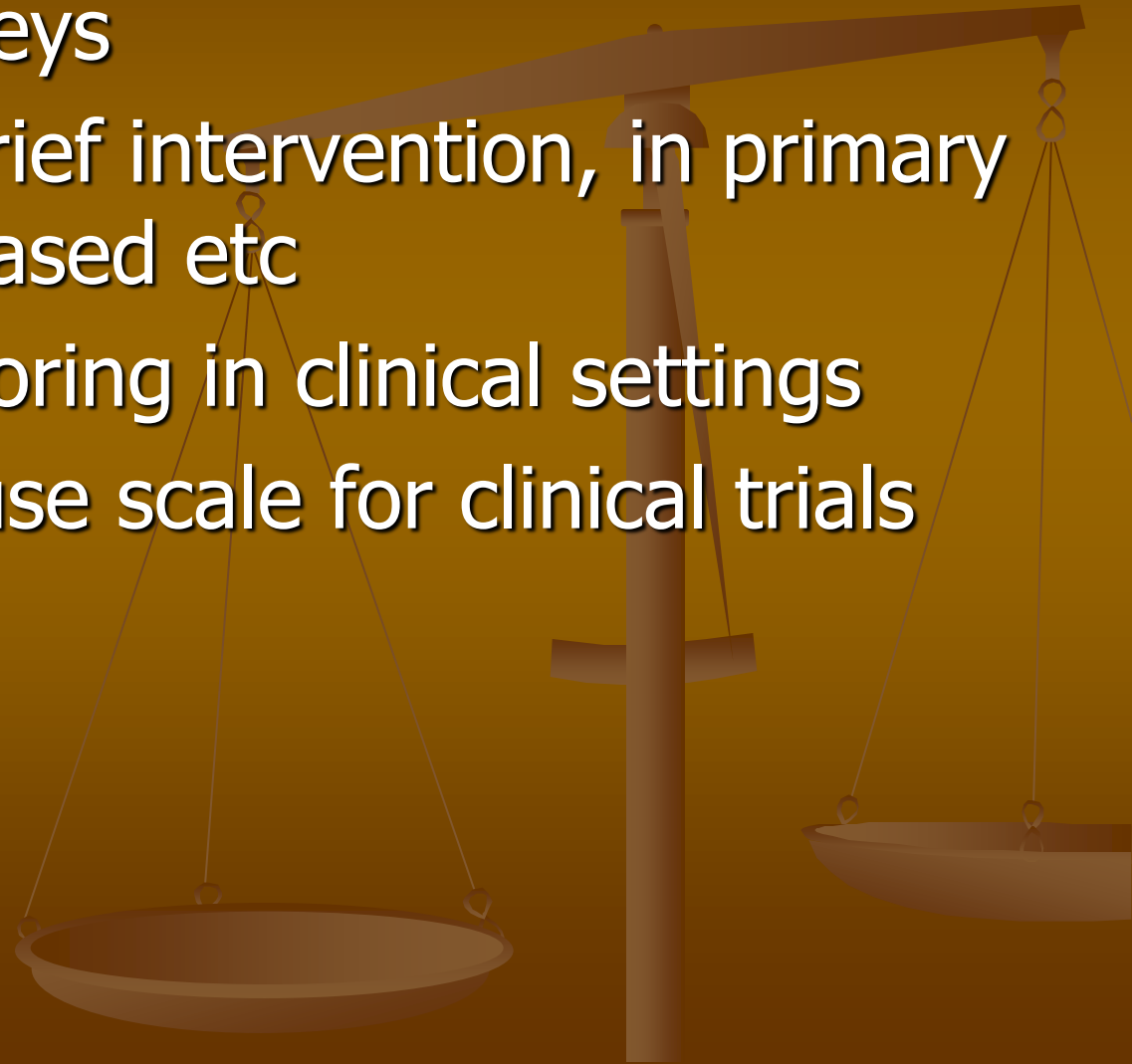


- General response since publication indicates the need for such a measure
- CUDIT/CUDIT-R being used for a range of purposes in different populations
- BTP and SHADE both opportunistic samples
- Performance as outcome measure in primary cannabis populations?
- Need to examine more in general populations
- Interpretive guide much needed
- Given it's brevity, breadth, and simplicity of scoring the CUDIT-R is, in general, the best of the available options.

# Applications for CUDIT-R



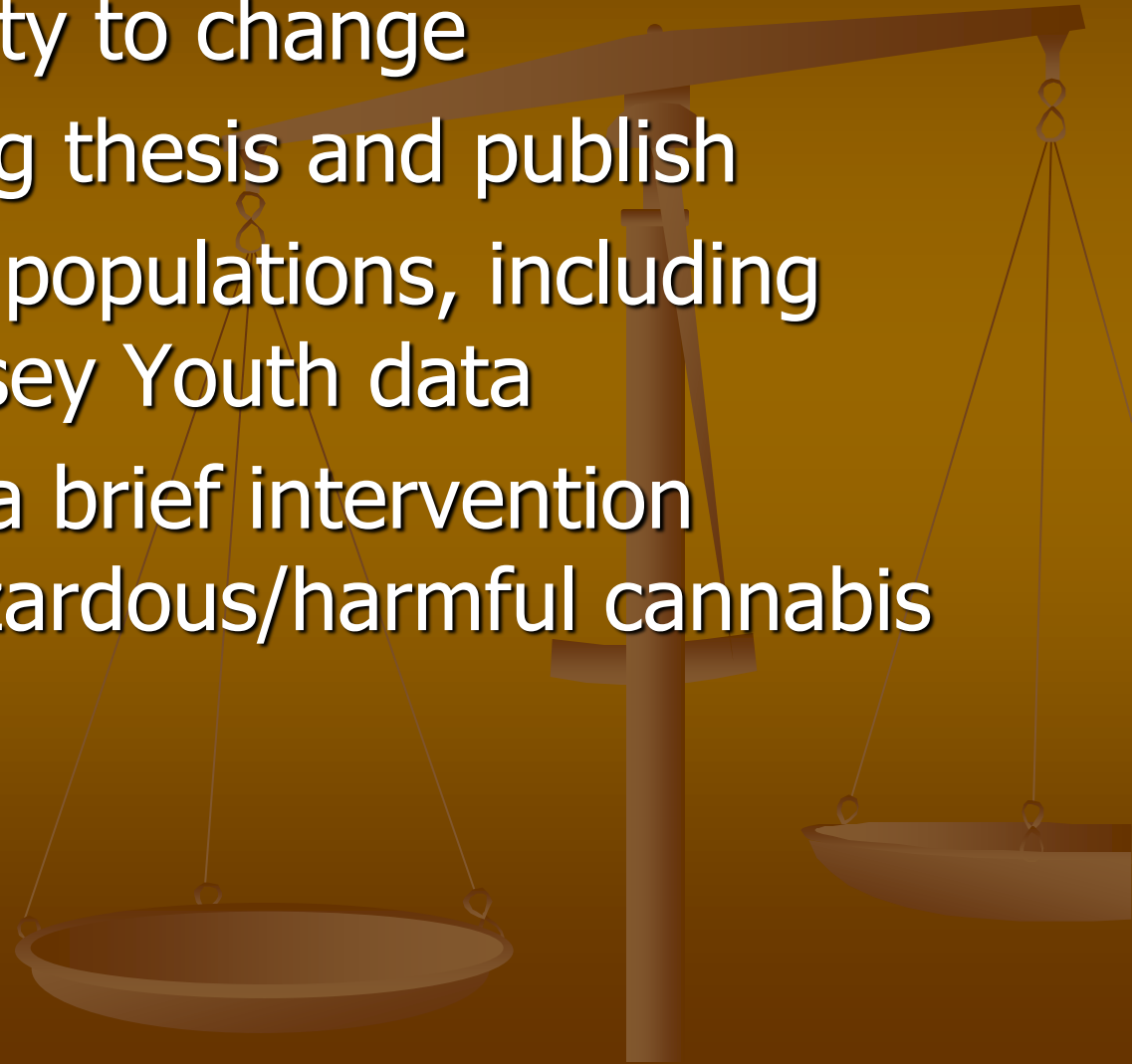
- Population surveys
- Screening for brief intervention, in primary care, internet based etc
- Outcome monitoring in clinical settings
- Brief cannabis use scale for clinical trials



# The Next Step.....



- Publish sensitivity to change
- Support norming thesis and publish
- Test with other populations, including analysing Odyssey Youth data
- Test as part of a brief intervention package for hazardous/harmful cannabis use





*Thank you*

