# **New Research Directions in Young** Adult Marijuana Use, **Consequences, and Prevention**

**University of Washington** 

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#### Research questions related to a changing legal climate

How will use by youth and adolescents be affected? 19% of seniors said they would try mj or increase use if legalized

Source: Kilmer & Lee (2013)

#### Marijuana News

More pot at school since law passed, superintendent says



1 by TRAVIS PITTMAN / KING 5 News Posted on December 11, 2012 at 11,54 AM Updated Tuesday, Dec 11 at 1:40 PM

 L2/11/12
 Law mage
 Vashington's school superintendent ending a reminder to students and arents. Just because the state has legalized marijuana possession, you still can't have it or use it at school.

Superintendent Randy Dom said Tuesday that there are reports from school districts indicating an increase of pot possession and use by young ennile experially since where nasses

Marijuana News

greater community acceptance of marijuana that could already be in motion based on the Initiative 502, attitudes about their own use

change e of the

could cha





Healthy Youth Survey March, 2013

Marijuana: perception of harm continues to go down mented (there are still qu

EPTION OF RISK FROM MARIJU pasingly more students think using n

| QUESTION: Using manijuana regularly has no risk/anly<br>slight risk. |    |
|--|----|
|  | 33 |
|  | 30 |
|  | 20 |

20% 20% 20% 200 - 20% Grade - 12% Grade - 12% Grade

# Research questions related to a changing legal climate

- How will use by youth and adolescents be affected?
   19% of seniors said they would try mj or increase use if legalized
- How is DUI reliably measured, and how long after use should one wait before driving?
- Will increased availability result in increased use (regardless of age group)?

Source: Kilmer & Lee (2013)

#### Impact of Outlet Density for Alcohol

Restrictions on alcohol retail outlet density.

- Higher density of alcohol outlets is associated with higher rates of consumption, violence, other crime, and health problems.
- Higher level of drinking rates associated with larger number of businesses selling alcohol within one mile of campus

From: "A Call to Action: Changing the Culture of Drinking at U.S. Colleges," NIAAA Task Force

# Research questions related to a changing legal climate

- How will use by youth and adolescents be affected?
   19% of seniors said they would try mj or increase use if legalized
- How is DUI reliably measured, and how long after use should one wait before driving?
- Will increased availability result in increased use (regardless of age group)?
- What, if any, are the harm reduction guidelines for marijuana use?
- Will an illegal market truly be avoided through legalization & sales through state-regulated stores?
   Source: Kilmer & Lee (2013)

# How do we approach this situation?

# Similarities between marijuana and alcohol

- Regardless of what state we're talking about, it is illegal for those under 21 to use and possess
- Illegal to drive while under the influence of marijuana
- Adolescents/students may see several positive reasons for use

### Motivations for Use

- Largely consistent with the alcohol literature, social, enhancement, and coping motivations are positively related to marijuana use.
- Coping motivations singled out as particularly important for predicting marijuana use and negative consequences.
- Limitation prior work utilized adapted measure of motivations for alcohol use.

Lee, Neighbors, & Woods (2007)

## Motivations for Use

We utilized qualitative open-ended responses for using marijuana among incoming first year college students to identify which motivations were most salient to this population

Lee, Neighbors, & Woods (2007)

# Motivations for Use

| Motive Category   | Proportion of<br>participants<br>endorsing motive | Proportion of<br>primary<br>motives |
|---|---|-------------------------------------|
| Enjoyment/fun (e.g., be happy, get high, enjoy feeling)                                     | 52.14%  | 24.03%                              |
| Conformity (e.g., peer pressure, friends do it)   | 42.81%  | 16.40%                              |
| Experimentation (e.g., new experience, curiosity)   | 41.25%  | 29.36%                              |
| Social enhancement (e.g., bonding with friends, hang out)                                   | 25.71%  | 8.66%                               |
| Boredom (e.g., something to do, nothing better to do)                                       | 25.08%  | 4.15%                               |
| Relaxation (e.g., to relax, helps me sleep)   | 24.64%  | 6.97%                               |
| Coping (e.g., depressed, relieve stress)  | 18.14%  | 5.10%                               |
| Availability (e.g., easy to get, it was offered)  | 13.74%  | 2.23%                               |
| Relative low risk (e.g., low health risk, no hangover)                                      | 10.88%  | 0.95%                               |
| Altered perception or perspectives (e.g., to enhance experiences,<br>makes things more fun) | 10.58%  | 1.81%                               |
| Activity enhancement (e.g., music sounds better, every day activities<br>more interesting)  | 5.68%   | 0.80%                               |
| Rebellion (e.g., rebelling against parents, thrill of something illegal)                    | 5.21%   | 0.32%                               |
| Alcohol intoxication (e.g., I was drunk)  | 4.42%   | 0.47%                               |
| Food enhancement (e.g., enjoy good food, food tastes better)                                | 3.79%   | 0.00%                               |
| Anxiety reduction (e.g., be less shy, feel less insecure)                                   | 3.31%   | 0.00%                               |
| Image enhancement (e.g., to be cool, to feel cool)  | 2.85%   | 0.32%                               |
| Celebration (e.g., special occasion, to celebrate)  | 1.26%   | 0.16%                               |
| Medical use (e.g., alleviate physical pain, have a headache)                                | 1.26%   | 0.16%                               |
| Habit (e.g., feeling was addictive, became a habit)   | 0.95%   | 0.00%                               |
|   | Lee, Neighbors 8                                  | Woods (2007                         |

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## Withdrawal: Cannabis

| Di | agnostic Criteria  | 292.0 (F12.288)               |
|----|--|-------------------------------|
| Α. | Cessation of cannabis use that has been heavy and prolonged (i<br>daily use over a period of at least a few months). | i.e., usually daily or almost |

- B. Three (or more) of the following signs and symptoms develop within approximately 1 week after Criterion A: 1. Irritability, anger, or aggression.
- 2. Nervousness or anxiety.
- 3. Sleep difficulty (e.g., insomnia, disturbing dreams).
- 4. Decreased appetite or weight loss.
- 5. Restlessness.

- 6. Depressed mood.
- At least one of the following physical symptoms causing significant disco abdominal pain, shakiness/tremors, sweating, fever, chills, or headache.

- C. The signs or symptoms in Criterion B cause clinically significant distress or impairment in social, occupational, or other important areas of functioning. O. The signs or symptoms are not attributable to another medical condition and are not better explained by another mental disorder, including intoxication or withdrawal from another substance.



### Similarities between marijuana and alcohol

- □ Regardless of what state we're talking about, it is illegal for those under 21 to use and possess
- Illegal to drive while under the influence of marijuana
- Adolescents/students may see several positive reasons for use
- Misperceptions of the prevalence of use exist
  - Most sizeable misperceptions come from heaviest users

#### NORM PERCEPTION

- In survey of 5990 participants, 67.4% of students said the hadn't used MJ in the past year
   Thus, "most" students don't use marijuana
- □ Only 2% of students got this right!
  - 98% of students perceived the typical student to use at least once per year
- Misperceptions were related to use and consequences

Kilmer, et al. (2006)

### NORM PERCEPTION

- Perception of more frequent marijuana use by friends was associated with one's own use
  - Significantly more so when friends were perceived as being more approving of marijuana use
- Relationship to consequences was more complex
   Descriptive norms were positively associated with
  - consequences
     Only in the context of higher social expectancies, injunctive norms were negatively associated with consequences, particularly when accompanied by perceptions of frequent use

Neighbors, Geisner, & Lee (2008)

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- Misperceptions of the prevalence of use exist Most sizeable misperceptions come from heaviest users
- If target population is mandated students, these individuals did not choose to be in attendance at a class or workshop and may be resistant
- Brief motivational enhancement approaches seem promising for making an impact
- Mixed messages around enforcement could impact behavior

# SPD BLOTTER

"Officers Shall Not Take Any Enforcement Action—Other Than to Issue a Verbal Warning—For a Violation of I-502."

# seattle

Getting baked outside? Seattle police to look other way er 5. 2012 by:

KING 5, 12/6/12

"At least for now, Seattle Police plan to look the other way on the latter part until people get used to the new law."

# JERSEY101.5

Seattle Police Release Hilarious Statement About Legalized Marijuana

# CITYDESK

BAREDUARA Seattle Police to Pot Smokers: 'Responsibly Get Baked, Enjoy Lord of the Rings Marathon'

# We thought you might be inung.y. We also thought now might be a good time

for a refresher on the do's and don'ts of I-502.

DON'TS Don't drive while high. Don't give, sell, or shotgun weed to people under 21. Don't use pot in public. You could be cited but we'd rather give you a warning. DO'S Do listen to Dark Side of the Moon at a reasonable volume. Do enjoy Hempfest.

Remember: respect your fellow voters and familiarize yourself with the rules of I-502 at seattle.gov/police/marijwhatnow , SPD

# Seattle police to hand out Doritos to Hempfest attendees instead of public consumption tickets

By William Breathes in News, Say what? Thursday, August 15, 2013 at 11:20 am 3 Comments



### What are the differences/challenges?

- Unlike alcohol, no clear guidelines for a point at which risks are minimized
- Unlike alcohol, hard to estimate standard amount, intoxication levels, potency, etc.
  - Established measures of use and consequences are much less available
  - Those that are tend to be adapted from alcohol measures
- Being "into" marijuana use may reflect much larger lifestyle/identity

#### IDENTITY

- Students who use marijuana identified more strongly with "typical students" than with other marijuana using students
- Implications for motivational enhancement based interventions
  - Discrepancies
  - Impact of judgments or labels

Neighbors, Foster, Walker, Kilmer, & Lee (2013)

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  - Established measures of use and consequences are much less available
- Those that are tend to be adapted from alcohol measures
- Being "into" marijuana use may reflect much larger lifestyle/identity
- Perceived risk for future consequences, even if ones already experienced by the student, can be low

#### **RISK PERCEPTION**

- 43% of marijuana users experienced a past year academic consequence
  - Only 20% perceived risk for a future academic consequence, compared to 71% of abstainers
- 35% of marijuana users experienced a past year social consequence
  - Only 9% perceived risk for a future social consequence compared to 55% of abstainers

Kilmer, et al. (2007)

What do the data tell us about rates of use right now?

# Substance Use Data from Monitoring the Future Study

| Past Year MJ Use  | Past 30 day MJ Use   |
|---|--|
| <ul> <li>11.4% of 8<sup>th</sup> graders</li> <li>28.0% of 10<sup>th</sup></li> <li>36.4% of 12<sup>th</sup></li> <li>34.9% of college<br/>students</li> <li>30.2% of young<br/>adults</li> </ul> | <ul> <li>6.5% of 8<sup>th</sup> graders</li> <li>17.0% of 10<sup>th</sup></li> <li>22.9% of 12<sup>th</sup></li> <li>20.5% of college students</li> <li>17.7% of young adults</li> </ul> |

Source: Johnston et al. (2013)

# Information relevant to the school setting

America's Dropout Crisis:

The Unrecognized Connection To Adolescent Substance Use

"There is no problem so bad that alcohol and drugs will not make it worse."

Robert L. DuPont, M.D.<sup>1</sup> Kimberly M. Galdeira, M.S.<sup>2</sup> Helen S. DuPont, M.B.A.<sup>3</sup> Kathryn B. Vincent, M.A.<sup>2</sup> Corinne L. Shea, M.A.<sup>1</sup> Amelia M. Arria, Ph.D.<sup>23</sup>

#### March 2013

#### http://www.cls.umd.edu/docs/AmerDropoutCrisis.pdf

<sup>1</sup> Institute for Behavior and Health, Inc. (IBH), 6191 Executive Boulevard, Rockville, MD, 20852. <sup>2</sup> Center on Young Adult Health and Development (CYAHD), University of Maryland School of Public Health, 1142 School of Public Health Building, College Park, MD 20742.

 "Of all the problems that contribute to dropping out, substance use is one of the easiest to identify and one of the most easily stopped by interventions including treatment."

• "Research evidence shows that when adolescents stop substance abuse, academic performance improves."

#### America's Dropout Crisis:

#### The Unrecognized Connection To Adolescent Substance Use

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• Substance using students are at increased risk for academic failure, including drop out

 Marijuana has stronger negative relationship to GPA and other outcomes and risk for dropout than alcohol use

• "The more severe the substance use, the more likely the impact on academic performance and risk for dropout."

### Marijuana use trajectories: Source: Arria, 2013 relationship to "discontinuous" enrollment



Considering Responses:

What Works and What Lessons Can We Learn From Alcohol?

# **Eliciting Information**

"What are the good things about marijuana use for you?"

"What are the not-so-good" things about marijuana use?"

"What would it be like if some of those not-sogood things happened less often?"

"What might make some of those not-so-good things happen less often?"

What are the negative consequences associated with young adult marijuana use?

#### MARIJUANA CONSEQUENCES MEASURES

- Most college student marijuana consequence measures adapted from established alcohol measures
- May not adequately capture experiences of students
- Particularly important to capture unwanted effects if hoping to provide feedback on "consequences" in motivational enhancement programs.
- Students (n=207) were asked to identify up to five effects of marijuana use that "may not have been so good"
  - 805 separate effects identified
  - 193 students listed at least one consequence/effect
     88% of these listed 3 or more consequences

#### Sample list of consequences offered by students in open-ended survey

#### Top 10 Endorsed Marijuana Consequences: Study 1

- 1. Eating (e.g., eating too much) 2
- Sleep problems
- Productivity, apathy, motivation issues, or boredom Cognitive abilities, attention, or concentration problems 3 4.
- Memory problems
   Problems with lungs or coughing
- Problems with hings of coupring social awkwardness
   Physical difficulties outside of lungs, cough, mouth, or throat
- (e.g., feeling dizzy, sick, uncoordinated, etc.) 9. Not getting things done
- 10. Spending too much money

Notes. Preliminary analyses suggested that among the top ten types of consequences generated by participants, only two (not getting things done and financial impact) were reflected in items from the RHPI, and these two were the ninth and tenth most mentioned consequences.

Walter, Kilmer, Logan, & Lee (2012)

Lee, Kilmer, Neighbors, Walters, Garberson, & Logan (in prep)

#### MEASURE DEVELOPMENT

- 22 item College Marijuana Consequence Scale was developed
- Compared responses to the 18-item Rutgers Marijuana Problem Index (RMPI)
- 410 students who used marijuana at least once in the past 30 days



#### **CONCLUSIONS/NEXT STEPS**



Setting the stage for brief interventions, education, prevention, and outreach

# Personalized Feedback Interventions

Lee, C.M., Kilmer, J.R., Neighbors, C., Atkins, D.C., Zheng, C., Walker, D.D., & Larimer, M.E. (2013). Indicated prevention for college student marijuana use: A randomized controlled trial. *Journal of Consulting and Clinical Psychology*, *81*, 702-709.

*individualized* College Health for Alcohol and Marijuana Project (R21DA025833)



#### *i***CHAMP Participants** Two public PNW universities/colleges 1712 Screening criteria: Screened 5+ days use MJ past month Demographics (N = 212) 242 a 45.3% Female 74.8% White Invited to trial Mean Use at Screening 7.6 joints per week / 14.2 days past month (Campus 1) 212 10.5 joints per week / 18.3 days past month (Campus 2)









#### Consequences Associated with Marijuana Use **Consequences You Endorsed**

# \*

Social/Personal • Missed out on other things because you spent too much money on marijuana

These are the consequences you reported in the past 60 days...

- Academic / Cognitive Weak to work or school high Weak to work or school high Head academic adapts to perform tasks requiring concentration and coordination Head Invert motivation to do things
- Physical/Health
   O Had a loss of coordination or poor sense of balance
   Had afficulty listening or speaking
   O Had a cough

#### In all you indicated that 8 out of 25 marijuana-related consequences had occurred in the past 60 days. Consequences Related to Abuse/Dependence

- The consequences below are possible signs that a pattern of use could be associated with marijua abuse or marijuana dependence.
- In the past year, you endorsed ...
- 0 out of 4 consequences which are signs of marijuana abuse. 2 out of 7 consequences which are signs of marijuana dependence, including:
- You needed more marijuana to get the same high or found the same amount did not get you as high as it use to.
   You spent a lot of time either getting marijuana, using marijuana, feeling the effects of marijuana, or waiting for the effect to sever off.





| et's explore who's i  | Networ<br>mportant to  | r <b>k</b><br>you and        | who you ci                        | in count on fo   | r help | or support                                   |   |
|---|--|------------------------------|-----------------------------------|--|--------|--|---|
| Person's name or  | initials   | Does thi<br>know yo<br>marij | is person<br>ou smoke<br>juana?   | How does   | (or wo | uld) this pe<br>marijuana u                  | rson feel about your<br>ise?  |
|   |  |                              |                                   |  |        |  |   |
|   |  |                              |                                   |  |        |  |   |
|   |  |                              |                                   |  | _      |  |   |
| <b>Your Goals</b><br>ou listed these as y   | our 5 most k   | mportant                     | - coale                           |  |        |  | SOAL  |
|   |  |                              | a deserve                         |  |        |  | -   |
| Very Negatively   | Negati<br>2  | ively                        | Not Posi<br>Nega                  | itively or<br>tively<br>3  | Po     | sitively<br>4                                | Very Positively<br>5  |
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# **Our Findings**



At 3 months, intervention participants reported 24% fewer joints smoked per week relative to control participants.



At 3 months, intervention participants reported 21% fewer hours being high per week relative to control participants.





# **Thoughts from iCHAMP**

- Very encouraging results!
- No difference in # of days used, but how students are using within day
- Six months?
  - Assessment effects?
  - Seasonal effects?
  - Need for booster sessions?
- Attendance rates
  - 85% received feedback; 55% in-person
  - How do we get non-treatment seeking, non-mandated individuals to attend an intervention?

# Interventions for Mandated College Students

# Interventions for marijuana use with mandated students

- Need for group had been established.
- No "Tier I" type of interventions for marijuana use
- Motivational-enhancement based interventions have demonstrated success with mandated students for alcohol
- Motivational-enhancement based groups can impact drug use in the general adult population
- MOD was developed using ASTP as a model
- Using measure from past ABRC/CSHRB studies, pilot data were collected to see if the workshop "performs" the way a motivational-enhancement based program should

# **MOD Content**

- Elicit the "good" things and the "not-so-good" things about marijuana use from students
- Where applicable, bring in what the science says about the consequences students have identified
- Where applicable, highlight ways in which these "not-sogood" things can be reduced or eliminated
- Explore what would make some of those "not-so-good" things happen less often
- Review other substances when relevant and/or of interest to the participants



# Sample list of "not-so-good" things generated by students

Red eyes

- Impact on quality of sleep
- Laziness
- Paranoid
- Memory problems
- Not socially acceptable Groggy the next day
- Lung health
- Cost (money)
- Socially awkward
- Endurance
- Hard to quit even if you want to

- Concentration goes down Hard to sustain attention on one thing for long
- Coughing

Hard to focus

- Legal risks and concerns
- How viewed by others Assumptions from others
- Self-conscious
- Things get weird
- Not saying anything in social situations 
  Never truly satisfied (and want to
- Mental addiction
- get high more often) Less motivated
- Weight gain

Surveys from 54 completers during the 2011-2012 academic year

# **Contemplation of change:**

- The information I received will cause me to think differently about my pattern of substance use
  - 88.7% strongly agree or agree
  - 7.5% are undecided
  - 3.8% disagree or strongly disagree

# Intent to change:

- The information I received will cause me to
  - change my pattern of substance use
  - 39.6% strongly agree or agree
  - 45.3% are undecided
  - 15.1% disagree or strongly disagree
- □ I left the presentation with a specific goal in
  - mind about changing my substance use **31.4%** strongly agree or agree
  - 45.1% are undecided
  - 23.5% disagree or strongly disagree

# Next steps...

- Now that two years of post-intervention surveys have been collected as pilot data, move toward follow-up with behavioral outcomes (collaboration with SUNY-Albany)
- Continue to incorporate new scientific findings into conversations with students
- Examine elements/components contributing to intent to change and/or actual change
- Further identify strategies for reducing harm

# Future directions: Administrative Supplement!

## R01AA018276 Alcohol Use Trajectories and Prevention: A US-Sweden Comparison

# Administrative Supplement

- Evaluate the impact of recent legislation on adolescent perceptions of risks, access to marijuana, and marijuana trajectories as they transition to adulthood
- Recruited data from HS seniors in 2010 and 2011, with follow-up every 6 months
- Quasi-natural experiment to explore impact of I-502 among adolescents

# **Study Timeline**



# Research questions related to a changing legal climate

How will use by youth and adolescents be affected?

Source: Kilmer & Lee (2013)

# Specific Aims of Supplement

• Will MJ use be higher after passage of I-502 beyond what is expected by time trends?

• Will increases be high among those who still live in WA? Examine perceptions of risk and perceived access to mj pre-/post-December 2012

- Will perceived risk be lower and perceived access be higher after I-502?
- Will hypothesized decreases in PR and increases in PA will be higher for those still living in WA?

Research questions related to a changing legal climate

Will increased availability result in increased use (regardless of age group)?

Source: Kilmer & Lee (2013)

# Specific Aims of Supplement

• Will individuals living in areas with a higher density of retail outlets and in closer proximity to outlets will report greater increases in use, consequences, perceived access, and perceived descriptive marijuana norms and greater decreases in perceived risk?

Examine understanding of laws and perceptions of enforcement and relation to personal MJ use

- The degree to which each component of state law is understood
- The degree to which there is support for/opposition to each component
- Perceptions of the enforcement of what remains illegal under I-502 (e.g., use by minors, use in public, dealing, etc.).

# Thank you!

Special thanks to:

🗆 ADAI

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