



### 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)

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### 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

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### Research questions related to a changing legal climate

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  - 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)

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## How do we approach this situation?

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## 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

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## 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)

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## 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 participants endorsing motive	Proportion of primary motives
Enjoyment (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, makes things more fun)	10.58%	1.81%
Activity enhancement (e.g., music sounds better, every day activities 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 & Woods (2007)

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### 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

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### NORM PERCEPTION

- In survey of 5990 participants, 67.4% of students said they 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)

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### 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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### 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

Seattle Police won't be ticketing people for public consumption at this weekend's Hempfest. Instead, they'll be issuing munchies along with information on the newly-passed marijuana laws in Washington state.




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### 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

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### 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

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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

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### 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)

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

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## 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-so-good things happened less often?”

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

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

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### 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

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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
3. Productivity, apathy, motivation issues, or boredom
4. Cognitive abilities, attention, or concentration problems
5. Memory problems
6. Problems with lungs or coughing
7. Feeling antisocial or experiencing social awkwardness
8. 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 RMPI, and these two were the ninth and tenth most mentioned consequences.

Walter, Kilmer, Logan, & Lee (2012)  
 Lee, Kilmer, Neighbors, Walters, Garberson, & Logan (in prep)

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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

College Marijuana Consequence Scale	Rutgers Marijuana Problem Index
<ul style="list-style-type: none"> <li>• 376 listed at least one consequence</li> <li>• 85.3% listed 3 or more consequences</li> <li>• Average number of consequences = 6.8</li> </ul>	<ul style="list-style-type: none"> <li>• 290 listed at least one consequence</li> <li>• 56.9% listed 3 or more consequences</li> <li>• Average number of consequences = 3.3</li> </ul>

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CONCLUSIONS/NEXT STEPS

- Relevant consequences may not be captured on other measures of YA harms/risks
- Independent of what studies say about "negative effects," if there's a consequence/harm/effect identified by a student as unwanted, this can prompt consideration of change
- Understand the relevance and salience of consequences to the population we're working with
- Future studies can test usefulness with non-college samples

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

Horizontal lines for notes

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.

Horizontal lines for notes

individualized College Health for Alcohol and Marijuana Project (R21DA025833)



Horizontal lines for notes







### Feelings About Reducing Use or Quitting Marijuana

You noticed feeling confident enough in reducing or not using in 3 out of 20 situations.



You had less confidence in your ability to avoid smoking in these situations:

- Having to do some monotonous (boring) work
- Seeing someone else smoking marijuana and enjoying it
- Drinking alcohol
- Feeling like celebrating some good news or accomplishment
- Feeling angry about something or someone
- Have some time to yourself, free of responsibilities
- Using other drugs recreationally
- At a party where people were smoking marijuana
- With a date or close friend who was smoking marijuana
- In an uncomfortable situation
- Offered marijuana by someone
- Bored with nothing to do
- Stressed out with nothing to do

### Family History

We consider your risk based on family history to be:




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### Your Social Network

Let's explore who's important to you and who you can count on for help or support...



Person's name or initials	Does this person know you smoke marijuana?	How does (or would) this person feel about your marijuana use?

### Your Goals

You listed these as your 5 most important goals.



Very Negatively 1	Negatively 2	Not Positively or Negatively 3	Positively 4	Very Positively 5
Goal		How, if at all, does marijuana use affect attainment of this goal?	How, if at all, would reducing marijuana use affect attainment of this goal?	
Trying to build a new and better society for all.				
Trying to always be there fully for my friends.				
Trying to keep learning to my full capability.				
Trying to meet new friends and be an open person.				
Trying to live to my fullest.				

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## Our Findings

3 Month Outcomes     6 Month Outcomes

- # Days in last 30     # Days in last 30
- # Joints per week     # Joints per week
- Hours high per week     Hours high per week
- Consequences     Consequences

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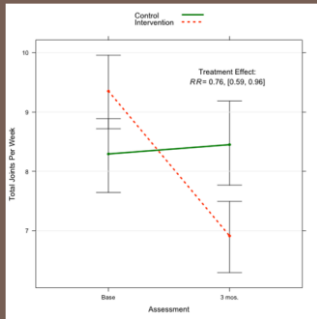
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At 3 months, intervention participants reported 24% fewer joints smoked per week relative to control participants.




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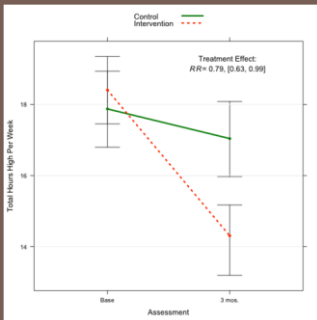
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At 3 months, intervention participants reported 21% fewer hours being high per week relative to control participants.




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## 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?

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## Interventions for Mandated College Students

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### 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

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### 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-so-good" 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



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### 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

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### 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

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### Future directions: Administrative Supplement!

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

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## 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

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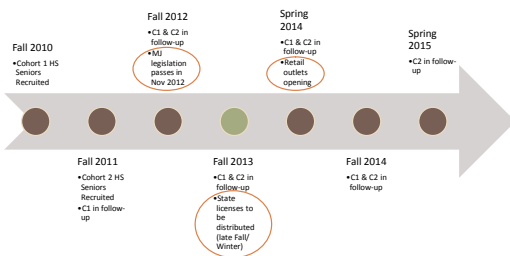
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## Study Timeline




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## Research questions related to a changing legal climate

How will use by youth and adolescents be affected?

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Source: Kilmer & Lee (2013)

## Specific Aims of Supplement

Examine associations between MJ legislation and changes in MJ use trajectories among youth initially assessed in HS.

- 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?

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## Research questions related to a changing legal climate

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

Source: Kilmer & Lee (2013)

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## Specific Aims of Supplement

Examine density/proximity of MJ retail outlets and relationship to use, risk perception, and perceived access

- 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.).

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## Thank you!

□ **Special thanks to:**

- ADAI
- NIDA & NIAAA
- Theresa Walter



**Jason Kilmer, Ph.D.**

**jkilmer@uw.edu**

**Christine Lee, Ph.D.**

**leecm@uw.edu**

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