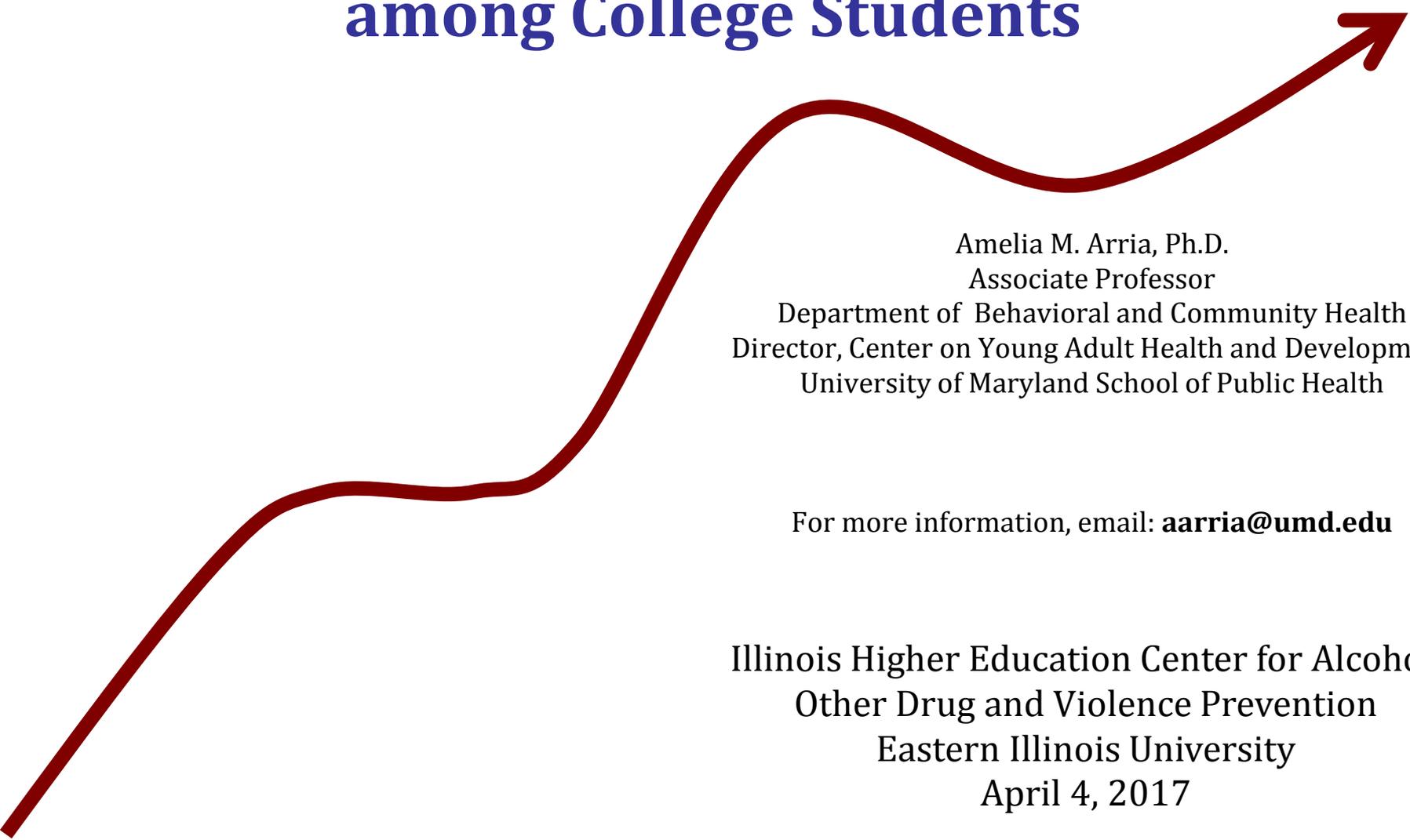


Prevalence and Etiology of the Non-Medical Use of Prescription Medications among College Students



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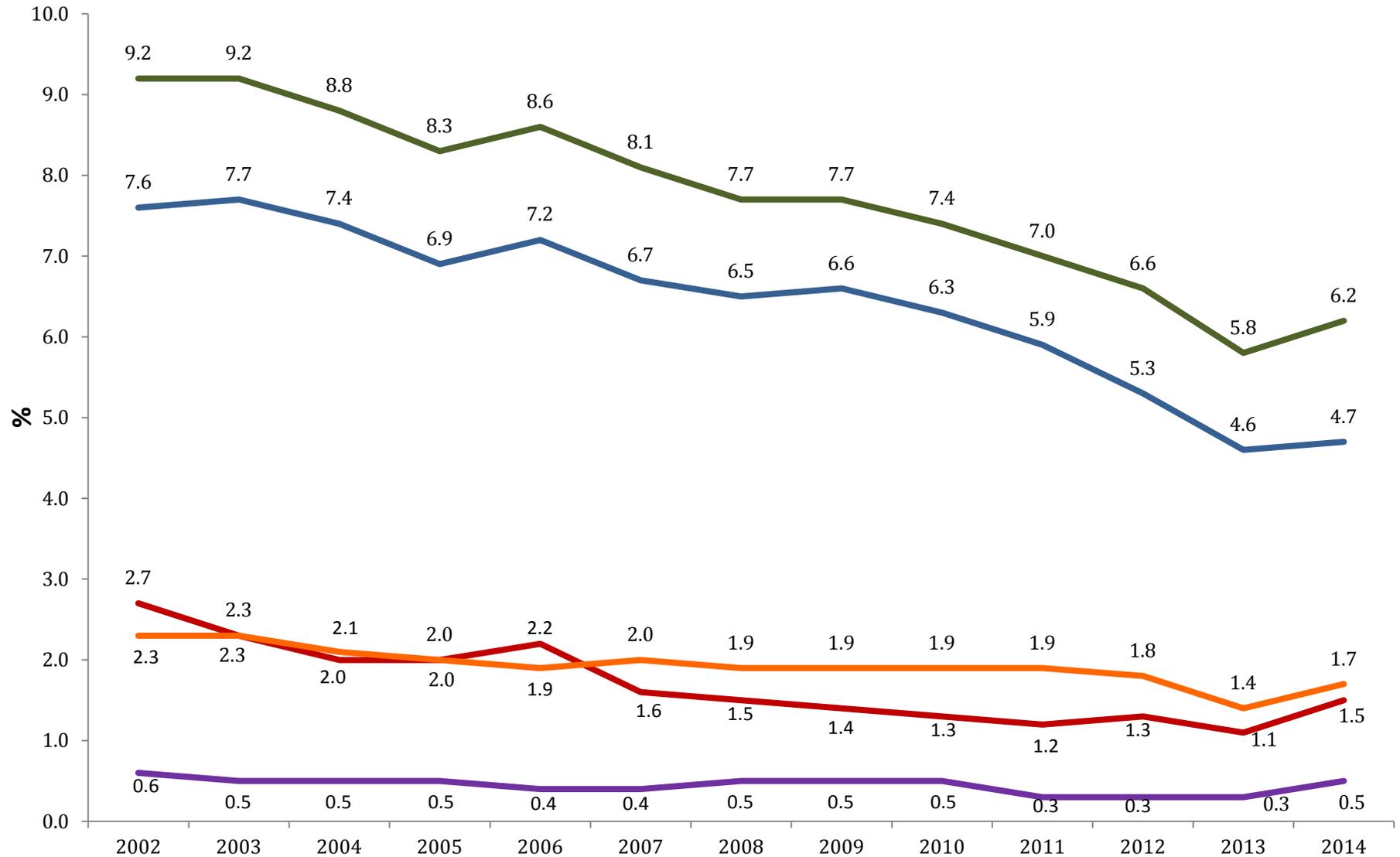
Overview

1. **National Estimates of Prevalence**
2. **Background on the College Life Study**
3. **What we know**
4. **What we suspect**
5. **What we can do**

National Estimates of Prevalence

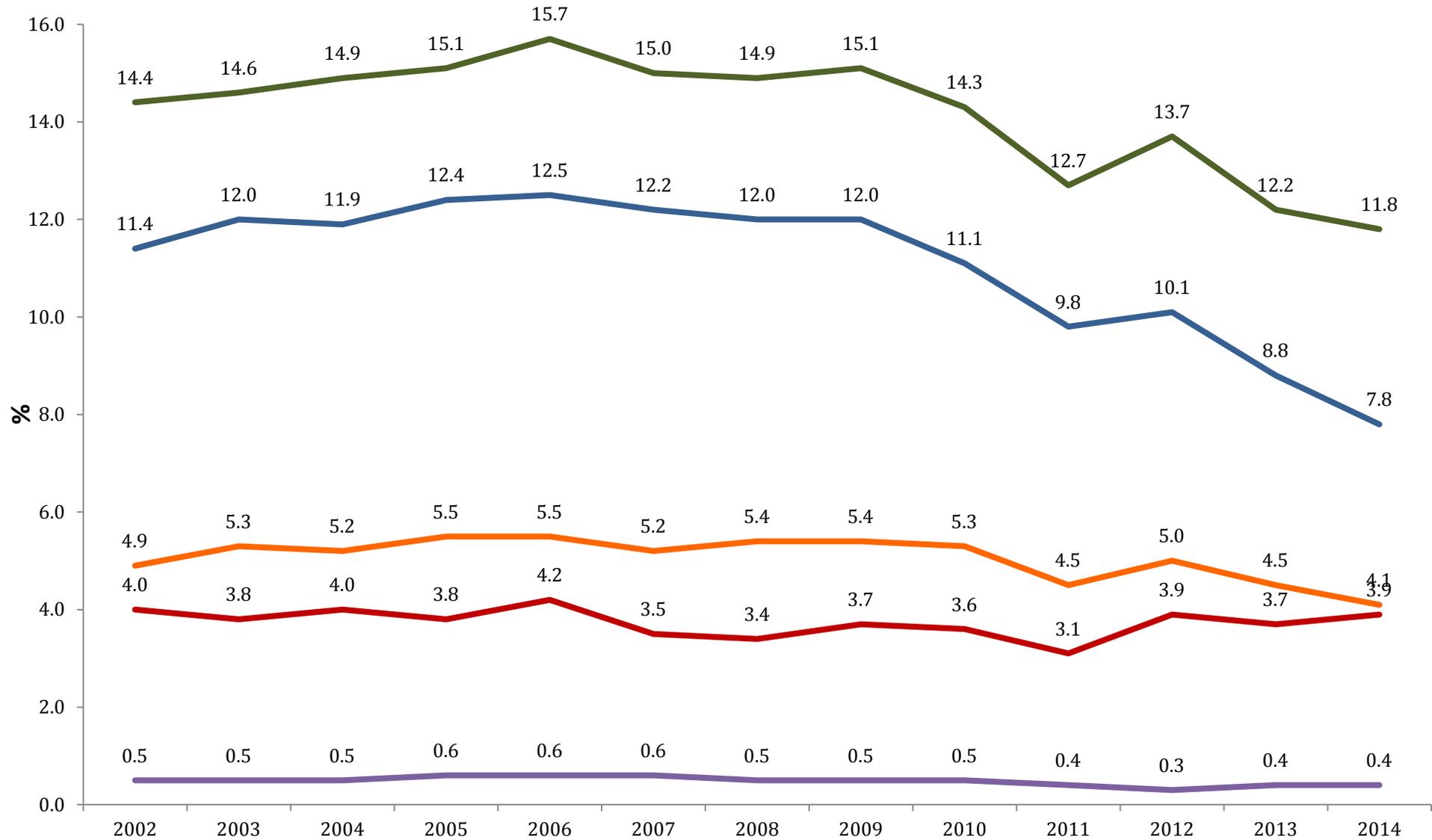
Past-Year Nonmedical Use of Prescription Drugs among 12- to 17-year-olds, 2002-2014 (SAMHSA, 2015)

— Any Psychotherapeutics — Pain Relievers — Stimulants — Sedatives — Tranquilizers

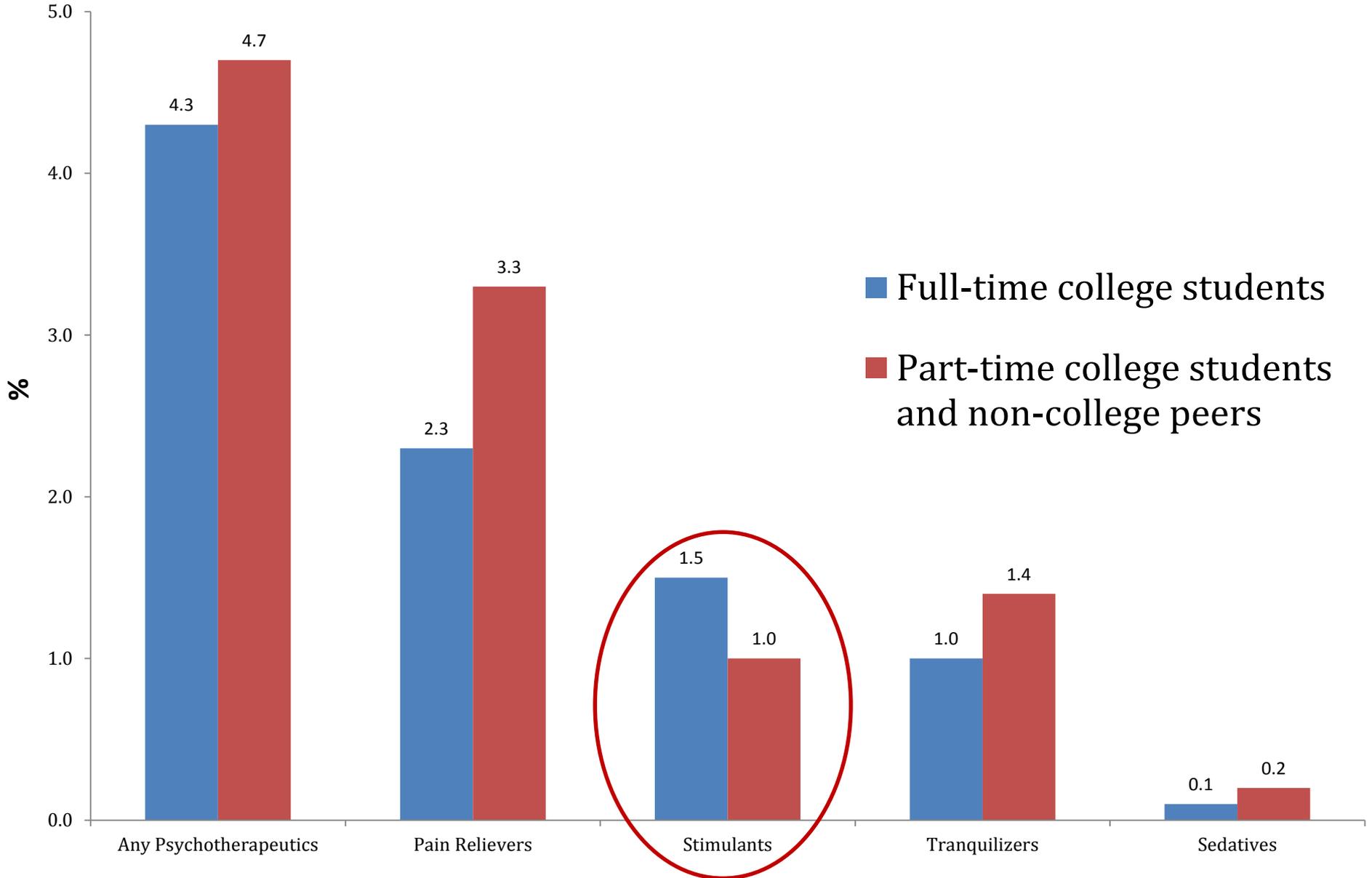


Past-Year Nonmedical Use of Prescription Drugs among 18- to 25-year-olds, 2002-2014 (SAMHSA, 2015)

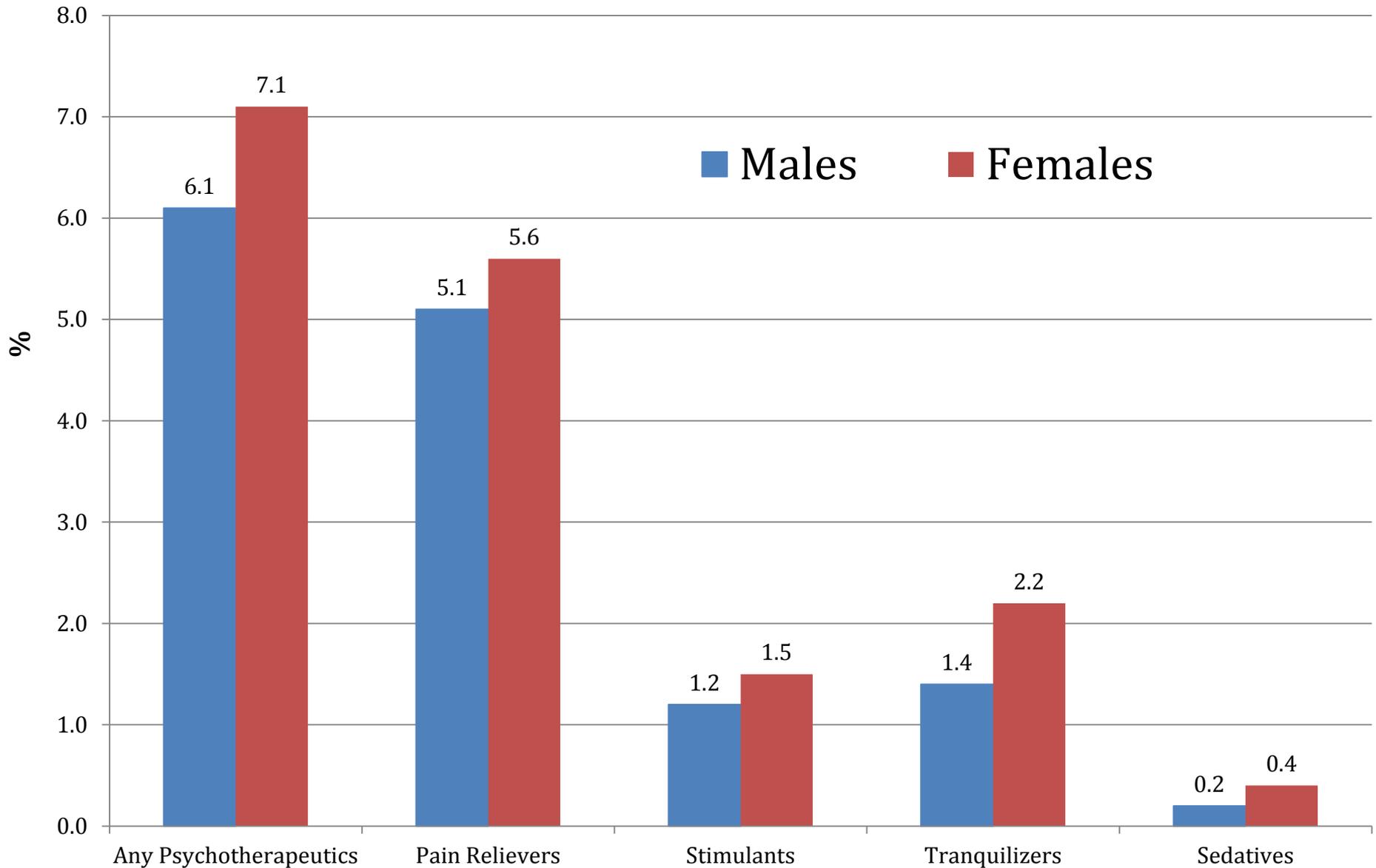
— Any Psychotherapeutics — Pain Relievers — Stimulants — Sedatives — Tranquilizers

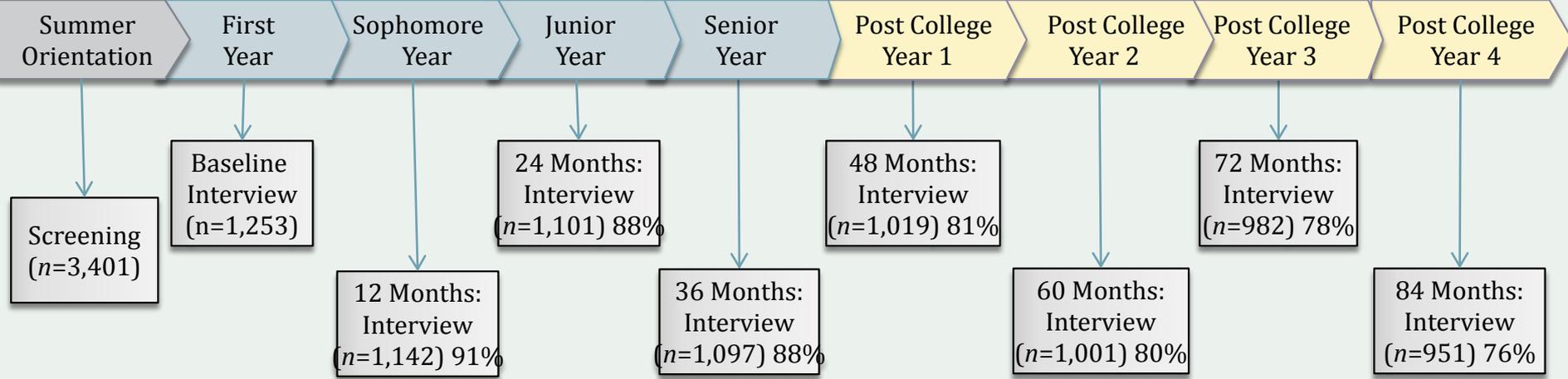
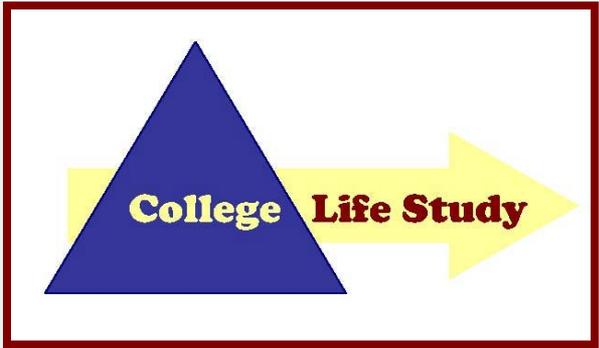


Prescription stimulants are the only class of prescription drugs that are nonmedically used more by full-time college students than part-time college and non-college peers (during the past month; ages 18-22; SAMHSA, 2015)



Past-Year Nonmedical Use of Prescription Drugs, among 12- to 17-year-olds, by Gender (SAMHSA, 2013)





Weighted lifetime prevalence of drug use in the first four years of college, by year

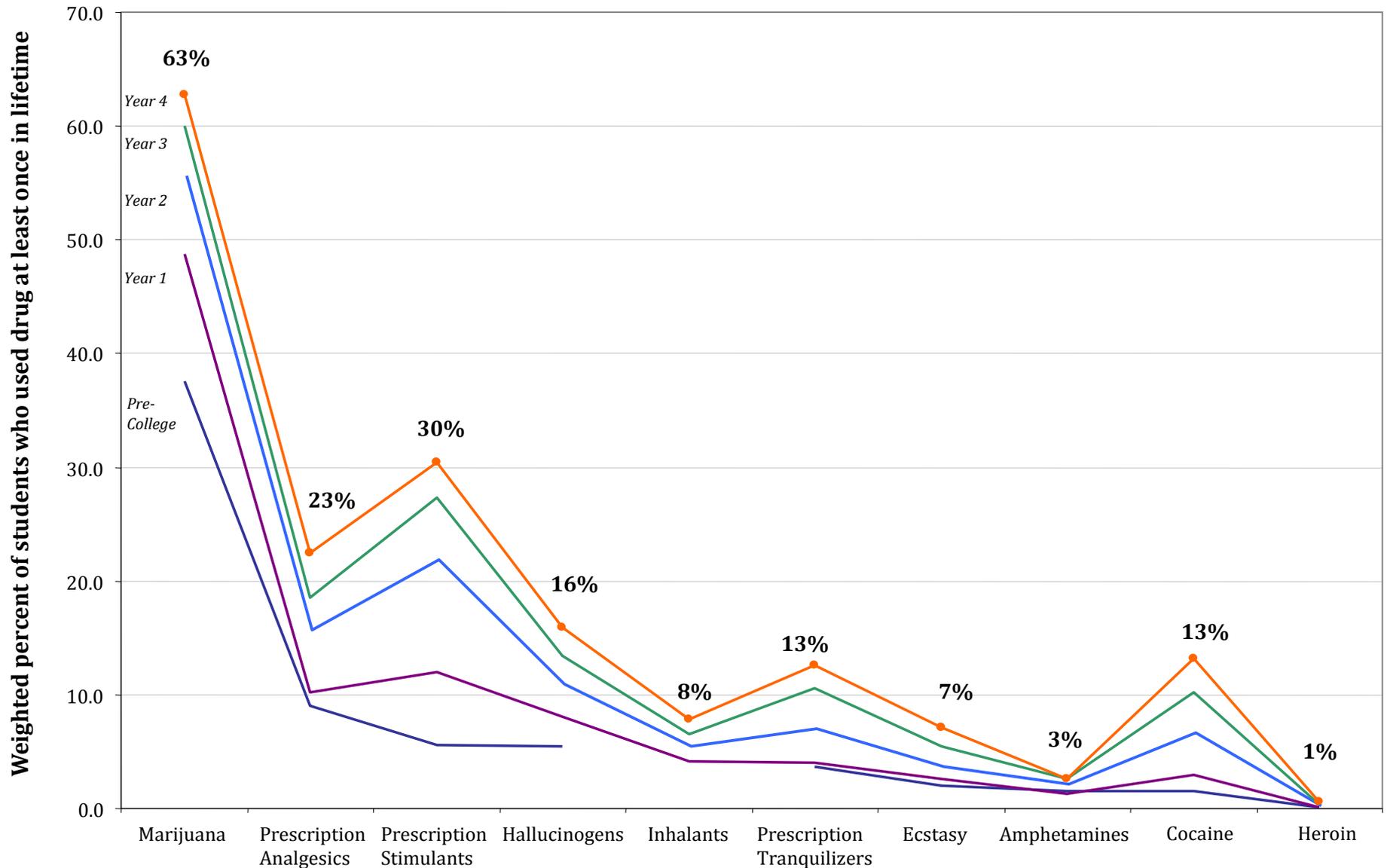
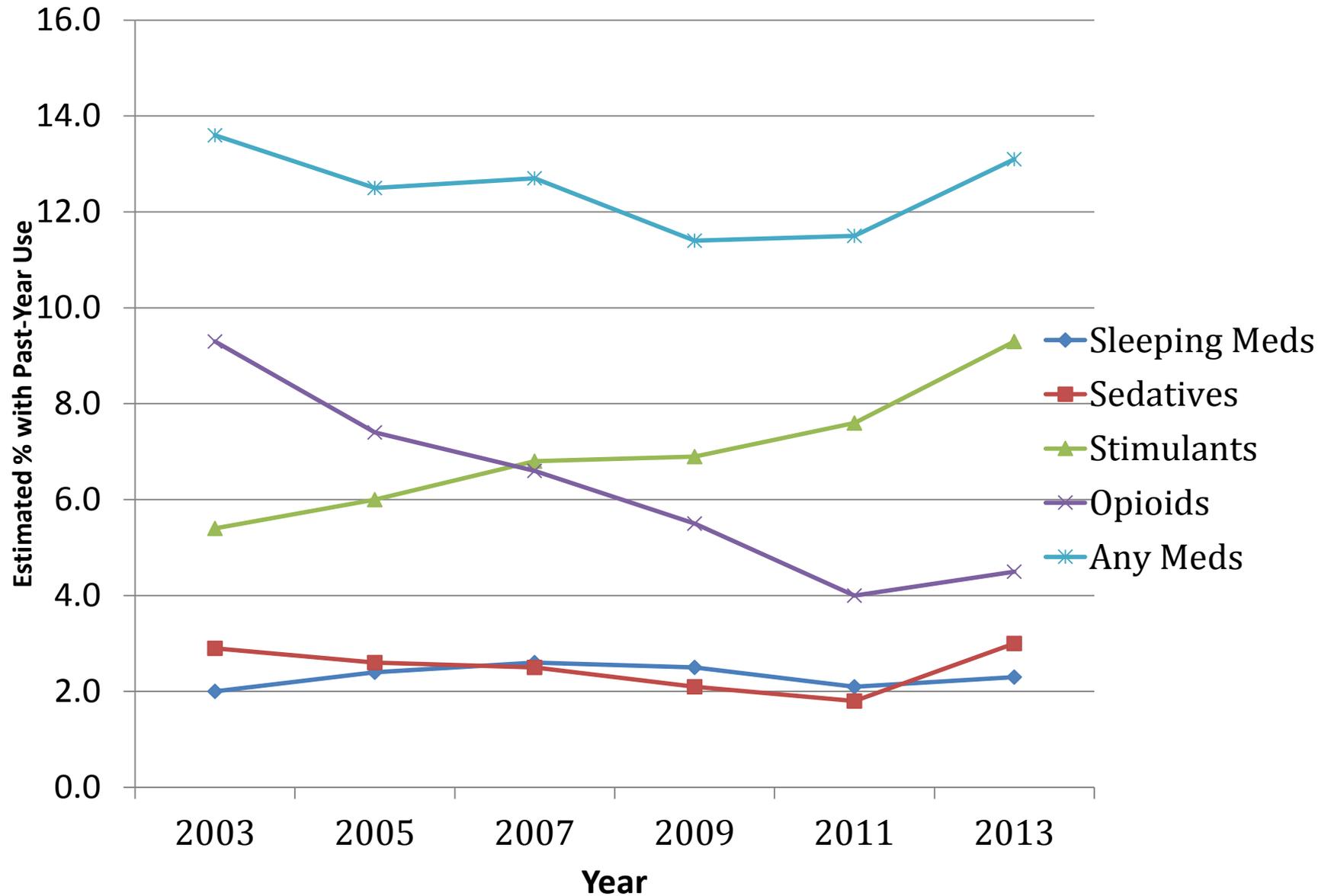


Figure 1. Trends in past-year nonmedical use of prescription medications: 2003-2013



What We Know

- Different drug classes = different harms
- Definition of nonmedical use
- Motives
- Research Studies of College Students
- Sources of obtaining drugs for nonmedical use
- Access and availability

What We Know, continued

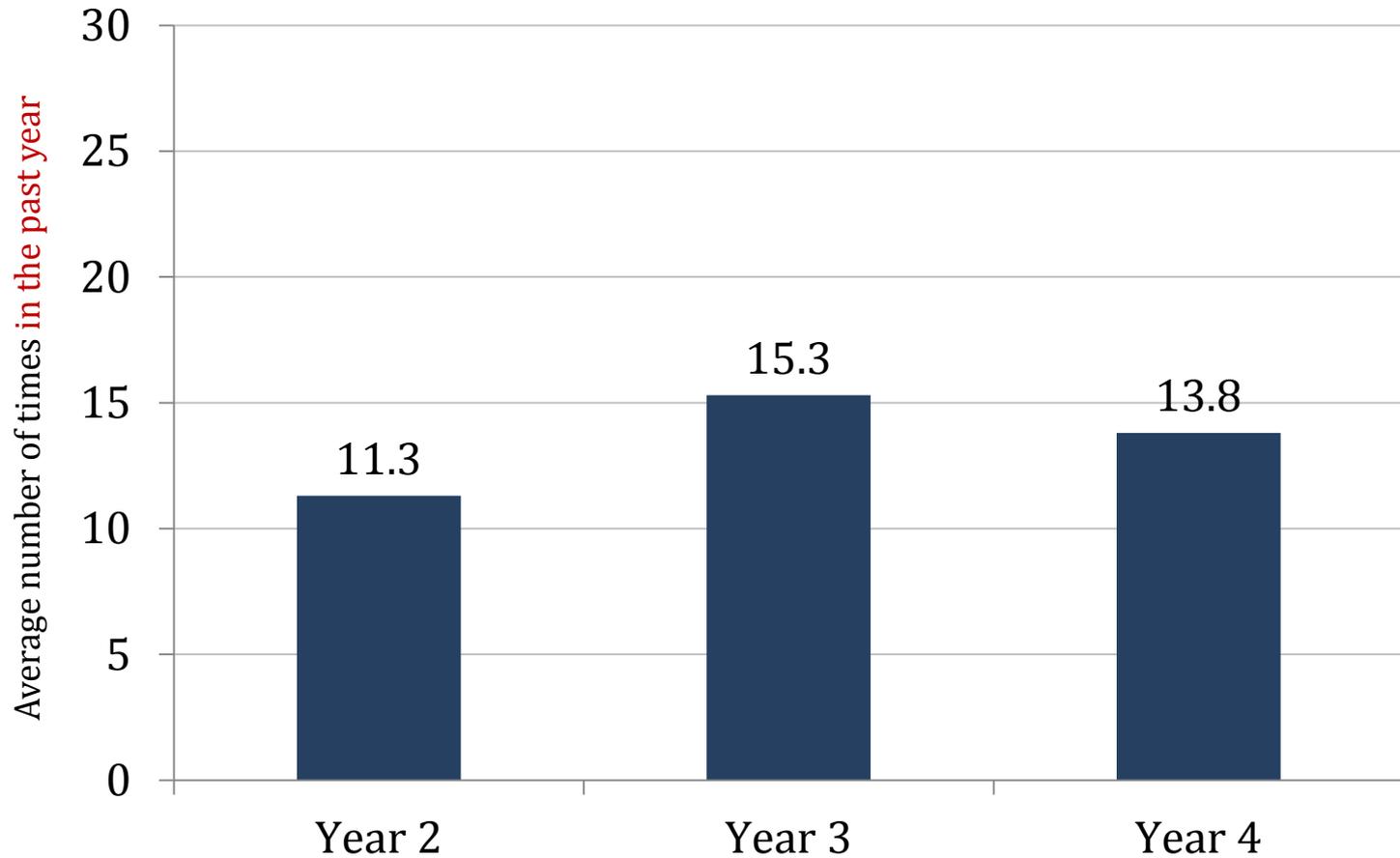
- Diversion is prevalent and fuels nonmedical use
- Overestimation of others use
- Positive and Negative Expectancies
- High-risk Groups for use and diversion
- Strong association with other drug use

Motives

- Curiosity
- Improve concentration
- Stay awake longer to study
- Stay awake longer to party, drink more
- Get high
- Relieve depression symptoms?

But remember, motives are not the same as risk factors

How **often** do users take prescription stimulants nonmedically?



What about students with ADHD who have their own prescribed ADHD medications?

Among 45 first-year college students with ADHD:

- 27% overused their own meds
- 16% nonmedically used someone else's ADHD meds

In another sample of 55 males (mean age 21) with ADHD:

- 22% misused or took too much of their meds
- 10% got high on their meds
- 8% grinding/sniffing
- Nearly all of the misusers (83%) met criteria for CD and/or SUD, and all were using immediate-release formulations.

Sources:

Arria, A.M., Caldeira, K.M., O'Grady, K.E., Vincent, K.B., Johnson, E.P., Wish, E.D. (2008). Nonmedical use of prescription stimulants among college students: Associations with attention-deficit-hyperactivity disorder and polydrug use. *Pharmacotherapy*, 28(2) 156-169.

Wilens, T.E., Gignac, M., Swezey, A., Monuteaux, M.C., Biederman, J. (2006). Characteristics of adolescents and young adults with ADHD who divert or misuse their prescribed medications. *J Am Acad Child Adolesc Psychiatry*, 45(4), 408-14.

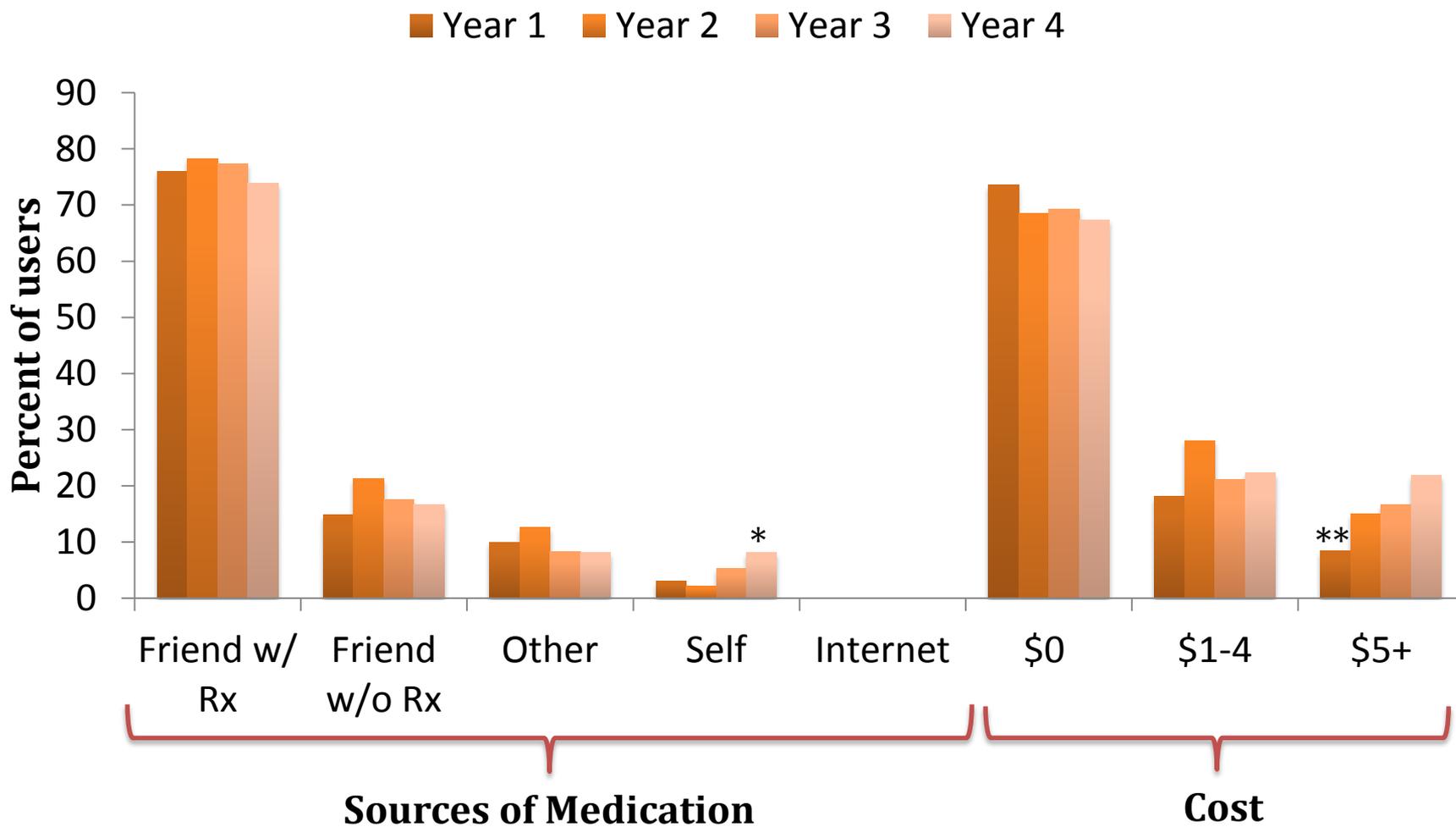
Sources

*Among college students,
friends and peers
are the most common
sources to obtain
prescription medications
used nonmedically*

References:

- McCabe SE, Teter CJ, Boyd CJ. Medical use, illicit use and diversion of prescription stimulant medication. *J Psychoactive Drugs* 2006;38(1):43-56. McCabe SE, Boyd CJ. Sources of prescription drugs for illicit use. *Addict Behav* 2005;30(7):1342-1350.
- McCabe SE, Cranford JA, Boyd CJ, Teter CJ. Motives, diversion and routes of administration associated with nonmedical use of prescription opioids. *Addict Behav* 2007;32(3):562-575.
- Barrett SP, Darredeau C, Bordy LE, Pihl RO. Characteristics of methylphenidate misuse in a university student sample. *Can J Psychiatry* 2005;50(8):457-461.

How are ADHD meds obtained for nonmedical use?



*Denotes significant difference from years 1 and 2 ($p < .05$).

**Denotes significant difference from years 3 and 4 ($p < .05$).

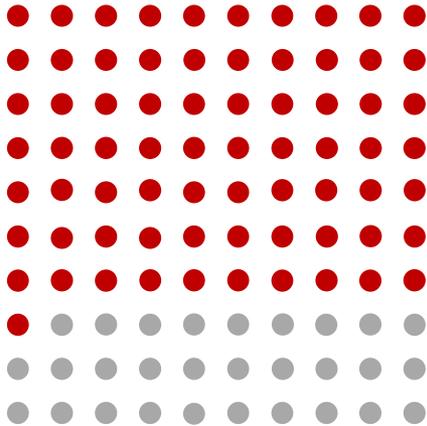
DIVERSION

*60.2% of one sample of college students with ADHD shared or sold their **prescription stimulants**;*

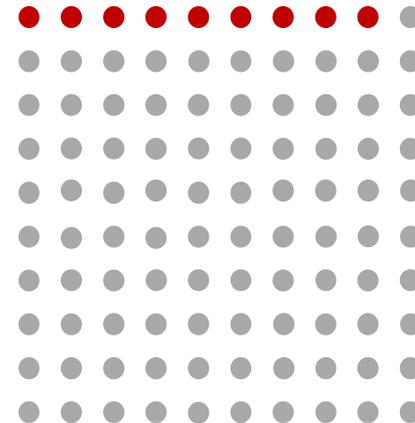
*35.4% of students with **prescription analgesics** diverted their medications.*

Students overestimate how many others use

**Students who reported their
peers used stimulants
nonmedically**



**Students who used stimulants
nonmedically**



Source: Carroll, B. C., McLaughlin, T. J., & Blake, D. R. (2006). Patterns and knowledge of nonmedical use of stimulants among college students. Archives of Pediatrics and Adolescent Medicine, 160(5), 481-485.

Nonmedical Use is also associated with:

High levels of
positive
expectancies
about the
purported benefit
on performance

“It will work”

Low levels of
negative
expectancies
about the
purported benefit
on performance

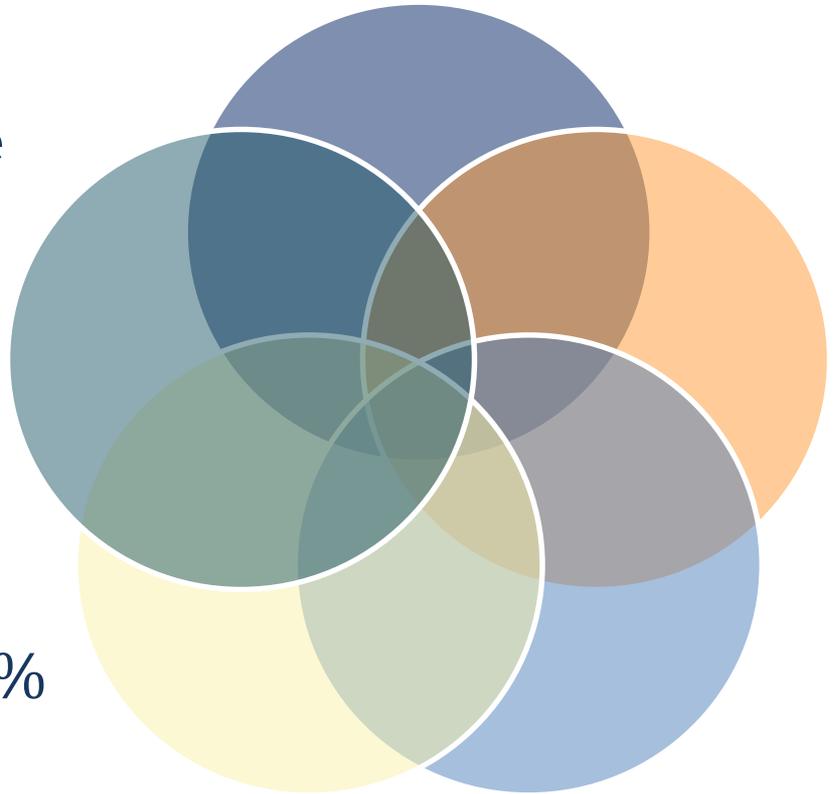
*“I won’t get in
trouble”*

High Risk Groups

- Students attending competitive colleges
- Students involved with Greek organizations
- High-risk drinkers and other drug users
- Students who are academically struggling
- Students who are not risk-averse
- Students who have misperceptions of prevalence and what is normative
- Students who perceive drugs as benign, safe to use

Nonmedical prescription drug use is strongly associated with alcohol and other drug use

- Numerous studies report past-year prevalence estimates for marijuana use of 85%+
- Cocaine: 35-60%
- Ecstasy: 52%
- Prescription Analgesics: 44%



Nonmedical Use



Medical Overuse



**Medically
Supervised Use**



Overlap between nonmedical prescription stimulant use and other drug use

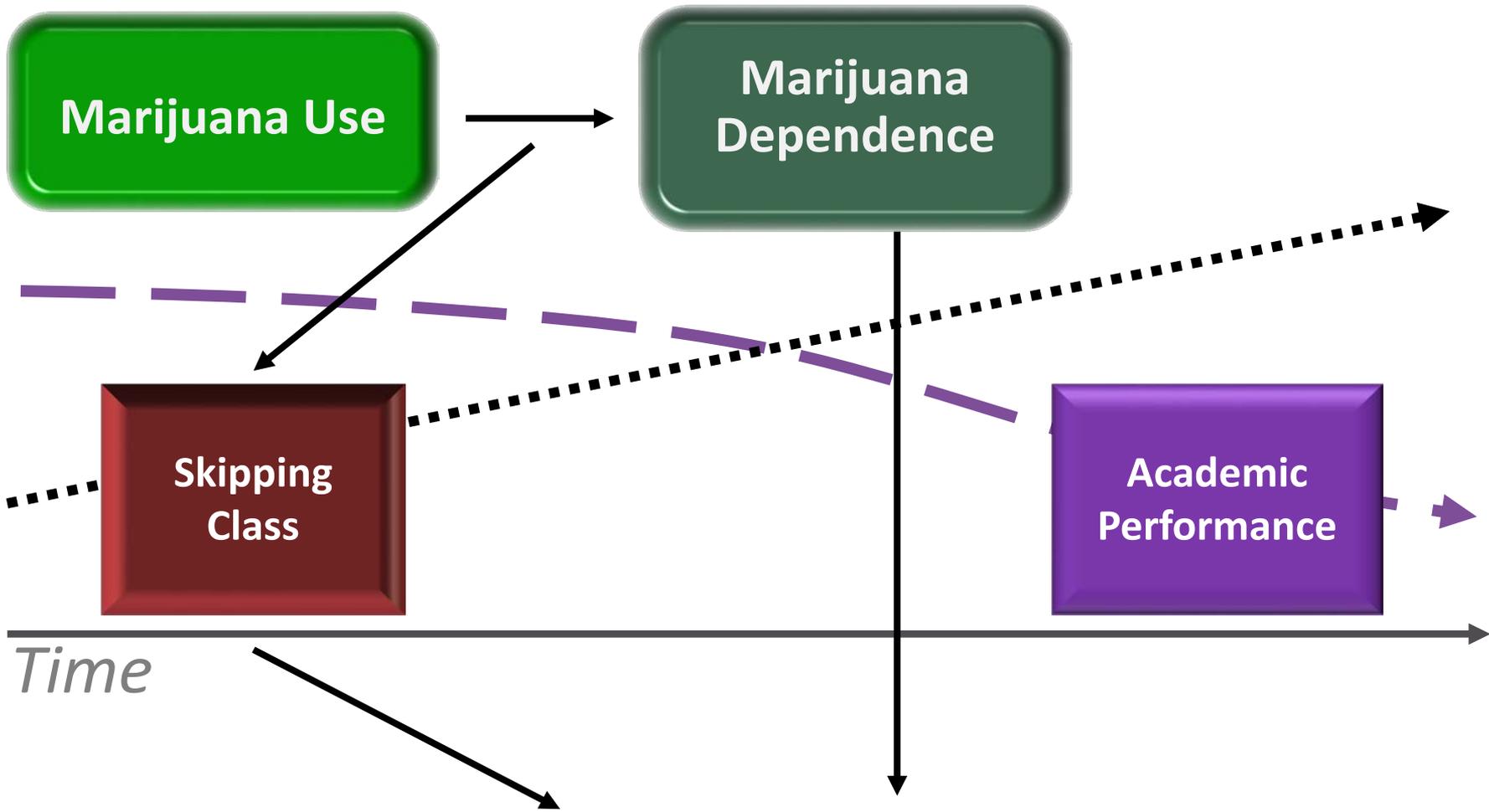
	NON-USERS of Rx Stimulants (<i>n</i> =989)	NONMEDICAL USERS of Rx Stimulants (<i>n</i> =217)
Alcohol	93.5 %	100.0 %
Tobacco Cigarettes	55.3	89.4
Marijuana	62.8	93.5
Hallucinogens	7.0	41.5
Cocaine	2.8	18.0
Inhalants	4.8	15.7
Ecstasy	2.6	15.2
Amphetamines	0.9	8.8
Heroin	0.2	0.9
Nonmedical use of prescription analgesics	10.1	44.2
Nonmedical use of prescription tranquilizers	3.7	20.7

What We Suspect

Marijuana and other drug use might be driving academic problems, and nonmedical use of prescription stimulants is a compensatory behavior... a shortcut, and largely unsuccessful.

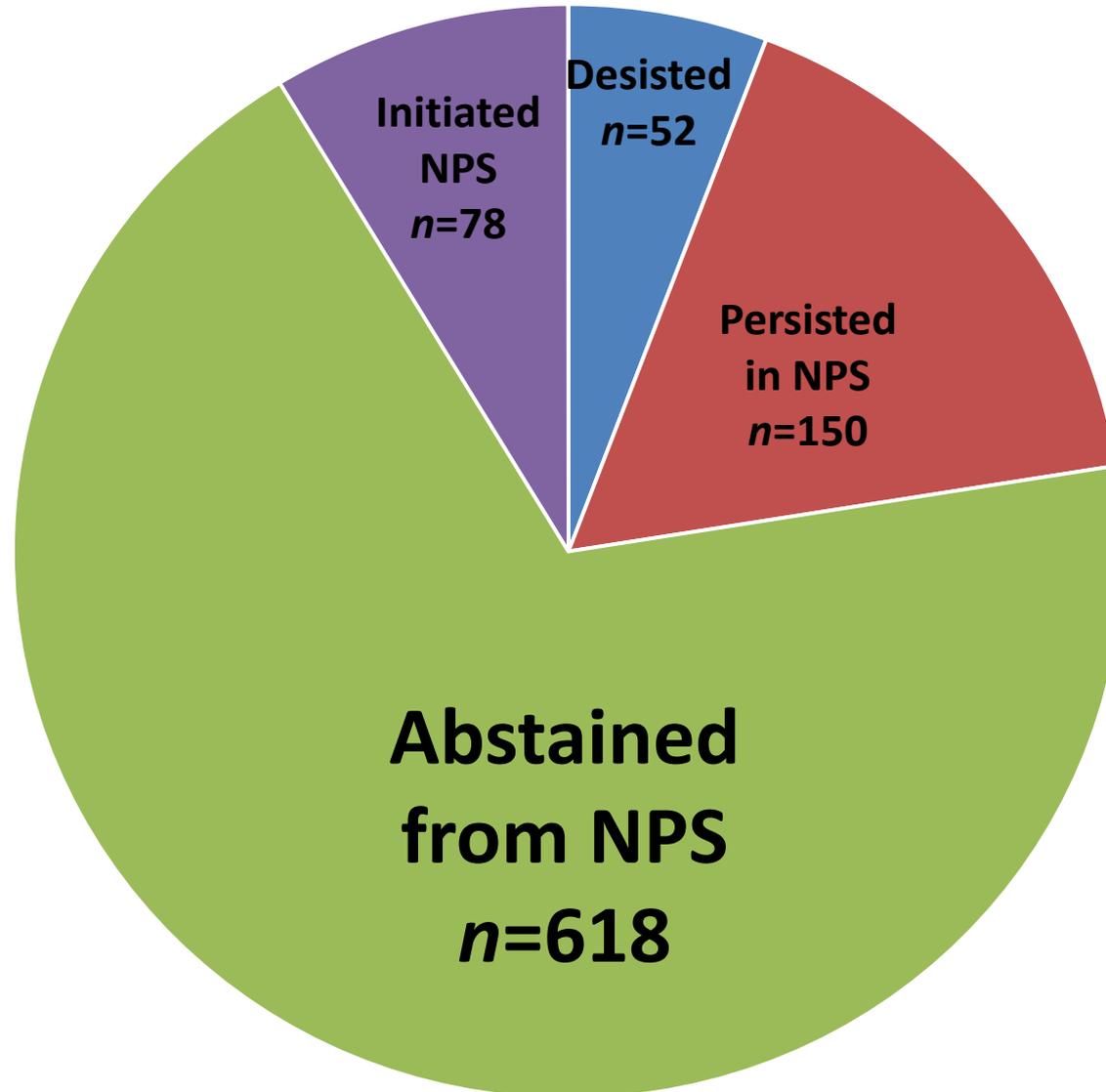
Nonmedical
stimulant users
spend less time
studying,
skip classes
more often,
and earn lower
grades.

Source: Arria AM, O'Grady KE, Caldeira KM, Vincent KB, Wish ED. (2008). Nonmedical use of prescription stimulants and analgesics: Associations with social and academic behaviors among college students. *Journal of Drug Issues*. 38(4), 1045-1060.

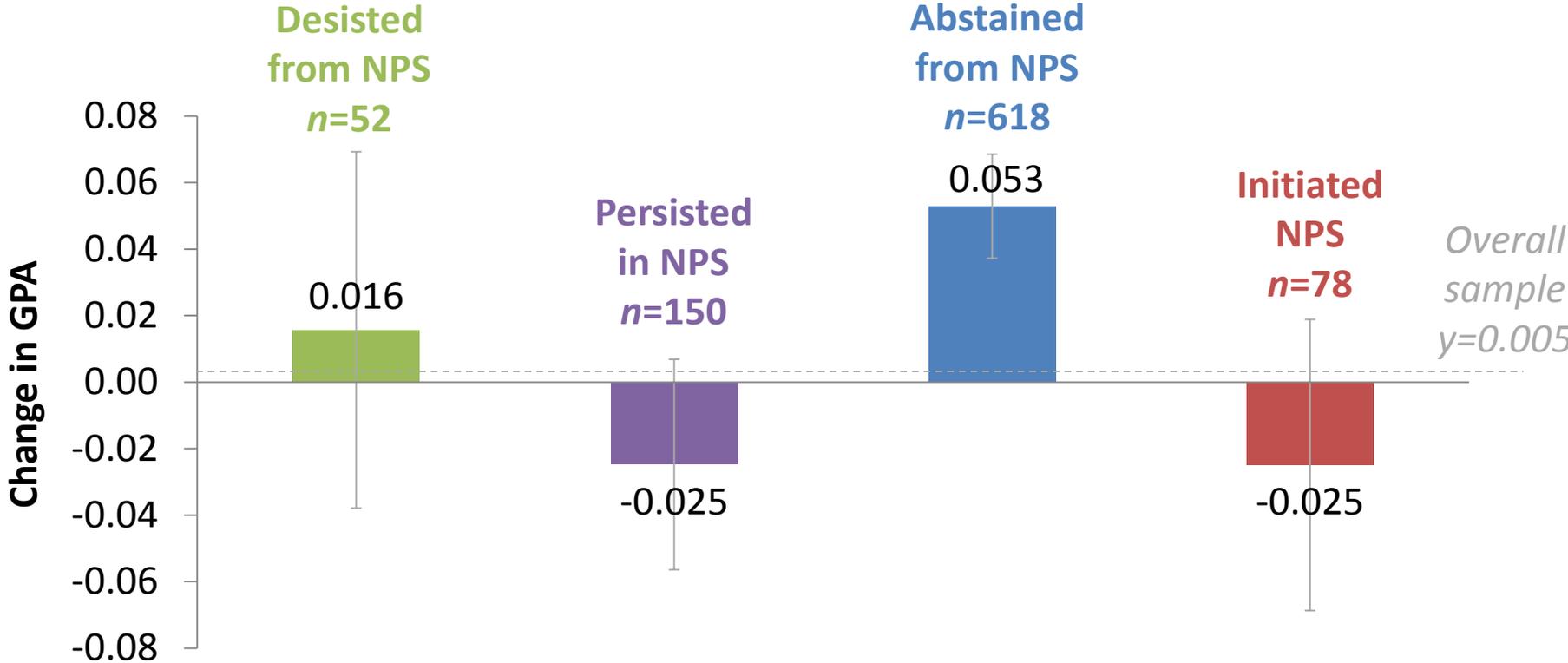


**Nonmedical Use of Prescription Stimulants
for Studying**

NPS use patterns from Year 2 to Year 3 of the College Life Study ($n=898$).



Estimated marginal means and standard error bars for change in GPA during years 2-3, by NPS use pattern ($n=898$).



Note. Sample is restricted to individuals who were never diagnosed with ADHD by Year 3. Change in GPA is computed as the difference between Year 3 GPA and Year 2 GPA, which were averaged from semesters 3-4 and 5-6, respectively. **Results are adjusted for the effects of sex and Year 2 GPA.** Normal distribution was assumed for GPA change score. Zero values for semester GPA were treated as missing because they cannot be distinguished from missing data due to studying abroad.

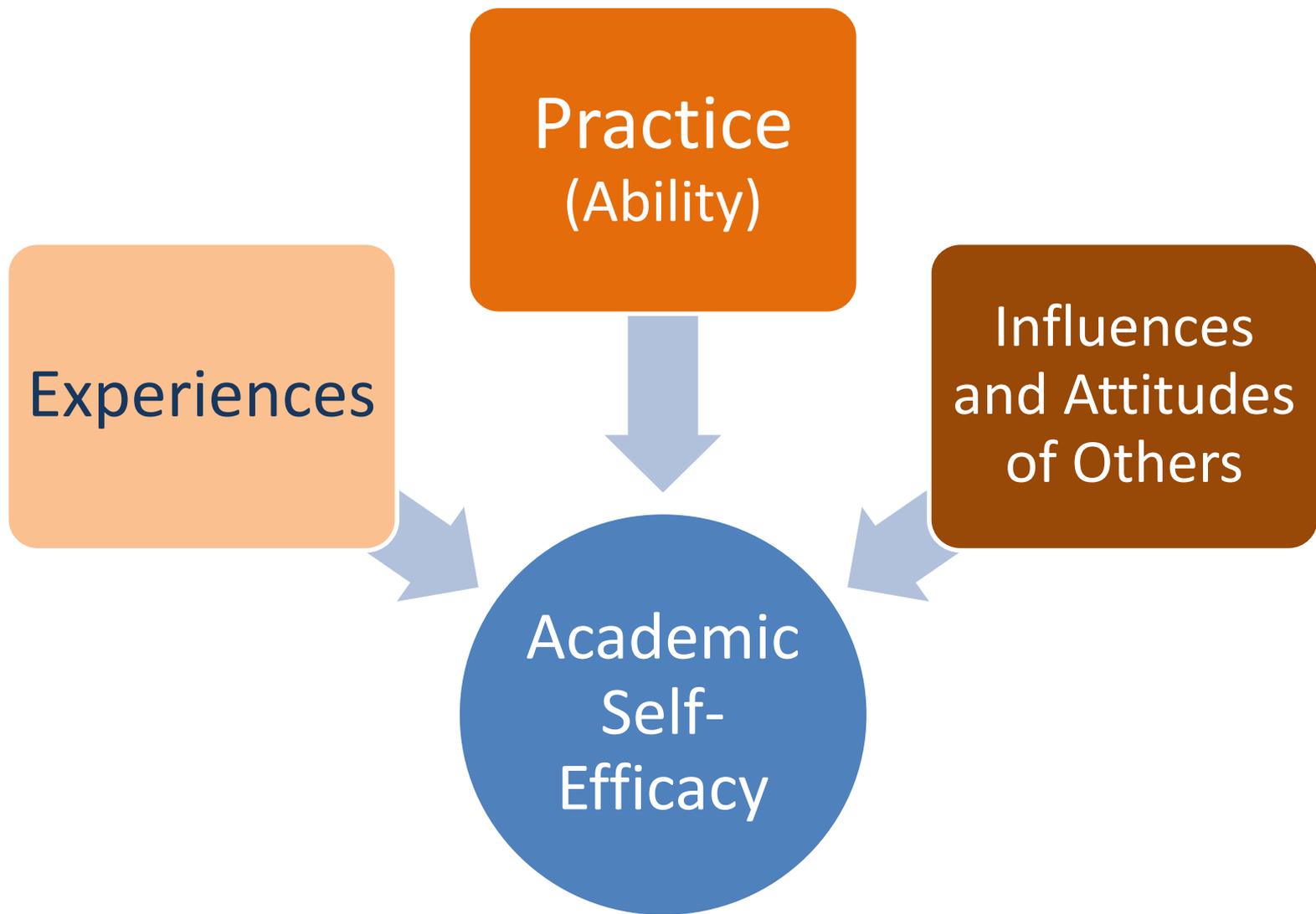
Source: Arria, A.M., et al., Do college students improve their grades by using prescription stimulants nonmedically?, *Addictive Behaviors* (2016), <http://dx.doi.org/10.1016/j.addbeh.2016.07.016>

Interpersonal factors are important influences on nonmedical use...

- Academic self-efficacy
- Perception of risk
- Perception of reward

Academic Self-Efficacy

- Definition: Having confidence about your ability to complete academic tasks
- Students who were less confident about their ability to avoid nonmedical prescription stimulant use when they had a large amount of work in a short amount of time were more likely to use (Bavarian, 2013).
- The more students procrastinate, the more likely they are to use prescription stimulants nonmedically. A possible solution: create a personalized study plan that outlines study times, learning goals (and class attendance) (Ponnet, 2015).



***Individuals with low academic self-efficacy
might be at high risk for NPS use***

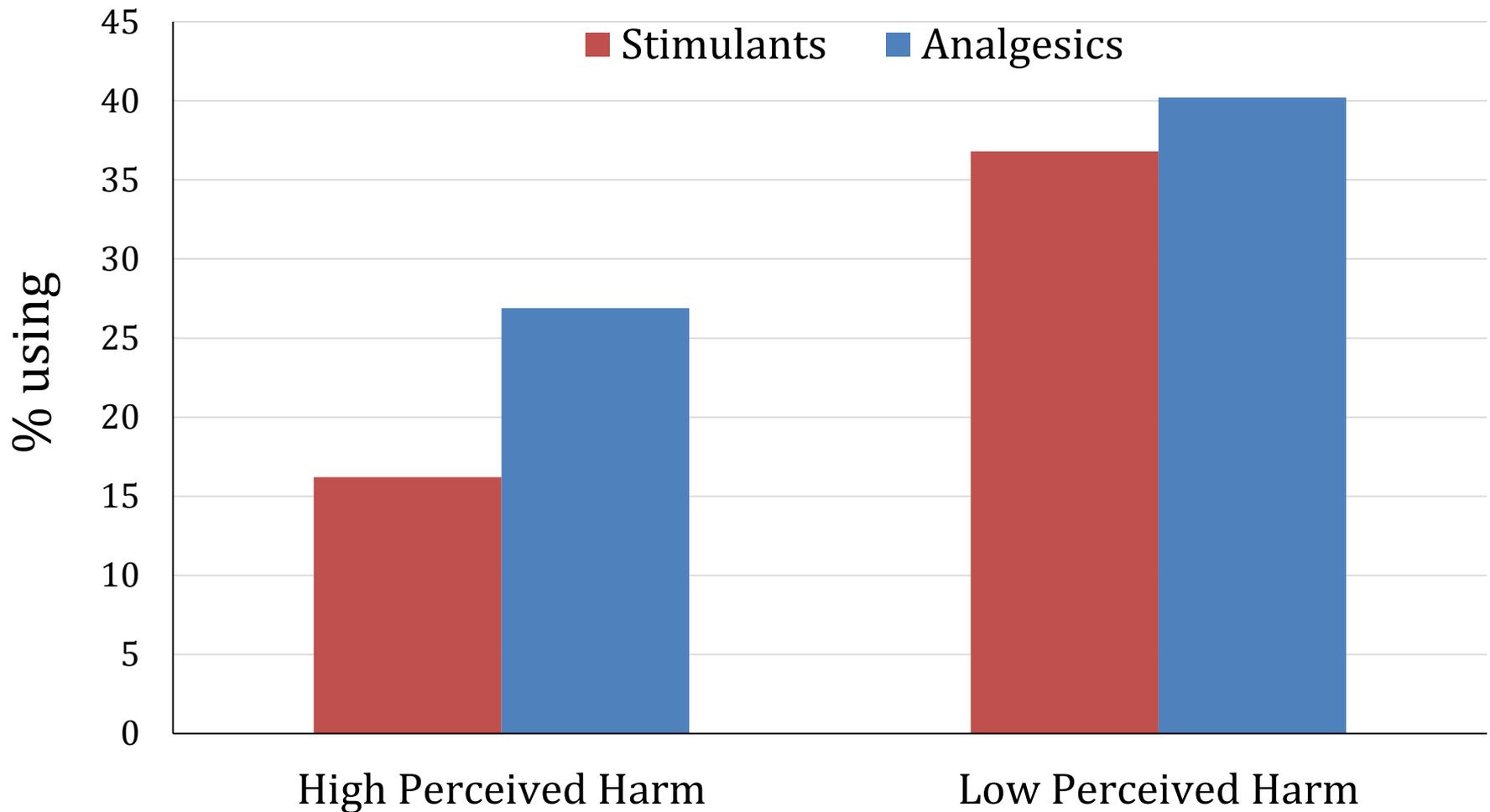
Risk and Reward...

1. Is it risky?

2. Is there a benefit to using?

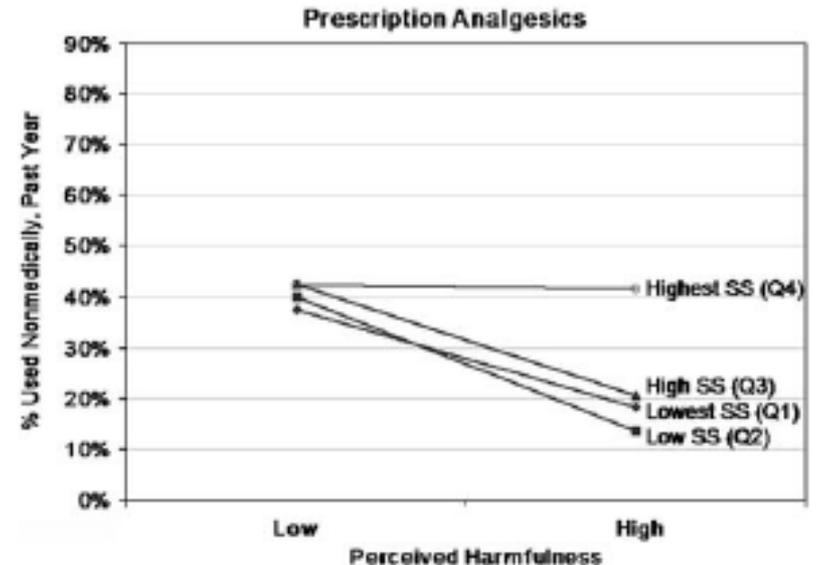
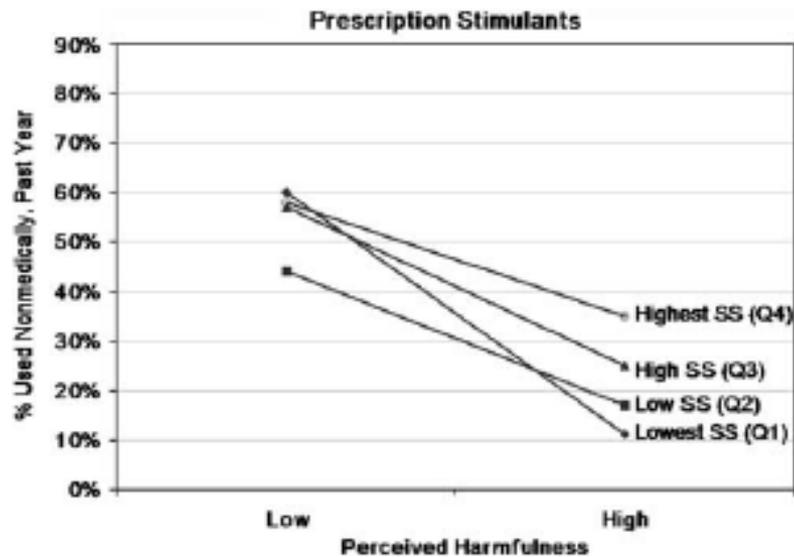
3. Does the benefit outweigh the risk?

Nonmedical use is higher among students who perceive lower levels of harm



Source: Arria AM, Caldeira KM, Vincent KB, O'Grady KE, Wish ED. (2008). Perceived harmfulness predicts nonmedical use of prescription drugs among college students: Interactions with sensation-seeking. *Prevention Science*. 9(3), 191-201.

However... among sensation-seekers, perceived harm did not influence analgesic use



Source: Arria AM, Caldeira KM, Vincent KB, O'Grady KE, Wish ED. (2008). Perceived harmfulness predicts nonmedical use of prescription drugs among college students: Interactions with sensation-seeking. *Prevention Science*. 9(3), 191-201.

What we can do

1. Improve physician education and vigilance
2. Intervene by discussing both risk and reward perceptions
3. Correct student misperceptions
4. Educate parents
5. Focus on more subtle consequences
6. Give non-using students a louder voice

Clinicians:

Considerations for Treating ADHD in High-Risk Patients

1. Monitor medication and other drug use
 - Pill counts
 - Frequent office visits
 - Urine toxicology screens
2. Prescribe medications with lower abuse potential
 - Non-stimulants
 - Extended-release preparations
3. Dose judiciously
4. Discuss compliance, “extra doses,” and treatment failure

Clinicians:

Considerations for Treating ADHD in High-Risk Patients

5. Utilize regular dosing, not PRN
6. Advocate for safe storage (don't advertise)
7. Ask about changes in euphoria, cravings
8. Discuss ethical and legal issues around diversion
9. Support prescription drug monitoring programs

Improving Clinical Practice on College Campuses

Increase vigilance regarding diversion and nonmedical use among college-bound patients.

Partner with local university health centers to promote staff awareness of diversion and the risks of nonmedical use.

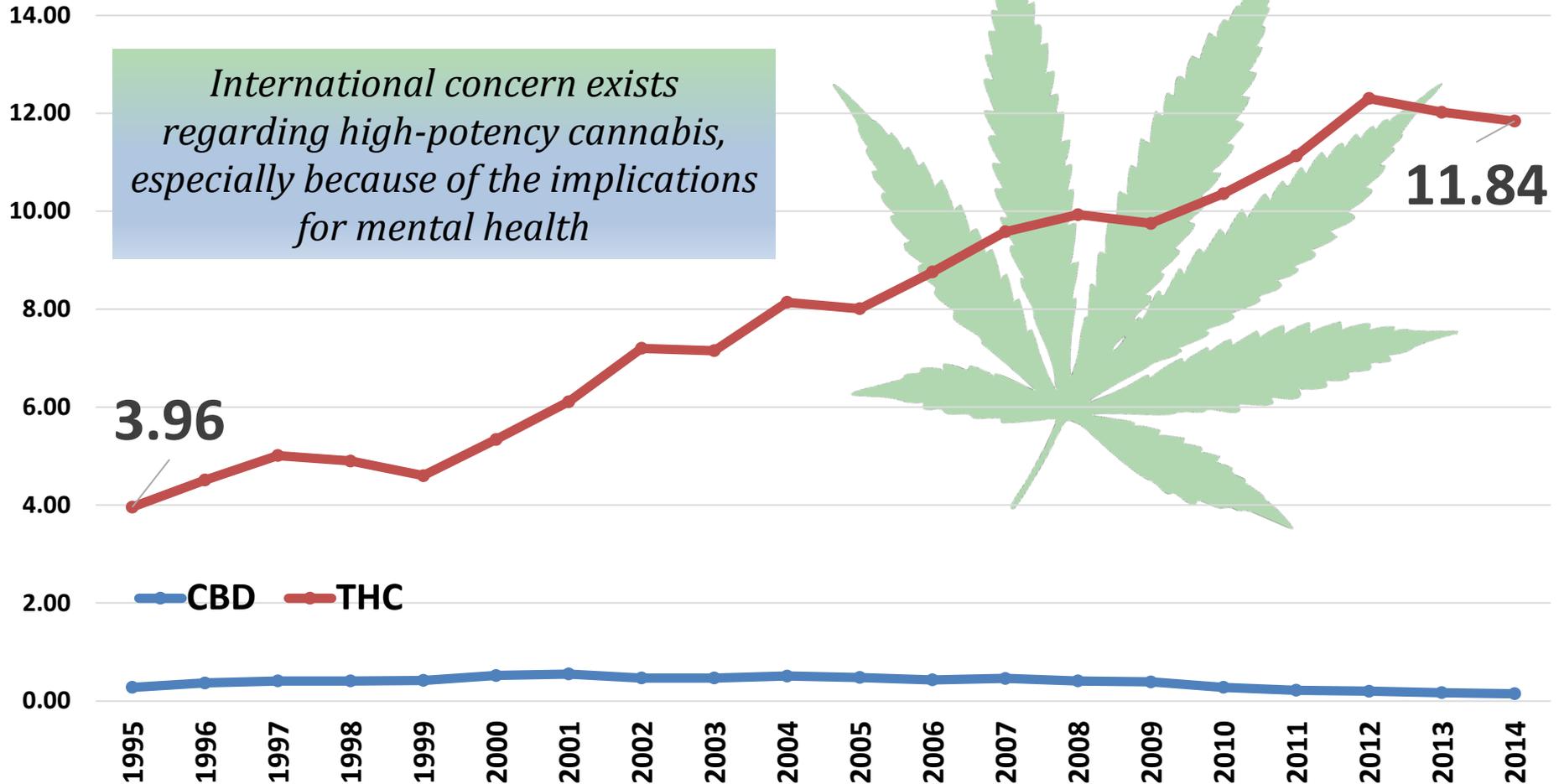
Work with counseling center staff to recognize signs of mental health issues and drug problems... and intervene with students who are academically struggling.

Screen ADHD patients for illicit drug use and convey risks of diversion.

Students

- Spread the word to other students about the true risks of nonmedical use and connection to marijuana use.
- Challenge misperceptions about “how many people are doing it.”
- Link nonmedical drug use to illicit drug use.
- Dispel “smart drug” myth.

THC concentrations have increased dramatically from 1995 to 2014



ElSohly, M. A., Mehmedic, Z., Foster, S., Gon, C., Chandra, S., & Church, J. C. (2016). Changes in cannabis potency over the last 2 decades (1995-2014): Analysis of current data in the United States. *Biological Psychiatry*, 79(7), 613-619.

Students on Medication

- Adhere to your provider's medication instructions.
- Never share your medication... not with anyone.
- Protect your medication from theft.
- Encourage responsible help seeking.
- Convey messages about risks of nonmedical use.

Parents

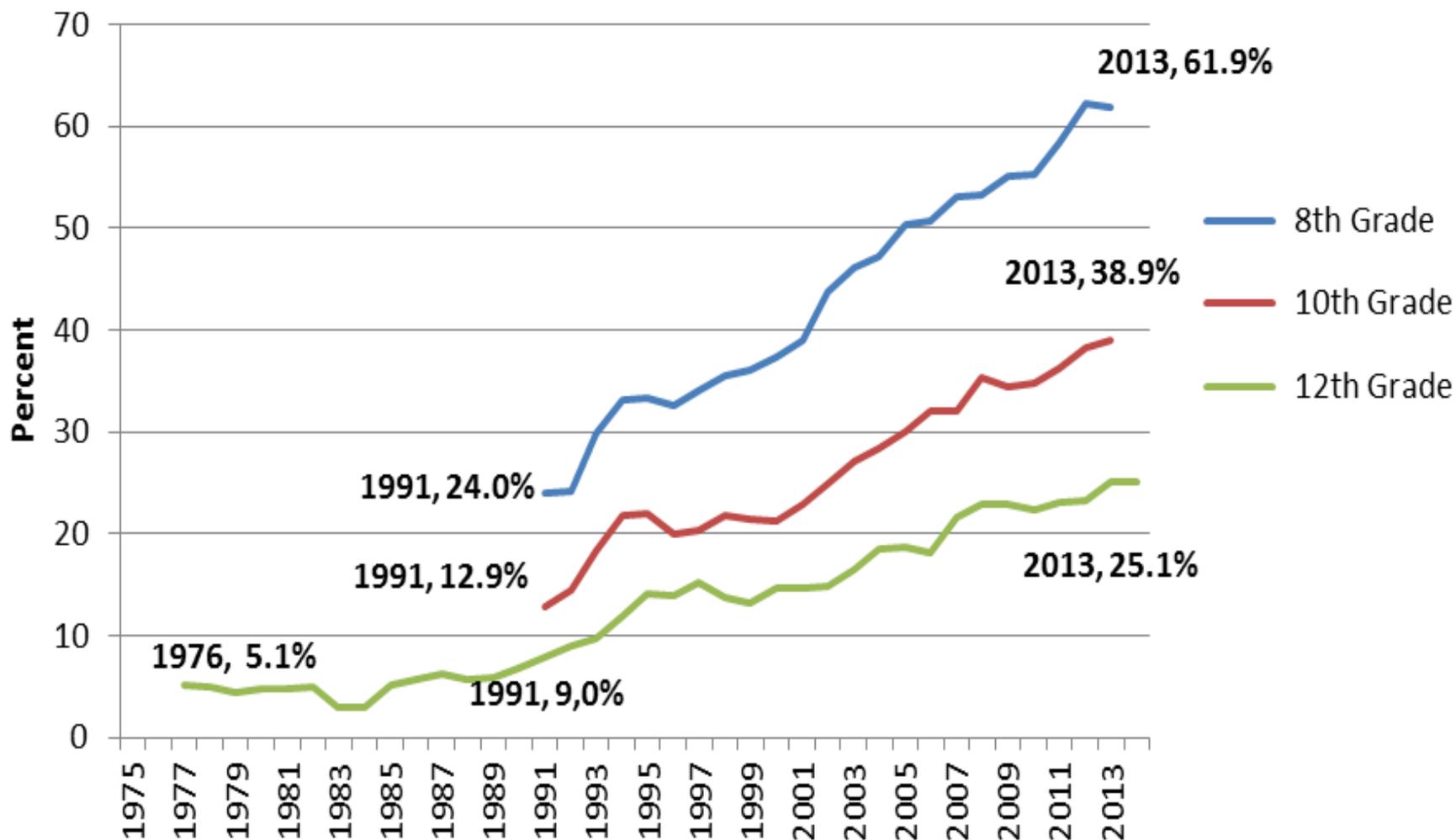
- Dispel “smart drug” myths.
- Do not condone or facilitate nonmedical use.
- Empower parents to take a central role in preventing nonmedical use of prescription drugs.
- Raise awareness about the opportunities for “new” drug use in college.
- Educate parents to recognize signs of emerging mental health and drug problems.
- Educate parents regarding medication adherence and role modeling of proper use
- Parent effectively to reduce risk of use

Colleges and Universities

- Sponsor ongoing dialogues that raise awareness and share experiences of college professionals
- Develop multidisciplinary campus action plans to reduce nonmedical prescription stimulant use.
- Have students re-think taking 18 credits per semester in the first year of college.
- Consider options for enforcing sanctions against diversion.

**Give students
who don't use a
LOUDER voice**

Trends in Abstaining from Illicit Drugs, Alcohol and Cigarettes - Lifetime



Interlocking Dimensions of Student Success



**For more information
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www.cyahd.umd.edu

Thank you!

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