

Marijuana Harmfulness to Youth Wellness

The Emperor's *New Policies*

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Do you know a **Teenager** Struggling with MJ Use?

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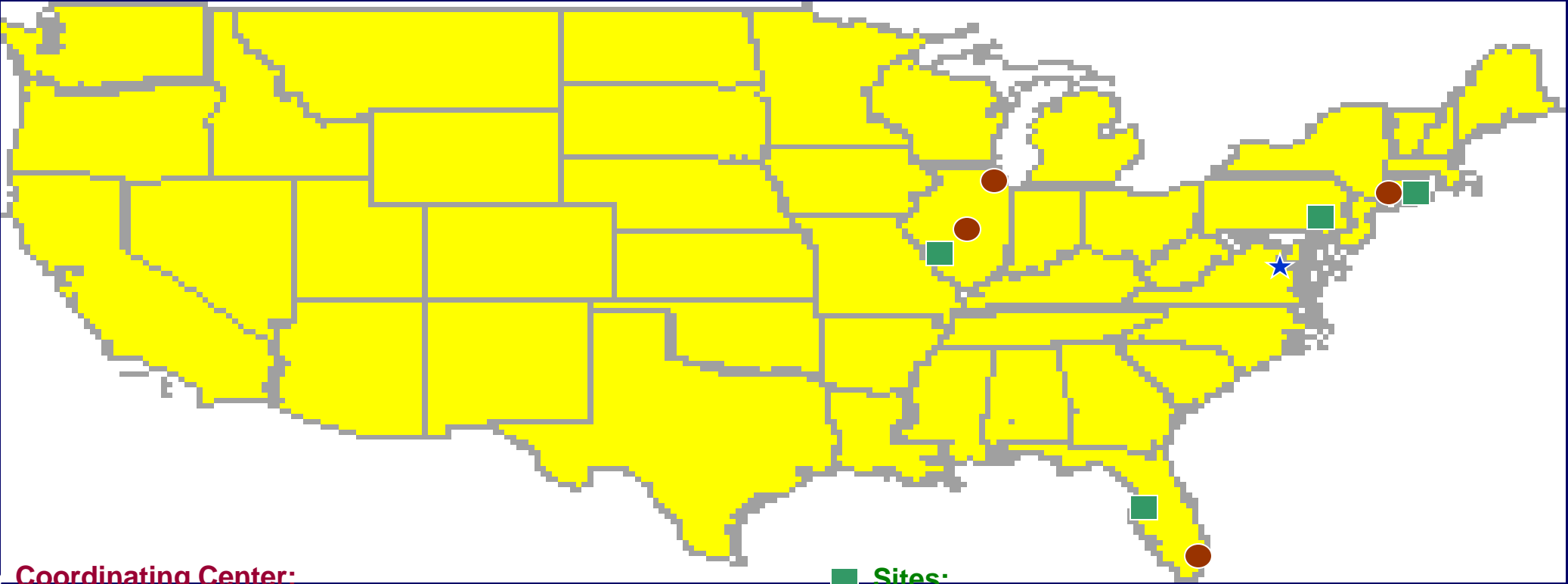
Dr. Yifrah Kaminer, IRB#12-078-3



ATOM STUDIES @ UCONN Health Center
Helping teenagers struggling with substance abuse for over 12 years!

CYT

Cannabis Youth Treatment Randomized Field Experiment



Coordinating Center:
Chestnut Health Systems, Bloomington, IL,
and Chicago, IL
University of Miami, Miami, FL
University of Conn. Health Center, Farmington, CT

Sites:
Univ. of Conn. Health Center, Farmington, CT
Operation PAR, St. Petersburg, FL
Chestnut Health Systems, Madison County, IL
Children's Hosp. of Philadelphia, Phil., PA

Sponsored by: Center for Substance Abuse Treatment (CSAT), Substance Abuse and Mental Health Services Administration (SAMHSA), U.S. Department of Health and Human Services

Clueless Youth and Helpless Parents

- ◆ There is a “debate” (honest/scientific/**misinformed?**) on the harmful/therapeutic properties of MJ between teens, parents, proponents of “medical” MJ (**approved already in 22 states-MN plus DC**) and **Legalization** (**CO** and **WA**) the clinical research community and public stake holders
- ◆ What is the impact of the De-criminalization, (possession of $\frac{1}{2}$OZ results in a fine only) “Medicalization”, and **Legalization** of MJ use on perception of harmfulness, peer approval, availability and use?
- ◆ What are the short/ long-term outcomes of teen MJ use: Driving fatalities, drug dependence, psychosis/MH & educational problems
- ◆ What preventive and policy measures are necessary considering developmental **Best Interest** of youth and emerging adults ≤ 25 .Y.O.

State of CT Marijuana Act

- ◆ In addition to CO and WA, legislators in 7 states have either pre-filed or introduced bills to fully legalize MJ for recreational use
- ◆ CT House Bill No. 5389
- ◆ CT Public Act No. 12-55
- ◆ An Act Concerning the Palliative Use of Marijuana (PUM)
- ◆ Debilitating medical condition means: cancer, glaucoma, AIDS, MS, Parkinson's, Neurological damage with intractable spasticity, epilepsy, cachexia, wasting syndrome, Crohn's, PTSD and **ANY** condition approved by DCP
- ◆ State of CT Regulation of the Dept of Consumer Protection (DCP) concerning PUM was approved in 2013

Marijuana's Effects on the Brain

HYPOTHALAMUS

Controls appetite, hormonal levels and sexual behavior

BASAL GANGLIA

Involved in motor control and planning, as well as the initiation and termination of action

VENTRAL STRIATUM

Involved in the prediction and feeling of reward

AMYGDALA

Responsible for anxiety, emotion and fear

BRAIN STEM AND SPINAL CORD

Important in the vomiting reflex and the sensation of pain

NEOCORTEX

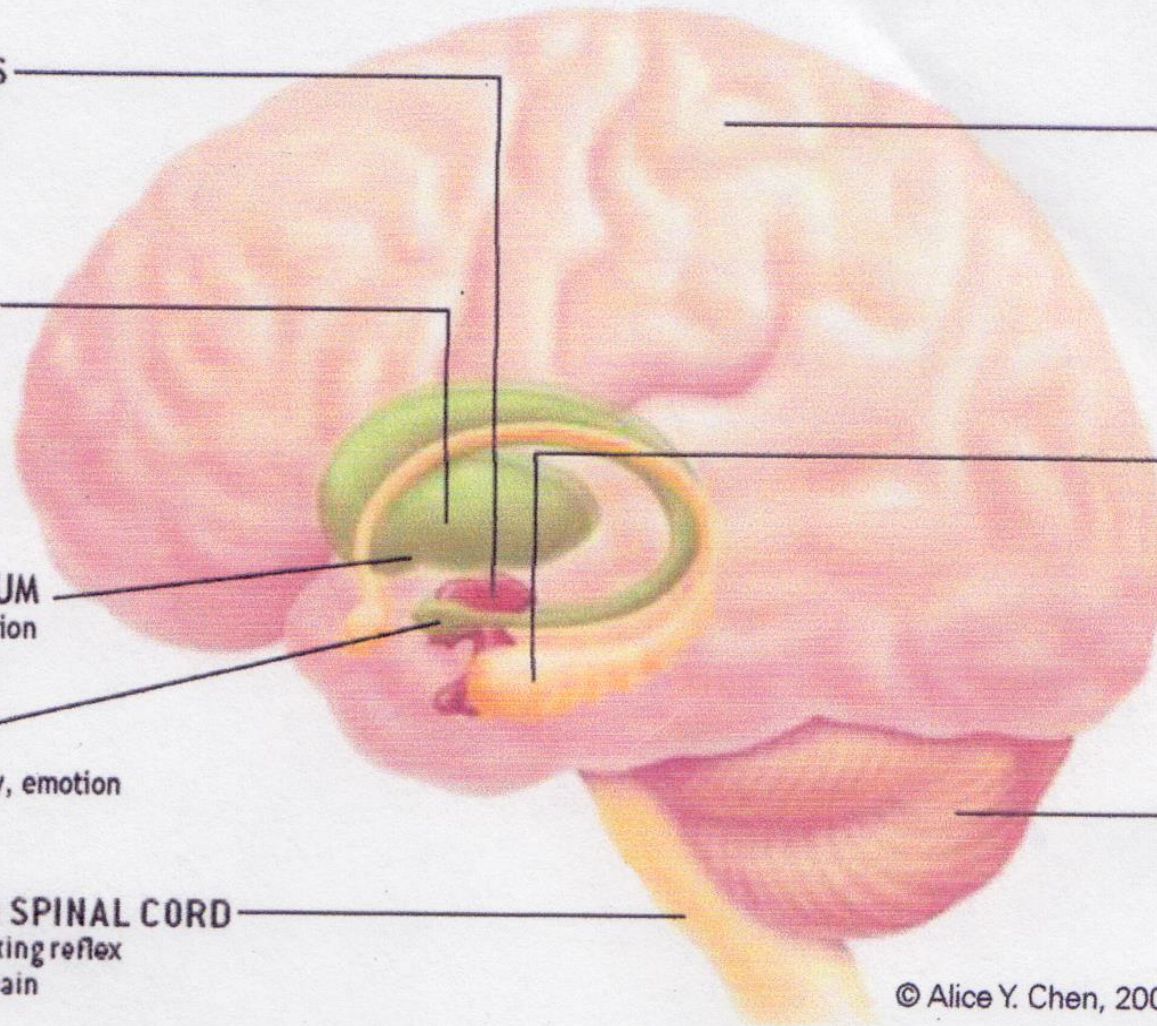
Responsible for higher cognitive functions and the integration of sensory information

HIPPOCAMPUS

Important for memory and the learning of facts, sequences and places

CEREBELLUM

Center for motor control and coordination



© Alice Y. Chen, 2004. Adapted from *Scientific American*.

When marijuana is smoked, its active ingredient, THC, travels throughout the body, including the brain, to produce its many effects. THC attaches to sites called cannabinoid receptors on nerve cells in the brain, affecting the way those cells work. Cannabinoid receptors are abundant in parts of the brain that regulate movement, coordination, learning and memory, higher cognitive functions such as judgment, and pleasure.

Definitions: Cannabis, Cannabinoids, THC, etc

- ◆ Cannabis: refers to the plant (*Cannabis sativa*) and its components
- ◆ Marijuana: comprises the dried flowering tops & leaves of the plant
- ◆ Hasish: consists of dried cannabis resin (THC content 2-20%)
- ◆ THC: Delta 9-Tetrahydrocannabinol is the primary psychoactive component of cannabis preparations (**increasing** potency trend).
- ◆ **Cannabinoids**: refers to any chemical compounds that include or are related to THC.
- ◆ Endocannabinoids: synthesized in the body
- ◆ Synthetic cannabinoids: manufactured in the lab (e., dronabinol)
- ◆ Cannabidiol: a non-psychoactive cannabinoid present in cannabis products that can modulated THC effects (e..g, Hemp products with little THC concentration)

Facts Vs. Myths

George Bernard Shaw

For every complex problem, there is a simple solution..... and it is always **Wrong**

Beware of false knowledge (**misinformation**): it is more **Dangerous** than ignorance

Scott Adams (Dilbert Cartoons)

Never under-estimate the ignorance of the public

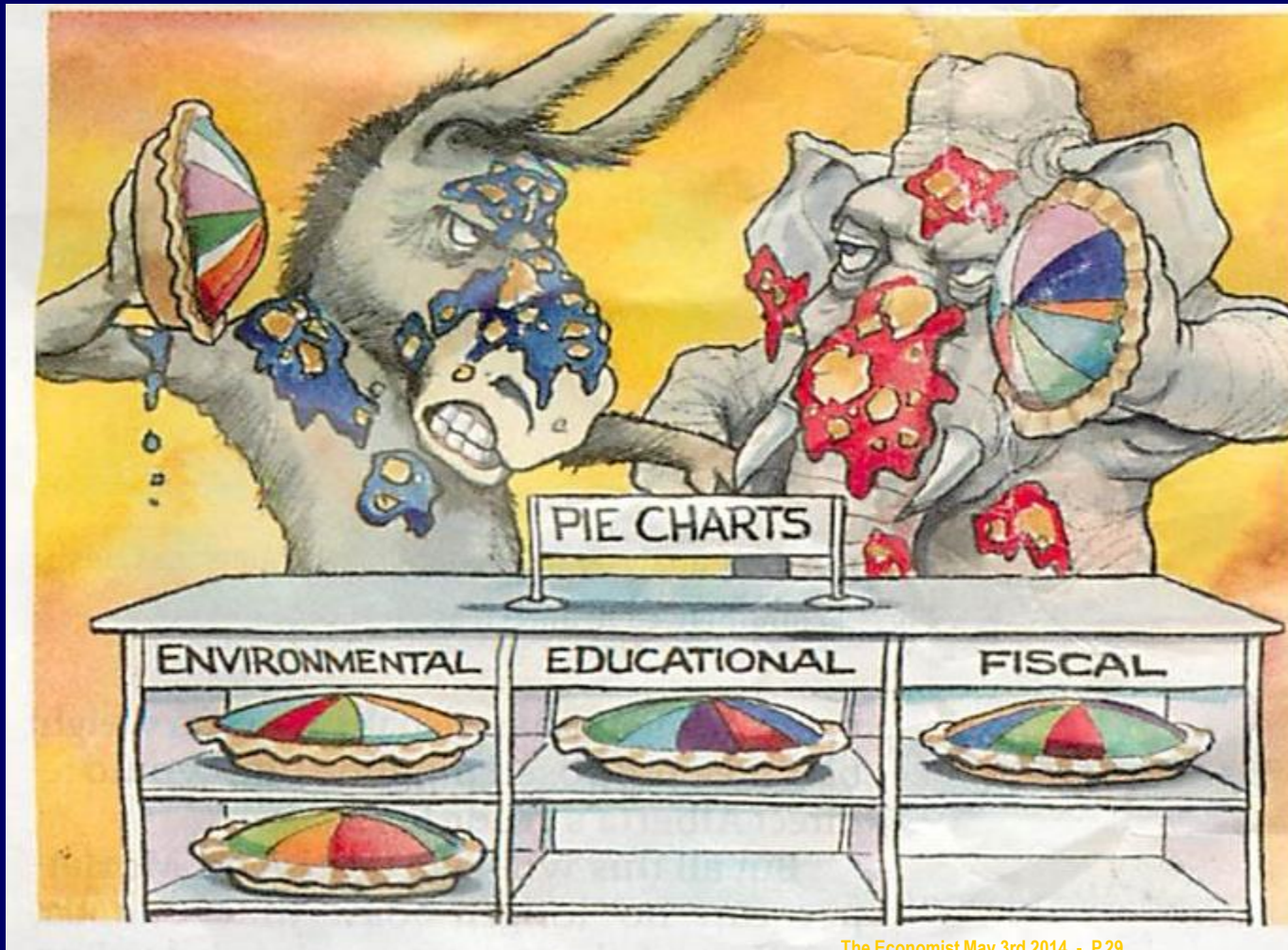
When Science Doesn't Support Beliefs

Then ideology Needs to Give Way- M. Shermer 10.2013

- Motivated reasoning-when our brain finds a way to support what we want to be true.
- Confirmation bias that directs the mind to seek confirming facts and ignore disconfirming evidence.
- Cherry picking and data mining of studies to suit ideological convictions.
- Examples: Gun Control and Global Warming
- “It is better to understand the way the world is than how we would like it to be”

When facts are weapons

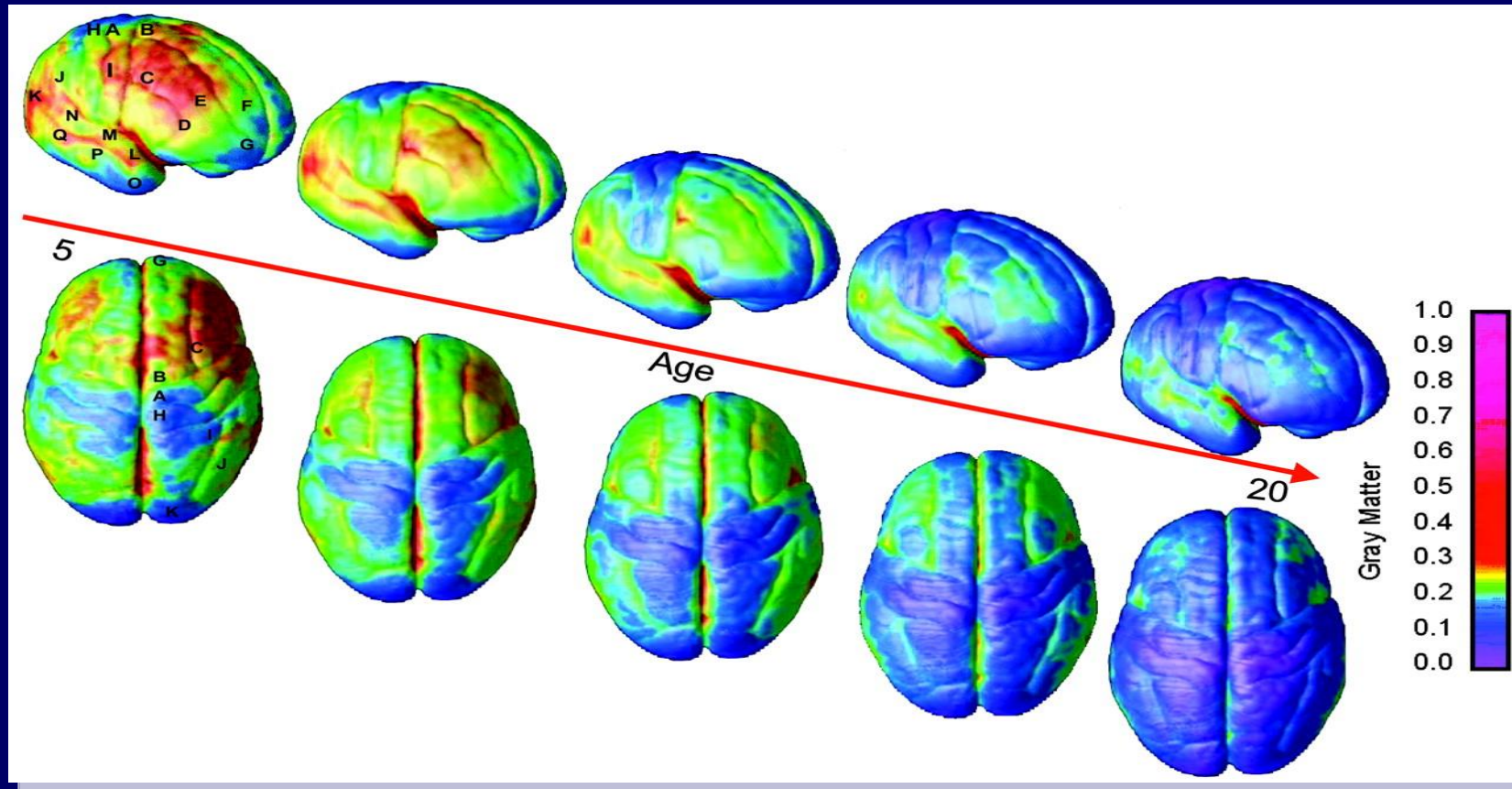
Politicians have never had access to so much data: how come their debates are so sterile?



Cannabis Risk/benefit Debate

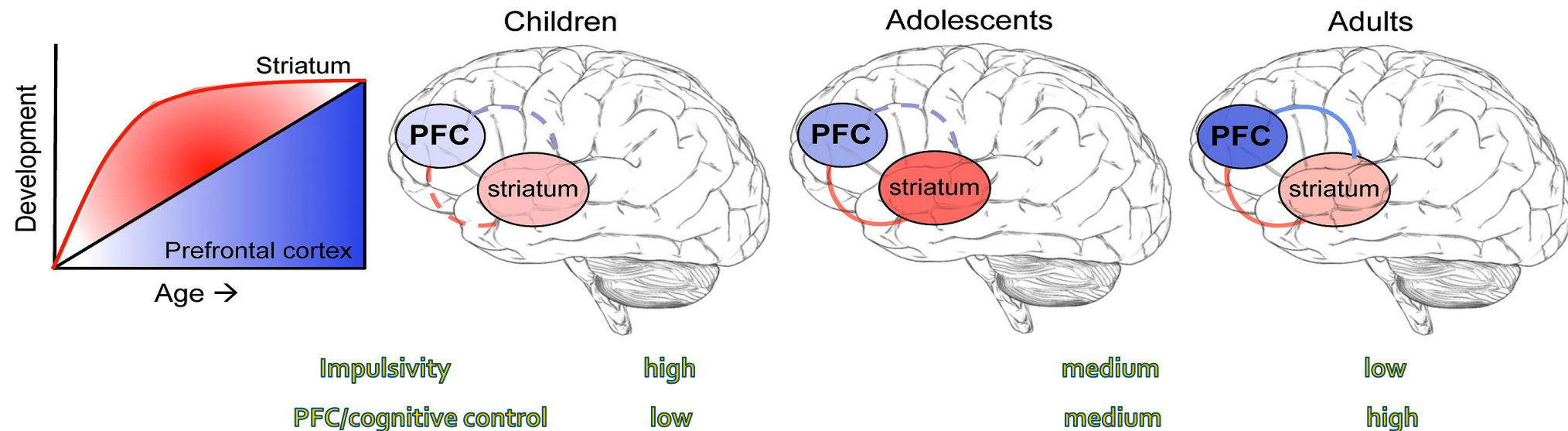
- ◆ Medications benefits and consumer safety have been highly regulated according to a clear multiphasic review and process by the FDA
- ◆ FDA mandates help to define safe and effective doses, quality control and accuracy of product labeling
- ◆ Cannabis termed “Medical” has no equivalent approval
- ◆ No medicine approved in the USA is **smoked**
- ◆ What does a poorly informed popular vote process has to do in approving, labeling, and distributing smokeable cannabis as a “medicine” **Against** medical advise of the AMA and CT MA?

Recent Studies Have Shown that Maturation of the Brain's Gray Matter Moves from Back to Front



Late to develop is the prefrontal cortex, involved in circuitry to control impulses, judgment, and decision-making

Vulnerability to SUD and Psychiatric Disorders



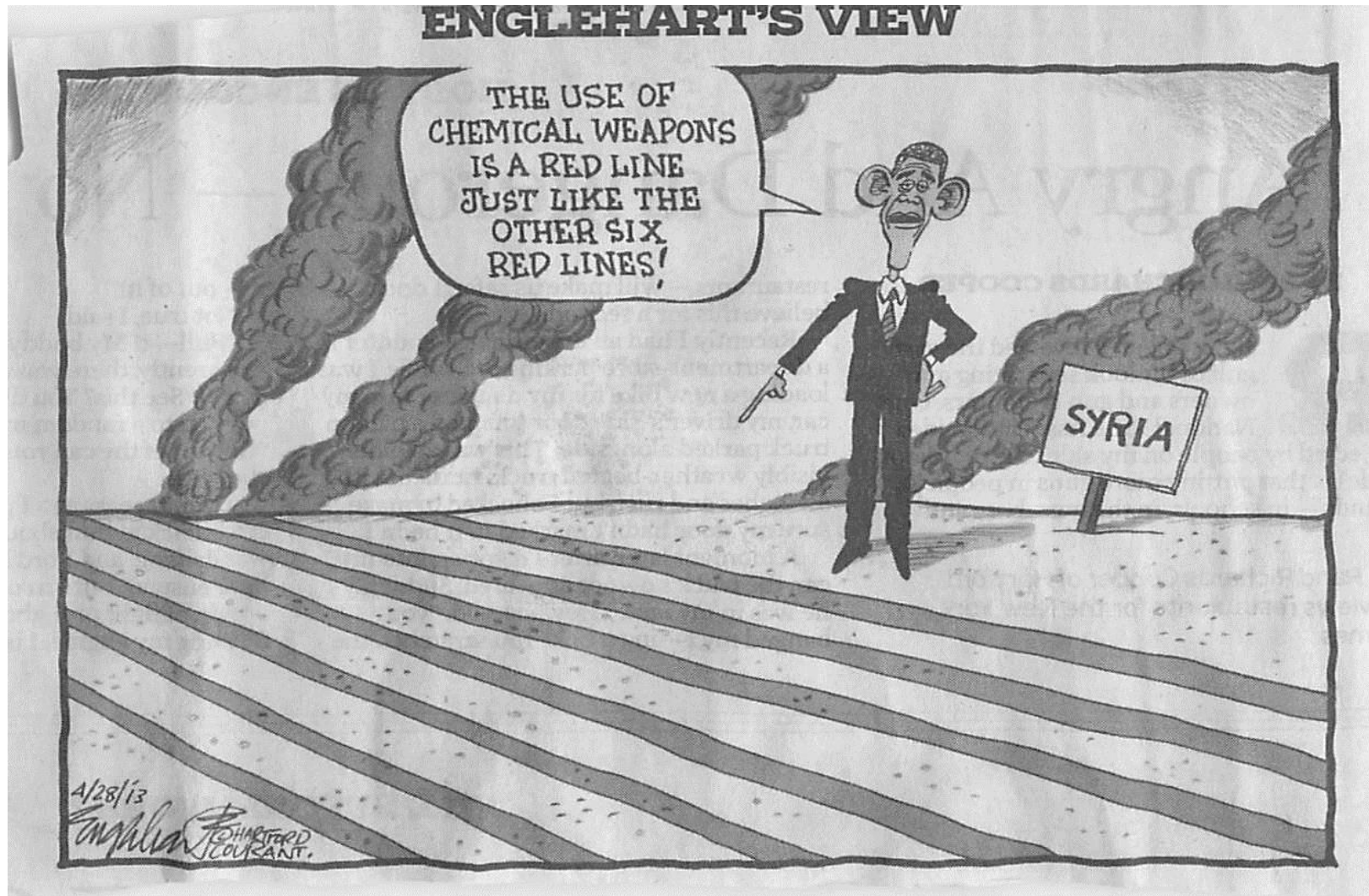
- Environment and activities during teenage years guide selective synapse elimination (“pruning”) during critical period of adolescent development
- “what teens do during their adolescent years -- whether it's playing sports or playing video games -- can affect how their brains develop” *J Giedd*

Erikson's Life-Cycle Chart: Adolescence

IDENTITY vs. IDENTITY DIFFUSION

- ◆ Anticipation of Achievement Vs. Work Paralysis
- ◆ Role Experimentation vs. Negative Identity
- ◆ Leadership Polarization vs. Authority Diffusion
- ◆ Ideological Polarization vs. Diffusion of Ideas

Erikson's Adolescence: Identity Vs. Identity Diffusion



Kohlberg's Stages of Moral Development

- Moral reasoning has 6 identifiable developmental stages.
- Pre-Conventional: 1. Obedience and punishment avoidance orientation; 2. Self-interest orientation (*what's in it for me?*)
- Conventional: 3. Interpersonal accord and conformity (*social norms*); 4. Authority and social-order maintaining morality

Post-Conventional: 5. Social contract orientation ; 6. Universal ethical principles (*principled conscience*)

*PC moralists live by their own ethical principles (human rights, life, liberty, justice). May question /disobey rules when inconsistent with their own principles.

Moral Reasoning II

- In Kohlberg's theory Justice is the essential characteristic of MR.
- There is “Moral Universalism” (can be no Relativism)
- Justice Operation: the process of resolving conflicting claims to reach an equilibrium. It includes Equality (impartiality) and Reciprocity (regards for the role of personal merit).
- Reversibility (moral musical chairs) is the result of both operations. The act would be satisfactory if persons switch roles.
- Humans are inherently communicative, capable of reason, and possess a desire to understand others and the world around them.

BAD MOVES

Book Description

Publication Date: May 8, 2013 |

ISBN-10: 0199668477 | ISBN-13: 978-0199668472

Making decisions is such a regular activity that it is mostly taken for granted. However, damage or abnormality in the areas of the brain involved in decision-making can severely affect personality and the ability to manage even simple tasks.

Here, Barbara Sahakian and Jamie Nicole LaBuzetta discuss the process of normal decision making - our strategies for making decisions, biases that affect us, and influential factors - and then describe the abnormal patterns found in patients with conditions such as severe depression, Alzheimer's, and accidental brain damage.

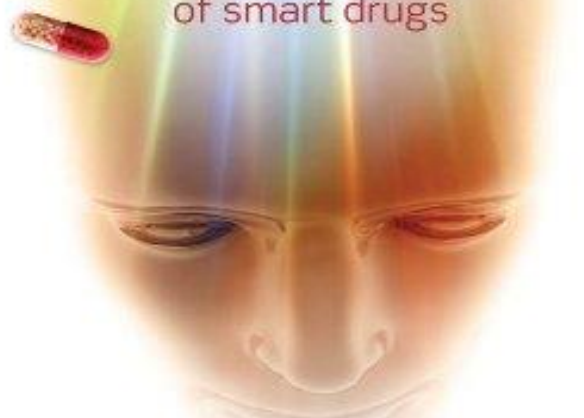
Using striking examples and case studies from their own research to show the impact of abnormal decision making, they introduce the concept of 'hot' and 'cold' decision making based on the level of emotions involved, showing that in various psychiatric conditions extreme emotions alter the pattern of decision making.

Looking at the ways in which the brain can be manipulated to improve cognitive function in these patients, they consider the use of 'smart drugs' that alleviate these problems. The realization that smart drugs can improve cognitive abilities in healthy people has led to growing general use, with drugs easily available via the Internet. They raise ethical questions about the availability of these drugs for cognitive enhancement, in the hope of informing public debate about an increasingly important issue.

BAD MOVES



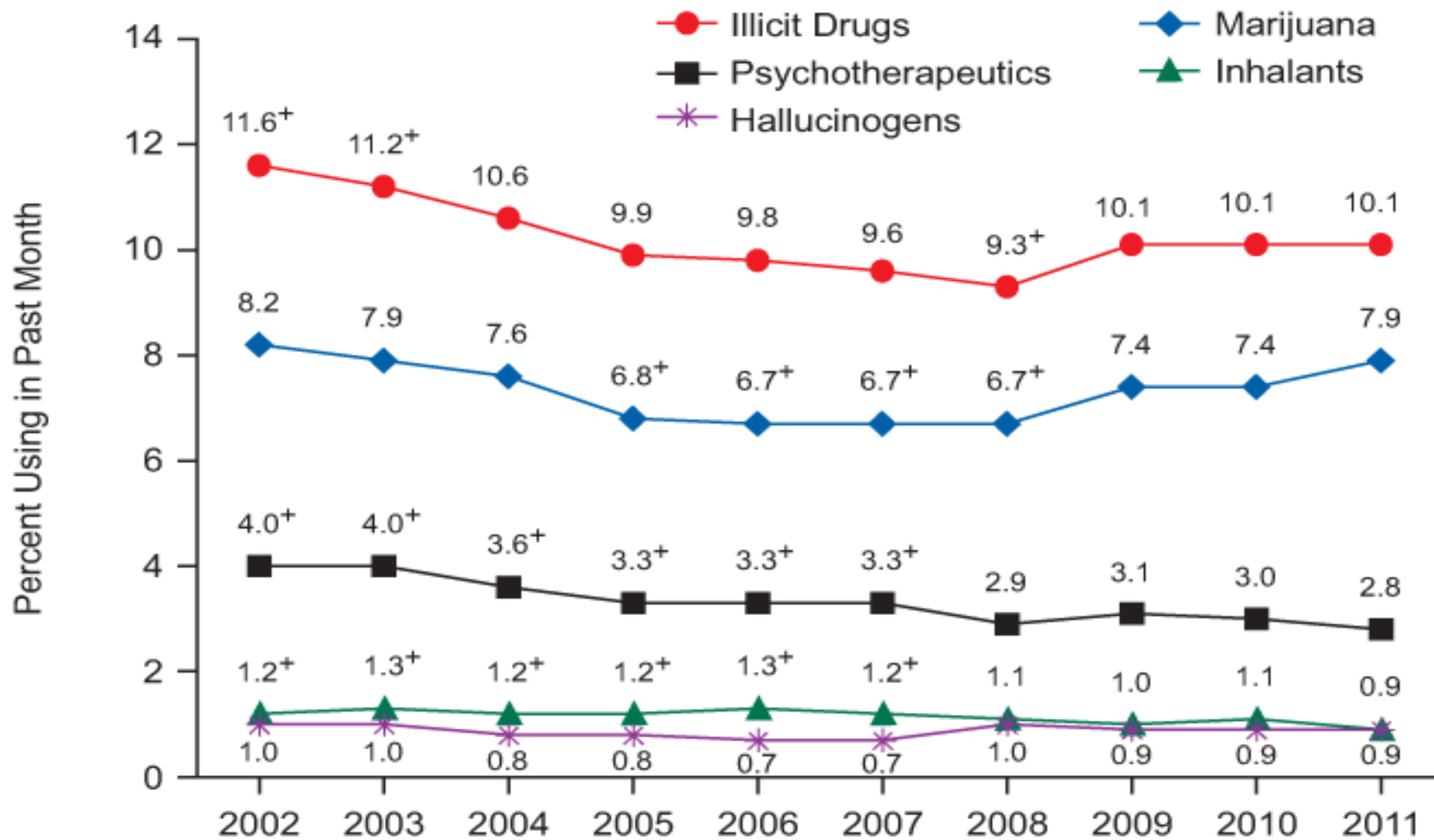
How decision making
goes wrong, and the ethics
of smart drugs



BARBARA J. SAHAKIAN &
JAMIE NICOLE LABUZETTA

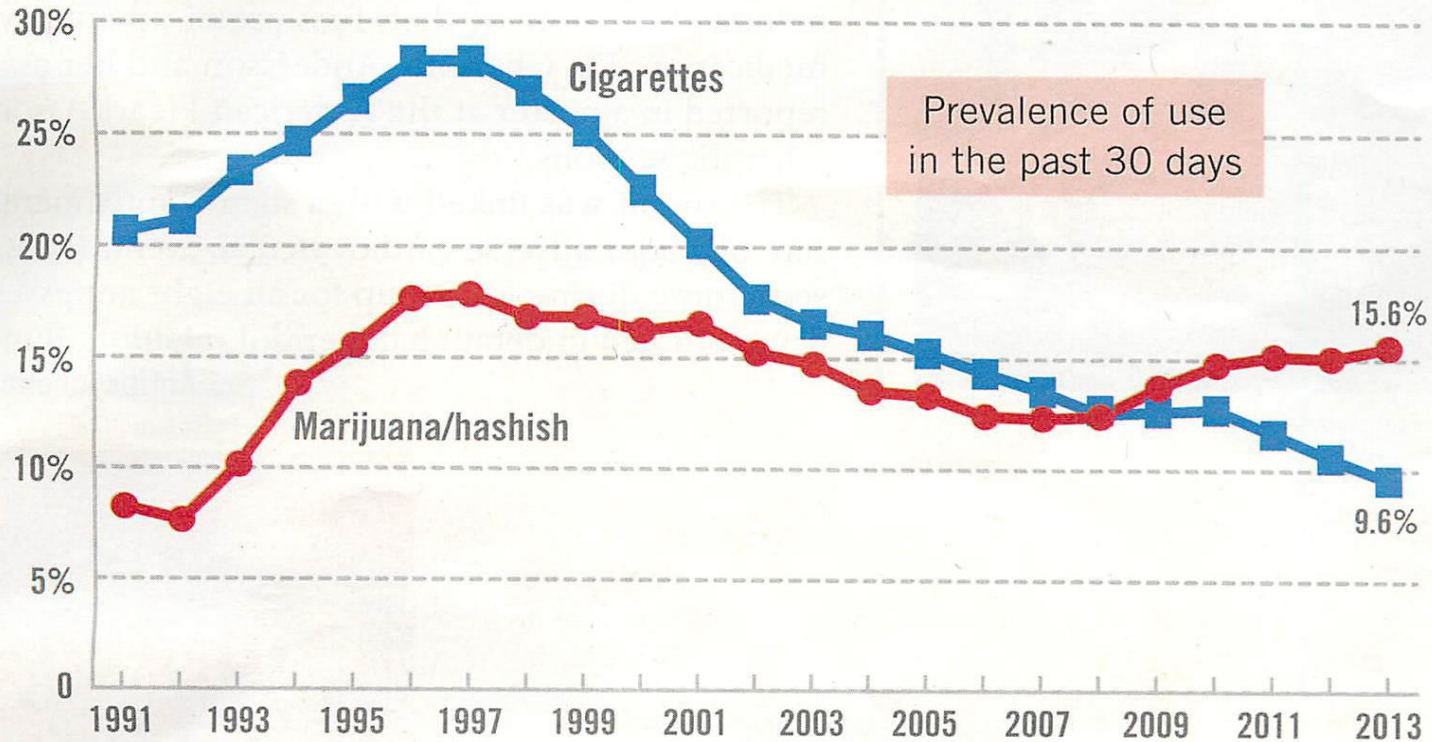
Epidemiology

Past Month Use of Selected Illicit Drugs among Youths Aged 12 to 17



⁺ Difference between this estimate and the 2011 estimate is statistically significant at the .05 level.

More 8th, 10th, and 12th graders use marijuana than smoke cigarettes



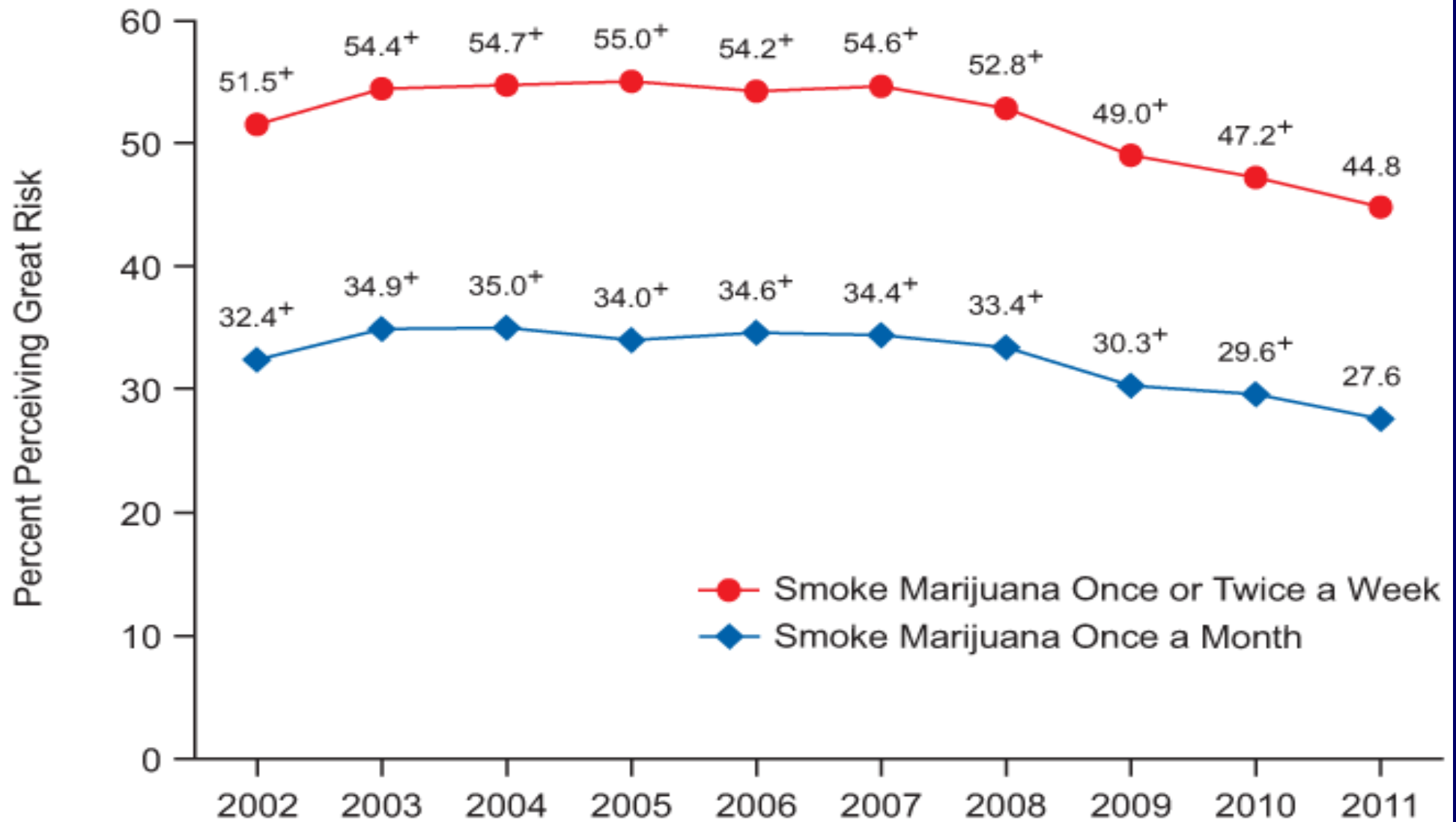
Note: For the 2013 survey, 45,449 students from 395 public and private schools participated.

Source: The Monitoring the Future study, University of Michigan

Frontline Medical News

Why is Marijuana Use Increasing?

Perceived Great Risk of Marijuana Use among Youths Aged 12 to 17



⁺ Difference between this estimate and the 2011 estimate is statistically significant at the .05 level.

Update MTF 2013

- ◆ Only 39.5% of seniors view MJ use as harmful (44%-012)
- ◆ 6.5% of seniors smoke daily (2.4%-1993)
- ◆ Past month use increased between 2008-13:
 - 8th Grade: 5.8-7%;
 - 10th Grade: 13.8-18%;
 - Seniors: 19.4-22.7%

Does Liberalizing MJ Laws Increase Teen Use?

Why is it so important?

- ◆ Decision to use MJ for the 1st time is sensitive to its legal status compared to a cont'd use.
- ◆ The effect of lifetime harm averted is larger than inducing a quit considering MJ effect on MH problems and lowering educational attainment

◆ YES

- ◆ “The impact of Decriminalization is concentrated among minors, who have a higher rate of uptake in the first 5 years following its introduction”.
- ◆ There is a “Trickle Down” effect: 1st time users age has been dropping. Williams & Bretteville-Jensen (J Health Economics, 2014)

Teen Driving Casualties-Alcohol & MJ

- ◆ 2,700 and 282,000 US teens age 16-19 Y.O. were killed or visited an ER respectively following road crashes. (CDC-Prevention, 2010)
- ◆ Alcohol was involved in 32% of deadly crashes (Nat'l Hi'way Traffic Safety Administration, 2011).
- ◆ 23% of teens admit to driving under the influence of alcohol, MJ, and/or prescription drugs.
- ◆ 34% of MJ users and 20% of drinkers respectively believe MJ **IMPROVES** their driving skills.
- ◆ 41% of MJ users and 19% of drinkers respectively believe the substance has NO impact on their driving skills (Students Against Destructive Driving. A survey of 1,708 11-12th graders, 2012).

MJ and Driving

- ◆ In driving-simulation and closed-course studies, people on MJ are slower to break and worse at safely changing lanes.
- ◆ 5ng/mL of THC in the blood has been found as the threshold for increased risk for a crash. Similarly to .08% blood alcohol level legal limit.
- ◆ However, it is a technical challenge to identify by law enforcement
- ◆ Poor driving and smell of MJ is the only reason for a car search.

Colorado Driving Fatalities & MJ

- ◆ From 2006-11 decreased by 16%
- ◆ Driving fatalities (DF) involving drivers positive for MJ (DPM) increased by 114%
- ◆ In 2006 DF involving DPM represented 5% of the total DF. By 2011 that increased to 13%
- ◆ In 2006 DPM were involved in 28% of DF involving drugs. By 2011 increased to 56%
- ◆ DPM association with DF was significant in CO since 09 when MMJ became available and prevalent. No sig change seen in NMMS. No change in proportion of alcohol impaired drivers in DF. Salomonsen-Sautel S et al. (2014)

Emergency Room MJ Admissions

- ◆ Colorado ER MJ referrals **26%** compared to 21% the national average
- ◆ From 2011-2013, **57%** increase in MJ related visits
- ◆ Hospitalization from 2008-2013 increased **82%** .
- ◆ City of Denver rates **45%** higher than the rest of Colorado.

RMHIDRA Vol. 2/2014

THC Extraction Labs/Crime Rates

- ◆ The emergence of butane hash oil (BHO) lab aimed at increasing MJ concentration of THC to 80-90% (compared to 10-15% in a cigarette).
- ◆ Butane is a volatile and explosive solvent that can cause “Flash Fire”. (Similar to Methamphetamine production explosions)
- ◆ This trend has caused explosions and burn related accidents some fatal. 26 confirmed explosions and 27 reported injury during Jan-Jun 2014 (double of the total # reported in 2013) [RMHIDTA Report Vol.2/Aug 2014](#)
- ◆ Annual crime rate in the Denver area increased by 6.7% in 2014

Kids and Cannabis Poisoning

- ◆ Exposures to MJ edible products for children ages 0-5 increased 268% (comparing 06-09 to 10-13).
- ◆ Calls about cannabis poisoning have doubled since 2009
- ◆ Colorado's rate of MJ related exposures is X3 the national average
- ◆ If parents are scared to report the reason for the ER visit it may lead to unnecessary procedures (E.g., spinal tap, CT) due to symptoms that might mimic meningitis.
- ◆ Costs of tamper-proof bags is an economical concern by producers.
(Denver Post, 2013)

Daily Use & Drug Testing in CO School

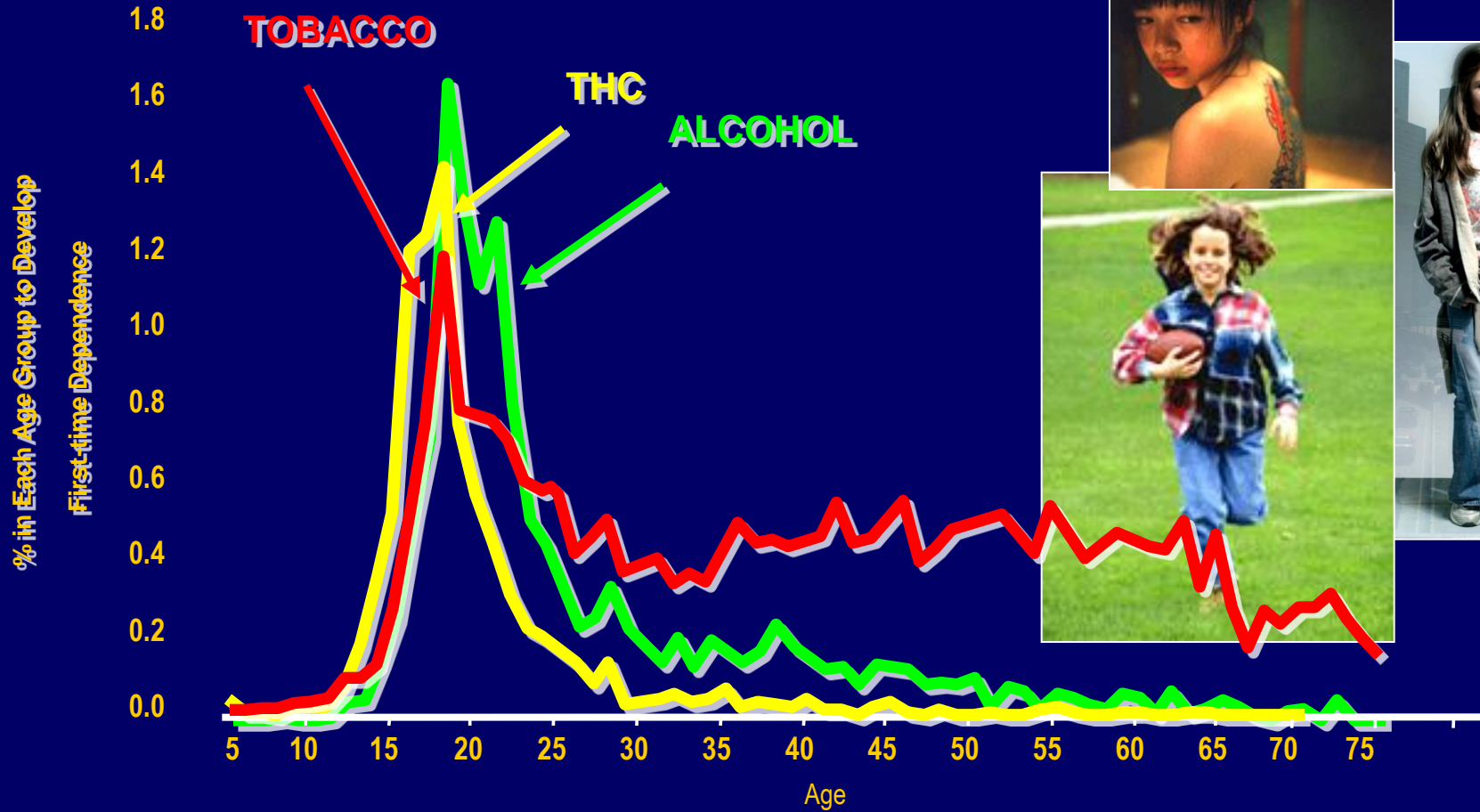
- ◆ Nat'l in 2011, 12th graders daily use was 6.6%. In CO it was 11.7%
- ◆ 16% of CO students have access to MMJ from card holders, dispensaries, retail MJ stores.
- ◆ In 2007 positive tests made up to 33% compared to 2012 57% of total drug screenings.
- ◆ Detected THC levels increased by 76% (from 225 to 396 nanograms) after 2009.
- ◆ Alcohol violations decreased from 8% (2006) to 5.6% (2013)
- ◆ MJ violations (same period) increased from 23.4% to 34%
- ◆ Top 9/42 states for current MJ use in high-school have MMJ. CT ranked 2nd (26%). Nat'l average 19.7%.
RMHIDTA, 2014

“Medical” Cannabis Policy and Teens Use

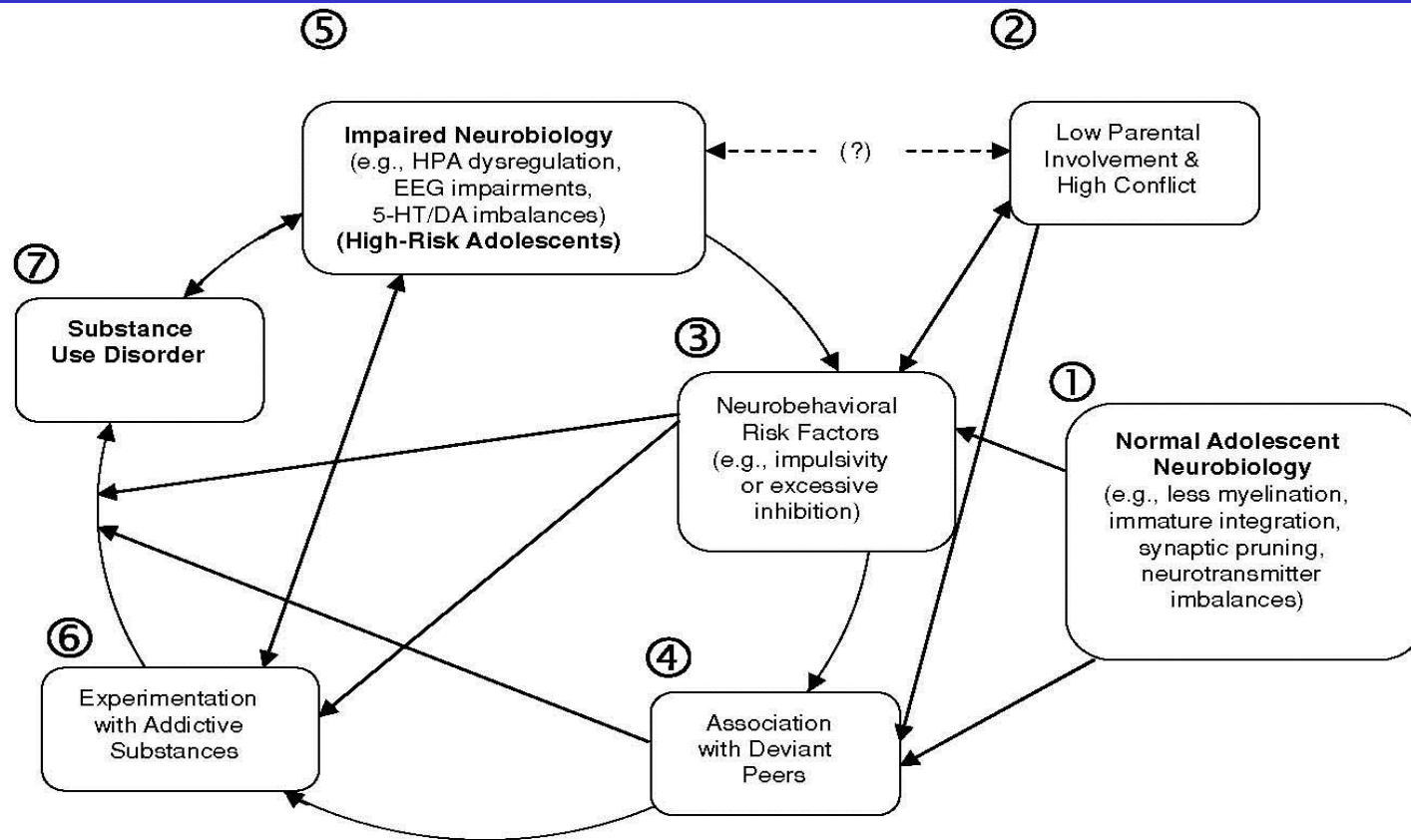
- ◆ A higher prevalence of teen cannabis use and a lower perception of risk in states with medical marijuana (MM) laws compared with those without (Wall MM, et al., *Ann Epidemiol*, 2011)
- ◆ The majority (74%) of teens (N=164; mean age-16) in treatment (Colorado-2.3%of adult pop. Have a MM registration) used MM with a median frequency of 50 times and mean of 117 (Samuelson-Sautel, *JAACAP*, 2012)
- ◆ Those using MM had earlier age of regular use, more symptoms of abuse and dependence, and more conduct symptoms compared with those NOT using MM

Addiction Is a Developmental Disease

starts in childhood and adolescence



Age for tobacco, alcohol and cannabis dependence, as per DSM IV



Labels for abbreviations
 HPA = Hypothalamic-Pituitary-Adrenal Axis
 EEG = Electroencephalogram
 5-HT = Serotonergic
 DA = Dopaminergic

FIGURE 1. Etiology of SUD Development in Adolescents

Is Marijuana Addictive? “Yes” it is!

- Research has established the neurobiological basis, reliability, validity, time course, and clinical relevance of Marijuana **Withdrawal** and **Dependence**

Withdrawal Syndrome

- Irritability, anger, depression, sleep difficulty, craving, decreased appetite
- Withdrawal symptoms undermine quit attempts and contribute to relapse
- Symptoms begin within 24-48 hours, peak within 4-6 days; last from 1-3 weeks

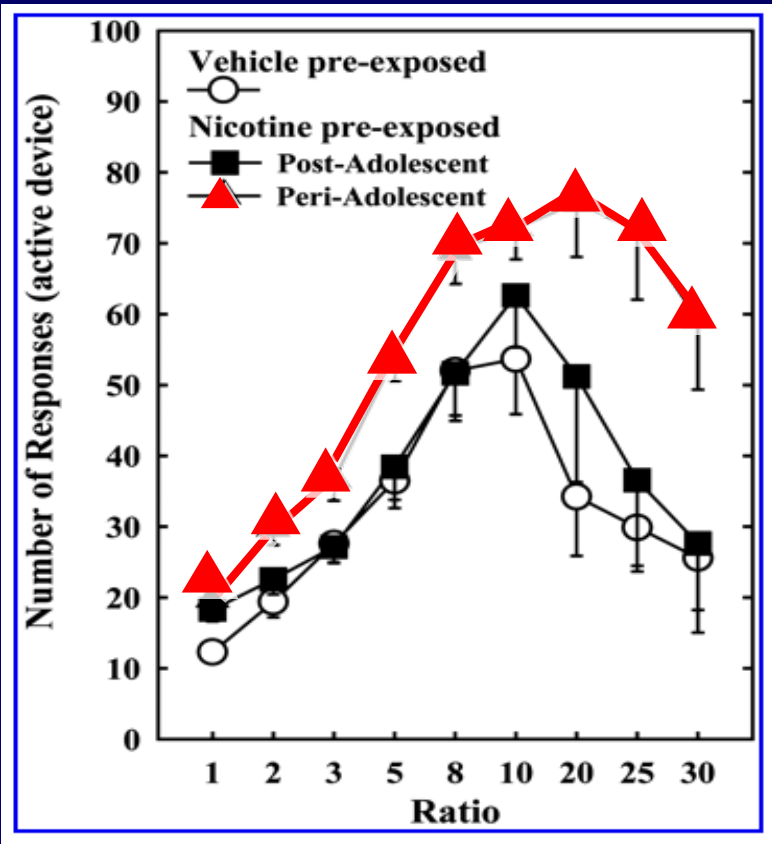
Is Marijuana Addictive II?

- 9% of those who try MJ become cannabis dependent, 5% of Americans are dependent on MJ
- **Consequences adults seeking treatment for MJ abuse/dependence**
 - average more than 10 years of near-daily use
 - Have more than six serious quit attempts
 - Inability to cut down/quit
 - Most experience cessation withdrawal
 - Continued use despite continued negative social, psychological, family-relationship, employment and other problems
 - Dissatisfaction with productivity, financial difficulties
 - Low: energy “**Amotivational syndrome**”? and self esteem

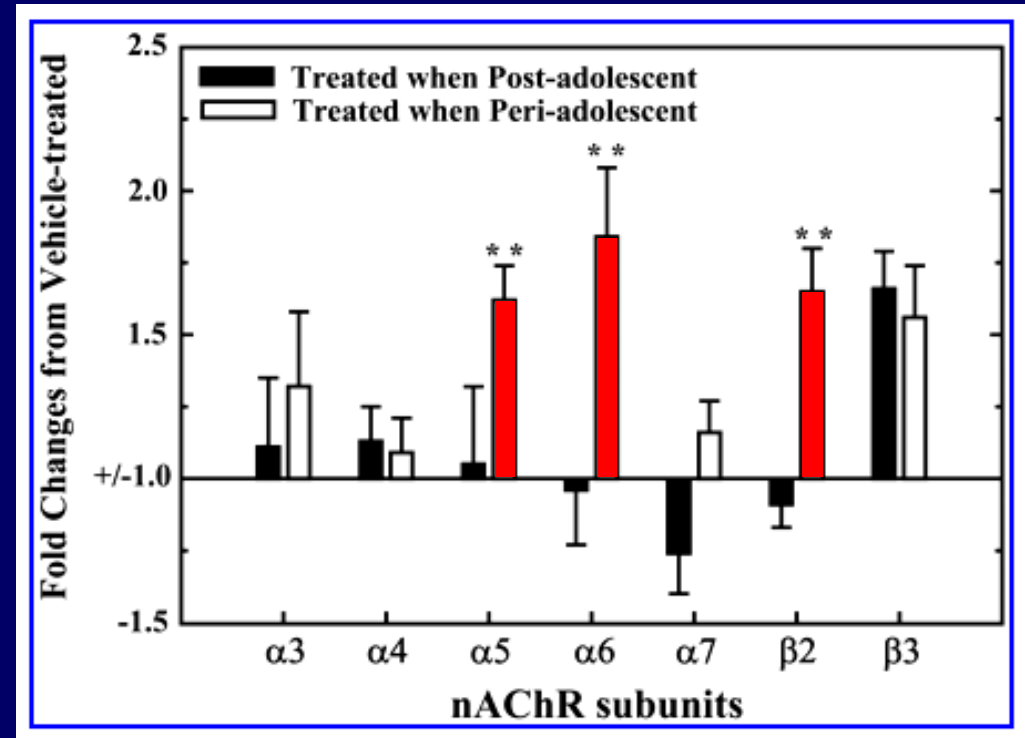
The Adolescent Brain Responds to Drugs Differently than the Adult Brain

Treatment of adolescent rats (but not young adults) with Nicotine leads to:

Increases in
Nicotine Self Administration



Increases in Nicotine Receptors



ADOLESCENTS ARE MORE VULNERABLE TO ADDICTION AND MJ EFFECTS

Longitudinal studies show:

- **Life time risk of dependence is rising from 9% to 17% if initiated in adolescence**
- **The earlier age of use the more likely use of heroin and cocaine**
- **Adolescents who started smoking MJ between ages 14-22 yrs but stopped by 22 had > cognitive problems at age 27 than those who started smoking MJ as adults**
- **Compared to controls and individuals who started MJ use >age 17, those who smoked MJ <17 had greater deficits in executive function, memory, verbal fluency, and learning.**

Marijuana's Effects on **your** Brain

- Impairs executive functioning, decision making; planning, organization, problem-solving (7-20 hrs); memory, learning (25 days); visual attention task; motor coordination and slows reaction time. **Chang L et al. (Brain, 2006)** Recovery after cessation is inconclusive
- Even recreational use causes structural changes including reduced size of the hippocampus and amygdala and affects development of the PFC . **Society of Neuroscience-Science Daily (15 April 2014).**
- Based on more than 20 yrs FU study in NZ, persistent use shows an average decline of 8 points of IQ. **Meier MH, (2012)**
- Impairment depends on age of onset, recency, frequency, duration of use, and cumulative dose of THC.

Substance Abuse and Psychiatric Disorders in Youth

- **1/2 of psychiatric disorders**
 - Onset before age 15
 - 3/4 by age 24
- **60-80% adolescents with substance use disorders (SUD)**
 - Have co-occurring psychiatric disorder
 - Associated with poorer treatment outcomes
- **Growing clinical and research consensus supporting integrated or concurrent treatment but progress impeded**
 - by systemic barriers and research gaps
 - **Lack** empirical research to guide development of an integrated treatment model

Cannabis Use and Early Onset Schizophrenia

- ◆ Early exposure to cannabis may represent a risk for developing EOS (<18 Years).
- ◆ May exacerbate neurobiological alterations associated with EOS.
- ◆ Cannabis use is associated with a more acute mode of 1st psychotic episode onset (N=511) (Mazzoncini R, *Acta Psych Scand*; 5/2010)
- ◆ There is a significant EOS and cannabis use disorders (CUD) interaction in the left superior parietal lobe.
- ◆ Both EOS and CUD had smaller gray matter volume in the parietal cortices compared with healthy controls.
- ◆ In the left thalamus the comorbid group had smaller gray matter volumes compared with healthy controls. Kumra et al. (*AACAP*; 2/2012)

Teens Initiation of MJ Use and Early-Onset Psychosis

A literature review (12 eligible studies) of initiated MJ use <18 Y.O. and experience of psychotic symptoms \leq 25 Y.O.

- ◆ Early initiation increase risk of EOP ($p < 0.001$)
- ◆ In Those with pre-existing vulnerability ($OR \geq 7.9$)
- ◆ In those using MJ more frequently ($p < 0.001$)

There is also a dose-response association between MJ use and EOP symptoms

- ◆ Those who use more tend to significantly experience greater # and severity of prodromal and diagnostic symptoms.
- ◆ Over treatment outcome is worse

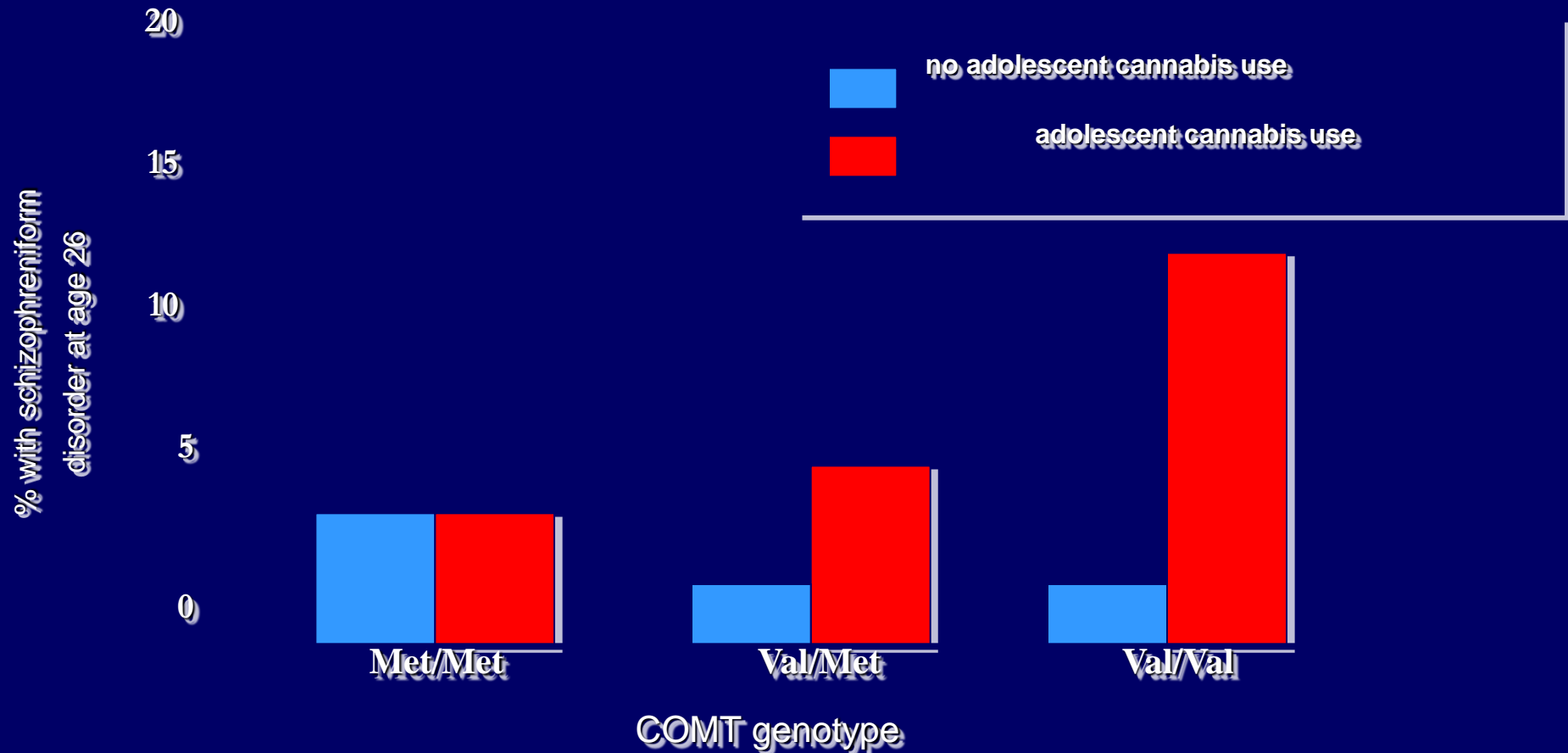
Bagot, Milin, Kaminer, (manuscript under review)

Cannabis and Psychosis in Adults

- ◆ MJ use associated with increased risk (X2-3) for schizophrenia N=50,000 Swedish males FU 15 and 27 yrs
- ◆ Estimate of 13% of SCZ could be averted if MJ use was prevented (Andreasson S et al. Lancet, 1987; Zammit S et al. BMJ, 2002)
- ◆ Meta-analysis of studies from NZ, Germany, Holland reported pooled OR of 1.4 (Moore TH, et al. Lancet,(2007)
- ◆ Several studies have not found a correlation (Hall & Degenhardt, Lancet, 2007)
- ◆ Differences might be attributed to dose and frequency response, short FU, poor control for reverse causation

Adolescent Cannabis Use Effects

Adult Psychosis in Individuals with Variations in the COMT Gene



Suicidal and NSSI Behavior

- ◆ Alcohol and other substance abuse predict suicide attempts and this relation increases with age. [Goldston et al. \(2009\)](#).
- ◆ MJ use increased the risk of first incidence of a suicide attempt (OR=4.8) in N=4175 teens followed for a year. [Roberts et al. \(2010\)](#)
- ◆ Early-onset (<16YO) cannabis use was associated with a modest increase in the risk for SA followed into adulthood, N=2311 ([Wilcox & Anthony, 2004](#))
- ◆ MJ associated with SA only among adolescent males , N=2090, [Afifi et al. \(2007\)](#)
- ◆ Cannabis use was associated with a current and past increased risk of nonsuicidal self injurious behavior (NSSI). [Laukkanen et al. \(2009\)](#)

Cannabis Use During Pregnancy

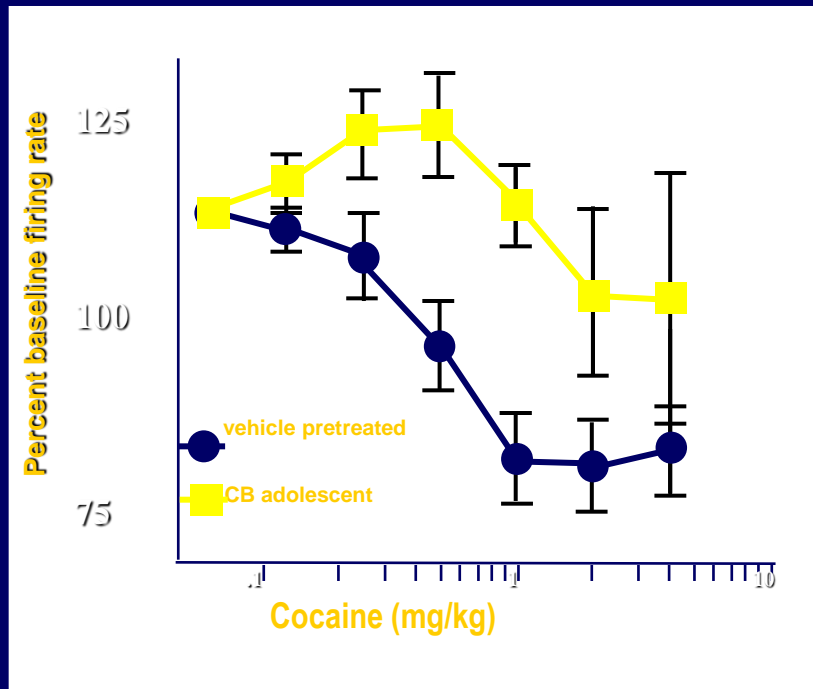
- ◆ At least half of the pregnancies in N. Am are unplanned
- ◆ Nearly 7% of women of childbearing age (15-44 years) reported last month use of Cannabis/Hashish (SAMHSA, 2006)
- ◆ Prenatal exposure has subtle adverse effects from Age 3 years on subsequent cognitive function, behavior, SA/MH in offspring (Porath-Waller AJ, 2007)

Cannabis Metabolic & Behavioral Effects on 3rd Generation of Sons

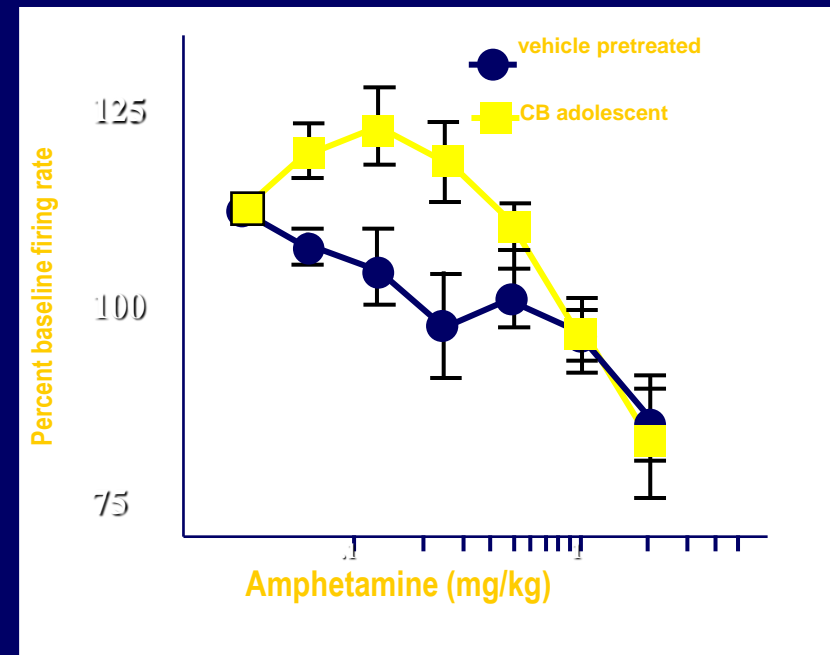
- ◆ Paternal cannabis exposure during adolescence in rats reprograms offspring reward neurocircuitry in a sex-dependent manner. **Hurd Y, (SFN Abstract 695.05, 2013)**
- ◆ These are permanent effects of temporary exposure to injections of THC to young rats reared by drug-naïve rat mothers.
- ◆ They weighed > those whose parents received saline injections, yet showed less motivation to seek highly tasty foods.
- ◆ Controlled mating of the adult pups who were NEVER exposed to THC studies of their offspring (i.e., 3rd generation) revealed epigenetic changes in males. These included mRNA expression changes in F0 and F1 generations affecting glutamatergic receptors and other genomic changes in the THC-exposed group.

Early Exposure to Marijuana Alters Response to Other

Drugs of Abuse



50



50

Early exposure to cannabinoids renders DA cells more reactive which could trigger a psychotic episode in a vulnerable individual

Parents and Sibs MJ Use: The Future is Now

- ◆ Over 40% of variance associated with the risk for CUD has been reported to be transmissible, that is, conveyed to children via conjointly genetic and parenting influences. **Hopfer C, et al. (2013)**
- ◆ We are made wise NOT by the recollection of our past, but by the responsibility of the future. **George Bernard Shaw**

Possible adverse effects of regular cannabis use with unknown causal relation

- ◆ Behavioral effects in children whose mothers smoked during pregnancy seem modest
- ◆ 1) small differences in higher cognitive processes such as perceptual organization and planning
- ◆ 2) Increased delinquency and behavioral problems (McLaren J, *Addiction* 2008)
- ◆ Adult onset schizophrenia, depression, and suicide-self harm
- ◆ Use of other illicit drugs by adolescents (Hall & Degenhardt, *Lancet* 2009)
- ◆ Some studies reported Respiratory infections and cancers due to compromised immunity (Tashkin DP, *J Clin Pharmacol*, 2002). Other studies have not. Tobacco smoking is a confounding factor.
- ◆ MJ provokes angina and elevates MI risk in pts with heart disease

Cannabinoid Hyperemesis Syndrome

- ◆ Cannabinoid receptor agonists are often used to treat nausea, vomiting, and anorexia
- ◆ However, several medical journals have published reports of intractable nausea and vomiting thought to be induced by chronic cannabis use and relieved ONLY by frequent and very hot baths/showers (N=44; Nicolson et al., *Psychosomatics*, 2012)
- ◆ 95% endorsed daily smoking; Age range 16-51; average use 9.8 yrs; no response to antiemetic meds
- ◆ THC is lipophilic, accumulation in fat may lead to toxicity and emesis. THC binds also to enteric NS slows peristalsis leading to “paradoxical “ hyperemesis
- ◆ Selective breeding, increased THC concentration, chemical additives, pesticides
- ◆ Increased body temp may reverse hypothalamic cannabinoid receptor stimulation

The Utilitarian View

- A 19th century Consequentialist thinking that places the moral worth of an action in its consequences or outcomes and emphasizes the good of the total society (“greatest good for the greatest numbers”, as opposed to benefits accruing by individuals or a group of individuals.
- Measurement is quantitative by adding up the positive aspects and contrast them with the negative ones
- Jeremy Bentham’s (1784-1832) “An introduction to the Principles of Morals and Legislation”
- Cost-benefit analysis is based on a utilitarian application
(David Stewart, 1998)

Rights and Duties

- How should we balance our duties with our obligations to the community
- Are there cases when individual rights should be sacrificed or restricted for the sake of a greater good? (e.g., CT Gun Control; 1st amendment vs. Hate Speech)
- Sense and sensibility: driving at 16, enlisting at 18, and drinking legal age at 21?

Legalization Promises Revisited: The Great Pot Experiment

Legalizing a drug is harder and more counterproductive than it looks

- ◆ “Will raise tax revenue” **Increase** costs associated with road crashes, Tx of addictive and MH disorders (alcohol and tobacco experience)
- ◆ “Money saved on policing weed can be spent on Tx for addicts”
Yeah Right (CT experience with pathological gambling and casinos revenues)
- ◆ “Will put criminals out of business” **NOT** so fast
- ◆ Many campaigners are dishonest, MMJ is more about paving the way for legalization than about helping the sick. **Customer=Patient**
- ◆ A conflict of interest is emerging between MMJ dispensaries and regulated legal sellers (e.g., price, black market, supply)

The Minimum Drinking Age Debate

- Initiated by founder of “Choose Responsibility” that focuses on Responsible Drinking (RD) and increasing awareness of the harms associated with alcohol use.
- Supporters of a Minimum Legal Drinking Age of 18 argue that: 1) it should be consistent with other legal rights, 2) Youth can and should be taught RD., 3) that MLDA-21 is unrealistic and leads to underground dangerous drinking.
- Supporters of MLDA-21 are concerned with “trickle down” effect
- The strongest support of MLDA-21 is associated with data that 25,000 have been saved since it was established in 1984. [Barnett \(2008\)](#)
- Drinking age of 21 may be preventing 600 homicides and 600 suicides annually (mostly in females). [Grucza RA et al. \(2012\)](#)

In Conclusion: I

- ◆ The adverse effects of MJ with cont'd increasing potency are not trivial
- ◆ There is a disconnect between scientific findings and teens perception given the continuous steady increase in use and decreasing perception of risk and disapproval
- ◆ Policy changes regarding the legal medical/medicinal use and decriminalization of the use of cannabis has not considered the impact on teens and parents and might have contributed to a changing adolescent perception
- ◆ Furthermore, medical MJ has and will find way to reach teens per the Colorado experience (Salomonsen-sautel, JAACAP, 12)

Smart Approach to MJ (SAM)

- ◆ Protect our youth and families by allocating resources for prevention/education in the school and community (starting in 4-5th grade)
- ◆ Support research of non smokeable MJ products.
- ◆ Move MJ from schedule 1 (e.g., LSD, MDMA, heroin): “not legitimate for medical use” to Schedule 2 (e.g., stimulants, opiates): “strong potential for abuse with legitimate medical use” (see MN medical MJ state law as a model)
- ◆ Oppose MJ legalization
- ◆ Fight back against “Big MJ” misinformation and targeting youth (similar to the alcohol and tobacco industries)

Adolescent Treatment of Marijuana Abuse (ATOM) Study

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◆ END OF PRESENTATION