

# B.R.A.D. Newsletter

Be Responsible About Drinking, Inc. • Spring/Summer 2007

## Alcohol and Brain Development

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## Alcohol and Youth Brain Development

The average age now reported for drinking is twelve years old. While most youth do not report excessive drinking on a regular basis, nearly 20% of 12 to 20 year olds are diagnosed as high-risk drinkers. The relationship between adolescent alcohol misuse and school is common knowledge: drinkers usually perform worse in school, are more likely to fall behind and have more social problems; particularly depression. But, we wondered if alcohol misuse affects brain development of young people?

The [American Medical Association](#) reports that alcohol can seriously damage long- and short-term growth processes of the brain. "Frontal lobe development and the refinement of pathways and connections continues until age 16, and a high rate of energy is used as the brain matures until age 20." Furthermore they state that damage can be long-term and irreversible. Even moderate and short-term use can impair learning and memory, more so than with adults. This is in part due to the fact that alcohol interrupts sleep, resulting in learning and memory impairment. Alcohol also disrupts releases of hormones necessary for growth and maturation. For those particularly interested in this topic, the AMA has compiled a summary of two decades of research into a PDF entitled *Harmful Consequences of Alcohol Use on the Brains of Children, Adolescents, and College Students*.<sup>1</sup>

<sup>1</sup>AMA Reports on Alcohol's Adverse Effects on the Brains of Children, Adolescents and Young Adults. [www.ama-](http://www.ama-assn.org/ama/pub/category/9416.html)

## Parts of the Brain Most Affected in Adolescence By Alcohol Misuse

The two key brain areas affected because they undergo dramatic changes during adolescence:

- **The hippocampus** handles many types of memory and learning. Heavy and extended alcohol use was associated with 10% smaller hippocampuses.
- **The prefrontal areas** (behind the forehead) play an important role in planning, decision making, impulse control and language. This area changes the most during adolescence.

## Extended Heavy Alcohol Use Can Impair Brain Function in Adolescents

The first concrete evidence that extended, heavy use of alcohol could impair brain function in adolescents came out of California in 2000. "Significant brain development continues through adolescence," states Dr. Sandra Brown, Chief of Psychiatry at the VA San Diego Healthcare System and Professor of Psychology and Psychiatry at the University of California, San Diego. "For example, certain brain nerve cell connections disappear up until age 16 as a function of environmental stimulation and redundancy, and cerebral metabolic rates increase in childhood, then taper toward adult levels by about age 20. Thus, alcohol may have quite different toxic effects on adolescent brains than on those of adults."

Her study compared 33 alcohol dependent teens to 24 alcohol abstinent teens. She found several differences in memory function between the two groups.

[assn.org/ama/pub/category/9416.html](http://www.ama-assn.org/ama/pub/category/9416.html), updated on February 2, 2007. Viewed on 4/11/07.

*A summary of the differences between the heavy drinkers vs. non-drinkers:*

- Adolescent drinkers scored worse than non-users on vocabulary, general information, memory and memory retrieval.
- Verbal and nonverbal information recall was most heavily affected, with a 10 percent performance decrease in alcohol users.<sup>2</sup>

This study suggests there are lasting implications for frequent drinkers into adulthood. Alcohol inhibits systems important to storing new information as long-term memories and makes it difficult to recall what was just learned.

The brain images below show how alcohol may harm teen mental function. Compared with a young non-drinker, a 15-year-old with an alcohol problem showed poor brain activity during a memory task. This finding is noted by the lack of pink and red coloring.



Image from Susan Tapert, PhD, University of California, San Diego.

### Teens Have a Higher Tolerance than Adults: Can Lead to Greater Misuse

A groundbreaking study found that the unpleasant physical symptoms associated with alcohol intoxication and hangover, that triggers most adults to stop drinking, is experienced far less by young adults. The study implicates the adolescent ability to quickly

<sup>2</sup> Adolescent Alcohol Dependence May Damage Brain Function: University of California at San Diego and VA Researchers Report First Findings. [www.nih.gov/news/pr/feb2000/niaaa-14.htm](http://www.nih.gov/news/pr/feb2000/niaaa-14.htm), February 14, 2000. Viewed on 4/11/07.

develop a tolerance to alcohol to the potential for greater misuse of alcohol.

In addition, adults may not realize the level of intoxication in a teenager because they show less impairment and sedation than an adult would with the same amount of alcohol. “Thus, the lack of overt signs of intoxication may mask the more potentially damaging effects of alcohol on neural systems involved in learning and memory,” states Marisa M. Silveri, Assistant Professor of Psychiatry at Harvard Medical School. She continues “these findings support the notion that the adolescent brain functions quite differently than the adult brain, particularly in its response to alcohol. Even though the adolescent brain has the ability to adapt to an alcohol challenge, this will likely come at a great cost as valuable cerebral resources are redirected from the important role of brain development to instead adapting to an alcohol challenge, and then restoring the system back to status quo once the alcohol is eliminated or the challenge is removed.”<sup>3</sup>

### What Can We Do

Since about 75-80% of teens report having drunk alcohol, we can see that it seems to be a common developmental experience (testing boundaries, risk taking). Fortunately, most youth do not engage in alcohol misuse regularly or go on to develop an alcohol addiction. However, we have a responsibility to create opportunities for our young people that reinforce healthy and safer decision making.

We can help diminish the risks that young people may take by:

1. Encourage them to participate in extra curricular activities (less likely to than misuse alcohol).
2. Discuss your family’s expectations for social outings that may involve alcohol.
3. Role model responsible alcohol use.
4. Reduce access to alcohol to youth.
5. Address sales and giving of alcohol to youth.
6. Discuss the health consequences associated with alcohol use, particularly with high-risk drinking.

<sup>3</sup> Adolescent Brains Are Insensitive To Alcohol For a Short Time, But At Great Cost. [www.medicalnewstoday.com/printerfriendlynews.php?newsid=55049](http://www.medicalnewstoday.com/printerfriendlynews.php?newsid=55049), October 29, 2006. Viewed on 4/11/07.

# Innovative Approach to Addressing Collegiate “Celebration Drinking”

Michigan State University (MSU) is the site of a successful global social norms campaign that began in 2000. Essentially, the social norms approach uses a variety of methods to correct negative misperceptions (usually overestimations of use), and to identify, model, and promote the healthy, protective behaviors that are the actual norm in a given population. When properly conducted, it is an evidence-based, data-driven process, and a very cost-effective method of achieving large-scale positive results. At MSU, the students’ misperception that the norm for drinking at parties and social occasions was 5 or more drinks had declined more than 1/3 by 2004 and more than 2/3 by 2005. In addition to the global campaign that broadly addresses typical drinking, in 2001 MSU researchers sought to find evidence regarding the existence of and social norms surrounding, “celebration drinking.”

The study results proved that “celebration drinking” is a distinct phenomenon that differs from college students’ typical drinking. In its cultural context, celebration drinking is associated with particular events and these are recognized as occasions when even those who may not typically drink will so, and those who are drinkers see these as occasions to drink more than usual to get drunk. Furthermore, the findings suggest that students overestimate the percentage of their peers who engage in celebratory drinking, suggesting that a social norms approach may be an effective way to reduce high-risk consumption and negative consequences during such occasions.

Reshaping the celebratory drinking culture about safe levels of drinking, about where to drink, with whom, and what to drink may reduce the pressure to drink excessively on all celebration occasions. The research shows that even on a campus where typical drinking levels have steadily declined over time due to an effective social norms campaign, students’ perceived and actual drinking behaviors during celebratory occasions remain a source of concern that a more targeted normative campaign may be able to address.

Source: <http://www.socialnorms.org/pdf/SNR4-2006.pdf>

## From our Mailbox



While I was working at Olive Garden on a busy Friday night, I overheard some girls talking about St. Patrick's Day and the 'events' they had planned. Of course, it was the typical talk about getting up early and being drunk all day but then one girl spoke up and said, "I don't think I'm going to get that drunk..." and her friends just stopped and looked at her.

They asked her why she said that because it was St. Patrick's Day and "everyone does it," but the girl responded with a statement that totally caught me off guard: "Whenever I go out drinking, I think of Brad and what happened to him, and I want to make sure I am safe." She then pulled out a B.R.A.D. card from her wallet/purse and passed it around the table to her friends. I was amazed at this girl's opportunity to stand up for her beliefs (and her safety) when her friends were on the opposite end and I wanted to hug her right there!

I thought you might enjoy this story... it looks as if the cards are having an effect on students!

*~Vince  
Michigan State University*

Thank you for your presentation on May 11, 2007 at Delaware Hayes High School. I was approached by several of the teaching staff who said they thought the message was needed and felt the presentation was well accepted by the students. I also had several members of the senior class tell me they thought your presentation was the best pre-prom presentation they have had during their high school career. Thank you for making a difference in the lives of young people.

*~ Officer Rod Glazer  
Delaware Police Department  
School Resource Officer/DARE Officer  
Delaware, OH*

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## Educational Material Requests

If you are interested in placing an order, we encourage you to do directly from our website at [www.brad21.org/request\\_literature.html](http://www.brad21.org/request_literature.html).

| Item  | Prices      |
|---|-------------|
| Birthday card   | \$.18 each  |
| Alcohol poisoning wallet card                             | \$.15 each  |
| Alcohol poisoning magnet                                  | \$.30 each  |
| Organizational brochure                                   | \$.10 each  |
| Alcohol poisoning information sheet                       | \$.05 each  |
| Alcohol poisoning poster                                  | \$5.00 each |
| Alcohol awareness CD with vignettes and facilitator guide | \$100.00    |



## DONATE TO THE FOUNDATION

The B.R.A.D. Foundation has relied on the generous donations of friends and advocates of the organization's educational goals and activities. The continuation and scope of our projects is dependent on the donations received. You can find information about making donations at [http://www.brad21.org/make\\_a\\_donation.html](http://www.brad21.org/make_a_donation.html)

Be Responsible About Drinking, Inc. (B.R.A.D.) is a Michigan nonprofit corporation. The organization has been approved by the Internal Revenue Service for tax deductible status under Section 501(c)(3).

## MISSION OF B.R.A.D. FOUNDATION

To educate young adults and their parents as to the effects and consequences of alcohol use and abuse. Our educational materials and presentations focus on the signs and symptoms of alcohol poisoning and encourage responsible use of alcohol.

## HISTORY OF B.R.A.D. FOUNDATION

Be Responsible About Drinking, Inc. (The B.R.A.D. Foundation) was founded on February 2, 1999 by the family and friends of Bradley McCue, a Michigan State University junior who died of alcohol poisoning on November 5, 1998, his 21<sup>st</sup> birthday. The Foundation is now in its eighth year. We want to thank you and the numerous universities, organizations and proactive individuals that have supported our mission. We could not have done this without you.