

The Higher Education Center for Alcohol and Other Drug Abuse and Violence Prevention, a division of the United States Department of Education, has recently released a series of Frequently Asked Questions about Legal Age 21. You will find the questions, and their responses (in italics) complete with references below. Because we felt the information presented in their responses insufficiently answered many of these complex questions, we also offer our own research-based answer.

We invite you to read this debate of the important issues surrounding Legal Age 21 to acquaint yourself with both sides of the argument. The questions and answers presented here will help prepare you for conversations with friends and colleagues about [CR] and the drinking age discussion. You may also find the Frequently Asked Questions posted in “Mission” section of our website and the Myths and Realities page posted in “Legal Age 21” to be helpful.

Shouldn't we lower the minimum legal drinking age to 18?

The National Highway Traffic Safety Administration (NHTSA) estimates that through 2002, the increase in the minimum legal drinking age has saved 21,887 lives in the 50 states.¹ NHTSA estimates that the current MLDA will continue to save 1,000 lives each year.² While alcohol was involved in 60 percent of U.S. vehicular fatalities in 1982, the rate in 2005 stood at 39 percent.³

Most studies show that there is an inverse relationship between MLDA and two outcomes: alcohol consumption and traffic crashes. The success of the 21 MLDA has been achieved with minimal enforcement, yet it has been found that with increased enforcement efforts such as compliance checks, the sale of alcohol to minors can be cut by at least half.⁴

However . . .



Though NHTSA now estimates the number of lives saved to be 23,733, this remarkably precise “estimate” is of total lives (including victims over 21), not of lives saved under 21.⁵

Recent research not considered above suggests that the minimum legal drinking age (MLDA) has not prevented deaths among 18-20 year-olds, but has simply postponed them to later ages—primarily 21-24.⁶ It seems that as there is a marked increase in drunk driving deaths in one age group, there is a parallel decrease in the one adjacent to it. If the drinking age is 18, fatalities in that cohort go up but go down in the 21-24 cohort, and vice versa: if the drinking age is 21, fatalities go down in the 18-20 group but go up in the 21-24 set. If the consequence of a higher drinking age was to simply postpone fatalities occurring amongst 18-20 year-olds until they became 21-24 year-olds, then the “lives saved” assertion bears more careful scrutiny. The study’s authors emphasize: “A sobering note of caution is warranted by evidence that some of the life-saving benefits of a higher MLDA may be attenuated by a redistribution of deaths over the life cycle.”⁷ To our knowledge there are no studies that have challenged this finding. Thus we do not know what portions of the NHTSA estimated “lives saved” are in actuality fatalities postponed.

Finally, because the 21 MLDA was primarily a mechanism to reduce drunk driving, researchers often overlook that well over 1,000 18-24 year-olds die each year of alcohol-related causes other than traffic accidents.⁸ In recent years these alcohol-related fatalities occurring off the roads have increased at rates outpacing the size of the population.⁹ In light of such evidence, the debate over the 21 MLDA deserves reopening.

But I've heard that the reduction in traffic deaths has to do with the better safety measures, tougher enforcement, and the use of designated drivers. Is this accurate?

“After the age-21 MLDA was implemented, alcohol-involved highway crashes declined immediately (i.e., starting the next month) among the 18- to 20-year-old population. Careful research has shown declines are not

[CR]

due to enforcement of and tougher penalties for driving while intoxicated, but are directly a result of the legal drinking age.¹⁰”

However . . .

That is not quite right. This (accurately quoted) statement is a bold assertion that is, surprisingly, not footnoted in the article cited. Nor does the statement appear to be based on the careful and qualified analysis that precedes it. Nowhere in the body of the paper are claims of immediacy or direct influence made; in almost all cases (legal drinking age and its effects on traffic crashes, alcohol consumption, and other social problem outcomes), the majority of studies cited found no significant relationship whatsoever between the drinking age and those variables.¹¹ In terms of traffic fatalities specifically, claims of an “immediate” and “direct” effect of the 21 year-old drinking age are not made anywhere in the main body of the paper that makes the assertion above. Those doubting our interpretation might read the article for themselves.

<http://www.collegedrinkingprevention.gov/media/Journal/206-Wagenaar&Toomey.pdf>

The record is also quite clear about the effectiveness of other measures. According to NHTSA estimates, safety belts and airbags have combined to save 206,287 lives between 1975 and 2004.¹² By comparison, NHTSA estimates the 21 MLDA saved 23,733 lives in the same period.¹³ It is clear then that 21 MLDA did not act alone to reduce fatalities (alcohol-related or otherwise) that occurred in the latter years of the 20th century. Furthermore, the decline in alcohol-related traffic fatalities occurred in all age groups during this same period.¹⁴ NHTSA estimates that the lives saved by the drinking age are in addition to the effects of tougher enforcement and better safety measures, a fact perhaps lost in this question’s original answer. Moreover, as stated earlier, a number of the 18-21 year-old “lives saved” by the 21 MLDA seem as likely to have been simply pushed back to the 21-24 age group.¹⁵



Finally, between 1982 and 1992, in spite of raising the drinking age to 21, the US experienced a lower rate of decline in alcohol-related traffic fatalities than in the following countries (no other countries were examined in the report):¹⁶

United Kingdom: 50% decline

Germany: 37% decline

Australia: 32% decline

The Netherlands: 28% decline

Canada: 28% decline

United States: 26% decline

This downward trend in drunk driving across the industrialized world shows quite clearly that the 21 MLDA in the United States was, at best, the least effective measure to limit drunk driving amongst these developed countries.

There is evidence to show that education broadly defined works to increase public awareness of the risks of drinking and driving.¹⁷ The “designated driver,” a term unknown before 1984, has doubtless saved many lives.

Hasn't the minimum legal drinking age been lowered before? What were the results of that natural experiment?

“Between 1970 and 1975, 29 states lowered their minimum drinking ages. Meanwhile, 13 states kept the legal age at 21.¹⁸” Researchers found a marked increase in alcohol-related teen car crashes in the states with reductions. “Once the 21 age was restored...alcohol-involved highway crashes immediately declined in this age group.”¹⁹

New Zealand lowered its minimum purchase age for alcohol from 20 to 18 in 1999. Researchers noted in 2006 that “...significantly more alcohol-involved crashes occurred among 15- to 19-year-olds than would have occurred had the purchase age not been reduced to 18 years. The effect size for 18- to 19-year-olds is remarkable given the legal exceptions to the pre-1999 law and its poor enforcement.”²⁰

[CR]

After the minimum age was lowered, New Zealand researchers found that this change in the minimum drinking age “...has resulted in increased presentations to the [central city emergency department] of intoxicated eighteen and nineteen year olds. A similar trend was seen in the 15-17 year olds.”²¹ Rates of drunk driving and disorderly conduct have also increased.²²

However . . .

The MLDA was lowered in 29 states in the years following Congress’ decision to allow 18 year-olds the right to vote. In effectively setting the legal age of majority at age 18, many states lowered their drinking ages to reflect that reality. Before and after measures of these age changes show increased alcohol-related traffic fatalities amongst 18-20 year-olds.²³ However, research suggests that alongside these increases in alcohol-related traffic fatalities amongst 18-20 year-olds there was also likely a decrease in alcohol-related traffic fatalities amongst 21-24 year-olds.²⁴

New Zealand lowered its minimum purchase age for alcohol from 20 to 18 in 1999, and researchers have noted increases in alcohol-related traffic fatalities similar to those experienced in the United States in the 1980s.²⁵ Using methods favored by the American studies from the 1980’s, the New Zealand researchers use 20-24 year-olds as a control group.²⁶ These methods may compromise the legitimacy of these findings because many of the lives saved by a higher drinking age are fatalities postponed to a later age and not actually prevented.²⁷

As mentioned earlier, there is an apparent trade-off that occurs when one moves the minimum drinking age one way or the other. This was true both in the wake of the change in U.S. states during the 1970s and in New Zealand following the 1999 change. First-time legal drinkers are more likely to get in trouble at whatever age; thus, we need to address the risks and behaviors of first-time legal drinkers—at any age—in a better way.

If a person can go to war, shouldn't he or she be able to have a beer?

“Many rights have different ages of initiation. A person can obtain a hunting license at age 12, driver’s license at age 16, vote and serve in the military at 18, serve in the U.S. House of Representatives at age 25 and in the U.S. Senate at age 30 and run for President at age 35. Other rights we regulate include the sale and use of tobacco and legal consent for sexual intercourse and marriage. The minimum age of initiation is based on the specific behavior involved and must take into account the dangers and benefits of that behavior at a given age.”²⁸

However . . .

For better or worse, American society has determined that upon turning 18 teenagers become adults. This means they can enlist, serve, fight and potentially die for their country. And while the “fight for your country” argument is a powerful one, it only begins to capture the essence of adulthood. Most importantly, at age 18 you become legally responsible for your actions. You can buy and smoke cigarettes even though you know that, in time, they will probably give you lung cancer. You may even purchase property, strike binding legal contracts, take out a loan, vote, hold office, serve on a jury, or adopt a child. But strangely at 18 you cannot buy a beer. In most other countries, the age of majority coincides with the legal drinking or purchasing age.²⁹

Critics are quick to point out that 18 is not an age of majority, but one step amongst many that together mark the gradual path to adulthood. This argument notes that young adults cannot drink until 21, rent cars until 25, run for the U.S. Senate until they are 30, and run for President until 35. This is, the critics suggest, evidence of a graduated legal adulthood. But this argument falls flat. First, rental car companies are not legally prevented from renting cars to those under 25; this is a decision made by insurance companies. In fact, some rental companies do rent to those under 25, and the associated higher rates compensate for that potential liability. Second, age requirements for these high public offices are more appropriately seen as exceptions to full adulthood, rather than benchmarks of adulthood.

[CR]

Finally, and most importantly, the Constitution speaks to the legal age of majority only once and that is in the 26th Amendment to the Constitution where, “The right of citizens of the US, who are 18 years of age or older, to vote shall not be denied or abridged...on account of age.”

Many youth under age 21 still drink, despite the current legal drinking age. Doesn't that prove the policy is ineffective?

While some youth may choose to consume alcohol before age 21, studies show that they consume less and suffer fewer secondary effects such as alcohol-related injuries when the drinking age is 21.³⁰

Studies also indicate that delaying onset of drinking will substantially reduce the risk of alcohol problems and dependence later on in life.³¹ Further, when the legal drinking age is 21, those under age drink less than when the drinking age is lower, and they continue to drink less through their 20s.³²

“There is also some ‘trickle-down’ effect in that when youth get alcohol they often give it to even younger teens.”³³ “When the legal age is 21, 19- and 20-year-olds can often obtain alcohol from their friends. When the drinking age was 18 and 19, 17- and even 16-year-olds were often able to get alcohol from their friends. If the drinking age is lower, more alcohol will be available to younger high school students and perhaps even middle school students.”³⁴

However . . .

Many young people under the age of 21 consume alcohol, and continue to do so despite nearly 25 years worth of prohibition of that behavior. In fact, research shows that consuming alcohol before the age of 21 is actually a normative behavior. Ninety-five percent of those who will be alcohol consumers in their lifetime first begin to drink before they turn 21.³⁵ Though today fewer 12-20 year-olds are drinking, those who choose to drink are drinking more. Between 1993 and 2001, the rate of 12-20 year olds who reported consuming alcohol in the past 30 days decreased from

[CR]

33.4% to 29.3%, while rates of binge drinking increased among that age group over those same years, from 15.2% to 18.9%.³⁶ Among college students, a decade's worth of research in the College Alcohol Study found both the proportion of students abstaining and the proportion of students engaging in frequent binge drinking had increased. Furthermore, as compared to 1993, more 18-24 year old students who chose to drink in 2001 were drinking excessively—defined by frequency of drinking occasions, frequency of drunkenness, and drinking to get drunk.³⁷

There is evidence that the decline in alcohol consumption by those under 21 seen throughout the 1980s and 1990s was not the result of the 21 year-old drinking age, but part of a larger societal trend. “Nationwide per capita consumption peaked around 1980 and dropped steeply during the 1980s. Drinking by youth followed this same pattern. The predominant reason was not changes in state MLDA but rather a close link between youthful and adult alcohol consumption...Increasing the MLDA did make some difference but not as much as might be guessed from a simple ‘before and after’ comparison.”³⁸ This evidence suggests that the 21 year-old drinking age is not an unqualified success, but rather a well-intentioned social policy whose 25 year history has led to several unintended consequences, including but not limited to an increase in the prevalence of abusive drinking amongst young people.

Youth in other countries are exposed to alcohol at earlier ages and engage in less alcohol abuse and have healthier attitudes toward alcohol. Don't those countries have fewer alcohol-related problems than we do?

Actually, that is a myth. Despite anecdotal reports of adults teaching youth to drink in moderation, survey data provide no evidence that European youth are more responsible about alcohol consumption than American youth. A recent study compared rates of alcohol consumption and alcohol-related problems in the United States with those in Europe and found that both rates and frequency of drinking among European youth are higher than in the United States. Additionally, about half of the European countries surveyed had higher rates of intoxication among their youth.³⁹

Further, “...a greater percentage of young people from nearly all European countries in the survey report drinking in the past 30 days. For a majority of these European countries, a greater percentage of young people report having five or more drinks in a row.⁴⁰ Additionally, per capita consumption of alcohol and cirrhosis death rates are both higher in France and Italy, two countries with a lower legal drinking age.”⁴¹

Reports of fewer alcohol-related crashes among European youth are likely due to youth driving “...less frequently in Europe than in the United States. Compared with the United States, Europeans have higher legal driving ages, more expensive automobiles and greater access to public transportation. Looking beyond traffic crashes, however, European countries have similar or higher rates of other alcohol-related problems compared with the United States.”⁴²

“European countries are now looking to the United States for research and experience regarding the age-21 policy. Europeans are initiating the debate on the most appropriate age for legal access to alcohol.”⁴³

However . . .

Any generalizations of the behavior of “European” youth should be scrutinized. The drinking cultures of northern and southern European countries vary markedly; history and an extensive body of cross cultural research would suggest that cultural attitudes towards alcohol use play a far more influential role than minimum age legislation. Recent research published by the World Health Organization found that while 15 and 16 year-old teens in many European states, where the drinking age is 18 or younger (and often unenforced), have more drinking occasions per month, they have fewer dangerous, intoxication occasions than their American counterparts. For example, in southern European countries ratios of all drinking occasions to intoxication occasions were quite low—roughly one in ten—while in the United States, almost half of all drinking occasions involving 15 and 16 year-olds resulted in intoxication.⁴⁴

[CR]

Though its legal drinking age is highest among all the countries surveyed, the United States has a higher rate of dangerous intoxications per drinking occasions than many countries that not only have drinking ages that are lower or nonexistent, but also have much higher per capita consumption levels.⁴⁵

I've read that if we educate teens about using alcohol safely starting at age 18, that will encourage responsible drinking. Is that true?

*Alcohol education programs have been in place for years and have been proven by numerous studies to be ineffective at reducing high-risk drinking and other risky behavior when used in isolation.*⁴⁶

However . . .

“Ineffective” is a very strong word. In fact, the effectiveness of alcohol education continues to be widely debated. Various approaches to alcohol education have been developed and can generally be grouped into those that support abstinence and those that view abstinence as unrealistic, and must therefore work to equip individuals with decision-making skills for safe alcohol use. There is both formal education, through schools and institutions, and informal education through the family and peers. While alcohol education programs that advocate abstinence have been proven ineffective,⁴⁷ interactive education programs have had greater success in their ability not only to educate drinkers, but also to alter their drinking habits.

Recently in the United States, Outside the Classroom has produced AlcoholEDU, an interactive online prevention program used by 450 colleges and universities throughout the country. AlcoholEDU increases practical knowledge, motivates students to change their behavior, and decreases students’ risk of negative personal and academic consequences as a result of alcohol use.⁴⁸ In 2004, students who completed AlcoholEDU were 20% less likely to be heavy-episodic drinkers and 30% less likely to be problematic drinkers, numbers that prove that alcohol education can be a useful tool in altering students’ drinking habits.⁴⁹ This research provides



evidence for the first time that “...an interactive educational program can substantially reduce the negative consequences of high-risk drinking.”⁵⁰

I've read that the adolescent brain continues to develop through the early 20s. What are the long-term effects of alcohol use on a developing brain?

*Studies suggest that the adolescent brain goes through a series of structural and functional changes that may make it more susceptible to long-term impairments due to alcohol use. These dynamic changes affect the planning, decision-making, impulse control, voluntary movement, and speech-production processes.*⁵¹

*Specifically, the American Medical Association reports that “...frontal lobe development and the refinement of pathways and connections continue until age 16, and a high rate of energy is used as the brain matures until age 20.”*⁵²

*“The hippocampus handles many types of memory and learning and suffers from the worst alcohol-related brain damage in teens. Those who had been drinking more and for longer had significantly smaller hippocampi (10 percent).”*⁵³

We asked Dr. H. S. Swartzwelder, frequently cited expert on adolescent brain development and substance abuse, MADD consultant, and Choose Responsibility board member to respond to this question.

“It is true that the brain continues to develop into a person’s 20s, particularly the frontal lobes which are critical for many of the higher cognitive functions that are so important for success in the adult world—such as problem solving, mental flexibility, and planning.

“It is also clear that alcohol affects the adolescent brain differently than the adult brain, but the story is not simple and the data should be interpreted cautiously as this complex science continues to evolve. Although alcohol affects some brain functions *more* powerfully during adolescence, it affects other functions *less* powerfully during the same period. For example,

[CR]

studies in animals clearly indicate that a single dose of alcohol can impair learning (and learning-related brain activity) more powerfully in adolescent animals than in adults. But on the other hand a somewhat higher dose will produce far greater sedation (and sedation-related brain activity) in adult animals than in adolescents. So, in terms of single doses of alcohol, the adolescent brain is not uniformly more or less sensitive to alcohol—it depends on the brain function that is being measured. Importantly, there has been little direct study of the effects of acute doses of alcohol on adolescent humans, compared to adults. One study found that a single dose of alcohol resulting in blood alcohol levels near 80mg/dl (the legal limit) impaired learning more powerfully among people in their early 20s than it did in people in their late 20s, but it will take more research to answer this question with authority in human subjects.

“Since the effects of single doses of alcohol can have markedly different effects on adolescents than on adults, it makes sense to ask whether this means that the adolescent brain is more or less sensitive to the effects of repeated doses of alcohol over time. In my view, the jury remains out on this question, but there are some studies in animals which suggest that the adolescent brain may be more vulnerable to long-term damage by alcohol than the adult brain. Similarly, there are some studies of humans who consumed large quantities of alcohol over extended periods of time during adolescence, and have relatively small hippocampi (a brain region critical for certain types of learning). All of these studies need to be fleshed out before the issue is settled, but, if nothing else, they give teens a very good reason to think carefully about drinking to excess... and this is probably the pivotal issue—how much is too much?

“Most studies of the effects of chronic alcohol exposure in adolescence, compared to adulthood, have focused on relatively high doses. Studies of lower doses, and less severe chronic dosing regimens, will be needed to determine whether the adolescent brain is more sensitive to the long-term effects of mild to moderate drinking. There are plenty of studies indicating that early, unsupervised drinking can lead to trouble for teens—both immediately and down the road. But this does not mean that an 18 year-old who has a beer or two every couple of weeks is doing irreparable damage

to her brain. It is the 18 year-old (or 30 year-old, for that matter!) who downs five or six drinks in a row on his way to a dance that worries me.”⁵⁴

There seems to be support for lowering the drinking age—is this true?

According to an ABC News/Washington Post poll conducted in 2005, the majority (78 percent) of Americans, youth and adults, support the age 21 drinking law.⁵⁵ In fact, 73 percent of young adults under the age of 34 oppose allowing 18- to 20-year-olds to drink.⁵⁶ A 2001 Associated Press poll found that fully three-quarters of adults and teens alike thought the drinking age should be enforced more vigorously.⁵⁷

“The current age restriction was signed into law by President Reagan on July 17, 1984. Its support today is nearly identical to its level then -- 79 percent in a Gallup poll in June '84.”⁵⁸

However . . .

There is support for lowering the drinking age, though polling data suggests this remains a minority view. Since the Supreme Court decision in *South Dakota vs. Dole* in 1987, however (South Dakota, joined by the states of Colorado, Hawaii, Kansas, Louisiana, Montana, New Mexico, Ohio, South Carolina, Tennessee, Vermont, and Wyoming had challenged the constitutionality of the 1984 legislation),⁵⁹ there has been virtually no public discussion or debate over the 21 year-old drinking age. Twenty years have passed, during which time data have been gathered and the practical effects of the law have been experienced. National (*Chronicle of Higher Education*; *US News and World Report*; *Newsweek*; *Fox News*) media interest in the issue, perhaps or perhaps not reflecting a change in public opinion, has surfaced repeatedly during the first half of 2007. This would suggest a desire to reopen debate.

So what strategies are effective for reducing high-risk alcohol use?

In addition to the minimum legal drinking age, there are several approaches and areas of strategic intervention that are backed by research

and that have been shown to be effective. Indeed, studies continue to show that employing a combination of interventions, such as MLDA paired with strengthening enforcement efforts or increasing beer taxes, are most promising.⁶⁰

However . . .

Strategies based on harm reduction and environmental management have been successful in reducing underage alcohol abuse. While research has shown that abstinence-based education programs alone have little to no effect on preventing use or abuse of alcohol among underage drinkers, harm reduction strategies that address the complex psychological expectancies that lead to excessive drinking amongst young people are effective in reducing rates and incidences of alcohol abuse.⁶¹

Environmental strategies such as alcohol advertising bans, keg registration, responsible server training, social norms marketing and community interventions are viable options for managing high risk drinking, especially on college campuses.⁶² Furthermore, evidence would suggest that a policy based on strengthening enforcement may be of limited success; for every 1,000 incidences of underage alcohol consumption, only two result in arrest or citation.⁶³ Advocates of enforcement should be required to demonstrate the level of incremental expense they would recommend in order to achieve a significantly better result. Under the 21 year-old drinking age, fewer underage individuals are drinking, but those who do choose to drink are drinking more, are drinking in ways that are harmful to their health, and engaging in behaviors that have a negative impact on the community.

¹ Kindelberger, J. (2005). Calculating lives saved due to minimum drinking age laws. *Traffic Safety Facts: Research Notes*. Retrieved June 12, 2007, from <http://www-nrd.nhtsa.dot.gov/Pubs/809860.PDF>

² National Highway Traffic Safety Administration (NHTSA). (2001). Alcohol and highway safety 2001: A review of the state of knowledge. Retrieved June 12, 2007, from <http://www.nhtsa.dot.gov/people/injury/research/AlcoholHighway/>

³ Mothers Against Drunk Driving (MADD). (2007). Total traffic fatalities vs. alcohol related traffic fatalities – 1982-2005. Retrieved June 14, 2007, from <http://www.madd.org/stats/1298>

⁴ National Institute on Alcohol Abuse and Alcoholism (NIAAA). (2006). Early drinking linked to higher lifetime alcoholism risk. Retrieved June 12, 2007, from <http://www.niaaa.nih.gov/NewsEvents/NewsReleases/earlydrinking.htm>

⁵ Kindelberger, J. (2005). Calculating lives saved due to minimum drinking age laws. *Traffic Safety Facts: Research Notes*. Retrieved June 12, 2007, from <http://www-nrd.nhtsa.dot.gov/Pubs/809860.PDF>

⁶ Dee, T.S. & Evans, N. (2001). Behavioral Policies and Teen Traffic Safety. *AEA Papers and Proceedings*, 91(2), 91-96.

⁷ Dee, T.S. & Evans, N. (2001). Behavioral Policies and Teen Traffic Safety. *AEA Papers and Proceedings*, 91(2), 91-96.

⁸ Hingson, R., Hereen, T., Winter, M. & Weschler, H. (2005). Magnitude of alcohol related mortality and morbidity among US college students ages 18-24: Changes from 1998 to 2001. *Annual Review of Public Health*, (26), 259-279.

⁹ *ibid.*

¹⁰ Wagenaar, A. and Toomey T. (2002). Effects of minimum drinking age laws: Review and Analyses of the Literature from 1960 to 2000. *Journal of Studies on Alcohol, Supplement 14*, 206-225.

¹¹ *ibid.*

¹² National Highway Traffic Safety Administration (2005). *Traffic Safety Facts 2004: A Compilation of Motor Vehicle Crash Data from the Fatality Analysis Reporting System and the General Estimates System*. Department of Transportation: Washington, DC.

¹³ *ibid.*

¹⁴ Epidemiology and Consequences of Drinking and Driving
Ralph Hingson, Sc.D., and Michael Winter, M.P.H. National Institute on Alcohol Abuse and Alcoholism (NIAAA). Bethesda, MD. Retrieved April 12, 2007: <http://pubs.niaaa.nih.gov/publications/arh27-1/63-78.htm>

¹⁵ Dee, T.S. & Evans, N. (2001). Behavioral Policies and Teen Traffic Safety. AEA Papers and Proceedings, 91(2), 91-96.

¹⁶ Sweedler, B.M. (1994). The worldwide decline in drinking and driving. *National Transportation Safety Board*. Washington, DC. Retrieved May 22, 2007, from <http://www.druglibrary.org/schaffer/Misc/driving/s18p1.htm>

¹⁷ Yanovitzky, I. (2002). Effect of news coverage on the prevalence of drunk driving behavior: Evidence from a longitudinal study. *Journal of Studies on Alcohol*, 63(3), 342-351.

¹⁸ Mothers Against Drunk Driving (MADD). (2004, Spring). "21" turns 20. *DRIVEN Magazine*. Retrieved May 30, 2007, from <http://www.madd.org/stats/8916>

¹⁹ *ibid.*

²⁰ National Highway Traffic Safety Administration (NHTSA). (2001). Alcohol and highway safety 2001: A review of the state of knowledge. Retrieved June 12, 2007, from <http://www.nhtsa.dot.gov/people/injury/research/AlcoholHighway/>

²¹ Everitt, R., & Jones, P. (2002). Changing the minimum legal drinking age—its effect on a central city emergency department. *The New Zealand Medical Journal*, 115(1146), 9–11.

²² Join Together. (2007). Alcohol crashes rose when N.Z. drinking age fell, study says. Retrieved May 26, 2007, from <http://www.jointogether.org/news/research/summaries/2007/alcohol-crashes-rose-when.html>

²³ Wagenaar, A.C. & Toomey, T.L. (2002). Effects of Minimum Drinking Age Laws: Review and Analyses of the Literature from 1960 to 2000. *Journal of Studies on Alcohol*. Supplement 14, 206-221.

²⁴ Dee, T.S. & Evans, N. (2001). Behavioral Policies and Teen Traffic Safety. AEA Papers and Proceedings, 91(2), 91-96.

²⁵ Kypri, K., Voas, R.B., Langley, J.D., Stephenson, S.C.R., Begg, D.J., Tippetts, A.S., & Davie, G.S. (2006). Minimum Purchasing Age for Alcohol and Traffic Crash Injuries Among 15- to 19-Year-Olds in New Zealand. *American Journal of Public Health*, 96(1), 126-131.

²⁶ *ibid.*

²⁷ Dee, T.S. & Evans, N. (2001). Behavioral Policies and Teen Traffic Safety. AEA Papers and Proceedings, 91(2), 91-96.

²⁸ Wagenaar, A.C. & Toomey, T.L. (2002). Effects of Minimum Drinking Age Laws: Review and Analyses of the Literature from 1960 to 2000. *Journal of Studies on Alcohol*. Supplement 14, 206-221.

²⁹ International Center for Alcohol Policies. (2005). *ICAP Blue Book: Practical Guides for Alcohol Policy and Prevention Approaches (Module 12: Legal Age Limits)*. International Center for Alcohol Policies (ICAP) Blue Book: Practical guidelines for alcohol policy and prevention approaches.

³⁰ Wagenaar, A. C. (1993). Minimum drinking age and alcohol availability to youth: Issues and research needs. In: Hilton, M.E., Bloss, G., eds. *Economics and the Prevention of Alcohol-Related Problems*. Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism, 175–200. (NIAAA Research Monograph No. 25, NIH Publication No. 93-3513).

³¹ Task Force of the National Advisory Council on Alcohol Abuse and Alcoholism, National Institute on Alcohol Abuse and Alcoholism. *A Call to Action: Changing the Culture of Drinking at U.S. Colleges* (Washington, D.C.: National Institutes of Health, 2002)

³² Ponicki, W. R., Gruenewald, P. J., & LaScala, E. A. (2007). Joint Impacts of Minimum Legal Drinking Age and Beer Taxes on US Youth Traffic Fatalities, 1975 to 2001. *Alcoholism: Clinical and Experimental Research*, 31(5), 804–813.

³³ Jones-Webb, R., Toomey, T., Miner, T., Wagenaar, A. C., Wolfson, M., & Poon, R. (1997). Why and in what context adolescents obtain alcohol from adults: A pilot study. *Substance Use & Misuse*, 32, 219–228.

³⁴ Wagenaar, A.C. & Toomey, T.L. (2002). Effects of Minimum Drinking Age Laws: Review and Analyses of the Literature from 1960 to 2000. *Journal of Studies on Alcohol*. Supplement 14, 206-221.

³⁵ Substance Abuse and Mental Health Services Administration (SAMHSA). (2007). 2005 National Survey on Drug Use and Health. Rockville, MD: U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration.

³⁶ National Institute on Alcohol Abuse and Alcoholism, Newes-Adeyi, G., Chen, C.M., Williams, G.D. & Faden, V.B. (2005). *Surveillance report #74: Trends in underage drinking in the United States, 1991-2003*. Rockville, MD: U.S. Department of Health and Human Services, National Institute on Alcohol Abuse and Alcoholism.

- ³⁷ Wechsler, H., Lee, J.E., Kuo, M., Seibring, M., Nelson, T.F. & Lee, H. (2002). Trends in college binge drinking during a period of increased prevention efforts: Findings from 4 Harvard School of Public Health College Alcohol Study surveys 1993-2001. *Journal of American College Health*, 50(5), 203-217.
- ³⁸ Cook, P. (in press). *Paying the Tab: The costs and benefits of alcohol control*. Princeton: Princeton University Press.
- ³⁹ Grube, J. W. (2005). *Youth drinking rates and problems: A comparison of European countries and the United States*. Calverton, MD: Pacific Institute for Research and Evaluation, Office of Juvenile Justice Enforcing the Underage Drinking Laws Program.
- ⁴⁰ Grube, J. W. (2001). *Comparison of drinking rates and problems: European countries and the United States*. Calverton, MD: Pacific Institute for Research and Evaluation, Office of Juvenile Justice Enforcing the Underage Drinking Laws Program.
- ⁴¹ Wagenaar, A.C. & Toomey, T.L. (2002). Effects of Minimum Drinking Age Laws: Review and Analyses of the Literature from 1960 to 2000. *Journal of Studies on Alcohol*. Supplement 14, 206-221.
- ⁴² *ibid.*
- ⁴³ *ibid.*
- ⁴⁴ Babor, T., Caetano, R., Casswell, S., Edwards, G., Giesbrecht, N., Graham, K., Grube, J., Gruenewald, P., Hill, L., Holder, H., Homel, R., Osterberg, E., Rehm, J., Room, R. & Rossow, I. (2003). *Alcohol: No Ordinary Commodity*. Oxford: Oxford University Press.
- ⁴⁵ *ibid.*, p. 47
- ⁴⁶ Wagenaar, A.C. & Toomey, T.L. (2002). Effects of Minimum Drinking Age Laws: Review and Analyses of the Literature from 1960 to 2000. *Journal of Studies on Alcohol*. Supplement 14, 206-221.; Task Force of the National Advisory Council on Alcohol Abuse and Alcoholism, National Institute on Alcohol Abuse and Alcoholism. *A Call to Action: Changing the Culture of Drinking at U.S. Colleges* (Washington, D.C.: National Institutes of Health, 2002).
- ⁴⁷ International Center for Alcohol Policies (ICAP). (2002). ICAP reports 4 (Revised): Drinking age limits. Washington, DC: Author.
- ⁴⁸ Outside the Classroom. (2005). Research Results: Population-Level Prevention. Retrieved 25 June 2007 from http://www.outsidetheclassroom.com/images/PDF/Data_PLP_031605b.pdf
- ⁴⁹ *ibid.*
- ⁵⁰ Wall, A.F. (2005). Online health education curriculum evaluation: Differential findings among college students. *Dissertation Abstracts International*, 66(12A), p. 4312, as cited in Outside the Classroom. (2005). Academic Study Finds Online Alcohol Prevention Reduces Negative Consequences of College Drinking. Retrieved 25 June 2007 from http://www.outsidetheclassroom.com/newsevents/press/pr_wallstudy.asp
- ⁵¹ Task Force of the National Advisory Council on Alcohol Abuse and Alcoholism, National Institute on Alcohol Abuse and Alcoholism. *A Call to Action: Changing the Culture of Drinking at U.S. Colleges* (Washington, D.C.: National Institutes of Health, 2002).
- ⁵² American Medical Association (AMA). (2004). Harmful consequences of alcohol use on the brains of children, adolescents, and college students. Retrieved April 5, 2007, from <http://www.ama-assn.org/ama/pub/category/9416.html>
- ⁵³ *ibid.*
- ⁵⁴ Swartzwelder, H.S. Personal communication, 26 June 2007.
- ⁵⁵ Cohen, J. (2005). Poll: Public back legal drinking age limit. *ABC News/Washington Post*. Retrieved April 16, 2007, from <http://abcnews.go.com/Health/PollVault/story?id=941810>
- ⁵⁶ *ibid.*
- ⁵⁷ The Associated Press (AP). (2001, July 5). Teen drinking poll. *USA Today*. Retrieved June 13, 2007, from <http://www.usatoday.com/news/health/2001-07-05-drinking-poll.htm>
- ⁵⁸ Cohen, J. (2005). Poll: Public back legal drinking age limit. *ABC News/Washington Post*. Retrieved April 16, 2007, from <http://abcnews.go.com/Health/PollVault/story?id=941810>
- ⁵⁹ *South Dakota v. Dole* 483 U.S.203 (1987). Docket Number: 86-260. p. 28-S.
- ⁶⁰ Wagenaar, A.C. & Toomey, T.L. (2002). Effects of Minimum Drinking Age Laws: Review and Analyses of the Literature from 1960 to 2000. *Journal of Studies on Alcohol*. Supplement 14, 206-221.; Wagenaar, A. C. (1993). Minimum drinking age and alcohol availability to youth: Issues and research needs. In: Hilton, M.E., Bloss, G., eds. *Economics and the Prevention of Alcohol-Related Problems*. Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism, 175-200. (NIAAA Research Monograph No. 25, NIH Publication No. 93-3513).
- ⁶¹ Neighbors, C., Larimer, M., Lostutter, T., and Woods, B. (2006). Harm reduction and individually focused alcohol prevention. *International Journal of Drug Policy*, 17, 304-309.
- ⁶² Weitzman, E., Nelson, T., Lee, H., and Weschler, H. (2004). Reducing drinking and related harms in college: Evaluation of the "A Matter of Degree Program." *American Journal of Preventive Medicine*, 27, 187-196.
- ⁶³ Wolfson, M., Wagenaar, A.C. & Hornseth, G.W. (1995). Law officers' views on enforcement of the minimum drinking age: a four state study. *Public Health Reports*, 110(4), 428-438.