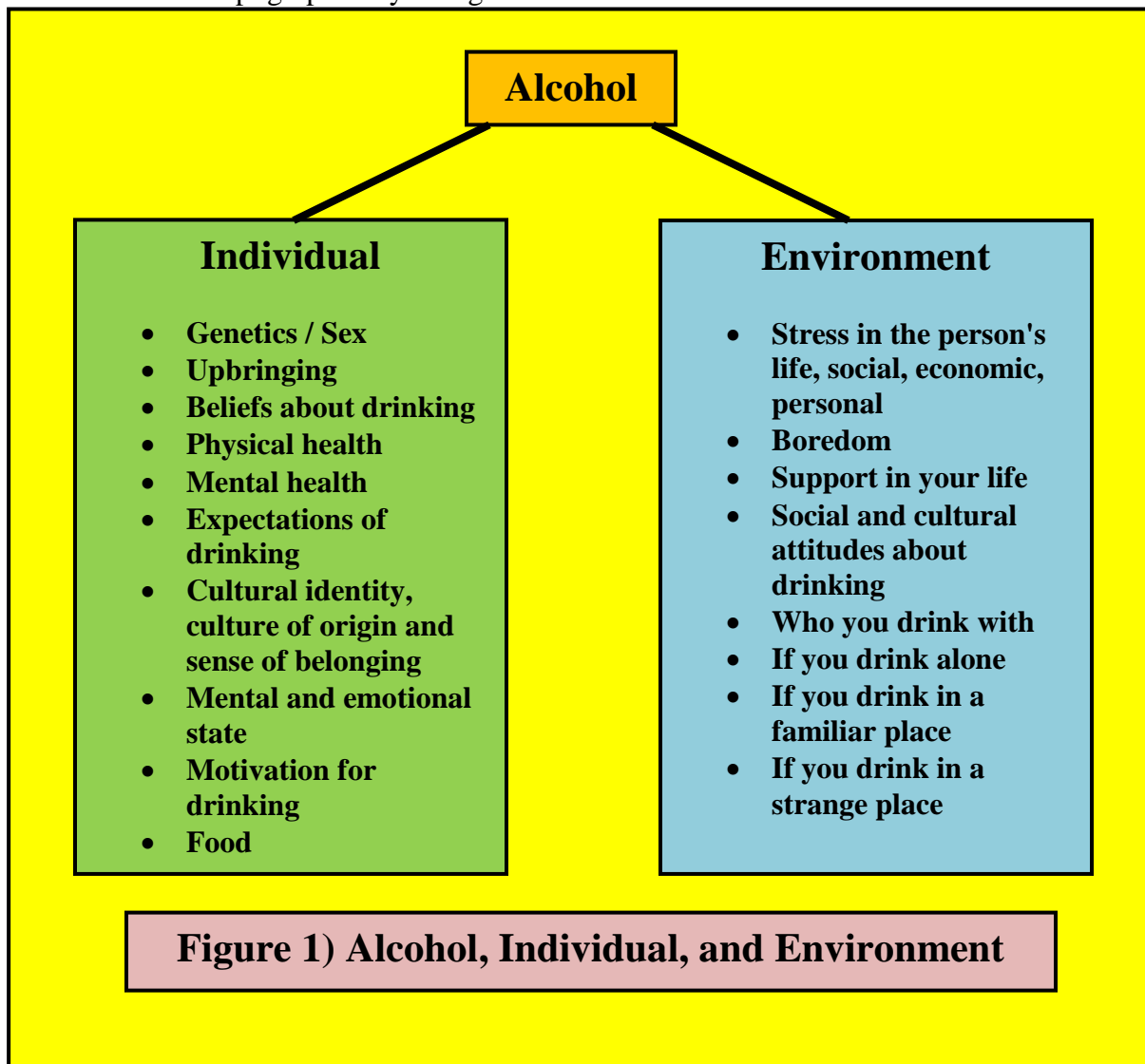


Alcohol, Individual, and Environment

In the 1970s and 80s when Harvard professor Norman Zinberg MD was doing research on the effects of recreational drugs on human beings he found a lot of effects which could not be explained simply by the chemical effects of the drug on the histology and the physiology and the neuro-anatomy of the human subject alone. What Dr. Zinberg discovered was that in order to understand the effects of a drug on an individual one also had to look at the mindset and beliefs and many other internal factors of the individual as well as looking at the environment and culture in which the individual used the drug. Dr. Zinberg referred to the beliefs and other internal factors as the "set" (short for mind-set) and he referred to the external factors as the "setting". The book in which Dr. Zinberg published the results of his research is titled Drug, Set, and Setting and is a pioneering work in this field. Dr. Zinberg's research is not just for illegal drugs--it applies to the legal drug alcohol as well--and so does the research of many others who followed Dr. Zinberg. In HAMS we use the terms **Alcohol, Individual, and Environment**. We illustrate the concept graphically in Figure 1.



INDIVIDUAL

GENETICS / SEX

The single-gene theory of "alcoholism" has been abandoned long ago by all serious researchers as has the term "alcoholism" itself which is now limited to appearing in works of pop psych like AA's "Big Book". Contemporary researchers know that many different genes can have an effect on the way an individual metabolizes alcohol as well as having an influence on an individual's tendency to become a habitual drinker. Contemporary researchers use a diathesis-stress model--what those big words mean is that both genetics and environment have a contribution to make in a person's drinking habits. At HAMS we believe in free will, too.

Tolerance

Some people are born with a much higher tolerance to alcohol than others. Men also generally have a higher tolerance to alcohol than women because of genetic factors--women have less of the enzyme which breaks down alcohol in their stomachs.

Asian Flush

When alcohol is metabolized in the human body it is first converted into a poison called acetaldehyde. Acetaldehyde is very rapidly converted into a harmless acetyl radical by an enzyme called acetaldehyde dehydrogenase. In most people the enzyme which breaks down the acetaldehyde is very efficient. However, some Asians have less efficient forms of this enzyme which allows the build up of the poisonous acetaldehyde in their systems. This toxin can cause them to flush bright red after a single drink and to become very ill from drinking alcohol. Antabuse does the same thing--it causes the build up of acetaldehyde in your body by blocking the action of this enzyme. There are two types of Asian flush syndrome--fast-flushing and slow flushing. That fast flushers have the least efficient form of the enzyme need to break down the toxin and get the sickest from drinking alcohol. Fast-flushers never become addicted to alcohol--but this does not mean that they do not sometimes choose to get addicted to other drugs. Slow flushers are less likely to become addicted to alcohol than non-flushers.

Adoption Studies

Goodwin and colleagues studied both adopted sons and adopted daughters of alcoholics into non-alcoholic families in an attempt to find a genetic basis for alcoholism. What they found was that about one in five sons of alcoholics became alcoholics whether they were raised by alcoholic parents or non-alcoholic parents. The prevalence of alcoholism in the general population was assumed to be about one in twenty. On the other hand daughters of alcoholics were no more likely to become alcoholics than daughters of non-alcoholics. The Goodwin studies suggest that both genetic and environmental factors are at work in the development of a drinking habit. This is because we have to explain why four out of five sons of alcoholics do not become alcoholics and also why the daughters show no apparent genetic tendencies. It is most likely that environment is responsible for both of these outcomes.

Rat Park

We discuss Rat Park in detail below. Suffice it to say that the same rats will consume eight times as much morphine in a bad environment as they do in a pleasant environment. This clearly shows that both environment and genetics have a major effect on drug and alcohol use.

The Stress Vulnerability Protective Factors Model

Many researchers today prefer the stress vulnerability protective factors model (formerly called the diathesis-stress model). This model states that some people have a greater genetic vulnerability to developing an alcohol problem than other people. However, environmental factors (called stressors) are also required for an alcohol habit to develop--this is not something which occurs in a vacuum. The environment can also contain protective factors which can help to prevent an alcohol habit from developing.

How many genes are involved in problem drinking?

Very many! In 2008 Ducci and Goldman have published an excellent review of what is known about the genetics of alcohol abuse. Genes which affect alcohol abuse fall into the following categories:

- Genes which predispose people to addictions in general whether the addiction is alcohol or tobacco or some other drug or behavior
- Genes which predispose people specifically towards alcohol abuse - these are genes which cause one to have a low response to the effects of alcohol so that one has to drink a lot to become intoxicated
- Genes which specifically protect one from becoming alcohol addicted--specifically the genes responsible for Asian flush syndrome
- Genes which predispose people towards mental health problems such as Anxiety, Depression, ADHD, or Antisocial Personality Disorder - these disorders make it more likely that one will abuse alcohol

Ducci and Goldman estimate that the heritability of alcohol problems is around 0.5. in contrast the heritability of Anxiety Disorder is around 0.32 and that of Autism around 0.9. this means that alcohol problems are moderately heritable.

RELIGIOUS UPBRINGING

A 2004 article by Galen and Rogers states that there is less problem drinking among college students who are religious than those who are not. Some people cite this as evidence that giving children a religious upbringing will reduce the likelihood of them becoming adult problem drinkers--however, the one does not necessarily follow from the other. Many people with a religious upbringing wind up rebelling against it and doing the exact opposite of what they were told. This is particularly common if the upbringing is strict and repressive. If they are raised as religious teetotalers the rebellion can often come in the form of drug use or heavy drinking. I once conducted an informal survey on an email group for people with alcohol problems and

nearly half of the people who responded stated that they had had an oppressive religious upbringing which they had rebelled against. Moreover, drug and alcohol counselors who work with a twelve step model report that it is virtually impossible to get people who have rebelled against their religious upbringing to accept AA's "higher power". It is unfortunate that these people are rarely referred to secular alternatives.

Although the Galen and Rogers study is an interesting first step--it leaves several questions unanswered. Does a religious upbringing lead to more or fewer problem drinkers? Is an upbringing in a liberal religion which allows drinking more likely to give rise to problem drinking than a conservative teetotaler religion or vice versa?

Data from Cahalan and Room (1974) shed some interesting light into questions which were not addressed by Galen and Rogers, The data in Table 1 come from Cahalan and Room's 1974 analysis of data collected by the National Institute of Mental Health in 1967 and 1969. This data was collected by interviewing a random sample of 1561 Americans throughout the United States.

	N	Non-drinker	Problem-Free Drinker	Potential Problems Only	Heavy Drinker No Consequences	High Consequences
Catholic	487	6%	37%	23%	19%	16%
Jewish	40	8%	60%	25%	5%	3%
Liberal Prot.	220	10%	42%	24%	13%	11%
Conservative Prot.	663	24%	37%	19%	6%	14%
No Religion	84	6%	42%	20%	14%	18%
Other	67	15%	28%	25%	19%	12%

This data suggests that cultural factors such as religious affiliation can have a major impact on a person's drinking pattern. It is interesting to note that the Conservative Protestants in this data sample have both high rates of alcohol abstainers and high rates of drinkers suffering severe consequences from their drinking. We hypothesize that this is a result of black-and-white thinking about alcohol. On the other hand Jews, who traditionally frown on drunkenness and use alcohol in their religious rituals, have high rates of moderate drinkers and few abstainers or problem drinkers.

Now what we can say as harm reductionists? From a harm reductionist point of view you do not need to let your upbringing determine your behavior for your entire life. You can choose to drink in the way that is right for you or to abstain from alcohol. The power is yours--not your upbringing's.

BELIEF

Belief is a factor of overwhelming importance in how one deals with alcohol. If one believes that one is in control and that practicing harm reduction, moderation, or alcohol abstinence is entirely

in the power of the individual then one will have a fairly easy time controlling drinking or quitting. If one believes that quitting is easy then it will be easy--Alan Carr's book The Easy Way to Stop Drinking is devoted to convincing people that it is easy to quit. If one believes that it is hard then it is hard. And if one is convinced that it is absolutely impossible to quit without divine intervention then that person will have to wait around until God intervenes--unless of course they choose to change their beliefs.

If people believe that alcohol will make them belligerent and cause them to fight then they will become belligerent and fight when they drink. If people believe that alcohol will make them docile and sleepy then they will become docile and sleepy when they drink. In this section we shall look at some famous studies of the effects of belief on drug and alcohol use.

Alan Marlatt Shows the Power of Belief

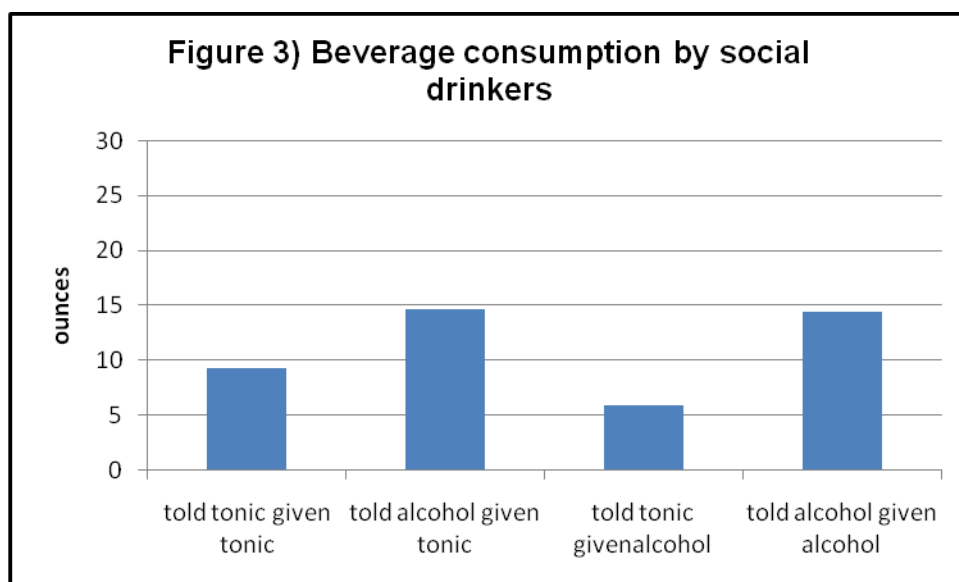
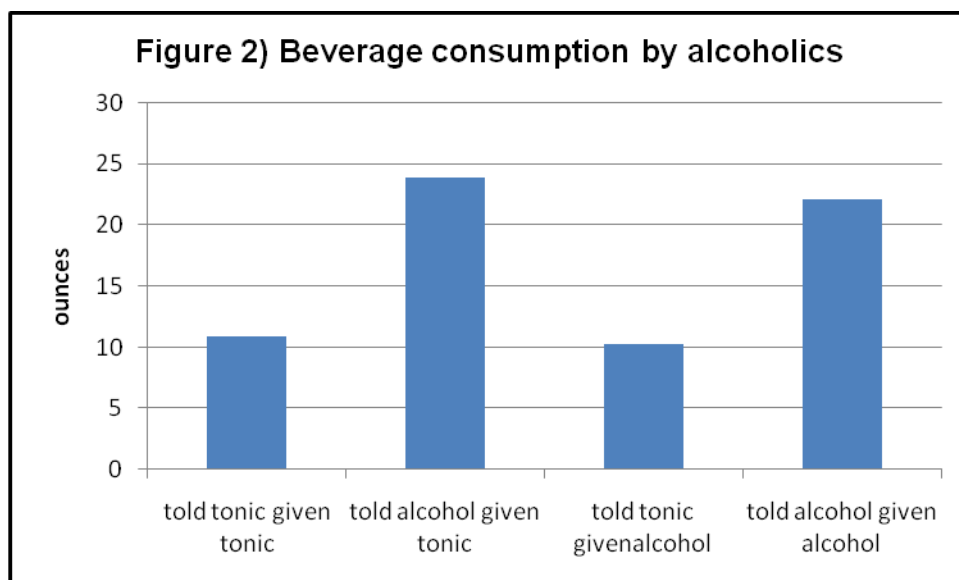
In 1973 Dr. G. Alan Marlatt and his colleagues published a study which showed that belief has a greater effect than alcohol itself on the behavior of alcoholics. Subjects in this experiment were divided into four groups:

- Group one) Subjects in this group were given tonic only and told truthfully that it was tonic only
- Group two) Subjects in this group were given a five to one mixture of tonic and vodka and told falsely that they were being given tonic only
- Group three) Subjects in this group were given tonic only and told falsely that it was a mixture of vodka and tonic
- Group two) Subjects in this group were given a five to one mixture of tonic and vodka and told truthfully that it was a mixture of vodka and tonic

A pretest of the beverages demonstrated that subjects were unable to distinguish the vodka tonic mixture from the tonic only drink.

The Marlatt experiment studied the effects of belief on both alcoholics and social drinkers. The subjects of this experiment were 32 alcoholics and 32 social drinkers. Care was taken to avoid borderline cases--the alcoholics in the study were people who reported major alcohol related problems and no intention to abstain. The results of the experiment are summarized in Table 2 and illustrated graphically in Figures 2 and 3.

Table 2) Ounces of beverage consumed per condition					
Beverage condition	Alcoholics		Social drinkers		Condition X-bar
	Told tonic	Told alcohol	Told tonic	Told alcohol	
Given tonic	10.94	23.87	9.31	14.62	14.69
Given alcohol	10.25	22.13	5.94	14.44	13.19
Condition X-bar	10.6	23	7.63	14.53	13.94



The only significant factor in the Marlatt experiment was what the subjects believed that they were drinking. The Marlatt experiment demonstrated beyond a shadow of a doubt that alcoholics do not suffer from a loss of control when they consume a single drink of alcohol--in other words the "one drink one drunk" theory is false. What is essential is belief.

PHYSICAL AND MENTAL HEALTH

Both physical and mental health can have a major effect on the way in which alcohol impacts you. If you have liver damage this can lead to [reverse tolerance](#). Drinking when you are ill can prolong the physical illness.

Many people abuse alcohol because they are self-medicating a mental health issue. We strongly recommend that you find a good harm reduction therapist to help you deal with any mental health issues.

EXPECTATIONS OF DRINKING

This is strongly tied into both beliefs and cultural expectations. If you believe that drinking makes you fight you will fight when you drink. If you believe that it makes you docile you will become docile. If you believe that it makes you glamorous or rich it probably won't--but these beliefs might make it harder to control or quit.

Cultural Identity (Ethnicity) and Drinking

Harvard Medical School conducted a study of the development of adolescents into adults starting in 1940. This study selected 456 lower class boys from the inner city schools of Boston and followed their development into adulthood. In the mid 1970s Dr. George Vaillant took data on the drinking patterns of 401 of the subjects of this study who were now men in their late 40s. The data in Table 3 is from Dr. Vaillant's 1980 book (revised edition 1995). Dr. Vaillant refers to these subjects as "the Core City Sample".

	N	Abstainers	Problem-Free Drinkers	Alcohol Abuse	Alcohol Dependence
Irish	76	21%	43%	8%	28%
Old American	35	20%	40%	13%	27%
Polish, Russian	17	18%	53%	11%	18%
English, Anglo-Canadian	98	21%	45%	11%	23%
Northern Europe other	20	5%	65%	5%	25%
French Canadian	26	15%	54%	8%	23%
Southern Europe other	23	30%	57%	9%	4%
Italian	99	18%	70%	8%	4%
Jewish	6	50%	33%	17%	0%
Chinese	1	0%	0%	100%	0%

The data from the Core City Sample show a very strong influence of ethnic and cultural identity on drinking patterns. This is particularly striking when we compare the drinking patterns of the Irish (n = 76) with the Italians (n = 99). 70% of the Italians fall into the category of problem-free drinkers and only 4% of them fall into the category of Alcohol Dependence. Whereas only 43% of the Irish in the sample are problem-free drinkers and 28% of them fall into the category of alcohol dependence.

The difference is attributed to the fact that traditionally the Italians teach their children responsible drinking in the home whereas the Irish often view alcohol as the devil's brew. This data clearly demonstrates that cultural factors in one's upbringing can have a major impact on one's pattern of alcohol use.

MENTAL AND EMOTIONAL STATE

Many people report bad effects if they drink when they are angry or depressed.

MOTIVATION FOR DRINKING

Drinking because you are happy and want to celebrate will have a majorly different effect than drinking because you are sad and trying to kill the pain.

FOOD AND WATER

We cannot emphasize too much how important it is to be well hydrated and to drink on a full stomach to avoid BAC spikes.

ENVIRONMENT

STRESS AND BOREDOM

Rat Park

The Rat Park experiment is an excellent example of the effects of stress and boredom on drug use in animals.

We have all heard the horror stories about monkeys or rats who are able to self-administer drugs like cocaine by pulling a lever and who give themselves fatal overdoses. Anti-drug crusaders use these as cautionary tales about the power of drugs and the powerlessness of the drug taker. However, they are leaving out certain crucial factors in the equation. To wit--the animals are locked in tiny little cages and isolated from their fellows and they are totally bored shitless with absolutely nothing to do except to administer drugs to themselves.

Dr. Bruce Alexander and his colleagues decided to investigate whether animals would become drug addicts in a naturalistic environment or if it was the fact that the animals were locked up in such awful conditions which led to their addiction. This study was published in 1978 and is often referred to as the "Rat Park" study.

Dr. Alexander and colleagues had one group of rats with access to an opiate solution in a naturalistic setting where the rats could run around and play with and have sex with other rats. The other group of rats was in the usual isolated cages. What they found was that the rats who

lived in Rat Park consumed only one eighth as much of the opiate solution as did the rats in isolated cages. In other words--addiction is a function of environment!

What this tells us as harm reductionists is that if you live in a bad, sad and miserable environment then it may well drive you to drink. We encourage you to do what you can to better your environment. Even hanging out with the other HAMS members in the HAMS chat room can be a way to get some needed social contact and to help you get away from over-drinking.

SUPPORT

Very often the worst possible mistake that a person can make in response to a spouse's drinking is to assume that abstinence is the only solution and that the drinking spouse must "hit bottom" to get better. The real truth is that if the drinking spouse is willing to work at harm reduction then this person should be offered support for every positive change. Experience shows that far more people get better through baby steps and small changes than do through dramatic conversions of the AA type. So support every positive change--the marriage you save may be your own.

SOCIAL AND CULTURAL ATTITUDES TOWARD DRINKING

Extreme attitudes can lead to rebellion. Although many children of alcoholics become alcoholic through imitation, many others become teetotalers through rebellion. Many children of teetotalers follow suit and become teetotalers themselves whereas others rebel and become heavy drinkers. But moderation tends to bring about moderation.

One can conform to the environment one lives in or one can rebel against it--or one can choose to follow one's own path.

WHO DO YOU DRINK WITH IF ANYONE?

If you hang out with heavy drinkers when you drink then you will be more likely to drink heavily. If you hang out with moderate drinkers you will be more likely to moderate. Some people choose to drink alone at home for safety reasons. This is not necessarily a problem. However if you drink when alone and when with company this means that you drink all the time and this can be a problem.

STRANGE VS. FAMILIAR ENVIRONMENT

Environment Changes Tolerance

If you drink alcohol or take drugs in an unaccustomed setting your tolerance is much lower than if you drink or use drugs in your usual setting. This phenomenon is called **Conditioned Tolerance**. In 1982 Dr. Siegel and colleagues published a study on the effects of morphine and environment on rats. They injected the rats with increasing doses of morphine in the same environment for many days in a row to get the rats to build up tolerance to the morphine. Then one day they gave the rats the same dose of morphine as usual in a totally novel environment. All the rats showed signs of overdose and several of them died. None of the rats had died of

overdose in their usual environment. This study proved the existence of conditioned tolerance. Interviews with people who have had drug overdoses confirm the existence of conditioned tolerance

What are the implications of this for people who practice alcohol harm reduction? If you choose to drink alcohol in a strange and new environment rather than your accustomed environment then you should be prepared for the possibility that the alcohol might have a much greater effect than usual and that you may become far more intoxicated than usual. So be prepared and plan ahead!

MORE ON ENVIRONMENT

Cohen et al 1971 demonstrated that alcoholics can control their drinking if they are rewarded by being placed in a positive rather than an impoverished environment.

REFERENCES:

Alexander BK, Coombs RB, Hadaway PF. (1978). The effect of housing and gender on morphine self-administration in rats. Psychopharmacology (Berl). 58(2), 175-9.

PubMed Abstract: <http://www.ncbi.nlm.nih.gov/pubmed/98787>

Bigelow, George; Liebson, Ira. (1972). Cost factors controlling alcoholic drinking. The Psychological Record Volume 22.

Abstract:

<http://thepsychologicalrecord.siuc.edu/22%20Bigelow%20&%20Liebson%20Abstract.pdf>

Cahalan D. Room, R. (1974). Problem drinking among American men. New Brunswick, NJ: Rutgers Center of Alcohol Studies.

Cohen M, Liebson IA, Faillace LA, Allen RP. (1971). Moderate drinking by chronic alcoholics. A schedule-dependent phenomenon. J Nerv Ment Dis. 153(6), 434-44.

PubMed Info: <http://www.ncbi.nlm.nih.gov/pubmed/5123713>

Abstract:

http://journals.lww.com/jonmd/Abstract/1971/12000/Moderate_Drinking_By_Chronic_Alcoholics_A.6.aspx

Ducci F, Goldman D. (2008). Genetic approaches to addiction: genes and alcohol. Addiction. 103(9), 1414-28.

PubMed Abstract: <http://www.ncbi.nlm.nih.gov/pubmed/18422824>

Free Full Text: <http://www.pubmedcentral.nih.gov/picrender.fcgi?artid=2665791&blobtype=pdf>

Galen LW, Rogers WM. (2004). Religiosity, alcohol expectancies, drinking motives and their interaction in the prediction of drinking among college students. J Stud Alcohol. 65(4), 469-76.

PubMed Abstract: <http://www.ncbi.nlm.nih.gov/pubmed/15376822>

Gerevich J, Bácskai E, Farkas L, Danics Z. (2005). A case report: Pavlovian conditioning as a risk factor of heroin 'overdose' death. Harm Reduct J. 2, 11.

PubMed Abstract: <http://www.ncbi.nlm.nih.gov/pubmed/16042795>

Free Full Text: <http://www.pubmedcentral.nih.gov/picrender.fcgi?artid=1196296&blobtype=pdf>

Donald W. Goodwin, MD; Fini Schulsinger, MD; Niels Møller, MD; Leif Hermansen, MD; George Winokur, MD; Samuel B. Guze, MD (1974). Drinking Problems in Adopted and Nonadopted Sons of Alcoholics. *Arch Gen Psychiatry*. 31(2), 164-169.

PubMed Abstract: <http://www.ncbi.nlm.nih.gov/pubmed/4851437>

Abstract: <http://archpsyc.ama-assn.org/cgi/content/abstract/31/2/164>

Donald W. Goodwin, MD; Fini Schulsinger, MD; Joachim Knop, MD; Sarnoff Mednick, PhD; Samuel B. Guze, MD (1977). Alcoholism and Depression in Adopted-Out Daughters of Alcoholics. *Arch Gen Psychiatry*. 34(7), 751-755.

PubMed Abstract: <http://www.ncbi.nlm.nih.gov/pubmed/879972>

Marlatt GA, Demming B, Reid JB. (1973). Loss of control drinking in alcoholics: an experimental analogue. *J Abnorm Psychol*. 81(3), 233-41.

PubMed Info: <http://www.ncbi.nlm.nih.gov/pubmed/4710045>

Abstract: <http://psycnet.apa.org/journals/abn/81/3/233/>

Siegel S. (1984). Pavlovian conditioning and heroin overdose: Reports from overdose victims. *Bulletin of the Psychonomic Society*. 22, 428-430.

Siegel S, Hinson RE, Krank MD, McCully J. (1982). Heroin "overdose" death: contribution of drug-associated environmental cues. *Science*. 216(4544), 436-7.

PubMed Abstract: <http://www.ncbi.nlm.nih.gov/pubmed/7200260>

Vaillant, G E. (1995). The natural history of alcoholism revisited Cambridge, Mass. Harvard University Press.

Wall TL, Peterson CM, Peterson KP, Johnson ML, Thomasson HR, Cole M, Ehlers CL. (1997). Alcohol metabolism in Asian-American men with genetic polymorphisms of aldehyde dehydrogenase. *Ann Intern Med*. 127(5), 376-9.

PubMed Abstract: <http://www.ncbi.nlm.nih.gov/pubmed/9273829>

Free Full Text: <http://www.annals.org/cgi/reprint/127/5/376.pdf>

Zinberg, N. (1984). Drug, Set, and Setting: The Basis for Controlled Intoxicant Use. Yale University Press. New Haven, CT.

Excerpts: <http://www.druglibrary.org/schaffer/lsd/zinberg.htm>