

## Chapter 4: Alcohol

- History
  - How did we ever come to be drinkers of alcohol?
    - Bad water
    - Fermentation versus distilling
  - Alcohol in the Colonies
    - We consumed vast quantities of alcohol
      - Social History of Alcohol: Chapter 1 is on line.
      - Prohibition was enacted and then repealed.

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How do we view people who drink too much?  
How we conceptualize a disorder is important  
Leads to different understandings and treatments

- Moral Model (the town drunk in colonial times and Otis (Andy Griffith Show)
  - Drinking too much reflects moral shortcomings.
- Early 1900's and the Disease Model
  - Advantages: You can't be responsible for having a disease. May allow more to seek treatment. Less stigma.
  - AA is based on Disease Model
    - How did AA start?
  - (What kind of field is it that claims Alcoholism is a disease but the treatment is non-medical?)

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### 12 Steps of Alcoholics Anonymous (AA)

- Disease Model Assumptions
  - Binary diagnosis, you either have it or you don't.
    - Probably alcoholics are born different from non-alcoholics
    - Alcoholics are qualitatively different, not quantitatively different.
      - Must be something different about the alcoholics and it isn't just their behavior. What is this difference?
  - Consuming any amount will lead to loss of control drinking
    - It is a physiological thing: must avoid all alcohol even rum cake
      - Drunken Compartment
    - An alcoholic can never drink again – never cured
    - Goal must be total abstinence for ever
      - Could lead to **Abstinence Violation Effect**
  - First step of AA: Admit you're powerless and can't control your drinking.

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Some early tests of the disease model

- Merry (see next slide)
- Sobels: The controlled drinking controversy.
- Balanced Placebo Design: Do cravings result from actual alcohol or the belief that you have consumed alcohol? ( see second slide)
- These early studies 1950 – 1970 questioned our beliefs about the physical effects of alcohol vs our beliefs.

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Does drinking lead to “loss of control”?

- Merry 1966 gave alcoholics in treatment either orange juice only or OJ spiked with alcohol on alternating days and measured craving each day.

TABLE I—GRAVING SCALE SCORE

Mixture	Patients	Days	Doses	Craving score (points)
0	9	8	72	33
A	9	7	63	33
2A	9	1	9	13

TABLE II—DAYS ON WHICH CRAVING WAS EXPERIENCED

Mixture	Patients	Days	Doses	Craving reactions
0	9	8	72	20
A	9	7	63	15
2A	9	1	9	9

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2 Independent Variables

Drink Alcohol	Drink Tonic

- Ex: Does alcohol help you focus?  
– 2 groups: alcohol or not and measure focus
- But are the 2 groups equal except for alcohol?

Drink Alcohol Believe getting alcohol	Drink Tonic Believe no alcohol

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Make 2 lvs in one study

One Variable

Drink Alcohol	Drink Tonic
10 people	10 people

Two Variables

	Drink Alcohol	Drink Tonic	
Told Alcohol	5 people	5 people	c
Told Tonic	5 people	5 people	d
	a	b	

- Compare column means: 1 variable
  - If alcohol makes you focus: then A>B
- Compare row means: 1 other variable
  - If belief you are drinking alcohol makes you focus: then C>D

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Marlatt Demming and Reid 1973, gave alcoholics from community alcohol or not (BPD) in taste rating task and measured how much they drank to make their ratings.

TABLE 1  
CONDITION MEANS FOR TOTAL AMOUNT OF BEVERAGE CONSUMED (IN FLUID OUNCES)

Beverage condition	Alcoholics		Social drinkers		Condition $\bar{X}$
	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 $\bar{X}$	10.60	23.00	7.63	14.53	13.94*

\* Grand  $\bar{X}$ .

- No effect of actual consumption of alcohol, but those who believed they were drinking alcohol drank much more than those who didn't think they were drinking alcohol.

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Marlatt's Results: How much desire to drink after consuming a taste measured by how much you drank to make your ratings

	Drink Alcohol	Drink Tonic	
Told Alcohol	22.13	23.87	23.00
Told Tonic	10.25	10.94	10.60
	32.38	34.81	

- What you were told (alcohol or not) made a big difference. What you actually got did not

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Is AA effective?

- Treatment Outcomes for AA?
  - Hard to measure
    - AA doesn't survey members. It is anonymous.
    - No one follows up dropouts.
      - If you go to AA meetings, you see all those that it worked for, but how many did it not work for and they dropped out?
      - I.e. what if 100 people initially go to AA and 90 drop out. Of the 10 that remain, 8 stay sober. By going to meetings and asking how they are doing, almost all will say it works. But can you say it worked for the 90 who dropped out?
- Don't underestimate the importance of social support.
- AA can be effective if you go and believe in it
  - But where is the "active ingredient"?
    - The steps? Your belief? Social Support?

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69 year-old arrested for drunk driving on a horse.



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The nation's first DUI test took an unusual twist with the arrest of Bill Blument, a 69-year-old working cowboy. Blument was charged with riding a horse while intoxicated in Stockton, California.

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Diagnosis Today  
What is an Alcoholic?

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## Treatments

FRONTIERS IN NEUROSCIENCE: THE SCIENCE OF SUBSTANCE ABUSE  
**Addiction Is a Brain Disease, and It Matters**  
 Alan I. Leschner

- **Medical Treatments**
  - Antabuse
  - Acamprosate
    - Decreases intensity of cravings
- **Psychological Treatments**
  - No difference in outcomes between inpatient and outpatient.

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## Treatment (cont)

- **Cognitive-Behavioral Treatment**
  - Assess High Risk Situations
    - Marlatt found most likely to relapse in response to high risk situations
      - AA's slogan: H A L T
    - Coping with Cravings
    - Find alternatives to drinking
    - Drink Refusal skills
    - Anger Management
    - Stress Management
    - Increase number of positive activities
    - Cue Exposure. (Oh boy!)
      - Take crack addicts to crack houses

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## Treatment (cont)

- **Motivational Enhancement**
  - Brief interventions can be helpful.
  - Based on “Stages of Change” model that recognized that many people change on their own, when they decide that’s what they want to do.
    - 4 stages in the “change” process
      - Precontemplative – aren’t even thinking about changing
      - Contemplative – are considering change
      - Action – decided to change and are ready to do it
      - Maintenance – maintain the new behaviors
- **Project Match**
  - A big multi-site national funded treatment study that pitted all 3 treatments against each other to see if certain type clients might do better with specific treatments.
    - Generally no different between treatments.
    - All equally effective.

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### Assorted Interesting Stuff

- Alcohol Myopia Theory
  - When we drink our field of information processing shrinks so that we are most aware of only that which is immediately in front of us.
- Expectancies (see next slide for college drinking beliefs)
- Contingency Management
  - Pay addicts for clean urine
- Marital/Couples Therapy.
- Harm Reduction - This approach redefines “success” from achieving abstinence to reducing harm from drinking/drugs.
  - Ex: Needle Exchange Program for IV drug users
  - Ex: Drug Consumption Rooms



International Journal of Drug Policy 18 (2007) 5–9

Commentary

Drug consumption rooms: An overdue extension to harm reduction policy in the UK?

Charlie Lloyd<sup>a,\*</sup>, Neil Hunt<sup>b,c,1</sup>

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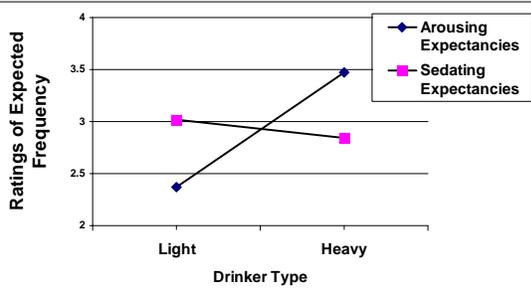
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### Frequency Ratings as a Function of Drinker Type and Expectancy Type



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### Prevention?

- Social Norming
  - Do others drink more or less than you think they do?
- D.A.R.E.
  - We can't demonstrate that it is any more effective than what has been traditionally taught in Health Ed Classes.
    - See Video



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Development of a Rational Scale to Assess the Harm of Drugs of Potential Misuse, Nutt et al. 2007

	Parameter	
Physical harm	One	Acute
	Two	Chronic
	Three	Intoxication harm
Dependence	Four	Intensity of pleasure
	Five	Psychological dependence
	Six	Physical dependence
Social harms	Seven	Intoxication
	Eight	Other social harms
	Nine	Health care costs

Table 1. Assessment parameters

- Harm was measured by having experts rate each drug (0-3) on 9 dimensions of potential harm.

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	Physical harm			Dependence				Social harms				
	Mean	Acute	Chronic	Intoxication	Mean	Pleasure	Psychological dependence	Physical dependence	Mean	Intoxication	Social harm	Health care costs
Heroin	2.78	2.8	2.5	3.0	3.00	3.0	2.6	2.0	2.54	1.6	2.0	2.0
Cocaine	2.33	2.0	2.0	3.0	2.30	3.0	2.8	1.3	2.17	1.8	2.5	2.3
Buprenorphine	2.23	2.3	1.9	2.5	2.01	2.0	2.2	1.8	2.00	2.4	1.9	1.7
Street methamphetamine	1.86	2.5	1.7	1.4	2.08	1.8	2.3	2.3	1.87	1.6	1.9	2.0
Alcohol	1.49	1.9	2.4	NA	1.83	2.3	1.6	1.6	2.21	2.2	2.4	2.1
Ketamine	2.00	2.1	1.7	2.1	1.54	1.9	1.7	1.0	1.49	2.0	1.5	1.5
Benzodiazepines	1.43	1.5	1.7	1.8	1.83	1.7	2.1	1.8	1.65	2.0	1.5	1.5
Amphetamine	1.81	1.3	1.8	2.4	1.67	2.0	1.9	1.1	1.50	1.4	1.5	1.6
Tobacco	1.14	0.9	2.9	0	2.01	2.3	2.6	1.8	1.42	0.8	1.1	2.4
Buprenorphine	1.60	1.2	1.3	2.3	1.64	2.0	1.5	1.5	1.49	1.6	1.5	1.4
Cannabis	0.99	0.9	2.1	0	1.51	1.9	1.7	0.8	1.50	1.7	1.3	1.5
Solvents	1.28	2.1	1.7	0	1.01	1.7	1.2	0.1	1.51	1.9	1.5	1.2
Al-NDA	1.44	2.2	2.1	0	1.30	1.9	1.2	0.8	1.56	1.2	1.9	1.0
LSD	1.13	1.7	1.4	0.3	1.23	2.2	1.1	0.3	1.32	1.6	1.3	1.1
Methylphenidate	1.32	1.2	1.3	1.6	1.35	1.4	1.3	1.0	0.97	1.1	0.8	1.1
Anabolic steroids	1.45	0.8	2.0	1.7	0.88	1.1	0.8	0.8	1.13	1.3	0.8	1.3
QNB	0.86	1.4	1.2	0	1.19	1.4	1.1	1.1	1.30	1.4	1.3	1.2
Ecstasy	1.05	1.6	1.6	0	1.13	1.5	1.2	0.7	1.09	1.2	1.0	1.1
Allylthiouracil	0.93	1.5	0.9	0.3	0.87	1.6	0.7	0.3	0.97	0.8	0.7	1.4
Wet	0.59	0.3	1.2	0	1.04	1.6	1.2	0.3	0.85	0.7	1.1	0.8

Table 3. Mean independent group scores in each of the three categories of harm, for 20 substances, ranked by their overall score, and mean scores for each of the three subcategories

- Here are the ratings of harm for each of the 9 dimensions

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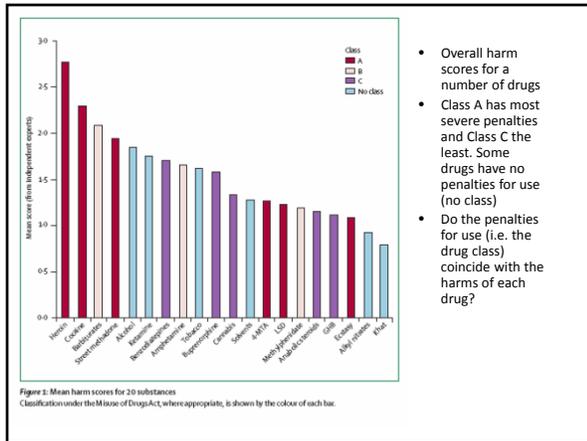
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- Overall harm scores for a number of drugs
- Class A has most severe penalties and Class C the least. Some drugs have no penalties for use (no class)
- Do the penalties for use (i.e. the drug class) coincide with the harms of each drug?

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## Chapter 4: Alcohol Use

- Heavy, problematic drinking has many impacts
  - 7% of the population meet the diagnostic criteria for alcohol abuse or dependence
  - More than 50% of American Adults have a close family member who has or has had alcoholism
  - 25% of children under age 18 are exposed to alcohol abuse or dependence in the family
  - Of the 11 Million victims of violent crime each year, 25% report that the offender had been drinking prior to committing the crime
  - Traffic crashes involving alcohol killed more than 16,000 people in 1997 alone.
  - Estimated economic cost of alcohol abuse was \$184 Billion for 1998 alone: \$638 for every man, woman and child in the US.

From 10<sup>th</sup> special report to congress

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- Motor Vehicle Crashes are the leading cause of non-natural death in the US.
  - 50% of all highway deaths involve alcohol. For those aged 16 – 24, 60% of those highway deaths are alcohol related
  - 25% of motorcycle crashes involved an intoxicated driver
  - A study of pedestrian fatalities found that one-third had a BAL of .15 or higher
  - A NTSB study of general aviation accidents found that 86% of pilots has a BAL of .04 or higher and 45% had a BAL of .15 or higher.
  - A NTSB study of boating accidents found that 38% of boating fatalities had a BAL of .10 or higher
  - The NTSB estimates that alcohol is involved in 69% of drowning deaths
  - 60% of emergency room patients injured by falls had detectable levels of alcohol in their blood. 53% of these had a BAL of .20 or higher.

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Volume 76 No. 16 MTSU SOURCEBOOK 1994/95

## Freshman falls 3 stories, breaks back and ribs

Injuries prevent student from returning for fall semester

By Jerry Corliss  
Staff Writer

An MTSU student remains at Middle Tennessee Medical Center after falling three floors from the balcony of his University Court apartment. Witnesses said 18-year-old freshman Christopher Wall lost his balance while he was spitting water into a sink off the balcony around 10:30 p.m. Thursday.

"Chris was spitting water into the sink, and when he went back to get his clothes, the majority of his body weight was on the railing and he fell,"

Lewery, Wall's roommate who was on the balcony when the accident happened.

"When he hit the railing, his body weight carried him over," said Lewery. Sophomore and neighbor Tiffany Green grabbed onto wall's neighbor Courtney Steiner and called 911 at the request of Lewery, who called Wall on the ground spitting up blood.

Lewery and friend Jason Smith, who was also on the balcony, tried to keep Wall still while the paramedics rushed to the scene.

"He was conscious when the paramedics came," said Lewery.

Wall, whose blood alcohol level was .022, which is 22 percent above the legal minimum, first underwent surgery Saturday to repair his neck and will remain at MPMC for a week to 10 days.

Wall suffers from three broken vertebrae in his neck. Three broken vertebrae in his back, two cracked ribs, a small contusion on the back of his head and fluid in his lungs, said Lewery.

"He's not paralyzed," he said. "But he can't feel off."

Wall will not be returning to MTSU this semester, said Lewery. ■

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### What Happens When We Drink?

- 1 oz. Pure alcohol contains 210 “empty” calories
- Absorption begins immediately
  - Some in the mouth
  - Up to 20% through the stomach wall
  - Balance goes to small intestines
- Alcohol is an irritant
  - Increases hydrochloric acid in stomach
    - Don’t drink with ulcers
- Rate of Absorption?
  - Carbon Dioxide hastens absorption

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### What Happens When We Drink? (cont.)

- Role of the Pylorus Valve in Stomach
  - Sticks closed with higher amounts of alcohol
    - Vomiting, self protection mechanism?
- 80% absorbed into blood stream from small intestine
- Alcohol is soluble in water
  - Goes into muscles, organs, brain (not fat)
  - Takes less than 2 minutes for brain tissue to accurately reflect blood-alcohol concentration

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### How Does Body Get Rid of Alcohol?

- 10% exits unmetabolized (breath, sweat, urine)
- 90% metabolized by liver
  - Breaks down into acetaldehyde then acetic acid then leaves the liver and becomes carbon dioxide and water
  - Liver does the work at a constant rate
    - 1/2 oz. Pure alcohol per hour (1 shot 86 proof)
  - Methanal (wood alcohol) is poison
    - Breaks down into formaldehyde

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### Effects on the Body

- Vasodilator of surface blood vessels
  - Feeling of flushing or warmth
  - Hastens loss of body heat
- Kidneys – thru pituitary gland, forces kidneys to produce more urine.
- Liver (job is regulate blood sugar levels)
  - Liver is diverted w/alcohol, so blood sugar levels can drop, brain can be mildly deprived.
  - Hypoglycemia – low blood sugar, can lead to coma
  - More likely when drinking on empty stomach or for long bouts.
- Brain – alcohol is depressant, slows activity. Too much stops HR and Breathing mechanisms.

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### Acute Effects of Alcohol

- 1 drink for 160# male results in BAC = .011
- 4 in 1 hr. = .092
  - you are legally intoxicated & can't drive
  - Judgment is affected first
  - Muscle coordination is impaired
  - You show a stagger and a slur.
  - But w/ altered judgment, you'll think you've never functioned better
- 4 in 1 hour for 140# female = .132

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### Acute Effects (cont.)

- 10 drinks in hour BAC = .20
  - Emotions are erratic
- One pint of whiskey = stuporous
  - Judgment, coordination, and sensory perception are gone.
  - 16 hours before alcohol is metabolized
- 1 ¼ pints of whiskey – coma, close to death
  - Heart rate and breathing affected
  - If a female, probably dead by now.



Comparisons for a 120# female: 180# Male

1 drink =	.03	.008
2 drinks =	.07	.032
4 drinks =	.157	.080

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### Why Females get more “Bang for the Buck”

- Body weight
  - Males have more body mass for alcohol to spread into
- Higher percentage of body fat in females
- Text says that men break down more alcohol in the stomach?



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### BiPhasic Effects of Alcohol

- Simulant Effects are associated with Rising BACs
  - Elated, Energized, Excited, Talkative, Up, Vigorous
- Sedative Effects are associated with Falling BACs
  - Down, Heavy head, Inactive, Slow thoughts, Sluggish
- Martin et. al. (1993) had college students drink alcohol and rate the degree they experienced these effects. Rated on rising limb and falling limb.

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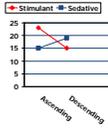
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### BiPhasic Results



- Some have suggested that alcoholics are less sensitive to effects on the descending limb



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