Abnormal Psychology

Substance Use Disorders

Psychology 3303

Professor June Gruber
“I wish for a world that views disability, mental or physical, not as a hindrance but as unique attributes that can be seen as powerful assets if given the right opportunities.”

-Oliver Sacks
Roadmap

Course Logistics

Substance Use Disorders

Substance Types

Models & Treatments

Take-Away Qs
Course Logistics

Exam 1 Grading

Great work so far
Grades posted on CANVAS
Exams handed back in class today
LAST NAME: A-H [THEIR LEFT SIDE], I-Z [RIGHT SIDE]
Gruber 5% boost :)

Course Logistics

Calendar Update

Emailed recent syllabus last week

Updated on course website

Check to make sure doing correct readings!

Next week: 7.1: PSYCHOPATHY & 7.2: LEGAL/ETHICAL ISSUES
Course Logistics

Your Feedback

Brief survey to be emailed :)
Roadmap

Course Logistics

Substance Use Disorders

Substance Types

Models & Treatments

Take-Away Qs
What is a “Substance”

A substance is any natural or synthetic product that has psychoactive effects (change in perception, thoughts, emotions, and behaviors)

- Alcohol
- Tobacco
- Caffeine
- Other Drugs
Quick Facts

28 million people in U.S. have used an illegal substance in the past year

Almost 25% of all high school seniors have used an illegal drug within the past month.
Youth and Substance Abuse

8 of 32 Have used an illicit drug in the past 30 days

12 of 32 Have used in the past year

15 of 32 Have tried at least once in their lifetime
Substance Abuse Costs

1 in 4 US deaths can be attributed to alcohol, tobacco, or illicit drugs.

Economic burden $414 billion in US annually.

Alcohol alone costs $166 billion.
DSM-IV
Abuse Versus Dependence

**Abuse**
Maladaptive pattern of SU leading to clinically significant impairment or distress (1 or more during 12-month period):

- Failure to fulfill major role obligations at work, school, or home
- Use in situations in which it is physically hazardous
- Legal problems
- Use despite persistent or recurrent social or interpersonal problems

**Dependence**
Maladaptive pattern of SU leading to clinically significant impairment or distress (3 or more over 12 months):

- Tolerance
- **Withdrawal**
- Substance taken in larger amounts or over longer period than intended
- Persistent desire or unsuccessful efforts to cut down or control use
- Great deal of time spent in activities necessary to obtain substance
- Important social, occupational, or recreational activities are reduced or terminated
- Substance use continues despite knowledge of recurrent physical or psychological problems due to SU
Substance Related Conditions

“Long-Term”

**Substance Abuse:**
Diagnosis given when recurrent substance use leads to significant harmful consequences.

**Substance Dependence:**
Diagnosis given when substance use leads to physiological dependence or significant impairment or distress.
DSM-IV —> DSM-5
Alcohol Use Disorder: A Comparison Between DSM–IV and DSM–5

In May 2013, the American Psychiatric Association issued the 5th edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM–5). Although there is considerable overlap between DSM–5 and DSM–IV, the prior edition, there are several important differences:

**Changes Disorder Terminology**
- DSM–IV described two distinct disorders, alcohol abuse and alcohol dependence, with specific criteria for each.
- DSM–5 integrates the two DSM–IV disorders, alcohol abuse and alcohol dependence, into a single disorder called alcohol use disorder (AUD) with mild, moderate, and severe sub-classifications.

**Changes Diagnostic Thresholds**
- Under DSM–IV, the diagnostic criteria for abuse and dependence were distinct: anyone meeting one or more of the “abuse” criteria (see items 1 through 4) within a 12-month period would receive the “abuse” diagnosis. Anyone with three or more of the “dependence” criteria (see items 5 through 11) during the same 12-month period would receive a “dependence” diagnosis.
- Under DSM–5, anyone meeting any two of the 11 criteria during the same 12-month period would receive a diagnosis of AUD. The severity of an AUD—mild, moderate, or severe—is based on the number of criteria met.

**Removes Criterion**
- DSM–5 eliminates legal problems as a criterion.

**Adds Criterion**
- DSM–5 adds craving as a criterion for an AUD diagnosis. It was not included in DSM–IV.

**Revises Some Descriptions**
- DSM–5 modifies some of the criteria descriptions with updated language.
• Desire or efforts to reduce or control use
• Much time spent trying to obtain the substance
• Social, recreation, or occupational activities given up or reduced
• Continued use despite knowing problems caused by the substance
• Craving to use the substance is strong

Two or more of the following within a year:
• Failure to meet obligations
• Repeated use in situations where it is physically dangerous
• Repeated substance use legal
• Tolerance
• Withdrawal
• Substance taken for a longer time or in greater amounts than intended
• Desire or efforts to reduce or control use
• Much time spent trying to obtain the substance
• Social, recreation, or occupational activities given up or reduced
• Continued use despite knowing problems caused by the substance
• Craving to use the substance is strong

• Two or more of the following within a year:
  • Failure to meet obligations
  • Repeated use in situations where it is physically dangerous
  • Repeated substance use legal problems
  • Continued use despite problems caused by the substance
  • Tolerance
  • Withdrawal
  • Substance taken for a longer time or in greater amounts than intended
Chris suddenly stopped taking amphetamines after prolonged abuse of the drug. He became very ill and died.

His death is an example of:

a) Substance dependence

b) Substance abuse

c) Withdrawal symptoms

d) Synergistic effects
**Substance Types**

**CNS Depressants & Stimulants**

- **Depressants**
  - Alcohol
  - Barbiturates
  - Benzodiazepines
  - Inhalants

- **Stimulants**
  - Cocaine
  - Amphetamines
  - Nicotine
  - Caffeine

**Other Groups**

- **Opioids**
  - Heroin
  - Morphine

- **Hallucinogens/PCP**

- **Cannabis**

- **Prescription Drug**
Depressants slow the activity of the central nervous system (CNS):

- Reduce tension and inhibitions
- May interfere with judgment, motor activity, and concentration
Depressants: Alcohol
Depressants: Alcohol

Affects, in order,

1. executive function
2. motor coordination
3. emotion
4. vital life functions (breathing, heart rate, temperature, consciousness).
Depressants: Alcohol

All alcoholic beverages contain ethyl alcohol

Absorbed into the blood through the stomach lining and takes effect in bloodstream and CNS

Enhances activity of GABA in septal/hippocampal system, contributing to sedative effects.

Affects serotonin activity across the brain, leading to mood changes.
Depressants: Alcohol

Levels of impairment are closely tied to the concentration of ethyl alcohol in the blood:

- BAC = 0.06: Relaxation and comfort
- **BAC = 0.09: Intoxication**
- BAC > 0.55: Death
- Most people lose consciousness before they can drink this much
Depressants: Alcohol

Consuming 5 drinks or more on a single occasion is known as binge drinking.

23% of all people in USA over age 12 binge drink at least one time per month.

Men account for 81% of binge drinking episodes.
Depressants:
Sedative-Hypnotic Drugs
Depressants: Sedative-Hypnotic Drugs

Sedative-hypnotic drugs include barbiturates and benzodiazepines

Produce feelings of relaxation and drowsiness

- At low doses, calming or sedative effect
- At high doses, function as sleep inducers or hypnotics
Depressants: Sedative-Hypnotic Drugs

Barbiturates

Used for sedation, anesthesia, anxiolytic, hypnotic, anticonvulsant

At high doses, affect reticular formation, causing people to become drowsy
Depressants: Sedative-Hypnotic Drugs

Benzodiazepines are often prescribed to relieve anxiety

- Most popular sedative-hypnotics available include Xanax, Ativan, and Valium
- Depressant effect on the CNS by binding to GABA receptors and increasing GABA activity
- Relieve anxiety without causing related drowsiness
- As a result, they are less likely to slow breathing and lead to death by overdose
### Substance Types

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<tr>
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<th>Other Groups</th>
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Stimulants

Stimulants are substances that increase the activity of the central nervous system (CNS):

• Cause increases in blood pressure, heart rate, and alertness
• Cause rapid behavior and thinking

Common stimulants:
• Cocaine
• Amphetamines
• Caffeine
• Nicotine
Stimulants: Cocaine
Stimulants: Cocaine

Derived from the leaves of the coca plant, cocaine is a powerful natural stimulant.

28 million people in the U.S. have tried cocaine.

Cocaine produces a euphoric rush of well-being by stimulating CNS and decreasing appetite.
Stimulants: Cocaine

High doses of cocaine can produce cocaine intoxication:

- Mania, paranoia, and impaired judgment
- Hallucinations and/or delusions, a condition known as cocaine-induced psychotic disorder

Once cocaine effects subside, the user experiences a depression-like letdown, popularly called “crashing”.

Stimulants: Cocaine

Increases **dopamine** at key receptors in the brain by preventing the neurons that release it from reabsorbing it.

Increases **norepinephrine** and **serotonin**
Stimulants: Cocaine

What are the dangers of cocaine?

- Behavioral and significant physical danger
- **Infarction: Stroke, Heart Attack**

The greatest danger of use is the risk of **overdose:**

- Excessive doses depress the brain’s respiratory function, and **stop breathing**
- Can also cause **heart failure**
Stimulants:
Amphetamines
Stimulants: Amphetamines

Stimulant drugs manufactured in the laboratory:

- **Methamphetamine**, in particular, has had a surge in popularity in recent years
- Most often taken in pill or capsule form
- Can be injected or taken in “ice” and “crank” form
Stimulants: Amphetamines

- Increase **energy** and **alertness** and lower appetite when taken in small doses
- Produce a rush, intoxication, and psychosis in high doses
- Cause an **emotional letdown** as they leave the body
- Stimulate CNS by increasing **dopamine, norepinephrine, and serotonin**
Stimulants: Amphetamines

Tolerance develops quickly; users are at great risk of becoming dependent.

Approximately 1.5% to 2% of Americans become dependent on amphetamines at some point in their lives.
Before and After
Stimulants: Caffeine
Stimulants: Caffeine

Caffeine is the world’s most widely used stimulant.

• Around 80% of the world’s population consume it daily.

• Coffee, Soda, Tea, Energy Drinks, Chocolate
Stimulants: Caffeine

Caffeine acts as a stimulant in the CNS, producing a release of dopamine, serotonin, and norepinephrine in the brain.

- More than 2 to 3 cups of brewed coffee can lead to caffeine intoxication
- Seizures and respiratory failure can occur at doses greater than 10 grams of caffeine (about 100 cups of coffee)
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Hallucinogens/PCP

Cannabis

Prescription Drug
Opioids
Opioids

Opioids includes...

• Natural (opium, heroin, morphine, codeine)

• Synthetic compounds (methadone)

• Each drug has a different strength, speed of action, and tolerance level
Opioids

Provide pain relief and relaxation by depressing the CNS:

- Opioids bind to the receptors in the brain that ordinarily receive endorphins (NTMs that naturally help relieve pain and decrease emotional tension)
- When these sites receive opioids, they produce pleasurable and calming feelings, just as endorphins do
- In addition to reducing tension, opioids can cause nausea, narrowing of the pupils, and constipation
Opioids

Heroin abuse and dependence

Heroin use exemplifies the problems posed by opioids:

• After just a few injections, users may become caught in a pattern of abuse (and often dependence)
• Users quickly build a tolerance for the drug and experience withdrawal when they stop taking it
• Early withdrawal symptoms include anxiety and restlessness; later symptoms include twitching, aches, fever, vomiting, diarrhea, and weight loss from dehydration
Opioids

What are the dangers of heroin abuse?

• Respiratory center in the brain shuts down, paralyzes breathing and causes death (during sleep).

• Ignorance of tolerance is also a problem.

• About 2% of those dependent on heroin and other opioids die under the influence of the drug each year.
Opioids

- Impure drugs
- Opioids are often “cut” with noxious chemicals
- Dirty needles and other equipment can spread infection
The Opioid Epidemic by the Numbers

In 2016...

- 116 people died every day from opioid-related drug overdoses.
- 11.5 million people misused prescription opioids.
- 42,249 people died from overdosing on opioids.
- 2.1 million people had an opioid use disorder.
- 948,000 people used heroin.
- 170,000 people used heroin for the first time.
- 2.1 million people misused prescription opioids for the first time.
- 17,087 deaths attributed to overdosing on commonly prescribed opioids.
- 19,413 deaths attributed to overdosing on synthetic opioids other than methadone.
- 15,469 deaths attributed to overdosing on heroin.
- 504 billion in economic costs.
CNS Depressants & Stimulants

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**Hallucinogens/PCP**

**Cannabis**

**Prescription Drug**
Other kinds of substances can cause problems for users and for society:

**Hallucinogens**
Produce delusions, hallucinations, and other sensory changes

**Cannabis substances**
Produce sensory changes, but have both depressant and stimulant effects

**Combinations of substances = polysubstance use**
Hallucinogens

Hallucinogens, also known as psychedelic drugs, produce powerful changes in sensory perceptions.

Include natural hallucinogens
- Mescaline
- Psilocybin

And synthetic hallucinogens
- Lysergic acid diethylamide (LSD)
- MDMA (Ecstasy)
LSD is one of the most famous and powerful hallucinogens. Within two hours of being ingested, a state of hallucinogen intoxication:

- Increased and altered sensory perception
- Hallucinations may occur
- Extremely strong emotions
- Some physical effects
- Effects wear off in about six hours

Hallucinogens appear to produce these symptoms by binding to serotonin receptors.

- These receptors control visual information and emotions, thereby causing the various effects of the drug on the user
Researchers at Johns Hopkins University have suggested that psilocybin, which is found in hallucinogenic mushrooms, be reclassified from a Schedule I drug, with no known medical benefit, to a Schedule IV drug, which is akin to prescription sleeping pills. Anthony Devlin/PA Wire, via Associated Press
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**Hallucinogens/PCP**

**Cannabis**

**Prescription Drug**
Cannabis
Cannabis

The drugs produced from varieties of the hemp plant are, as a group, called **cannabis**, they include:

- **Hashish**, the solidified resin of the cannabis plant
- **Marijuana**, a mixture of buds, crushed leaves, and flowering tops

Active ingredient in cannabis is **tetrahydrocannabinol (THC)**.
When smoked, cannabis produces a mixture of hallucinogenic, depressant, and stimulant effects. At low doses, the user feels joy and relaxation.

- May become anxious, suspicious, or irritated
- This overall “high” is technically called cannabis intoxication
- At high doses, cannabis produces odd visual experiences, changes in body image, and hallucinations
Cannabis

Most of the effects of cannabis last 3 to 6 hours. Mood changes may continue longer.
Cannabis

Is marijuana dangerous?
As the strength and use of the drug has increased, so have the risks of using it.

- May cause **panic reactions** similar to those caused by hallucinogens.
- Because of its sensorimotor effects, marijuana has been implicated in **accidents**.
- Marijuana use has been linked to **poor concentration** and **impaired memory**.
Cannabis

Also used medicinally to treat a variety of medical conditions including:

- Pain management
- Nausea from cancer chemotherapy
- Poor appetite from chronic illness, such as HIV
- Seizure disorder
- Chron's disease
- Many others
Roadmap

**Substance Abuse**

What is a “Substance”

The Difference Between Abuse and Dependence

Substance Types

Models & Treatments
MODELS
1. Biological Vulnerability Factors

Family history, twin and adoption studies all provide evidence of genetic effect.

- Genes influence metabolism and biosynthesis of substances
- Dopamine receptor gene (DRD2), dopamine transporter gene (SLC6A3), ADH2, ADH3, GABA receptors, etc.

People who have greater stimulative effect of alcohol at increased risk for excessive drinking.

Greater reward sensitivity in sons of alcoholics but takes more alcohol for them to feel effects.
2. Personality Predictors

Impulsivity, low behavioral control, anti-sociality.

• Associated with especially bad outcomes for individual and offspring
3. Coping and Expectancy Theories

Those who use substances to cope with negative emotions is associated with greater risk for abuse.

Positive expectancies for substances effects associated with greater risk for abuse.
4. Environment and Context

Cultural and gender differences associated with norms for drinking.

Extreme stress, coupled with availability and reinforcement for substance use, increases use.
5. Disease vs. Harm-Reduction Models

Disease model: some people are biologically incapable of using substance without abusing it.

Harm reduction model: teaching responsible use (of alcohol).
TREATMENTS
Medications

Antagonist drugs
• Block or change effects of addictive drug
• Naltrexone and naloxone - opioid antagonists
• Disulfiram

Antidepressants and benzodiazepines
• Reduce withdrawal symptoms and mood symptoms

Methadone
• Synthetic opioid
Behavioral and Cognitive Treatments

Behavioral

• Aversive classical conditioning
• Covert sensitization therapy
• Cue exposure and response prevention

Cognitive

• Identify expectations for drug use and triggers
• Challenge expectations
• Anticipate problem situations and develop coping capacities
Motivational Interviewing

- RESIST telling them what to do: Avoid telling, directing, or convincing your friend about the right path to good health.
- UNDERSTAND their motivation: Seek to understand their values, needs, abilities, motivations and potential barriers to changing behaviors.
- LISTEN with empathy: Seek to understand their values, needs, abilities, motivations and potential barriers to changing behaviors.
- EMPOWER them: Work with your friends to set achievable goals and to identify techniques to overcome barriers.
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Thank You!

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