

# USC Mann

Alfred E. Mann School of Pharmacy  
and Pharmaceutical Sciences

## Spring 2024: RXRS 202: Comparative Neuropharmacology: A Kaleidoscope of Experiences

Satisfies GE-G

*Course Syllabus 11.9.2023*

**Course Weight:** 4 Units (two 1.5-hour sessions per week – 15-week semester)

### Instructors

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### Catalogue Description

How drugs impact culture in individual, society, and global communities.

### Introduction

Citizenship in our diverse world is dependent on human behaviors, positive and negative, creating bridges or barriers. Our behaviors are influenced by interactions between our minds and the environment. Drugs, both legal and illegal, alter the human mind create culture, impact social structure, establish and execute laws, and shape our global community. The wide spectrum and diversity of drugs ranging from stimulants like caffeine, alcohol, tobacco, and recently cannabis, are acceptable in many communities as components of recreation, or relaxation. Other drugs with mind altering properties such as hallucinogens like LSD, ecstasy, and amphetamines can drive creativity influencing music, the arts, and spirituality. At the same time drugs and drug use are the subject of policy leading to laws to regulate or block their use resulting in potential new opportunities or conflicts in global citizenship and culture.

The purpose of this course is to explore the curriculum bridging pharmacological and social perspectives of drug use and their current and historical impact on the human experience. Humanity is a remarkably diverse entity that manifests at all levels of intellectual and artistic pursuits. These differences are evident in politics, law, religion, creative art, ethics, and cultures and such differences have been sources of inspiration and global citizenship as well as sources of conflict. As changes the global economy, transportation, and communications create a world with greater integration and fewer physical and intellectual barriers, it is critical that we understand the history, current affairs, and future directions of our diverse world. Drugs have played a critical role in our past and will continue to play a greater role in the future as reflected by the legalization of many previous contrabands. The world has been shaped by legal drugs including caffeine, nicotine, and alcohol some of which continue to be regulated in many societies. The world has also been shaped by drugs in the illegal realm including opium and its opiate derivatives, hallucinogens, and amphetamines and many others. The purpose of this course is to explore how both legal and illicit drugs have shaped our global cultures, impacted art and creativity, and continue to be a medium to enhance the human experience and in some cases damage human progress. We will examine how drugs interact with the nervous system both centrally and peripherally to impact creativity in the arts, literature, and philosophy. We will explore how aspects of culture and creativity, law, and politics impact or clash with drug culture and use from both our domestic and global perspectives. This course is unique in that it will take a pharmacological and biological perspective to explore this topic and how different drugs impact different aspects of our nervous system and its consequences for both the individual and for society.

### **Course Objectives**

1. Discuss a wide spectrum of drugs that have had a long history in human civilization as part of the force that drives the development of the arts, law, and their appreciation.
2. Consider the ways that old drugs with a long human history and new drugs are emerging creating both novel opportunities for use as well as significant threats to the health of society both domestically and globally.
3. Isolate the effects of different drugs along with their unique pharmacological interactions within the nervous system and how they drive unique aspects of human behavior in both use and abuse and why different societies approach different drugs with diverse perspectives.
4. Distinguish the fundamental pharmacological mechanisms altered and enhanced by different classes of drugs impacting the nervous system and behaviors underscoring changes in arts, law, policy, and the human experience.
5. Examine how the human brain is composed of complex circuits in distinct anatomical regions that integrate cognition, perception, and other behaviors that can be enhanced or altered with drug use.
6. Evaluate the potential origins of creativity in the human brain and how they are influenced by drugs by examining a wide spectrum of historical and cultural origins and uses both domestic and global.
7. Differentiate how drug use is a fundamental aspect of the human experience and involves both legal and illegal agents, and how it impacts society and its laws through history and in current policy development of both society and the individual citizen.
8. Illustrate that there are both benefits and risks in drug use to drive creativity that can have both immediate and long-term consequences on the medical condition of individuals, society, and global communities.

## Deliverables, Evaluation, and Grading:

Assignment/Description	Due Date	Points	Weight
Reaction Paper 1	Thurs. Feb. 15	15	15
Reaction Paper 2	Thurs., April 11	15	15
Participation	In class (no credit for zoom)	10	10
Midterm Exam	Tuesday, February 24, 2024	30	30
Final Exam	Wednesday, May 8, 2024 – 2 to 4 PM	30	30
<b>Total</b>			<b>100%</b>

**No late essays will be accepted for any reason short of a serious, documented emergency.** An official note explaining why you were unable to write the essay will be required for an extension.

**There are no make-up exams.** If exceptional circumstances prevent you from attending an exam, your reason for missing it must be accompanied by a written statement from a third party (e.g., a note from a medical doctor).

### Assignment Descriptions

Evaluation will be based on two written assignments that will consist of a short (750 to 1000 word) paper in the form of a Reaction Paper focusing on a topic from the class as selected by the student. Students can discuss their selection with any of the instructors. The paper is a written assignment engaging students to share their opinions, critical assessment of a topic of interest, and to formulate a body of knowledge. There will be a midterm taken by students through Blackboard that will be a combination of short answer, fill-in-the-blank, and true and false questions. The subject matter will be inclusive up to the date of the midterm. The Final Exam will be administered during the Examination Week and will be in a similar format as the Midterm. The subject matter will focus on material in the second half of the course but could draw upon information and concepts addressed in the first half of the course.

### Course Evaluation

Students will be asked to complete an anonymous critical evaluation of the course at its completion.

### Course Readings

***Required Readings:*** Each week students will be assigned a single article to read in preparation of the presentation of the topic and for discussion. Reading will consist of manuscripts, published articles, or excerpts from longer written documents.

***Recommended Readings:*** Each week a supplementary or complementary reading will be suggested but not required. These readings are meant to support and enrich the topic of the lecture. Students that may be more deeply interested in a topic and that could benefit from further enrichment will have the opportunity through supplementary articles.

Other course materials including but not limited to the syllabus, supplemental reading assignments and additional handouts will be posted on <http://blackboard.usc.edu/>. The students will also be encouraged to use the online discussions among students via Blackboard.

**Course Outline**

This course will be in the format of a directed seminar/lecture under the guidance of the instructor for the specific session. During each weekly session the instructor will engage the students with questions and draw comments or interpretations primarily based on the assigned reading. Students are expected to ask questions and participate in an interactive fashion.

Week & Date	Topic	Objectives/Subtopic	Assigned Readings
<b>Introduction and Background</b>			
<b>Week 1</b>  Tues. Jan. 9	<b>Lecture 1</b>  <b>Course introduction and expectations.</b>  <b>Where is creativity in the human brain?</b>	This lecture will cover the structure and goals of the course including an overview of the topics, expectations, grading, and the role of required reading. We will begin our discussion on the impact of drugs on creativity by examining anatomical regions of the brain that are the targets of drugs. We will explore regions of the brain involved in literature (reading), art (vision, motor systems), philosophy (thinking), as well as perception.	<b>1<sup>o</sup> Reading:</b> M. A. Runco and G. J. Jaeger (2012) The Standard Definition of Creativity. Creativity Research Journal 2012 Vol. 24 Issue 1 Pages 92-96.  <b>2<sup>nd</sup> Reading:</b> Q. Chen, R. E. Beaty and J. Qiu (2020) Mapping the artistic brain: Common and distinct neural activations associated with musical, drawing, and literary creativity. Hum Brain Mapp Vol. 41 Issue 12 Pages 3403-3419.
<b>Week 1</b>  Thur. Jan. 11	<b>Lecture 2</b>  <b>Where do drugs act? Receptors and ligands that control creativity.</b>	Drugs are chemicals. To better understand the role of drugs in the brain we need to examine the fundamental properties of brain chemistry from the perspective of how drugs bind to their targets (receptors). We will discuss the location of these receptors, their basic role, and how they can be influenced by drugs in terms of activating or inhibiting normal function.	<b>1<sup>o</sup> Reading:</b> A. W. Flaherty (2005) Frontotemporal and dopaminergic control of idea generation and creative drive. J Comp Neurol Vol. 493 Issue 1 Pages 147-53  <b>2<sup>nd</sup> Reading:</b> TBD
<b>Week 2</b>  Tues. Jan. 16	<b>Lecture 3</b>  <b>The Reward System of the Brain: It's not that simple!</b>	Dopamine plays a central role in the reward system of the brain where new behaviors are established based on one's experiences. We often think that drug addiction and the impact of different drugs on the brain are focused on high-jacking dopamine. IN this lecture we will discuss the role of dopamine in the brain, introduce the concept of neuroplasticity and explore other neurotransmitter systems in the creative process that are directly or indirectly impacted by dopamine.	<b>1<sup>o</sup> Reading:</b> D. J. Nutt, A. Lingford-Hughes, D. Erritzoe and P. R. Stokes (2015) The dopamine theory of addiction: 40 years of highs and lows. Nat Rev Neurosci Vol. 16 Issue 5 Pages 305-12  <b>2<sup>nd</sup> Reading:</b> C. Luscher (2016) The Emergence of a Circuit Model for Addiction. Annu Rev Neurosci Vol. 39 Pages 257-76.

<p><b>Week 2</b></p>	<p><b>Lecture 4</b></p> <p>Thur. Jan. 18</p> <p><b>Normal perception and the emergence of hallucinations in creativity.</b></p>	<p>In this lecture we will explore the neurological basis of perception in several systems including the visual system, thinking (interpretation), and processing. We will discuss if hallucinations are an aspect of creativity and how thinking “outside the box” may be a source of creativity.</p>	<p><b>1<sup>o</sup> Reading:</b> K. H. Preller and F. X. Vollenweider (2018) Phenomenology, Structure, and Dynamic of Psychedelic States. Curr Top Behav Neurosci Vol. 36 Pages 221-256.</p> <p><b>2<sup>nd</sup> Reading:</b> J. Pearson (2019) The human imagination: the cognitive neuroscience of visual mental imagery. Nat Rev Neurosci Vol. 20 Issue 10 Pages 624-634.</p>
<p><b>Week 3</b></p>	<p><b>Lecture 5</b></p> <p>Tues. Jan. 23</p> <p><b>Addiction: The Human Brain Doing What it was Designed to Do.</b></p>	<p>In this lecture we will examine several aspects of the creativity process from the perspective of the developing brain, especially the adolescent brain when creativity can be at one of its highest points (mathematics or musical composition). We will discuss the height of neuroplasticity and propensity to drug use in the young brain.</p>	<p><b>1<sup>o</sup> Reading:</b> L. B. Del Piero, D. E. Saxbe and G. Margolin (2016) Basic emotion processing and the adolescent brain: Task demands, analytic approaches, and trajectories of changes. Dev Cogn Neurosci Vol. 19 Pages 174-189.</p> <p><b>2<sup>nd</sup> Reading:</b> S. W. Kleibeuker, C. K. De Dreu and E. A. Crone (2016) Creativity Development in Adolescence: Insight from Behavior, Brain, and Training Studies. New Dir Child Adolesc Dev Vol. 2016 Issue 151 Pages 73-84.</p>
<p><b>Week 3</b></p>	<p><b>Lecture 6</b></p> <p>Thur. Jan. 25</p> <p><b>Where do Drugs come from? From nature, from your garden, from the laboratory.</b></p>	<p>Drugs are everywhere. They are both natural and synthetic. In this lecture we will explore the sources of many of the drugs to be discussed in this course from sources in the far-reaches of Asia, to common gardens, and laboratories both pharmaceutical practicing good lab procedures to backroom rogue kitchens with criminal chemists.</p>	<p><b>1<sup>o</sup> Reading:</b> Selections from <i>Fentanyl, Inc.</i> B. Westoff (2019) How Rogue Chemists Are Creating the Deadliest Wave of the Opioid Epidemic, Grove Press, NY.</p> <p><b>2<sup>nd</sup> Reading:</b> D. S. Fabricant and N. R. Farnsworth (2001) The value of plants used in traditional medicine for drug discovery. Environ Health Perspect Vol. 109 Suppl 1 Issue Suppl 1 Pages 69-75</p>
<p><b>Specific Drugs impacting Human Creativity in Art, Literature, and Philosophy</b></p>			
<p><b>Week 4</b></p>	<p><b>Lecture 7</b></p> <p>Tues. Jan. 30</p> <p><b>Opium, an ancient drug with a long history in</b></p>	<p>Opium has one of the most predominant positions in all of human history, dating back to almost the dawn of civilization. In this lecture we will explore the emergence</p>	<p><b>1<sup>o</sup> Reading:</b> Selections from L. Inglis (2019) <i>Milk of Paradise</i>, Pegasus Books, NY.</p>

	<b>anthropology and ancient art.</b>	of the relationship between humans and the opium plant by sampling its utility in art, specifically sculpture and religious/burial ceremony. How did humans discover the power of the opium plant? How did opium change the course of creativity in neolithic humans?	<b>2<sup>nd</sup> Reading:</b> Selection from J. H. Halpern and D. Bilstein (2019) <i>Opium: How an ancient flower shaped and poisoned our world.</i> Hachette Books, NY.
<b>Week 4</b>	<b>Lecture 8</b> Thur. Feb. 1  <b>Opium enters the mainstream literature.</b>	While opium is a very ancient drug, its exposure into mainstream culture and discussion of its impact on society is rather recent. In this lecture we will examine a specific example of cultural exposure of opium to the general population through one of the first exposes of popular culture. We will begin to explore both its power on creativity and power to destroy.	<b>1<sup>o</sup> Reading:</b> <i>Confessions of an Opium Eater</i> by Thomas De Quincy  <b>2<sup>nd</sup> Reading:</b> <i>The Man Who Invented the Drug Memoir</i> by Dan Chiasson from <i>The New Yorker</i> , October 10, 2016.
<b>Week 5</b>	<b>Lecture 9</b> Thur. Feb. 6  <b>Opiates including Heroin impacting modern literature</b>	The exposure to a mind-altering drug such as heroin can create novel perspectives, impact creativity, and lead to the development of strange perspectives. Literature has shared many creative outcomes with music and art under the influence of heroin. In this lecture we will explore the impact of heroin on modern literature focusing on remarkable creations by such writers as William S. Burroughs and other members of the beat generation (and even before their establishment). How did opiates create new worlds in science fiction as well as distort (or focus) contemporary perspectives on many issues.	<b>1<sup>o</sup> Reading:</b> Excerpts from William S. Burroughs <i>Naked Lunch</i>  <b>2<sup>nd</sup> Reading:</b> Excerpts from "Doors of Perception" by Aldous Huxley.
<b>Week 5</b>	<b>Lecture 10</b> Thur. Feb. 8  <b>The Impact of Heroin on Music: Jazz and Creativity.</b>	In this lecture we will explore the emergence of cannabis (marijuana) from early tropical sources to its impact to increase creativity in music and literature	<b>1<sup>o</sup> Reading:</b> E. B. Russo and J. Marcu (2017) <i>Cannabis Pharmacology: The Usual Suspects and a Few Promising Leads.</i> <i>Adv Pharmacol</i> 2017 Vol. 80 Pages 67-134  <b>2<sup>nd</sup> Reading:</b> F. Iszaj, B. Ehmann, M. D. Griffiths and Z. Demetrovics (2018) <i>A Qualitative Study on the Effects of Psychoactive Substance use upon Artistic Creativity.</i> <i>Subst Use Misuse</i> Vol. 53 Issue 8 Pages 1275-1280.

<p><b>Week 6</b></p>	<p><b>Lecture 11</b></p> <p>Tues. Feb. 13</p> <p><b>Cannabis, THC, and composing and listening to music.</b></p>	<p>In this lecture we will explore the emergence of cannabis (marijuana) from early tropical sources to its impact to increase creativity in music and literature.</p>	<p><b>1<sup>o</sup> Reading:</b> E. B. Russo and J. Marcu (2017) Cannabis Pharmacology: The Usual Suspects and a Few Promising Leads. Adv Pharmacol 2017 Vol. 80 Pages 67-134</p> <p><b>2<sup>nd</sup> Reading:</b> F. Iszaj, B. Ehmann, M. D. Griffiths and Z. Demetrovics (2018) A Qualitative Study on the Effects of Psychoactive Substance use upon Artistic Creativity. Subst Use Misuse Vol. 53 Issue 8 Pages 1275-1280.</p>
<p><b>Week 6</b></p>	<p><b>Lecture 12</b></p> <p>Thurs. Feb. 15</p> <p><b>The legalization of cannabis, emergence of CBA, and impact on arts and creativity.</b></p> <p><b>Due Date:</b> <b>Reaction Paper 1</b></p>	<p>Many states in the US have either legalized or decriminalized cannabis use and possession. In this lecture we will explore the altered legal status of cannabis in terms of use and accessibility especially its use to elevate the enjoyment of the arts and to increase creativity. Will cannabis and its derivative such as CBA increase creativity in its users?</p>	<p><b>1<sup>o</sup> Reading:</b> S. M. Zellers, J. M. Ross, G. R. B. Saunders, J. M. Ellingson, T. Walvig, J. E. Anderson, et al. (2023) Recreational cannabis legalization has had limited effects on a wide range of adult psychiatric and psychosocial outcomes. Psychol Med 2023 Pages 1-10</p> <p><b>2<sup>nd</sup> Reading:</b> S. Hoeper, E. Crosbie, L. M. Holmes, L. Godoy, V. DeFrank, C. Hoang, et al. (2022) "The Perfect Formula:" Evaluating Health Claims, Products and Pricing on Cannabis Dispensary Websites in Two Recently Legalized States. Subst Use Misuse Vol. 57 Issue 8 Pages 1207-1214.</p>
<p><b>Week 7</b></p>	<p><b>Lecture 13</b></p> <p>Tues. Feb. 20</p> <p><b>Lysergic acid diethylamide (LSD) creating new Music and Art in the Psychedelic Sixties.</b></p>	<p>In this lecture we will explore the utility and abuse of LSD in today's world. How has it continued or emerged as a novel force in creativity and recreation? How is LSD being re-purpose to create novel experiences to treat disorders such as PTSD, anxiety, and depression.</p>	<p><b>1<sup>o</sup> Reading:</b> I. Wießner, M. Falchi, L. O. Maia, D. Daldegan-Bueno, F. Palhano-Fontes, N. L. Mason, et al. (2020) LSD and creativity: Increased novelty and symbolic thinking, decreased utility and convergent thinking. J Psychopharmacol Vol. 36 Issue 3 Pages 348-359</p> <p><b>2<sup>nd</sup> Reading:</b> E. Krediet, T. Bostoen, J. Brecksema, A. van</p>

			Schagen, T. Passie and E. Vermetten (2020) Reviewing the Potential of Psychedelics for the Treatment of PTSD. <i>Int J Neuropsychopharmacol</i> Vol. 23 Issue 6 Pages 385-400.
<b>Week 7</b>	<p><b>Lectures 14 and 15</b></p> <p>Thurs. Feb. 22</p> <p><b>Modern use of LSD in art, creativity, and healing the broken mind.</b></p> <p><b>Cocaine and the arts. Not just for movie stars.</b></p>	<p>In this lecture we will explore the utility and abuse of LSD in today's world. How has it continued or emerged as a novel force in creativity and recreation? How is LSD being re-purpose to create novel experiences to treat disorders such as PTSD, anxiety, and depression.</p> <p>Cocaine is an example of a drug that can allow one to overcome social barriers, reverse inhibitions, and motivate one to attempt incredible goals. It can make one invincible. However, this is only a psychosocial effect of the drug and often benefits are short term with severe medical and psychological consequence emerging with prolonged drug use. In this lecture we will examine the role of cocaine on motivation, anxiety, and its harnessing the dopamine system.</p>	<p><b>1<sup>o</sup> Reading:</b> I. Wießner, M. Falchi, L. O. Maia, D. Daldegan-Bueno, F. Palhano-Fontes, N. L. Mason, et al. (2020) LSD and creativity: Increased novelty and symbolic thinking, decreased utility and convergent thinking. <i>J Psychopharmacol</i> Vol. 36 Issue 3 Pages 348-359</p> <p><b>2<sup>nd</sup> Reading:</b> E. Krediet, T. Bostoen, J. Breeksema, A. van Schagen, T. Passie and E. Vermetten (2020) Reviewing the Potential of Psychedelics for the Treatment of PTSD. <i>Int J Neuropsychopharmacol</i> Vol. 23 Issue 6 Pages 385-400.</p> <p><b>1<sup>o</sup> Reading:</b> A. N. Samaha, S. Y. Khoo, C. R. Ferrario and T. E. Robinson (2021) Dopamine 'ups and downs' in addiction revisited. <i>Trends Neurosci</i> Vol. 44 Issue 7 Pages 516-526.</p> <p><b>2<sup>nd</sup> Reading:</b> H. A. G. Teive, P. T. Marques, L. P. Oliveira, F. M. B. Germiniani, L. Paola and C. H. F. Camargo (2019) Overcoming bashfulness: how cocaine aided Freud to summon the courage to meet Charcot. <i>Arq Neuropsiquiatr</i> Vol. 77 Issue 11 Pages 825-827</p>
<b>Week 8 – Tuesday, February 27, 2024 – MIDTERM EXAM</b>			
<b>Week 8</b>	<p><b>Lecture 16</b></p> <p>Thurs. Feb. 29</p> <p><b>Mescaline, Peyote, and the power of the cactus on literature.</b></p>	<p>Many literary and music composers have celebrated the insightful power of hallucinogens in their creative genius. We will explore the source of these hallucinogens and their impact on creativity.</p>	<p><b>1<sup>o</sup> Reading:</b> Aldous Huxley (1954) <i>The Doors of Perception</i></p> <p><b>2<sup>nd</sup> Reading:</b> Allen Ginsburg (1956) <i>Howl</i>.</p>

<p><b>Week 9</b></p>	<p><b>Lectures 17 &amp; 18</b></p> <p>Tues. Mar. 5 Thurs. Mar. 7</p> <p><b>Promoting euphoria using party drugs including Ecstasy, Special K, and Angel Dust.</b></p>	<p>In this lecture we will explore drugs that promote euphoria for both creativity and the enjoyment of arts, especially music. We will examine regions of the brain and behaviors impacted by MDMA, ketamine, ecstasy, and other derivatives. Do they elevate our enjoyment of the arts? Do they open new avenues to creativity? How do they work?</p>	<p><b>1<sup>o</sup> Reading:</b> J. Bearn and M. O'Brien (2015) "Addicted to Euphoria": The History, Clinical Presentation, and Management of Party Drug Misuse. <i>Int Rev Neurobiol</i> 2015 Vol. 120 Pages 205-33</p> <p><b>2<sup>nd</sup> Reading:</b> T. F. M. Ter Bogt and R. C. Engels (2005) "Partying" hard: party style, motives for and effects of MDMA use at rave parties. <i>Subst Use Misuse</i> Vol. 40 Issue 9-10 Pages 1479-502</p>
<p><b>Spring Recess Sunday, March 10, 2024 to Sunday, March 17, 2024</b></p>			
<p><b>Week 10</b></p>	<p><b>Lecture 19</b></p> <p>Tues. Mar.19</p> <p><b>Homage to the grape: Alcohol in the history of art.</b></p>	<p>Wine has secured a position of great honor throughout history as demonstrated by its depiction in ancient art as well as its continuous appearance in the Bible. In this lecture we will explore the earliest evidence of wine and beer in history through literature, sculpture, and painting. We will discuss the purpose of wine in religion, artistic appreciation, and celebration.</p>	<p><b>1<sup>o</sup> Reading:</b> J. C. Harris (2011) The triumph of Bacchus. <i>Arch Gen Psychiatry</i> 2011 Vol. 68 Issue 1 Pages 8-9.</p> <p><b>2<sup>nd</sup> Reading:</b> A. M. Rosso (2012) Beer and wine in antiquity: beneficial remedy or punishment imposed by the Gods? <i>Acta Med Hist Adriat</i> Vol. 10 Issue 2 Pages 237-62.</p>
<p><b>Week 10</b></p>	<p><b>Lecture 20</b></p> <p>Thurs. Mar. 21</p> <p><b>Alcohol and the creation of modern literature and music</b></p>	<p>Modern literature is littered with hard drinking writers. Punk music is epitomized by images of the Sex Pistols spitting beer onto their sweaty mosh-pit followers. Alcohol in beer, wine, or hard drinks can act as a stimulant to drive novel ideas, breakdown inhibitions, or to simply used to relax with after a stressful work day. How can one compound have so many psychological outcomes? In this lecture we will explore aspects of our understanding of the impact of alcohol of systems in the brain that control a wide spectrum of behaviors.</p>	<p><b>1<sup>o</sup> Reading:</b> D. Nutt, A. Hayes, L. Fonville, R. Zafar, E. O. C. Palmer, L. Paterson, et al. (2021) Alcohol and the Brain. <i>Nutrients</i> 2021 Vol. 13 Issue 11</p> <p><b>2<sup>nd</sup> Reading:</b> S. Dieguez (2010) 'A man can be destroyed but not defeated': Ernest Hemingway's near-death experience and declining health. <i>Front Neurol Neurosci</i> Vol. 27 Pages 174-206</p>

<p><b>Week 11</b></p>	<p><b>Lecture 21</b></p> <p>Tues. Mar. 26</p> <p><b>Relax, have a cigarette. The role of Nicotine on creativity.</b></p>	<p>In the movies and in portraits of our most admired writers of the 20<sup>th</sup> century cigarettes are ubiquitous with relaxation, taking time out, and pausing to think. A writer may sit back, light up, and get back to the typewriter to compose a masterpiece of literature? How does nicotine, the primary psychoactive drug in cigarettes stimulate thinking and creativity? Why does it promote relaxation?</p>	<p><b>1<sup>o</sup> Reading:</b> I. Smith (2015) Psychostimulants and Artistic, Musical, and Literary Creativity. Int Rev Neurobiol Vol. 120 Pages 301-26.</p> <p><b>2<sup>nd</sup> Reading:</b> A. C. Parrott (1998) Nesbitt's Paradox resolved? Stress and arousal modulation during cigarette smoking. Addiction Vol. 93 Issue 1 Pages 27-39.</p>
<p><b>Week 11</b></p>	<p><b>Lecture 22</b></p> <p>Thurs. Mar. 28</p> <p><b>Sleeping, dreaming, and the creative mind.</b></p>	<p>Sleep is fundamental to brain health. During sleep we dream but how does dreaming impact creativity? Do new ideas and ways of thinking emerge from our dreams? How is thinking and creativity impacted negatively by sleep disruption, insomnia, and drug use. In this lecture we will explore the role of sleep in creativity and how dreams can be harnessed to develop novel ideas and avenues of creativity.</p>	<p><b>1<sup>o</sup> Reading:</b> T. Tsunematsu (2022) What are the neural mechanisms and physiological functions of dreams? Neurosci Res 2022</p> <p><b>2<sup>nd</sup> Reading:</b> M. da Mota Gomes and A. E. Nardi (2021) Charles Dickens' Hypnagogia, Dreams, and Creativity. Front Psychol 2021 Vol. 12 Pages 700882</p>
<p><b>Week 12</b></p>	<p><b>Lecture 23</b></p> <p>Tues. Apr. 2</p> <p><b>Amphetamines</b></p>	<p>Students and artists have been known to abuse drugs, especially those used for conditions such as ADHD to enhance cognition and to increase intelligence. Can the repurposing of such drugs as Ritalin and the amphetamines lead to increased creativity especially in writing and reading? WE will look at the abuse of such drugs, their intended and unintended consequences and their impact on education, especially realms of competitive higher education.</p>	<p><b>1<sup>o</sup> Reading:</b> M. Talbot (2009) Brain gain: the underground world of neuro-enhancing drugs. New Yorker Pages 32-43.</p> <p><b>2<sup>nd</sup> Reading:</b> M. Esposito, G. Cocimano, F. Ministrieri, G. L. Rosi, N. D. Nunno, G. Messina, et al. (2021) Smart drugs and neuroenhancement: what do we know? Front Biosci Vol. 26 Issue 8 Pages 347-359</p>
<p><b>Week 12</b></p>	<p><b>Lecture 24</b></p> <p>Thurs. Apr. 4</p> <p><b>Caffeine and The Emergence of Coffee Houses in London and the literary scene.</b></p>	<p>Today we are all aware of the rise of coffee chains such as Starbucks throughout the world. It is not well recognized that in 18<sup>th</sup> century London, coffee house outnumbered beer consumption pubs. In this lecture we will explore the rise of the coffee house, the impact of caffeine on creativity, especially literature and orations, acting as both a relaxant and a stimulant.</p>	<p><b>1<sup>o</sup> Reading:</b> Slection from S. Johnson (2016) Wonderland: How Play Made the Modern World, Riverhead books.</p> <p><b>2<sup>nd</sup> Reading:</b> D. L. Zabelina and P. J. Silvia (2020) Percolating ideas: The effects of caffeine on creative thinking and problem solving. Conscious Cogn Vol. 79 Pages 102899</p>

### Special Topics

<p><b>Week 13</b></p>	<p><b>Lecture 25</b></p> <p>Tues. Apr. 9</p> <p><b>Brain Injury, Disease, and the Emergence of Creativity.</b></p>	<p>In this course we have learned how drugs can alter brain neurotransmitters and behavior to impact creativity. When the brain experiences traumatic insults such as cancer, degenerative disease, or acute injury can responses to these event impact creativity? In this lecture we will explore a spectrum of situations and case reports where insults to the brain have resulted in the emergence of enhanced artistic creativity. Why?</p>	<p><b>1<sup>o</sup> Reading:</b> B. L. Miller and C. E. Hou (2004) Portraits of artists: emergence of visual creativity in dementia. <i>Arch Neurol</i> Vol. 61 Issue 6 Pages 842-4</p> <p><b>2<sup>nd</sup> Reading:</b> J. Bogousslavsky (2006) Creativity in painting and style in brain-damaged artists. <i>Int Rev Neurobiol</i> Vol. 74 Pages 135-46.</p>
<p><b>Week 13</b></p>	<p><b>Lecture 26</b></p> <p>Thurs. Apr. 11</p> <p><b>Do Animals Get Stoned?</b></p> <p><b>Due Date: Reaction Paper 2</b></p>	<p>Humans get intoxicated using a wide spectrum of drugs to elevate creativity or to better enjoy the arts, especially music and the visual arts. While animals do not typically make art (but a few do) how does the state of intoxication impact their lives. Do animals ever get stoned? In this lecture we will explore a spectrum of examples from the animal kingdom where elephants, primates, and even insects consume drugs to transcend to a different mind state. Is this accidental or is there a purpose to their altered states?</p>	<p><b>1<sup>o</sup> Reading:</b> Selections from R. K. Siegel (2005) <i>Intoxication: The Universal Drive for Mind-Altering Substances</i>, Park Street Press.</p> <p><b>2<sup>nd</sup> Reading:</b> Selections from R. Dudley (2014) <i>The Drunken Monkey: Why We Drink and Abuse Alcohol</i> University of California Press.</p>
<p><b>Week 14</b></p>	<p><b>Lectures 27 &amp; 28</b></p> <p>Tues. Apr. 16</p> <p>Thurs. Apr. 18</p> <p><b>Neuropsychiatry and the driving forces of creativity: Depression</b></p>	<p>What would “The Raven” by Edgar Allen Poe look like if the author was treated for his neuropsychological stressors such as depression, anxiety, and paranoia? In this lecture we will examine the origins of depression and their potential forces in driving creativity and art.</p>	<p><b>1<sup>o</sup> Reading:</b> Akinola, M. and W. B. Mendes (2008) The dark side of creativity: biological vulnerability and negative emotions lead to greater artistic creativity. <i>Personal. Soc. Psychol. Bull.</i> <b>34</b>, 1677–1686.</p> <p><b>2<sup>nd</sup> Reading:</b> R. M. Holm-Hadulla (2013) Goethe's anxieties, depressive episodes and (self-)therapeutic strategies: a contribution to method integration in psychotherapy. <i>Psychopathology</i> Vol. 46 Issue 4 Pages 266-74.</p>

	<b>The MPTP and the Story of the Frozen Addicts.</b>	There was a time when the synthesis of drug derivatives was both legal and home- derived concoctions common. The dramatic consequences of synthesis of a meperidine derivative contaminate called MPTP adulterated numerous sources of synthetic opiates. Regretfully, rather than providing a euphoric high this contaminate led to the acute onset of what appeared as Parkinson’s disease in a number of drug addicts in Northern California.	<b>1<sup>o</sup> Reading:</b> The MPTP Story by J. W. Langston, (2017) J Parkinsons Dis 7 1 Pages S11-s22  <b>2<sup>nd</sup> Reading:</b> F. I. Carroll, A. H. Lewin, S. W. Mascarella, H. H. Seltzman and P. A. Reddy (2012) Designer drugs: a medicinal chemistry perspective. Ann N Y Acad Sci Vol. 1248 Pages 18-38
<b>Week 15</b>	<b>Lecture 29</b>  Tues. Apr. 23  <b>Using creativity to treat neurological disorders: Musicology and dementia</b>	The goal of this lecture is to explore how the arts can be used to treat neurological disorders. We will examine the potential impact of music on dementia as well as experiences such as theater and dance can impact brain structure and function.	<b>1<sup>o</sup> Reading:</b> Selections from Oliver Sachs (2008) <i>Musicophilia</i> .  <b>2<sup>nd</sup> Reading:</b> A. M. Carapellotti, R. Stevenson and M. Dumas (2020) The efficacy of dance for improving motor impairments, non-motor symptoms, and quality of life in Parkinson's disease: A systematic review and meta-analysis. PLoS One Vol. 15 Issue 8 Pages e0236820.
<b>Week 15</b>	<b>Lecture 30</b>  Thurs. Apr. 25  <b>Hallucinogens and the religious experience.</b>	Evidence in neolithic man, including that from Incan civilizations, have suggested that mind-altering drugs have played a central role in the religious experience. Drugs have been used to promote religiosity in ceremonial participants as well as to sedate those who were destined for sacrificial roles. In this lecture we will explore how a range of hallucinogens are utilized in both ancient and modern religious ceremonies. Do drugs allow some to get closer to heaven?	<b>1<sup>o</sup> Reading:</b> D. J. Snipes, A. J. Jeffers, E. G. Benotsch, J. McCauley, D. Bannerman, C. Granger, et al. (2015) Religiosity in the non-medical use of prescription medication in college students. Am J Drug Alcohol Abuse 2015 Vol. 41 Issue 1 Pages 93-9.  <b>2<sup>nd</sup> Reading:</b> M. Kometer, T. Pokorny, E. Seifritz and F. X. Volleinweider (2015) Psilocybin-induced spiritual experiences and insightfulness are associated with synchronization of neuronal oscillations. Psychopharmacology (Berl) Vol. 232 Issue 19 Pages 3663-76.
<b>FINAL EXAM: Wednesday, May 8, 2024 – 2 to 4 PM yes, a Wednesday</b>			

## Online learning Etiquette

The course content and delivery are designed for in-person instruction. Please consult the professor in advance if you need to participate via zoom on a particular date (e.g., in case of illness).

- If it is not possible to have your webcam on during the entire class, do your best to have it on when speaking.
- Turn off your microphone when not speaking.
- If you need to step away from your computer during class (e.g., get a drink of water, use the bathroom, attend to a family member/pet) please do so quietly and without disturbing your classmates. Return to the class when you can.
- Be aware the contents of conversations typed into the chat box, even private conversations, are visible by the instructors.

## Course Content Distribution and Synchronous Session Recordings Policies

USC has policies that prohibit recording and distribution of any synchronous and asynchronous course content outside of the learning environment. Recording a university class without the express permission of the instructor and announcement to the class, or unless conducted pursuant to an Office of Student Accessibility Services (OSAS) accommodation. Recording can inhibit free discussion in the future, and thus infringe on the academic freedom of other students as well as the instructor. ([Living our Unifying Values: The USC Student Handbook](#), page 13).

Distribution or use of notes, recordings, exams, or other intellectual property, based on university classes or lectures without the express permission of the instructor for purposes other than individual or group study. This includes but is not limited to providing materials for distribution by services publishing course materials. This restriction on unauthorized use also applies to all information, which had been distributed to students or in any way had been displayed for use in relationship to the class, whether obtained in class, via email, on the internet, or via any other media. ([Living our Unifying Values: The USC Student Handbook](#), page 13).

## Academic Integrity

The University of Southern California is foremost a learning community committed to fostering successful scholars and researchers dedicated to the pursuit of knowledge and the transmission of ideas. Academic misconduct is in contrast to the university's mission to educate students through a broad array of first-rank academic, professional, and extracurricular programs and includes any act of dishonesty in the submission of academic work (either in draft or final form).

This course will follow the expectations for academic integrity as stated in the [USC Student Handbook](#). All students are expected to submit assignments that are original work and prepared specifically for the course/section in this academic term. You may not submit work written by others or "recycle" work prepared for other courses without obtaining written permission from the instructor(s). Students suspected of engaging in academic misconduct will be reported to the Office of Academic Integrity.

Other violations of academic misconduct include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

The impact of academic dishonesty is far-reaching and is considered a serious offense against the university and could result in outcomes such as failure on the assignment, failure in the course, suspension, or even expulsion from the university.

For more information about academic integrity see the [student handbook](#) or the [Office of Academic Integrity's website](#), and university policies on [Research and Scholarship Misconduct](#).

## **Statement on Academic Conduct and Support Systems**

### **Academic Integrity:**

The University of Southern California is a learning community committed to developing successful scholars and researchers dedicated to the pursuit of knowledge and the dissemination of ideas. Academic misconduct, which includes any act of dishonesty in the production or submission of academic work, comprises the integrity of the person who commits the act and can impugn the perceived integrity of the entire university community. It stands in opposition to the university's mission to research, educate, and contribute productively to our community and the world.

All students are expected to submit assignments that represent their own original work, and that have been prepared specifically for the course or section for which they have been submitted. You may not submit work written by others or "recycle" work prepared for other courses without obtaining written permission from the instructor(s).

Other violations of academic integrity include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), collusion, knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

The impact of academic dishonesty is far-reaching and is considered a serious offense against the university. All incidences of academic misconduct will be reported to the Office of Academic Integrity and could result in outcomes such as failure on the assignment, failure in the course, suspension, or even expulsion from the university.

For more information about academic integrity see [the student handbook](#) or the [Office of Academic Integrity's website](#), and university policies on [Research and Scholarship Misconduct](#).

Please ask your instructor if you are unsure what constitutes unauthorized assistance on an exam or assignment, or what information requires citation and/or attribution.

### **Students and Disability Accommodations:**

USC welcomes students with disabilities into all of the University's educational programs. The Office of Student Accessibility Services (OSAS) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at [osas.usc.edu](http://osas.usc.edu). You may contact OSAS at (213) 740-0776 or via email at [osasfrontdesk@usc.edu](mailto:osasfrontdesk@usc.edu).

## **Support Systems:**

### [Counseling and Mental Health](#) - (213) 740-9355 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

### [988 Suicide and Crisis Lifeline](#) - 988 for both calls and text messages – 24/7 on call

The 988 Suicide and Crisis Lifeline (formerly known as the National Suicide Prevention Lifeline) provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week, across the United States. The Lifeline is comprised of a national network of over 200 local crisis centers, combining custom local care and resources with national standards and best practices. The new, shorter phone number makes it easier for people to remember and access mental health crisis services (though the previous 1 (800) 273-8255 number will continue to function indefinitely) and represents a continued commitment to those in crisis.

### [Relationship and Sexual Violence Prevention Services \(RSVP\)](#) - (213) 740-9355(WELL) – 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender- and power-based harm (including sexual assault, intimate partner violence, and stalking).

### [Office for Equity, Equal Opportunity, and Title IX \(EEO-TIX\)](#) - (213) 740-5086

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

### [Reporting Incidents of Bias or Harassment](#) - (213) 740-5086 or (213) 821-8298

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

### [The Office of Student Accessibility Services \(OSAS\)](#) - (213) 740-0776

OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

### [USC Campus Support and Intervention](#) - (213) 740-0411

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

### [Diversity, Equity and Inclusion](#) - (213) 740-2101

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

### [USC Emergency](#) - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

### [USC Department of Public Safety](#) - UPC: (213) 740-6000, HSC: (323) 442-1200 – 24/7 on call

Non-emergency assistance or information.

### [Office of the Ombuds](#) - (213) 821-9556 (UPC) / (323-442-0382 (HSC)

A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

*Occupational Therapy Faculty Practice* - (323) 442-2850 or [otfp@med.usc.edu](mailto:otfp@med.usc.edu)

Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.