



States of Consciousness

Instructor Manual

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This module covers a wide range of concepts related to human states of consciousness. These include levels of awareness, hypnotism/trance, sleep, and psychoactive drug states. In some ways, this module is unusual in the disparate topics presented and some instructors may feel more comfortable presenting some material (eg. Sleep) than other material (eg. Hypnosis/trance). The topics in this module are generally of interest to students because sleep, day dreaming and other states of consciousness are experiences to which they can easily relate.

Learning Objectives

- **Relevant APA Learning Objectives (Version 2.0)**
 - Describe key concepts, principles, and overarching themes in psychology (1.1)
 - Develop a working knowledge of psychology's content domains (1.2)
 - Describe applications of psychology (1.3)
 - Use scientific reasoning to interpret psychological phenomena (2.1)
 - Demonstrate psychology information literacy (2.2)
 - Build and enhance interpersonal relationships (3.2)
 - Adopt values that build community at local, national, and global levels (3.3)
- **Content Specific Learning Objectives: States of Consciousness**
 - List the various levels of awareness and articulate how they differ
 - Explain the phenomenon of priming

- Understand how the Implicit Associations Test (IAT) can be used to measure non-conscious states
- Explain the flexible correction model
- List the stages of sleep and understand their unique features
- Describe the effects of various classes of drugs on consciousness

Abstract

States of Consciousness: No matter what you're doing—solving homework, playing a video game, simply picking out a shirt—all of your actions and decisions relate to your conscious awareness of the world. As frequently as we use it, have you ever stopped to ask yourself: What really is consciousness? In this module, we discuss the different levels of consciousness and how they can affect your behavior in a variety of situations. We divide consciousness into low awareness states such as daydreaming and high awareness states such as deliberating. We also explore the role of consciousness in other, “altered” states like hypnosis and sleep and the influence of psychoactive drugs.

Class Design Recommendations

This module can be taught in one 60-minute class, or two shorter class periods (45 to 60 minutes). If it is taught in two class periods, we suggest using one period for: overview of the topic, levels of awareness, priming studies, mindfulness, and hypnosis; and a second period for: sleep and psychoactive drugs. Please also refer to the Noba PowerPoint slides that complement this instructor's manual.

Overview

- Warm-Up Discussion: What is consciousness and who has it?
- High and Low States of Awareness
- Hypnosis/Trance
- Sleep
- Psychoactive drugs

Module Outline

What is consciousness?

- Simply put consciousness is awareness; awareness of the self and of the environment. This simple definition, however, raises a number of questions. Principle among these is the question of whether all awareness is qualitatively the same. A simple inventory of daily behaviors suggests that consciousness can be divided into distinct states: day-dreaming, for instance, is less self-aware than is a weightlifter looking into a mirror trying to perfect her technique. Consciousness exists on a continuum:

Death----- Coma---- Sleep ----- Daydreaming -----High Awareness/Mindfulness

In addition, there are altered states of consciousness that do not exist on this awareness continuum but are, rather, defined by their deviation from normal patterns of perceiving. These are most commonly brought about through artificial means such as hypnosis/trance or the use of psychoactive drugs.

High Versus Low Awareness

- People constantly track sensory stimuli such as the direction and speed of movement or the distance of sound. It is impossible, however, to track all possible stimuli. As a result, humans focus their attention and this focus represents the most mindful, highest state of consciousness. An example of high awareness might be evaluating the livability of an apartment during a tour by the landlord. Mindfulness can be learned through training such as meditation and can help people sustain and direct attention.
- To conserve mental effort people often reduce their focus and rely on behavioral habits and cognitive heuristics. One example of this is driving on "auto-pilot" in which a person might travel from home to university without being highly aware of the route or particular sights along the way. Even when people are in lower states of consciousness, however, they are still able to process sensory stimuli. Some examples: a sleeping person might swat a fly off his arm, you might stop for a red light even though you are immersed in a daydream, you might hear your name spoken nearby even though you are attending to a different conversation (the cocktail party effect).

How can we study non-conscious states?

- Conscious states such as emotions and preferences are fairly straight-forward to investigate because we can rely on self-report measures. Although these are not without their limitations people tend to be reasonable reporters of their own high conscious states and experiences. But, what about states of low consciousness (both non-conscious and un-conscious states). To research these we need to turn to other methodologies:
 - Behavioral observation is one method to explore states of consciousness that the research participant may not, him or herself, be aware. For instance, researchers could watch body language as strangers interact with one another or video people while they sleep (with their permission of course!). Although these methods are not specifically mentioned in the module they may be helpful in teaching this content.
 - Implicit Associations Test (IAT). Introduced in the 1980s by Greenwald and his collaborators, the IAT, is a computer reaction time test. It can measure judgments to the thousands of a second. For instance, a photo of an ice-cream cone might appear on screen and the participant has to categorize this object as “good” or “bad” by hitting one or the other of two keys. It is possible to counterbalance the order of stimuli as well as whether the good or bad button is hit with the left or right hand to control for possible complications related to handedness. The IAT has been used, especially, in measuring implicit biases such as those involving ethnicity. One of the benefits of the IAT is that it is very difficult to fake. For example, researchers can throw out any responses that appear too deliberate (those, for example, that have a reaction time of longer than 800 milliseconds). Only rapid, non-conscious judgments are included.

Sleep

Everyone sleeps. Relative to some other animals humans sleep fewer hours (we sleep, on average, 8 hours in a 24 hour period while tigers sleep about 16 and mice sleep about 12). In addition, animals differ in the periods during a 24-hour cycle when they prefer to sleep. Humans are diurnal and experience wakefulness during daylight hours. Some animals, such as raccoons, tigers and skunks, are nocturnal; experiencing their hours of peak wakefulness during the night. Still others, such as some owls and wild cats, are crepuscular and experience wakefulness during twilight hours (typically, these are predators and the dim light acts as a hunting advantage).

Sleep is a drive state (see the Noba module on Drive States), meaning that sleepiness is a need that can only be satisfied by sleep. Although people can temporarily postpone sleep

they cannot do so indefinitely. Drowsiness occurs when circadian rhythms—the body's natural rhythms based on sleep habits and exposure to daylight—signal the time for the production of melatonin, a hormone associated with sleep. These rhythms can be changed, or disrupted, through long-distance travel, extended periods of wakefulness, or night-shift work. The phenomenon in which people have a difficult time adapting to the “normal” sleep schedule of a new geographic location is called *jet lag*. At the extreme, there are a number of sleep disorders such as insomnia and narcolepsy.

Sleep can be divided into several distinct stages. Traditionally, sleep stages were taught with simple numerical titles such as “stage 1” and “stage 2.” Each stage is differentiated by the type of brain activity occurring during that period. In truth, there has not been complete agreement about how many stages there are. More recently, instructors have been teaching sleep stages with updated nomenclature. Each stage is labeled in reference to rapid eye movement (REM) or non-REM activity. Newer stage names include titles such as “N1” (or NREM 1).

Each of these stages is associated with a unique profile of brain activity in terms of both electrical amplitude (intensity) and wave frequency. Interestingly, dreaming—the phenomenon that occurs in deep, REM (rapid eye movement) sleep is associated with brain waves that are more similar to those of wakeful states than are the wave patterns of other stages of sleep. During REM sleep the human body is virtually paralyzed, with the exception of a few minor, involuntary twitches. It is also the stage of sleep in which the brain is most active; similar in activity to a waking state. Because the body is paralyzed but the brain is active REM sleep has sometimes been called “paradoxical sleep”.

Sleep serves a variety of functions. Notably, it is a period of physical and mental rest for people. But resting is not the only function of sleep. Human babies require many hours of sleep and it appears that sleep supports growth. Sleep deficits are associated with a variety of impairments including memory problems, slower cognitive processing, irritability, and obesity. These deficits suggest the possible cognitive functions of sleep.

Psychoactive Drugs

Across both history and culture humans have used psychoactive substances to alter their states of consciousness. In many traditional societies naturally occurring plants such as peyote have been used in spiritual and religious ceremonies, or are associated with shamanistic rites. Other plants, such as the leaves of the cocoa plant (from which cocaine is processed) have been used more recreationally for the euphoria they induce. Caffeine, the mild stimulant found in coffee and tea and chocolate, is the most widely used psychoactive substance in the world. Alcohol is also widely used.

Drugs can be divided into different classifications based on their general effects on the human nervous system. Three of the most common categories—and those presented in this module—are: hallucinogens, depressants and stimulants. Although alcohol is a depressant it is common enough—and often relevant enough to students—that it is covered in its own section. As their names imply hallucinogens are those that produce hallucinations or otherwise warp perceptions of time or reality. LSD (acid) is an example of a hallucinogen that is associated with seeing visions of geometric patterns, pulsating surfaces, vivid colors, and the experience of synesthesia (the mingling of the senses). Depressants are those drugs that slow the nervous system. These include, but are not limited to, opioids (drugs derived from opium) such as morphine and heroin and are often used medically as pain killers as well as recreationally. Finally, stimulants are substances that accelerate the nervous system. Drugs such as “crystal meth” (methamphetamine) and cocaine are examples of drugs that produce euphoria, restlessness, pressured speech, and more loosely organized thinking. Caffeine, found in coffee and tea, is a mild form of stimulant.

Flow

Although the concept of flow is not specifically listed in the module or in the PowerPoint some students might bring it up. Flow is a concept studied by Mihalyi Csikszentmihalyi and his colleagues. Csikszentmihalyi was an avid rock climber and chess player and noticed, as many others have, that these activities are often psychologically absorbing. Many people who engage in such activities lose track of time and are highly focused, even losing a sense of the self as being distinct from the activity. This is often called “being in the zone.” Csikszentmihalyi offers a theory of flow in which it occurs when there is an optimal match of a person’s skill level to the challenge at hand. If the challenge is too difficult they likely experience frustration or anxiety and if the challenge is too easy they experience boredom.

Difficult Terms

Circadian Rhythms

Dissociation

Euphoria

Hallucinogens

Implicit Associations Test

Melatonin

Priming

Lecture Frameworks

We recommend starting the class with a discussion that will engage students by bringing the module material into the realm of their everyday experience. States of Consciousness is one module where students have ample personal life experience upon which to draw: they have all “zoned out,” all been asleep, and many have tried coffee or alcohol. Some may even have been knocked unconscious, taken a meditation course, or have been hypnotized. This personal connection to the material is an opportunity to make this area of psychology seem relevant. You can also tie the themes of this unit—awareness and attention, for example—in with other units such as sensation and perception.

- **Warmup:** There are several discussion prompts that could be used as warmups to this topic. See Activities & Demonstrations below
- **Direct Instruction:** Refer to the PowerPoint slides for the following major topics: the definition of consciousness, high and low levels of awareness
- **Activity/Demonstration:** To cover how attention can be focused see the awareness scan activity in the PowerPoint demonstration
- **Direct Instruction:** Refer to the PowerPoint slides to talk about priming and non-conscious states, as well as the Implicit Associations Test (IAT) used to study bias and other states of consciousness.
- **Activity/Demonstration:** To help students understand that one level of awareness (high or low) is not inherently superior to another (rather, they are both appropriate to different situations) it can be helpful for them to reflect on costs and benefits. Refer to the PowerPoint slide on the costs and benefits of awareness.
- **Direct Instruction:** Refer to the PowerPoint slides to talk about hypnosis.
- **Direct Instruction:** Refer to the PowerPoint slides to talk about sleep, its stages and functions, and dreams.
- **Direct Instruction:** Refer to the PowerPoint slides to talk about psychoactive drugs: hallucinogens, depressants, stimulants and alcohol
- **Activity/Demonstration:** To help students engage with the topic of psychoactive drugs it may be helpful to concentrate on commonly used and legal drugs such as caffeine and alcohol. See the PowerPoint slides for discussion prompts around these topics

Activities & Demonstrations

Who is Conscious?

- Time: 5-10 minutes
- Discussion: no materials required
- Directions:
 1. Here, the instructor can have students pair up or work in small groups to discuss the question “Who is conscious?” You can read a list of candidates or present them all at once. Some possible examples include: dogs, babies (humans), people while reading or watching a movie, people while sleeping. Even if students acknowledge that, yes, all of these are examples of consciousness push them deeper by suggesting elements of consciousness such as “self-awareness” and “scanning versus focused attention.” Instead of having them consider consciousness as a dichotomous variable encourage them to think about it on a continuum. In this way they can evaluate the four examples above and discuss where on the continuum they lie and which qualities are implicated in positioning them on the continuum.
 2. Main Learning:
 - Consciousness is not on-off, it is a continuum.
 - Consciousness includes self-awareness and the focus of attention
 - People (and other animals) differ in their overall ability to be conscious but also human consciousness shifts throughout the day from activity to activity.

Researching Non-Conscious States

- Time: 10 minutes
- Discussion: Can be introduced when discussing low awareness, the IAT or priming
- Directions:
 1. Ask students to form small groups and then ask them to consider how they might go about investigating non-conscious states. You might set the stage by pointing out that people can self-report on many conscious states—such as political preferences—but that self-report is difficult or impossible for non-conscious states.

2. Give each group a prompt to consider. How might they go about studying: 1) the thoughts or learning process of children under 2; 2) The ability of sleeping people to sense the environment around them; 3) subtle biases about classes of people such as various nationalities, ethnicities, or homeless people; 4) mind-wandering while reading; 5) the amount of background sound a person remembers during a single class period; 6) the content of a person's dreams. More than one group might address a particular example.
3. Main Learning:
 - In some cases, people are asked to self-report while in a highly aware state (eg. Reporting on dreams, or reporting on reading comprehension after reading a chapter). This has the problem of potentially filtering the actual experience through the limited conscious focus.
 - In some cases, observation of behavior might be best (watching infant behavior, or watching a sleeping person react to stimuli such as scratching or moving away from light)
 - In some cases, inducing a non-conscious state and tracking behavior might be useful. Two examples of this are priming studies and the IAT. Both are difficult to fake because the participant is blind to the research hypothesis and—presumably—the mechanism by which these methods work.

Disregard this Information

After going over the functions of each of the 4 Lobes of the Brain presented on the accompanying slide, administer a quick quiz to test the students' knowledge.

- Time: 5-10 minutes
- Materials:
- Directions:

You have all seen television programs or movies in which a person is on trial. Sometimes a witness offers a piece of objectionable testimony and the judge instructs the jurors to disregard the testimony. Is it possible for them to do so? To examine the degree to which this is possible let's conduct an in-class experiment:

- Overview: Liza has a certificate in computer programming and two years of experience with a wide range of programming projects. She is applying for a job as a computer programmer and you have been asked to review her application and make a determination

about hiring her. She is also a very honest person. She once informed an employee of a bank that he accidentally gave her four times the amount of money that she had requested. She returned the extra money, which would not have been otherwise traced back to her.

- Scenario One: It turns out that you have been given this information when you should not have been. This information about Liza being honest and returning the money is confidential. You should disregard this information in making your determination.
- Scenario Two: It turns out you have been given some of this information when you should not have been. This information about Liza being honest and returning the money is a mistake– it is a story about a different individual and never happened to Liza. You should disregard this information in making your determination.

---In which scenario do you think it would be easier to disregard the information? Why?

Note: If the students say “scenario two” it is because it is easier to disregard info that is inaccurate. This is the heart of the flexible correction model. If an individual is aware that certain information is biasing an attitude– such as current emotional state– it can be more easily dismissed and counter-acted as incorrect information and disregarded. Solicit examples from the class (knowing you are too hungry to make a good decision; knowing pressure from your parents is affecting your attitude; knowing that stereotypes– of homeless people, for instance– color your opinion).

Additional Activities

Sleep – 10 Things to Hate About Sleep Loss

- Time: 15 minutes
- Materials: Link to Web MD article: <http://www.webmd.com/sleep-disorders/excessive-sle...>
- Directions:

Here are the several negative effects of sleep loss listed in the article:

- Linked with depression
- Linked to aging appearance in skin

- Increases forgetfulness
 - Linked to weight gain
 - Linked with risk factors for death, such as cardiovascular disease
 - Impairs judgment about sleep habits!
 - Associated with increase in traffic accidents
 - Impairs attention
 - Kills sex drive
1. Using these effects of sleep loss as targets you can engage students in a number of ways. First, you can present the list as a true-false quiz, asking them which are real research findings (all of them are). Then, in small groups students can access and read the on-line article (and follow through any links that arouse their curiosity) to learn the answers for themselves.
 2. Second—an alternative activity—you can have students take stock of their own sleep habits. Begin by having them chart the activities of a typical day (or, of the previous day):

What time did you wake up?

What did you do between waking up and breakfast (whatever you consider breakfast to be)?

What did you do in the morning hours between your breakfast and noon?

What did you do between noon and your evening meal (when was your evening meal)?

What did you do between your evening meal and the time that you began preparing for bed?

How long did it take you from the time you began preparing for bed until the time that you turned off the lights to go to sleep?

What time did you sleep and how much sleep did you get?

Using this daily activity log as a basis you can ask students to reflect on how typical this day was (the more typical the better) and how much sleep they got. If the answer was fewer than 8 hours, and especially if it was fewer than 7 they likely suffer from some of the problems associated with sleep loss. Have them access and read the target article and reflect on the various ways that sleep loss might affect them personally. Optionally, you can then have them

either discuss reactions/insights with a partner OR write an “optimal day” in which they re-create the activity log in a more optimal way that would promote better sleep habits (this may mean more organization, sacrificing an activity, etc).

The Invisible Gorilla and Other Attentional Gaffs: In-Class Activity

Although it is not explicitly addressed in this module, there are a number of failures of awareness. Because attention acts like a spotlight, people who “focus their beam” on one thing might fail to notice other things. Below are two demonstrations of this. You might also want to refer to the Noba modules on attention (<http://nobaproject.com/modules/attention>) and Failures of Awareness (<http://nobaproject.com/modules/failures-of-awareness>....

ACTIVITY 1: RETURN OF THE INVISIBLE GORILLA

- Time: 5 min
- Materials: You will need the ability to project a video and use this video link: https://www.youtube.com/watch?v=IGQmdoK_ZfY
- Directions:
 1. In the original—and now pretty famous—video viewers are instructed to count the number of passes players dressed in white successfully complete. This forces them to concentrate on “white” players and ignore players dressed in black. In the middle of the video a person in a gorilla suit walks through the game, beats his or her chest, and walks off. About 50% of viewers fail to notice the gorilla entirely.

For this activity cue the “Monkey Business Illusion” video. It contains the same invisible gorilla illusion and will be good for students who have never been introduced to this demonstration. For students who are familiar with the invisible gorilla illusion this video will still have a few surprises! Just set it up as if you are doing the original invisible gorilla demonstration by saying, “It can be difficult to focus attention. In the following video you will be asked to keep track of how many successful ball passes there are.” Then play the video: the video also gives clear instructions for the viewer.

Main learning:

- Although the correct number of passes is listed at the end, some people will have counted different numbers of passes. This, in itself, is interesting and relates to accurate perception and eyewitness testimony.

- For some students who are not familiar with the original invisible gorilla illusion this video replays and they will have an opportunity to see the person in the monkey suit. Some students will have seen it but others will be amazed that they missed it.
- Of those students who smugly are on the lookout for the gorilla because they are familiar with this demonstration some will miss the two new changes (the background curtain changes colors and one player leaves the game).

Finish by having students share reactions to this demonstration. They may ask you to play the entire video a second time.

ACTIVITY 2: CHANGE BLINDNESS

- Time: 5 min
- Materials: You will need the ability to project a video and use this video link: <https://www.youtube.com/watch?v=ubNF9QNEQLA>
- Directions:
 1. Play the short video clip. In the first half of the video an “inspector” questions presumed suspects in a television murder. Then, at the half way point the video plays again, but this time it reveals that there were 21 changes made during the original questioning. It is possible that some students will have noticed some of the changes but unlikely that they will have noticed all of them. The changes include a new portrait in the background, a new clock on the ground and—perhaps most dramatic—a new dead body on the ground!

Ask students for their reactions. Ask about why they believe they did or did not notice specific changes (called change blindness). They may want you to play the clip again!

Outside Resources

App: Visual illusions for the iPad.

<http://www.exploratorium.edu/explore/apps/color-uncovered>

Book: A wonderful book about how little we know about ourselves: Wilson, T. D. (2004). *Strangers to ourselves*. Cambridge, MA: Harvard University Press.

<http://www.hup.harvard.edu/catalog.php?isbn=9780674013827>

Book: Another wonderful book about free will—or its absence?: Wegner, D. M. (2002). *The illusion of conscious will*. Cambridge, MA: MIT Press.

<https://mitpress.mit.edu/books/illusion-conscious-will>

Information on alcoholism, alcohol abuse, and treatment:

<http://www.niaaa.nih.gov/alcohol-health/support-treatment>

The American Psychological Association has information on getting a good night's sleep as well as on sleep disorders

<http://www.apa.org/helpcenter/sleep-disorders.aspx>

The LSD simulator: This simulator uses optical illusions to simulate the hallucinogenic experience of LSD. Simply follow the instructions in this two minute video. After looking away you may see the world around you in a warped or pulsating way similar to the effects of LSD. The effect is temporary and will disappear in about a minute.

<https://youtu.be/fVaLddnlaFc>

The National Sleep Foundation is a non-profit with videos on insomnia, sleep training in children, and other topics

<https://sleepfoundation.org/video-library>

Video: An artist who periodically took LSD and drew self-portraits:

<http://www.openculture.com/2013/10/artist-draws-nine-portraits-on-lsd-during-1950s-research-experiment.html>

Video: An interesting video on attention:

<http://www.dansimons.com/videos.html>

Video: Clip on out-of-body experiences induced using virtual reality.

https://youtu.be/4PQAc_Z2OfQ

Video: Clip on the rubber hand illusion, from the BBC science series "Horizon."

<https://youtu.be/Qsmkgi7FgEo>

Video: Clip showing a patient with blindsight, from the documentary "Phantoms in the Brain."

<https://youtu.be/Cy8FSffrNDI>

Video: Demonstration of motion-induced blindness - Look steadily at the blue moving

pattern. One or more of the yellow spots may disappear:

<https://youtu.be/4Aye9FWgxUg>

Video: Howie Mandel from America's Got Talent being hypnotized into shaking hands with people:

<https://youtu.be/UWKDFfpdIZI>

Video: Imaging the Brain, Reading the Mind - A talk by Marsel Mesulam.

http://video.at.northwestern.edu/lores/SO_marsel.m4v

Video: Lucas Handwerker – a stage hypnotist discusses the therapeutic aspects of hypnosis:

https://www.youtube.com/watch?v=zepp_H6K5wY

Video: Ted Talk - Simon Lewis: Don't take consciousness for granted

http://www.ted.com/talks/simon_lewis_don_t_take_consciousness_for_granted.html

Video: TED Talk on Dream Research:

<https://www.youtube.com/watch?v=y9ArPNAOHCo>

Video: The mind-body problem - An interview with Ned Block:

<https://vimeo.com/58254376>

Want a quick demonstration of priming? (Want a quick demonstration of how powerful these effects can be? Check out:

<https://youtu.be/QTtbDy3AZ9A>

Web: A good overview of priming:

[http://en.wikipedia.org/wiki/Priming_\(psychology\)](http://en.wikipedia.org/wiki/Priming_(psychology))

Web: Definitions of Consciousness:

<http://www.consciousentities.com/definitions.htm>

Web: Learn more about motion-induced blindness on Michael Bach's website:

<http://www.michaelbach.de/ot/mot-mib/index.html>

Evidence-Based Teaching

Attending Step Meetings as a Course Requirement: A Preliminary Investigation

Ann R. Bristow, Jennifer Provost, and Kristin Morton

Teaching of Psychology, April 2002; vol. 29, 2: pp.125-128

Abstract

Students in Drugs and Behavior courses evaluated their experiences of attending 12-step meetings (e.g., Alcoholics Anonymous). We describe the parameters of this course requirement and offer suggestions for implementation. As hypothesized, students reported that attendance at 12-step meetings increased their understanding of addiction treatment and was relevant to the objectives of a Drugs and Behavior course. These 2 dimensions were also positively correlated with students' reports of comfort attending meetings. Students wrote reaction papers addressing positive and negative feelings and issues regarding 12-step meeting attendance. We provide examples of these comments, as well as students' suggestions for increasing comfort when attending meetings, to guide instructors who might want to assign a similar activity.

Pay Attention! Demonstrating the Role of Attention in Learning

Janet D. Larsen

Teaching of Psychology, December 1991; vol. 18, 4: pp. 238-239

Abstract

In this demonstration, students receive one of three different sets of directions regarding what to learn about a set of stimulus cards. How attention affects memory is shown by students' tendency to recall best the characteristic they were told to remember.

Suggestions from the Society for Teaching's Introductory Psychology Primer

POSSIBLE ASSESSMENTS

(Out of Class)

Student Paper: (Instructor should ask students to read the article prior to class and to be prepared to discuss it. Allow 20 minutes for article discussion in class) Ask students to read an article about the neural basis of biological rhythms (e.g., Kolb, B., & Whishaw, I.Q. (2006). *An introduction to brain and behavior* (2nd ed.). New York: Worth) and discuss whether or not there is a biological basis to our circadian rhythm.

Student Paper/Project: (This is a fun activity that students can complete outside of class. It allows them to apply what they learned in class to their own lives, which will make the material more relevant and thus improve their retention) Ask students to assess their level of daytime sleepiness by calling the national Sleep Foundation hotline at 1-877-BE-AWAKE. The screening uses the Epworth Sleepiness Scale used by health-care providers to determine the quality of sleep a person experiences. Once students determined their own level of daytime sleepiness ask them to write a short paper about steps they can take to improve their sleeping habits.

Student Paper: (The instructor should ask students to read the article prior to the class meeting and provide students with a list of discussion questions ahead of time so they can prepare answers at home. This could also be done as a classroom debate. Instructor should allow 30 minutes for class discussion/debate): Ask students to read an article such as Goldberg, R. (Ed.) (2005). *Taking sides: Clashing views on controversial issues in drugs and society* (7th ed). Guilford, CT: McGraw-Hill and critically think about drug use and misuse. Students should develop arguments for and against the following topics: "Should marijuana be legalized for medicinal purposes?", "Are drug treatment programs effective?", or "Do drug addicts choose to be addicted to drugs?"

(In Class)

Student Paper: (This demonstration only take about 5-10 minutes of class time and is very effective because students can experience the concept of suggestibility first-hand). Start out with the following classroom demonstration: "Tell your students to close their eyes and imagine they are cutting a lemon...a large... sour... bitter lemon...so full of juice that it drips over their fingers onto the floor. Imagine how sucking the juice from the same fruit" (Bolt, M. (2007). *Psychology instructor's resource manual to accompany David G. Myers Exploring Psychology* (7th ed.). New York: Worth Publisher). Once you completed the demonstration ask students to write a short paper about what happened to them during the demonstration. "Where they salivating? Could they taste the sourness of the lemon juice in their mouths?"

“What does this tell you about suggestibility?” Instruct students to relate this experience to what they have learned about hypnosis and suggestibility.

Infusing diversity into the classroom (The instructor should ask students to read the article prior to the class meeting and provide students with a list of discussion questions ahead of time so they can prepare answers at home. This could also be done as a classroom debate. Instructor should allow 30 minutes for class discussion/debate): Ask students to read articles about consciousness as they relate to aging, culture, ethnicity, race, disability, gender, or sexual orientation. Possible topics to cover include: changes in REM sleep over the lifespan, trans-like states that are induced through religious beliefs (see video clip about the whirling dervishes), the use of mind altering drugs for 39 religious purposes (Trimble, J. E., Stevenson, M.R., & Worell, J. P. (2003). Toward an inclusive psychology: Infusing the introductory psychology textbook with diversity content).

Possible article:

Jones, P. N. (2005). The American Indian church and its sacramental use of peyote: A review for professionals in the mental-health arena. *Mental Health, Religion & Culture*, 8(4), 227- 290. doi: 10.1080/13674670412331304348.

The authors describe how the use of peyote is an essential part of the Native American Church ceremony and theology, and discusses reasons why the use of peyote under the ‘bona fide religious ceremonies of the Native American Church act’ should be allowed.

ACTIVITIES & TECHNIQUES

(In Class)

Classroom Exercise (Instructor should allow 15-20 minutes for students to complete the test and discuss the outcomes with the class): Introduce the topic of sleep with the National Sleep Foundation’s Sleep IQ test (<http://www.allegiancehealth.org/content.aspx?id=1294>)

Psychology in the News (Instructor should ask students to read the article and be ready to discuss it. Allow 20-25 minutes for discussion): New York Times article about the nature of free will (<http://opinionator.blogs.nytimes.com/2011/10/19/what-makes-free-will-free/>)

Videos that can be used as discussion starters:

- The nature of consciousness (Part 1 & 2) – An introduction to the nature of consciousness

(<http://www.youtube.com/watch?v=Gfl9t11xEtM&feature=related> and <http://www.youtube.com/watch?v=wg7pguocy4Q&feature=related>). (Instructor should allow 20-30 minutes to watch the videos and discuss how the scenes relate to the nature of consciousness).

- This video clip can be used to show the effects of cocaine on the brain. It illustrates how the dopamine reward centers of the brain are activated while eating, drinking, engaging in sexual activity. Further, it demonstrates how cocaine increases the amount of dopamine released and also blocks the reuptake of dopamine and explains the consequences of using cocaine. (<http://www.youtube.com/watch?v=4OS2C4NemJI>). (Instructor should allow 20-30 minutes to watch the video and discuss the effects of cocaine on the brain).
- This 7-minute video clip describes the pathology of addiction according to the theories presented in Dr. Ronald Ruden's book "The Craving Brain" (<http://www.youtube.com/watch?v=K3gffzfqEre0&feature=related>). (Instructor should allow 20 minutes to watch this video and discuss the pathology of addiction).
- This video clip about the whirling dervishes can be used as a starting point for discussion about religious experiences and consciousness (<http://www.youtube.com/watch?v=GJllofU-0jC0>). (Instructor should allow 20 minutes to watch this video and discuss religious experiences and their effects on consciousness).

RELEVANT TOP ARTICLES

(Annotated Bibliography)

Bristow, A. R., Provost, J., & Morton, K. (2002). Attending step meetings as a course requirement: A preliminary investigation. *Teaching of Psychology*, 29(2), 125-128.

This article describes a study in which students in a drug and behavior course were asked to attend a 12-steps meeting (i.e., Alcoholics Anonymous) and evaluate its effectiveness in treating alcoholism based on what they had learned in class. Students in this study reported that attending the meetings significantly increased their understanding of addiction treatment, especially when they felt comfortable attending the meetings. Following the visit of a 12-steps meeting, students are asked to write a short paper about their experience. This activity could be incorporated into the course and would allow students to see first-hand how addiction can be treated.

Palladino, J. J., & Carducci, B. J. (1984). Students' knowledge of sleep and dreams. *Teaching of Psychology*, 11(3), 189-191.

This article presents data from a study assessing students' knowledge about sleep and dreaming prior to lectures covering this topic in class. The study illustrated that students have many misconceptions about sleep and dreaming. To identify misconceptions and correct them instructors may use either the Sleep and Dreams Information Questionnaire (SDIQ) or the National Sleep Foundation's Sleep IQ test <http://www.allegiancehealth.org/content.aspx?id=1294> to gauge students' understanding of sleep and dreaming. The surveys can also lead to a discussion about sleep disorders such as night terrors and sleep apnea.

Chalmers, D. (1995). The puzzle of conscious experience. *Scientific American*, 273, 80-86.

This paper by one of the leaders in the field of consciousness provides the reader with an overview of the history of the teaching of consciousness and how it has changed over the years. It describes the concept of consciousness and why consciousness is such a mysterious topic to study. It also explains why neuroscience alone cannot explain our conscious experience and why we have to also look to more subjective ways of studying consciousness to increase our understanding of the topic. Instructor may choose to read this article to prepare for class and/or ask students to read and discuss this article in class.

Links to ToPIX Materials

Books & Films:

<http://topix.teachpsych.org/w/page/39236200/Sleep%20and%20Consciousness>

Current Events/ News:

<http://topix.teachpsych.org/w/page/19980980/Consciousness%20in%20the%20News>

Video/Audio:

<http://topix.teachpsych.org/w/page/19980981/Consciousness%20Video>

Teaching Topics

Teaching The Most Important Course

https://nobaproject.com/documents/1_Teaching_The_Most_Important_Course.pdf

Content Coverage

https://nobaproject.com/documents/2_Content_Coverage.pdf

Motivating Students

https://nobaproject.com/documents/3_Motivating_Students_Tips.pdf

Engaging Large Classes

https://nobaproject.com/documents/4_Engaging_Large_Classes.pdf

Assessment Learning

https://nobaproject.com/documents/5_Assessment_Learning.pdf

Teaching Biological Psychology

https://nobaproject.com/documents/6_Teaching_Bio_Psych.pdf

PowerPoint Presentation

This module has an associated PowerPoint presentation. Download it at https://nobaproject.com//images/shared/supplement_editions/000/000/298/States%20of%-20Consciousness.ppt?1507840173.

About Noba

The Diener Education Fund (DEF) is a non-profit organization founded with the mission of re-inventing higher education to serve the changing needs of students and professors. The initial focus of the DEF is on making information, especially of the type found in textbooks, widely available to people of all backgrounds. This mission is embodied in the Noba project.

Noba is an open and free online platform that provides high-quality, flexibly structured textbooks and educational materials. The goals of Noba are three-fold:

- To reduce financial burden on students by providing access to free educational content
- To provide instructors with a platform to customize educational content to better suit their curriculum
- To present material written by a collection of experts and authorities in the field

The Diener Education Fund is co-founded by Drs. Ed and Carol Diener. Ed is the Joseph Smiley Distinguished Professor of Psychology (Emeritus) at the University of Illinois. Carol Diener is the former director of the Mental Health Worker and the Juvenile Justice Programs at the University of Illinois. Both Ed and Carol are award-winning university teachers.

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