Consciousness

Instructor Manual

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Consciousness introduces scientific methods currently used to study consciousness, and defines consciousness and conscious experiences. The module also focuses on the role consciousness plays in visual perception, memory, body awareness, and decision-making. The module closes with a discussion on contemporary theories.

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)
    - Apply ethical standards to evaluate psychological science and practice (3.1)

- Content-Specific Learning Objectives: Consciousness
    - Understand scientific approaches to comprehending consciousness.
    - Be familiar with evidence about human vision, memory, body awareness, and decision making relevant to the study of consciousness.
    - Appreciate some contemporary theories about consciousness.

Abstract

Consciousness is the ultimate mystery. What is it and why do we have it? These questions are difficult to answer, even though consciousness is so fundamental to our existence. Perhaps the natural world could exist largely as it is without human consciousness—but taking away consciousness would essentially take away our humanity. Psychological science has addressed questions about consciousness in part by distinguishing neurocognitive functions allied with conscious experience from those that transpire without conscious experience. The continuing investigation of these sorts of distinctions is yielding an empirical basis for new hypotheses about the precursors of conscious experience. Richer conceptualizations are thus being built, combining first-person and third-person perspectives to provide new clues to the mystery of consciousness.

Class Design Recommendations

This module can be covered in a single class period.

Please also see the Noba PowerPoint slides that complement this outline.

One class period (50-75 min):

- Provide an overview of consciousness and conscious experiences
- Discuss conscious experiences of visual perception
- Demonstration: Motion-induced blindness
- Special topic: Blindsight
- Describe conscious experience of memory
- Delve into conscious experience of body awareness
- Talk about conscious experience of decision-making
- Activity: How much do you know about sleep?
- Special topic: Consciousness and sleep

Module Outline

Conscious Experiences

Consciousness refers to our ability to go through one subjective experience after another, including experiencing feelings and sensations, etc. Consciousness also signifies an individual's state (e.g., being comatose or sleepy or experiencing drug-induced euphoria). This module covers various states of self-consciousness and the process of having conscious experiences. A conscious experience can be thought of as a subjective experience of a mental event, such as sensory input, a memory, an idea, an emotion, a mood, or a continuous temporal sequence of happenings.

Other Minds. There are times when we feel that we understand what others are thinking by assessing how we would feel in the same situation or by knowing the other person and his or her behaviors. We're not always right, but utilizing neuroscientific techniques allows us to glean additional information to understand a person's state of mind - at times the information we gather is accurate and other times we are left with unanswered questions.

A Science of Consciousness. Initially, we attempted to understand consciousness solely through the first-person perspective. Fields such as philosophy, psychology, neuroscience, cognitive science, and contemplative science, have since then further contributed to our understanding of the mind. The challenge of this combinative approach is to define consciousness in its entirety, determine how to conceive of consciousness especially as it compares to all else that we know, and examine the relationship between our conscious mind and the surrounding physical environment.

According to Rene Descartes's philosophy of dualism, mental and physical phenomena are made up of different substances. Reductionism, on the other hand, posits that all mental events can be explained through physical elements. The debate between dualism and reductionism still continues to this day. Nevertheless, we have made great strides in understanding how consciousness works as will become evident below.

Conscious Experiences of Visual Perception

The reciprocal exchange of information between the higher-level visual areas (i.e., V5) and the primary visual cortex may be a key factor in visual awareness. This theory is corroborated by cases of people who have an impaired primary visual cortex and cortical blindness. Though

these people claim to not be able to see anything, they may yet receive sensory input through the activation of areas like the V5, but because the reciprocal exchange of information between different brain areas cannot take place, they have no conscious experience of the stimuli. However, they may be left with the ability to detect and respond to visual motion outside of consciousness - this is known as blindsight.

Neural synchronization and communication also play a role as emphasized in the Global Neuronal Workspace Theory of Consciousness, in which sharing of the information among the prefrontal, inferior parietal and occipital areas of the cortex is considered paramount. The Information Integration Theory of Consciousness suggests that sharing interrelated units of information constitutes as consciousness - the more complex and interrelated the sharing the connections between neurons and brain areas, the higher the levels of consciousness.

Conscious Experiences of Memory

Research on patients with amnesia has supported the theory that to consciously remember an event calls for a specific set of brain operations to occur among various neuronal networks in the cerebrum. In other words, episodic memory, or recalling past events, involves sharing and integrating information. Further research has revealed certain steps for conscious recollection. For instance, every-day memories for events depend on reciprocal interactions among multiple cortical areas and the hippocampus. Increased interactions leads to more secure memory storage, therefore, consciously retrieving memories depends on communication between elaborate sets of neural networks.

Conscious Experiences of Body Awareness

When rubbing our arm, we can feel the separate sensation of our hand touching the arm and the arm being touched by the hand. This kind of conscious experience of our self and body is mediated by specific brain mechanisms in an area of the cortex called the tempoparietal junction (see Outside Resources at end of textbook module for rubber hand illusion). Damage to this junction can lead to distorted body awareness and/or out-of-body experiences. Thus, the human brain has developed neural networks and mechanisms to help us construct our own awareness. A Social Neuroscience Theory of Consciousness posits that we use the same neural machinery to construct models of people's minds and attentional states in order to predict their behavior.

Conscious Experiences of Decision-Making

Weighing our options individually (conscious mode) vs. going with our gut or instinctual feeling (unconscious mode) are two ways we make decisions. The 'gut feeling' mode allows us to evaluate numerous factors alongside one another at the same time, leaving us with an overall gut instinct. In the conscious decision-making mode, we examine each factor thoroughly. We have to keep in mind that zeroing-in on an individual factor can restrict evaluating other considerations. Therefore, the careful analysis approach to decision making will most likely work well when there are fewer factors to consider, while a gut decision may be more effective when a large number of factors have to be considered. Keep in mind that though gut decisions can be accurate, they are not always correct either.

Whichever mode of decision-making we choose, it's important to ask ourselves if we feel that we freely came to our decisions. In an experiment, people were asked to freely choose whether or not to press the right or left button, and then actually press the button. Interestingly, although they pressed the button right away, their brain activity pattern predicted their decisions as much as 10 seconds before they made their decision. Is each conscious experienced preceded by precursor brain events that lead to consciousness? On the other hand, it does seem that we are in control of some decisions (e.g., we can decide whether to go right or left). Alternatively, we may have evolved to believe in free choice as it is a beneficial trait and helps us succeed as social beings.

Understanding Consciousness

Due to the fact that our conscious experiences are subjective, people have thought that we cannot study consciousness scientifically. However, a logical empirical account of the world cannot avoid subjectivity as it has a place in science. Conscious experiences can be studied systematically to further our understanding and many questions still remain. For example, do individuals have different first-person accounts of their conscious experiences? Can training, such as through meditation and introspection, generate a type of expertise in terms of consciousness? Future work is needed to address these and other related scientific questions!

Difficult Terms

Awareness
Conscious experience

Contemplative science
First-person perspective

Lecture Frameworks

Overviewa

Consciousness is an interesting module to teach partly because it is a relatively new field with many questions still left unanswered. Be forthright with your students about that. In fact, to a large degree, consciousness itself is a concept, which has been defined in myriad ways by psychologists and philosophers alike, meaning there is no ultimate definition of consciousness. We do, however, think that psychologist John Serle's (2000) description of consciousness, in that it "consists of inner, qualitative, subjective states and feelings or awareness," is a good way to start.

First Class Period

- Discussion/warm-up
    - Ask students to describe what they think consciousness is and put up their answers on a slide or on the board.
    - Then, put this quote on the next slide and ask them to consider what Hippocrates meant: *"Men ought to know that from the brain, and from the brain only, arise our pleasures, joys, laughter and jests, as well as our sorrows, pains, griefs and tears. Through it, in particular, we think, see, hear, and distinguish the ugly from the beautiful, the bad from the good, the pleasant from the unpleasant..."*
    - Hippocrates's emphasis of the role of the brain in conscious experience is a fitting introduction to the lecture given that the module students have just read describes consciousness as it relates to neuronal activity and brain areas.
    - Describe John Serle's definition of consciousness. Ask students if they would add anything to it.
- Lecture: Refer to PowerPoint slides for the following:
    - Describe consciousness and conscious experiences.
    - Talk about how we use consciousness to understand others.

- Discuss the science of consciousness.

- Demonstration: Motion-Induced Blindness

  - According to Bonneh, Cooperman, and Sagi (2001; see Evidence-Based Teaching), motion-induced blindness refers to small, stationary but noticeable objects disappearing (only to reappear) when surrounded by a moving patterned background. Interestingly, the objects are actually present the entire time - they just momentarily vanish from our consciousness!
  - This 5-minute demo found at http://www.michaelbach.de/ot/mot-mib/index.html can be a fun introduction to the lecture on conscious experiences of visual perceptions. See Activities and Demonstrations for more details.

- Lecture: Refer to PowerPoint slides for the following:

  - Introduce the topic of consciousness and visual perception.
  - Talk about a phenomenon called blindsight. Whereas motion-induced blindness is an example of how we become momentarily unaware of an object that is right in front of us, blindsight illustrates that even if we do not consciously perceive an object, some part of our subconscious may still be aware of it.This is a great segue into the special topic below.

- Special Topic: Blindsight

  - *Discussion/warm-up*: Imagine you are a doctor testing a patient who received a blow to the head while playing football and now has some brain damage. You have run some tests and at this point you have discovered that the patient is blind. As a final test, you present a red plate to the patient and ask a very simple question: “Do you see the red plate in front of you?” The patient replies that he does not. This makes sense because you know that the patient is blind. But you try something a little different. You ask the patient if they can point in the direction of the red plate; is the plate to their right or left? Ask your students if they think the patient guesses correctly or not. In fact, the patient *is* able to point in the right direction even though they have just told you that they can’t see the red plate (which they really can’t).
  - What you have just described to your students is a very simple example of how blindsight can operate. As they briefly read in the module, blindsight refers to the ability of blind patients to detect visual stimuli of which they are not consciously aware.
  - Do all blind patients have blindsight? The answer is no. People with blindsight suffer

from cortical blindness (i.e., damage to their primary visual cortex), which means that they cannot process sensory information correctly even though their eyes are functional. Although they cannot describe the plate, reach for it, or know its there, they can give you correct answers about the plate's location, movement, and direction, especially when you give them a choice, such as "Is the plate to the left or right?" Ask your students what blindsight might be able to tell us about consciousness. Are there any questions that this phenomenon raises?

- One possible answer is that the very concept of blindsight suggests consciousness has something to do with what goes on in the brain! So, is there a single center for consciousness or are there different centers for different kinds of consciousness (e.g., visual, memory)? See Monti et al., (2013) in Evidence-Based Teaching section for scientific insight into neurobiological underpinnings of consciousness.
- For more information on blindsight, see Azzopardi and Cowey (1998) in the Evidence-Based Teaching section.
- If you have time, consider showing the 8-minute video (or parts of it) of a man with blindsight offered at the end of the textbook module: http://www.youtube.com/watch-?v=Cy8FSffrNDI&feature=youtu.be

- Lecture: Refer to the PowerPoint slides for the following:
  - Continue on with consciousness and visual perceptions, discussing the global neuronal workspace and information integration theories of consciousness.
  - Talk about consciousness, memory, and body awareness.
  - Describe consciousness and decision-making.
- Activity: What Do You Know about Sleep?
  - This 10-15 minute activity goes hand-in-hand with the special topic below. Before talking about consciousness and sleep, we think it would be interesting if you administered a quiz to see how much your students actually know about sleep! See Activities and Demonstrations for more information about the activity.
- Special Topic: Consciousness and Sleep
  - Most people think that we are unconscious when we sleep, except for when we are dreaming. Actually, sleep is an altered state of consciousness, characterized by periods of activity and inactivity.
  - We go through 4 stages: Non-Rapid Eye Movement Stage (NREM)-1, NREM-2, NREM-3,

and REM.

- Video: https://www.youtube.com/watch?v=rMHus-0wFSo (until 4:28 minutes)
    - Consider showing your students the first four and half minutes of this entertaining video that describes sleeping as a state of consciousness, unpacks the stages of sleep mentioned above, and demonstrates that the brain is quite active during some of these stages.

- Lecture: Final PowerPoint slide:
    - We recommend ending this module with a slide on a few exciting questions that researchers may be currently exploring in the field of consciousness.

Activities & Demonstrations

Motion-Induced Blindness: In-Class Demonstration

Time

5-7 minutes

Materials

Go to **http://www.michaelbach.de/ot/mot-mib/index.html**

Directions

- Load the website above.
- Ask students to fixate on the center at the flashing green light.
- Give them a few seconds and ask them what happens.

- A few things might occur. The students may report that after a little while, the yellow dots disappear either all at the same time, in pairs, or individually. Then, they randomly reappear again.
- In reality, the yellow dots are there the entire time! When we fixate on something, objects on the periphery start to disappear. When we blink or even shift our gaze slightly, the same objects will reappear.
- Ask your students what they think would happen if the background was a different color? What if the dots were smaller or the speed of the rotating pattern was faster? How about slower? Michael Bach's website gives you the option to test out all of these scenarios with your students.

How Much Do You Know About Sleep?: In-Class Activity

Time

This activity should take no more than 10-15 minutes.

Materials

You will need copies of the quiz below. Alternatively, you could also administer the quiz via clickers.

Directions

- Administer the quiz through clickers or handing out the survey.
- After students have completed the T/F quiz, go through the questions. Ask the students why they chose their answers. We recommend you offer the correct explanations, which are also provided below.
- See next two pages for quiz and answers.

This activity was adapted from Randy Smith's Instructor Manual for the David Myers' Introductory Textbook.

Quiz: How Much Do You Know About Sleep?

Respond to each of the following items by circling "T" for true or "F" for false.

T F 1. Sleep is state of unconsciousness.

T F 2. Melatonin is an effective treatment for a number of sleep-related problems.

T F 3. Dreaming occurs only in a stage of sleep referred to as REM sleep.

T F 4. Some people require as few as 4 hours of sleep a night to feel well rested

T F 5. We spend approximately 1/3 of our lives sleeping.

T F 6. During sleep your body rests.

T F 7. More than half of American adults have suffered from insomnia in the past year.

T F 8. Over-the-counter (OTC) medications are effective in treating sleep problems such as insomnia.

T F 9. Although in most people REM sleep is associated with muscle paralysis, some people act out their dreams during REM sleep

T F 10. Memory consolidation is a primary function of REM sleep.

T F 11. An animal's size is a key determinant of the amount of time the animal sleeps.

T F 12. Fetuses as young as 30 weeks begin to show brain activity consistent with REM sleep.

Answers

1. False. Sleep is an altered state of consciousness, characterized by different stages and patterns of brain activity.
2. False. Because there is too little evidence to establish the usefulness of melatonin, the FDA has not approved it as a treatment for insomnia. Also, its long-term safety is uncertain. Evidence does suggest that melatonin helps some people with circadian rhythm disruptions.
3. False. Research indicates that some hallucination-like dreams occur in stage 1. Unlike REM dreams, these stage 1 dreams do not follow a narrative or story line.

4. True. Some people require as few as 4 hours while others need as many as 10. Most people require between 6 and 10 hours of sleep.
5. True. We spend approximately 1/3 of our lives sleeping.
6. False. Although the body rests during sleep, the brain is active and still controls body functions. More specifically, REM sleep is an active sleep during which dreams occur, breathing and heart rate increase and become irregular, and eyes move back and forth under the eyelids. Even in the deepest non-REM sleep, our minds still process information.
7. True. According to the 2005 Sleep in America poll, 54 percent of American adults report that, within the last year, they have experienced at least one or more symptoms of insomnia at least a few nights a week.
8. False. Although generally safe, OTC medications can cause nausea and, more rarely, fast or irregular heartbeat, blurred vision, and heightened sensitivity to sunlight. Because of the side effects of OTCs and because they are often ineffective in relieving sleep problems, experts generally advise against their use.
9. True. Men over 50 are more likely to experience REM behavior disorder. They may hurt themselves or their bed partners. About one-third of them develop Parkinson's disease within three years of REM behavior disorder's onset.
10. False (or is it True?) Clearly there is disagreement on this one. Although there is evidence for the role of dreaming in memory consolidation, Palladino and Bloom cite Jerome Siegel's review published in the November 2003 *Scientific American* that challenges the idea that REM sleep has a role in memory consolidation: "The findings that argue against memory consolidation include the demonstration that people who have brain damage that prevents REM sleep, or who have a drug-induced blockade of REM sleep, have normal—or even improved—memory." (p. 96).
11. True. Bigger animals—elephants, giraffes, humans—need less sleep than smaller animals — rats, cats, voles. The reason seems related to the fact that small animals have higher metabolic rates and higher brain and body temperatures than do large animals.
12. True. Brain activity in fetuses is similar to that experienced by children and adults in REM. This activity is associated with facial muscle twitches and muscular tonicity, which would also be expected during REM sleep.

Outside Resources

1. Video: Demonstration of motion-induced blindness - Look steadily at the blue moving pattern. One or more of the yellow spots may disappear.
http://www.youtube.com/watch?v=4Aye9FWgxUg

2. Web: Learn more about motion-induced blindness on Michael Bach\\\'s website
http://www.michaelbach.de/ot/mot-mib/index.html

3. Video: Clip showing a patient with blindsight, from the documentary \\\"Phantoms in the Brain.\\\"
http://youtu.be/Cy8FSffrNDI

4. Video: Clip on the rubber hand illusion, from the BBC science series \\\"Horizon.\\\"
http://www.youtube.com/watch?v=Qsmkgi7FgEo

5. Video: Clip on out-of-body experiences induced using virtual reality.
http://www.youtube.com/watch?v=4PQAc_Z2OfQ

6. App: Visual illusions for the iPad.
http://www.exploratorium.edu/explore/apps/color-uncovered

7. Web: Definitions of Consciousness
http://www.consciousentities.com/definitions.htm

8. Video: The mind-body problem - An interview with Ned Block
http://vimeo.com/58254376

9. Video: Imaging the Brain, Reading the Mind - A talk by Marsel Mesulam.
https://www.youtube.com/watch?v=Xp_LXwZns6Q&feature=youtu.be

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

Evidence-Based Teaching

Adams, V. H., Devos, T., Rivera, L. M., Smith, H., & Vega, L. A. (2014). Teaching About Implicit Prejudices and Stereotypes A Pedagogical Demonstration. *Teaching of Psychology, 41(*3), 204–212.

Teachers from various universities in California examined the impact of adding the implicit association test (IAT) in a social psychology teaching module on students' perceived knowledge of implicit biases. The findings showed an increase in students' perceived knowledge of implicit biases - the more students displayed implicit prejudice against African Americans compared to European Americans, the more likely they were to be engaged in course material and motivated to control prejudice. Notably, IAT could serve as an essential teaching tool especially for those who showed marked implicit biases.

Azzopardi, P., & Cowey, A. (1997). Is blindsight like normal, near-threshold vision? *Proceedings of the National Academy of Sciences, 94*(25), 14190–14194.

This article talks about the phenomenon of blindsight, in which patients have a damaged striate cortex and lose the ability to 'consciously' see objects visual field. However, when forced to make choices among different options, they can often detect the stimuli presented in their clinically blind visual field. Skeptics have argued that there is no difference in the behavior of people that have poor conscious vision and may also detect objects correctly during clinical and forced-choice tests. Using two different paradigms (i.e., yes/no vs. forced choice), a hemianopic patient, and a control group, Azzopardi and Cowey found that people with blindsight process stimuli in an extraordinary and unusual way.

Bonneh, Y. S., Cooperman, A., & Sagi, D. (2001). Motion-induced blindness in normal observers. *Nature*, *411*(6839), 798–801.

Bonneh and colleagues present the phenomenon of motion-induced blindness in normal-sighted observers under natural conditions. They demonstrate that slowly moving stimuli disappear (and then reappear after a few seconds) when superimposed over a faster moving patterned background. The authors suggest that this disappearance may be a result of interrupted attentional processing, revealing the complex interplay between different object representations in our visual system.

Dijksterhuis, A. (2004). Think Different: The Merits of Unconscious Thought in Preference Development and Decision Making. *Journal of Personality and Social Psychology, 87*(5), 586–598.

Dijksterhuis evaluated unconscious and conscious thought as it pertains to decision-making in multiple experiments. He hypothesized thatconscious thought would be ill-suited to making decisions due to its limited capacity. On the other hand, unconscious thought would be much better suited. In the first three experiments, participants had to choose among many options, each had distinct and multiple attributes. Some participants were asked to consciously think about the choice for a few minutes before making their decision, while others were asked to

engage in a distractor task before offering their choice. The findings supported the hypothesis that unconscious thought led to better decisions. The final two experiments provided further evidence of the merits of unconscious thought in decision-making.

Monti, M. M., Lutkenhoff, E. S., Rubinov, M., Boveroux, P., Vanhaudenhuyse, A., Gosseries, O., ... Laureys, S. (2013). Dynamic Change of Global and Local Information Processing in Propofol-Induced Loss and Recovery of Consciousness. *PLoS Comput Biol, 9*(10), e1003271. doi:10.1371/journal.pcbi.1003271

Monti and colleagues used brain-imaging techniques to examine information flow in 12 healthy participants as they underwent anesthesia and lost consciousness. The researchers analyzed the various properties of participant brains with a complex mathematical theory that is used to study air-traffic patterns and social media activity. They found that communication between various brain areas becomes increasingly difficult and ineffective when we are not conscious, making it complicated for neural signals to travel from one brain area to another. The results also suggest that there is no single consciousness center in our brain. Instead, we have a network, in which an uncountable number of neurons talk to one another. These findings shed light on the neural biology of the experience of consciousness.

Ramachandran, V. S., & Hirtsein, W. (1998). The perception of phantom limbs. *Brain*, 121,

1603–1630.

Amputees often experience phantom limb, a sensation in which they feel the amputated limb is still there and can actually experience pain. Using non-invasive imaging techniques, Ramachandran and Histsein investigate how neural plasticity operates in our brains and examine the relationship between sensory neurons and conscious experience. The researchers offer a phantom limb theory, demonstrate how phantom limb can be induced in non-patient populations, and make comments about how our brain creates body image.

Siegel, J. M. (2003). Why we sleep. *Scientific American,289*, 92-7.

In his informative article, Siegel discusses how research on sleep has advanced in the past few decades. The author continues on to reviews the concept of sleep, how it evolved, and its hypothesized functions. He also discusses findings on the mysterious stage of sleep, called REM, its characteristics and neurobiological bases.

Suggestions from the Society for Teaching's Introductory Psychology Primer

Stiegler-Balfour, J. J. (2013). Consciousness. In S.E. Afful, J. J. Good, J. Keeley, S. Leder, & J. J. Stiegler-Balfour (Eds.). *Introductory Psychology teaching primer: A guide for new teachers of Psych 101.* Retrieved from the Society for the Teaching of Psychology web site: **http://teachpsych.org/ebooks/intro2013/index.php**

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., & Whishaws, 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. (LO 3.1, 9.2)

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 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=12…**

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/wh...**

Videos that can be used as discussion starters:

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 addition 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=12...** 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.

ADDITIONAL REFERENCES

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.

PowerPoint Presentation

This module has an associated PowerPoint presentation. Download it at https://nobaproject.com//images/shared/supplement_editions/000/000/266/Consciousness-.pptx?1416598536.

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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