

Unit 3: What Does it Mean to be a Human Being?

Neuroscience, Artificial Intelligence and the Soul.

Lesson 1 - Day 2: Physicalism, Modern Science, and Consciousness

Time Length: 45-50 min.

INSTRUCTIONAL OUTCOMES

Next Generation Science Standards (NGSS):

HS-LS1-2: Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms. (Relates to discussing consciousness and its relationship to the soul within humans.)

HS-LS1-2: Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials. (Applicable to discussions about neural correlates of consciousness and brain function.)

HS-ESS2-7: Construct an argument supported by evidence for how forces responsible for plate motion cause changes to the Earth's surface. (While not directly related, constructing arguments supported by evidence applies to the discussions on consciousness and its nature.)

Common Core Standards (CCSS):

ELA-LITERACY.RST.11-12.1: Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. (Aligns with discussions and analysis of various philosophical and scientific viewpoints on consciousness.)

ELA-LITERACY.RI.11-12.8: Delineate and evaluate the reasoning in seminal U.S. texts, including the application of constitutional principles and use of legal reasoning. (While not directly related to U.S. texts, this standard emphasizes the evaluation of reasoning, which is relevant to discussions about consciousness and its interpretation.)

Content Learning Outcomes:

- Define consciousness and discuss how this experience cannot be reduced to physical processes.
- Expand conceptual vocabulary for relevant discussions at the junction of theology and bioscience.
- Discuss what neuroscience leaves out about consciousness.
- Explain the basic concepts in neural-correlates-of consciousness.
- Demonstrate how the Islamic view of the world and the soul provides a comprehensive worldview that is lacking in scientism/physicalism.

Materials:

- **Presentation Slides** (Slides 11-22)
- **Triple-Entry Vocabulary Journal** (Student Responsibility)

- **Neuroimaging & Consciousness** by Dr. Macksood Aftab
- **Mary's Room: A philosophical thought experiment - Eleanor Nelsen**
- **Science and Epistemology** - Supplemental Material

Instruction/Teacher Facilitation:

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- ❖ In the last lesson, we discussed the Islamic understanding of the human and compared that to the Neuroscience Reductionist view of a human. We continued the discussion by asking what the world is made of. Ending the lesson with the topic of consciousness being a key aspect of humanity.
- ❖ Let's pick up from there; in Islam, the consciousness is an essential part of being human because it is a feature of the soul. The realm of science, on the other hand, views consciousness as an illusion since it can not be directly observed or measured.

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Is Science/Neuroscientific Reductionism right in claiming that consciousness is only an illusion??

- ❖ What is consciousness exactly and how do we know if it does indeed exist?
 - Let's consider Ibn Sina (Avicenna)'s Floating Man Experiment:
 - In this philosophical thought experiment, Ibn Sina asks us to imagine a person who has suddenly come into existence, suspended in an empty space, with no sensory experiences and no connection to the external world. This person has no sight, sound, touch, smell, or any other sensory input. This person is also devoid of any memories or knowledge of his/her past experiences. In other words, this person is isolated from the external world and has a completely blank mental slate.
 - He argues that even in this state of sensory deprivation and mental isolation, the person would still be aware of their own existence. The doubt itself about whether one exists or not is a form of awareness. This awareness of one's existence, according to Ibn Sina, does not depend on sensory experiences or the external world. [So, regardless of the existence or non-existence of anything else, one knows at least they exist due to the fact that they have self-awareness.] He concludes that the thinking self, or the soul, is immaterial and possesses innate knowledge of its own existence.
 - The Floating Man experiment emphasizes the existence of the thinking self as distinct from the body and the external world.
 - This conclusion can be reached through individual introspection; no need for any scientific knowledge or training nor any physical/measurable parameters.
 - This Floating Man Experiment and ibn Sina's ideas were a precursor to the ideas of later philosophers, such as René Descartes.
 - Rene Descartes, known as the founder of modern philosophy, came up with the famous statement "Cogito, ergo sum" (I think, therefore I am).
 - Basically, it states that regardless of the existence of anything else, at least one thing exists, and that thing is me.
- ❖ How would we then define Consciousness? - (Ask students to answer)

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- Experience of the World
 - Sensations: Smell, Taste, Vision
 - Perceptions: Thoughts
 - Feelings: Love, Anger
 - Awareness: Of oneself
 - Intentionality: Understanding
- According to clinical medicine, consciousness is
 - Awakeness and Awareness: Alert & Oriented
 - Consciousness is assessed in the medical setting so that we can identify what it is to be human and what we look for when determining the presence of consciousness namely in end-of-life scenarios.
 - Glasgow Coma Scale - (medics test for patients to test their responsiveness) is used to objectively describe the extent of impaired consciousness.
 - If someone has been in an accident or lost consciousness at any point, when consciousness is regained, those attending to them will ask, "Do you know where you are?" and "Do you know what day/date is today?" - to see if the person is aware of their orientation. Note that both of these questions are asking about *non-physical* elements. The medical field is assessing or searing for experience, will, consent, and the ability to make decisions

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- ❖ Who has Consciousness? Who can we attribute consciousness to?
 - "What Is It Like to Be a Bat?" is a paper by American philosopher Thomas Nagel in which he argues that there are facts about a conscious experience that are subjective and can only be known from that subjective perspective. Even if we know all the objective facts about bats, we can not actually know what it is really like to be a bat.
 - Reductionists have trouble addressing this subjective experience argument.

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- ❖ Neuroscientific Reductionism state
 - Consciousness can be reduced to a brain state: "I am just my brain"
 - Friedrich Nietzsche's philosophical writing Thus Spoke Zarathustra: "The awakened and knowing say: body am I entirely, and nothing more; and soul is only the name for something about the body."
 - This "neurocentric" view has been widely accepted. **"The idea that we are our brains is now firmly established"** -Moheb Costandi, "Body Am I"
 - **Consciousness an Illusion** - Daniel Dennett
 - The Astonishing Hypothesis is a 1994 book by scientist Francis Crick about consciousness. Crick is one of the co-discoverers of the molecular structure of DNA. He later became a theorist for neurobiology and studied the brain.] In this book, he wrote: "You, your joys and your sorrows, your memories and your ambitions, your sense of personal identity and free will, are in fact no more than the behavior of a vast assembly of nerve cells and their associated molecules."
 - We Are Our Brains: A Neurobiography of the Brain, from the Womb to Alzheimer's by D. F. Swaab portrays this concept that we don't just have brains: we **are** our brains.

- All of this shows that neuroscientists believe that consciousness is just a brain function which occurs due to neurological interactions/neurons firing within your brain. So where in the brain exactly is consciousness occurring?

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- ❖ Neural Correlates of Consciousness (NCC) - Where does Consciousness Reside?
 - Conscious awareness is closely associated with the cerebral cortex, an intricately folded and connected sheet of nervous tissue. Each experience corresponds to a specific set of neural activities, called the neuronal correlates of consciousness (NCC). These neural activities occur in a posterior hot zone of the brain that consists of the parietal, occipital and temporal lobes of the cerebral cortex. The complexity of the neural excitations represents the degree to which a person is conscious.

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- Disorders of Consciousness
 - Locked-In-Syndrome - is a rare disorder of the nervous system where people are paralyzed except for the muscles that control eye movement. They are conscious (aware) and can think and reason, but cannot move or speak; they may be able to communicate with blinking eye movements.
 - Vegetative States - occurs when the cerebrum (the part of the brain that controls thought and behavior) no longer functions.
 - Minimally Conscious States - A person who shows clear but minimal or inconsistent awareness
- Assessment:
 - Intentional ability to carry out willed action or self-generated action
- Levels of Consciousness
 - Passive
 - Active
 - Communicating

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- Semantic reconstruction of continuous language from non-invasive brain recordings
 - In new research involving a passage read to a patient and looking at their brain activity in brain scans, the passage is reconstructed without the patient having to say/verbalize anything. The passage is seen being reconstructed in the brain.
 - A similar study was done using visual stimuli and that image was being reconstructed based on the activity in the brain of the patient.
 - The issue here is that the privacy of conscious experience is deteriorating.

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- Human Brain Organoids and Consciousness
 - Brain tissue is being developed in the lab to create a human brain organoid that can simulate the brain activity of a human.
 - An ethical question is if this brain organoid can feel pain because it does have the same brain circuitry that would feel pain in a normal human brain. And if so, have we replicated some degree of consciousness? Is consciousness the brain

itself, or is it very closely related to the brain and brain function, or is it completely extrinsic to the brain?

- Watch as Dr. Macksood Aftab explains the above aspects and gives an overview of **Neuroimaging & Consciousness**.

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- ❖ What is the problem with the neuroscientific reductionist view of consciousness being just neurological activity? - (Ask students to answer this question.)
 - If everything is reduced to just a physical state or neurons firing, then there is no room for the soul in this theory/philosophy. No soul means no purpose in life; the purpose of human existence is being ignored.
 - Consciousness would then be just alertness and not a moral consciousness.
 - Why is there an experience associated with a physical state? - Physical states often produce the experience of emotions. For example, a person whose heartbeat speeds up may be due to the feeling of excitement or nervousness. Also, the experience of emotions can affect physical states.
 - Hard Problem of Consciousness - which is the problem of accounting in physical terms for subjective, intrinsic, first-person experiences. Physicalism can explain the mechanism of how the brain works but it doesn't explain *why* it works the way it does. [Connect back to the discussion of consciousness and the questions of "who has consciousness" "What it is like being that person/animal" etc - the physicalism of neuroscientific reductionism doesn't account for a unique, personal, subjective existence.]
 - Are we Philosophical Zombies? - Proponents of the philosophical zombie argument, such as the philosopher David Chalmers, argue that since a philosophical zombie is by definition physically identical to a *conscious* person, this refutes physicalism because this is not logically possible because it establishes the existence of consciousness as a necessary fact (because it is, by definition, separated from a conscious being). Basically, its a self-refuting argument because it is clear, that just being physically identical does not make them consciously identical.
 - The brain is absolutely necessary but it is NOT a sufficient condition.

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- ❖ Group Thought Exploring Activity - Mary's Room
 - Ask the question: Can being a human be reduced to neuroscience?
 - Watch: **Mary's Room: A philosophical thought experiment**
 - Prep students by asking them to think of how to answer these questions:
 - From a neuroscience reductionist view, did Mary learn anything new from experiencing the red apple?
 - From an Islamic perspective of consciousness, did Mary learn anything new?
 - Outline with students points brought up in the video:
 - The Knowledge Argument - states that there are non-physical properties and knowledge that can only be discovered through conscious experience.

- Contrasting Physicalism - states that everything, including mental states, has a physical explanation.
- Students might discuss how it made her feel or react, actually seeing color is totally different than just learning about it. Some quality of this experience transcends the physical description.
- After discussion, clearly state to students that experiential knowledge is not the same as physical knowledge.
 - These experiences have properties called qualia - subjective qualities that you can not accurately describe or measure.
 - Qualia is unique to the person experiencing it. Physical facts can't completely explain mental states, especially feelings.

[Note: at 3:00 of the video, the topic goes into AI, so this serves as a good prelude to the next lesson.]

- There are limits to knowledge; knowing the facts about something is vastly different than experiencing something.

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- ❖ Summary: The Soul, Consciousness, and Neuroscience
 - a. Mental states can't be described by physical facts
 - i. Contradicts physicalism
 - b. How does a neuroscientist analyze consciousness
 - i. He needs to deny our experience and knowledge
 - c. How does a Muslim analyze consciousness
 - i. Consciousness is the experience of the unobservable soul that we know through introspection and revelation.
- The unobservable soul is known to us through introspection and revelation. Neuroscience studies the correlation between physically observable phenomena. Neuroscientific reductionism fails to explain fully what it means to be a human due to the lack of being able to study, as well as acknowledge, the soul. Islam has a complete worldview of the human and its existence that accounts for our physical and metaphysical properties and interactions.
- ❖ Extra Activity: How would each side defend their position? Model a debate.

Biology Connections:

- Chapter on the Nervous System in Biology Textbook.
- Study of neurons and nervous system, neurons communicating at the synapses, neurotransmitters
- Study of the human brain, cerebral cortex, fMRI scans, and limbic system.