Quiz 3 Sensation and Perception – Is Seeing Believing?

Question 1

NNUS School of Beans (SOB) wants to ensure its community is safe from COVID-19. It decides to test everyone in its batch of 1000 students every week for 6 months. NNUS School of Jeans (SOJ) wants the same, but decides to test each student in its batch of 1000 students once a month. Which of the following is a potential consequence?

- ☐ ~~SOB will have more false alarms and more misses; SOJ will have fewer false alarms and fewer misses~~
- ☐ ~~SOB will have fewer false alarms and fewer misses; SOJ will have more false alarms and more misses~~
- ☐ ~~SOB will have fewer false alarms but more misses; SOJ will have more false alarms but fewer misses~~
- ☑ SOB will have more false alarms but fewer misses; SOJ will have fewer false alarms but more misses

This question is adapted from the textbook page 154:

"A radiologist afraid of missing a tumour might identify anything that looks remotely like a tumour as the basis for more testing. Few cases of cancer would be missed (high hit rate), but many healthy patients would go through unnecessary procedures (high false alarm rate). In contrast, another radiologist might need a higher level of certainty about the presence of a tumour before asking for further tests. This would reduce the number of false alarms, but it would also run a higher risk of overlooking tumours (high miss rate)."

NNUS School of Beans (SOB) wants to ensure its community is safe from COVID-19. It decides to test everyone in its batch of 1000 students every week for 6 months. NNUS School of Jeans (SOJ) wants the same, but decides to test each student in its batch of 1000 students once a month. Which of the following is a potential consequence?

SOB (School of Beans) tests students every week: This frequent testing increases the chances of detecting a positive case earlier, which means fewer missed cases (fewer misses). However, with frequent testing, there is also an increased likelihood of false positives (false alarms), especially if the test is not perfectly accurate.

SOJ (School of Jeans) tests students once a month: The less frequent testing means there is a higher chance of missing cases (more misses) since the virus could go undetected for a longer period. However, testing less often reduces the total number of tests conducted, which in turn reduces the likelihood of false positives (fewer false alarms).

Question 2

Why does sensory adaptation occur?

- ☐ ~~We get bored of stimuli.~~
- ☑ Things that are unchanging are unlikely to threaten our survival.
- ☐ ~~We get used to things.~~
- ☐ ~~Our attention is diverted to something else.~~

Sensory adaptation helps to reduce the amount of information that our brains need to process and helps to prevent overloading of our sensory systems. This mechanism allows our brains to attend to new and potentially dangerous stimuli, while ignoring constant or irrelevant stimuli (that is likely to be safe).

Sensory adaptation is the process by which our sensory receptors become less sensitive to constant stimuli over time. This allows us to focus our attention on changes in our environment that could signal potential threats or important new information.

Unchanging stimuli are less likely to be of immediate importance or danger, so our nervous system reduces its responsiveness to them, allowing us to conserve energy and focus on more relevant stimuli.

Question 3

Which of the following statements about sensing and perception is accurate?

1. Our perception is selective.
2. An example of sensory adaptation is the adjustment of your eyes when transitioning from a brightly lit room to a dark room, in which you are able to see more clearly after a few minutes.
3. The perception of a painting can vary based on contextual factors, but the taste of bubble tea remains consistent regardless of context.

- ☐ ~~1~~
- ☑ 1, 2
- ☐ ~~1, 3~~
- ☐ ~~All of the statements are true~~
- ☐ ~~None of the statements are true~~

1 - True: We do fail to perceive some environmental inputs. Our perception is indeed selective because we focus on certain stimuli while filtering out others, based on relevance, past experiences, and expectations.

2 - True (But...): Your eyes adapt to the darkness after a while (Increase in sensitivity in the rods, decrease in sensitivity to the cones, pupils widen), BUT this form of adaptation (dark adaptation) is different from the formal definition of sensory/neuronal adaptation as in the textbook).

3 - False: both will be perceived differently based on contextual factors. The perception of both visual stimuli (like a painting) and taste can be influenced by contextual factors. For example, the taste of food can be affected by the environment in which it is consumed, such as the ambiance or presentation.

Question 4

Which of the following statements is true?

1. Everyone’s sensations and perceptions differ.
2. Perceptions may differ, but sensations will not.
3. Unless perceived, we remain unaware of sensations
4. We can perceive something but not be aware of it.

- ☐ ~~1 and 3~~
- ☐ ~~2 and 4~~
- ☑ 1, 3, 4
- ☐ ~~2, 3, 4~~
- ☐ ~~1, 2, 3, 4~~

1. Everyone's sensations and perceptions can differ due to individual variations in physiology, previous experiences, and environmental factors.

   While the basic mechanisms of sensation may be similar across individuals, the actual experience of those sensations (and the resulting perceptions) can differ due to individual differences, such as past experiences, expectations, and cultural influences.

2. Perceptions can differ due to the same factors that can affect sensations, as well as cognitive processes such as attention and memory.

   Sensations can vary among individuals due to differences in sensory organs, neurological differences, and other factors, so this statement is not entirely accurate.

3. Sensations must be perceived in order to become aware of them.

   Sensations need to be processed and perceived by our brain for us to become consciously aware of them. Otherwise, they remain at the level of raw sensory input.

4. It is possible to perceive something without being aware of it, for example, in the case of subliminal perception or inattentional blindness.

   There are instances where we can process sensory information at a subconscious level without being consciously aware of it. This is evident in phenomena like subliminal messaging.

The answer is 1, 3 and 4.

Question 5

Which of the following illusions is driven by bottom-up processing?

- ☐ ~~Timothy claimed that the planks in a train track picture get shorter the further they are.~~
- ☐ ~~Samantha looked at a picture of a grey box placed on top of a white box and noted that the grey shaded area of the white box was darker than the lighted grey box above.~~
- ☐ ~~Wendy pointing out that an abstract painting consisting of a black splashes of paint on canvas resembling a cow~~
- ☑ Jackie stared at a green flag on his laptop screen and saw a red flag appear when he switched to a white blank word document.
- ☐ ~~Jane realised that when she read a person's lips she ended up hearing different words even though the person was saying the same thing.~~

This is purely a biologically driven processes occuring due to the depletion of photopigments in cones, whereby incoming sensory information is processed differently as the cones are unable to react to certain wavelengths of light – it is a process not driven by a person's understanding of something.

Bottom-up processing refers to the perception driven by the actual sensory input—data from the environment that the sensory receptors receive and process without prior knowledge or expectations influencing the perception.

Samantha's observation about the grey shaded area being darker is an example of bottom-up processing because it is directly based on the sensory input from the image—specifically, the way the eye perceives light and shadow without prior knowledge or expectations influencing her perception.

Question 6

Which of the following statements is True?

- ☐ ~~A) If the retina is damaged, light is unable to enter the eye.~~
- ☐ ~~B) Both left and right hemispheres process both left and right visual fields.~~
- ☐ ~~C) Colour-blindness is caused by damage to the cornea.~~
- ☑ D) Both left and right hemispheres are connected to both eyes.
- ☐ ~~E) Left and right visual fields do not overlap.~~

Each eye has pathways to both hemispheres. A is False as light can enter the eye with a damaged retina but light will not be detected. B is false as each hemisphere processes the contralateral visual field. C is false as the cornea is unrelated to colour-blindness. E is false as visual fields overlap.

A) If the retina is damaged, light is unable to enter the eye.

False. Light can still enter the eye, but the retina, which is responsible for processing visual information, may not function properly, leading to impaired vision.

B) Both left and right hemispheres process both left and right visual fields.

False. The left hemisphere processes the right visual field, and the right hemisphere processes the left visual field. This is due to the way visual information is split and routed to the opposite hemisphere after it enters the eyes.

C) Colour-blindness is caused by damage to the cornea.

False. Colour blindness is typically caused by issues with the photoreceptors in the retina (specifically the cones) and not the cornea.

D) Both left and right hemispheres are connected to both eyes.

True. Each eye sends visual information to both hemispheres of the brain. The visual fields are split such that information from the left visual field of both eyes goes to the right hemisphere, and information from the right visual field of both eyes goes to the left hemisphere.

E) Left and right visual fields do not overlap.

False. The left and right visual fields do overlap in the central part of our vision, allowing for depth perception and a complete view of the environment.

Question 7

After a while, you don’t notice the feeling of your clothes touching your skin. This is...

- [x] sensation without perception
- [ ] ~~sensation with perception~~
- [ ] ~~perception without sensation~~
- [ ] ~~neither sensation nor perception~~

Sensory input happens all the time without need for a conscious desire. Our not noticing is a lack of perception. Hence, this is sensation without perception.

Sensation refers to the process of sensing our environment through touch, taste, sight, sound, and smell. The sensory receptors send this information to the brain.

Perception is the way our brain interprets these sensations and makes sense of everything around us.

In this scenario, your skin's sensory receptors continue to detect the sensation of your clothes touching your skin (sensation), but over time, your brain stops consciously registering or paying attention to it (lack of perception). This is an example of sensory adaptation, where the sensation is present, but perception fades.

Question 8

Which of the following examples is NOT a demonstration of consciousness?

- ☐ ~~A person recognizing their reflection in a mirror.~~
- ☐ ~~A dog responding to its name being called.~~
- ☑ A computer playing a chess game.
- ☐ ~~A child waking up when they hear a loud noise.~~

Recognizing oneself in a mirror is a classic demonstration of self-awareness, which is a key aspect of consciousness. The ability to recognize oneself shows that the person has a sense of self, which is a conscious experience.

The dog's response to its name indicates a level of awareness and perception of its environment. The dog is consciously processing the sound and recognizing it as something meaningful, which requires some level of consciousness.

Waking up in response to a stimulus (the loud noise) demonstrates a change in the child's level of alertness, which is a key aspect of consciousness. The child transitions from a less alert state (sleep) to a more alert state (wakefulness), showing a variation in its conscious awareness of the environment.

While the computer may demonstrate seemingly intelligent behaviour, it does not show proof of awareness, a change in alertness nor any indication of self-awareness.

Consciousness refers to the awareness of oneself and one's environment, including the ability to experience thoughts, emotions, and sensations.

A computer playing a chess game is not an example of consciousness because the computer is following pre-programmed algorithms to make decisions without any awareness or subjective experience.