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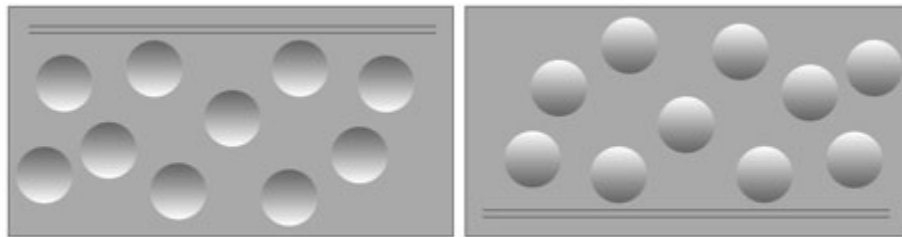
Cognition

Unconscious Inference in Perception

Unconscious inference in perception is part of a theory for visual perception, which explains how human vision is incomplete due to the blind spots in the back of our retina. Because of this the human mind infers a lot of incomplete information and fills in the “incomplete picture” our eyes see. Physiologist Hermann von Helmholtz created this idea of unconscious inference when looking at objects every day. In Volume III of Physiological Optics, Helmholtz states “I can recall when I was a boy going past the garrison chapel in Potsdam, where some people were standing in the belfry. I mistook them for dolls and asked my mother to reach up and get them for me, which I thought she could do. The circumstances were impressed on my memory, because it was by this mistake that I learned to understand the law of foreshortening in perspective" (Helmholtz 283). This tells us how an object’s Z-depth can be misleading to its actual size. The goal of perception is to help us infer properties about objects around us based on the evidence in the proximal stimulus and any prior knowledge we have before looking at an object. Because of this, each 2D stimulus is consistent with an infinite number of 3D objects. Our brain knows the X and Y of a cube or any object in a grid or plane, but our brain does not know the depth. Depth can be very ambiguous depending on what angle we are looking at an object. The Z dimensions of our brain are always being guessed by our brains. For example, if we look at a cup from a top-down view, it just looks like a circle. However, if we change angles, it is obvious that it’s a cup and not just a circle. If we do not have any prior knowledge of this,

our brain assumes it is just a circle and fills in the picture due to unconscious inference. The retina and any other sensory data from other sensory organs are not enough to reconstruct our world.

Distance and size must be inferred from uncertain cues in order to “complete the picture” our eyes see. In a way, perception is essentially a “bet” of what exactly we are looking at. Another example of unconscious inference would be the dot illusion shown below.



For the picture on the left, the dots are concave and recede into the gray surface of the background away from our perceptual view. While for the picture on the right, the dots are convex and are curved towards our perceptual view. Also if the images are flipped, then the inward dots would pop out at you. Because this illusion is utilizing concave and convex properties, our brain has to make an unconscious inference on how it is facing us. Perception requires that we use unconscious inference and go beyond the information given in order to perceive and understand what we are looking at. Without illusions, we would not be able to learn and use any type of top-down processing to learn an object’s properties when looking at it.

Work Cited:

Gigerenzer, G., 2012. *Edge.org*. [online] Edge.org. Available at:

<<https://www.edge.org/response-detail/10594>> [Accessed 7 March 2022].