

A simple model of perception

By Edwin Eugene Ott, Sr.

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introduction

I think most of us have encountered many instances in which we are baffled to understand how someone can interpret an event or profess some belief in such a manner that appears so obviously erroneous. We hear of persons being bilked out of money through blatant confidence schemes; of persons encountering extra-terrestrial beings or monsters in the local state park; of persons joining strange cults, and of persons committing extreme acts of protest. We probably ask ourselves in these cases, "Can these people be so uninformed, illogical, or mentally challenged? Do they consider themselves to be liars by telling their unbelievable stories?" In most cases, these persons seem to be normal people outside of their peculiar ideas.

I think many of these apparent paradoxes can be understood if we ourselves better understand the nature of perception. As one of my avocations, I am developing an educational website about reptiles and amphibians. The majority of the site's content is devoted to identifying the various species. The site contains many pictures of specimens in which the identifying characteristics are shown. I receive many letters from site visitors requesting help in identifying snakes which have been encountered. Attempting to reconcile the verbal descriptions with actual species is a challenging task and has been an impetus to my personal contemplation with the nature of perception. I have come to the conclusion that, no matter how outlandish a description may be, it is what the person perceived about the snake. I may have had a message or two in which the writer was deliberately providing a false or misleading description, but I have not yet determined such an incident to be true.

If my inquirers are actually perceiving what they describe, how can this be so if some of the descriptions are so clearly incorrect? In one case, I received a letter with good, detailed pictures attached. The writer, who had obviously compared his pictures with the pictures on the site, wrote that he thought the snake was either a Rattlesnake or a Copperhead, both venomous species. When I looked at the attached pictures, I saw a harmless Brown Snake. To me, concluding that the specimen was either a Rattlesnake or a Copperhead was like someone sending me a picture of a brown and white Shetland Pony and saying they thought it was either a Zebra or a Hippopotamus!

basic model

Consider the common motion-sensing security light. This system includes a sensing device, usually an infrared light sensor. This sensor is calibrated to vary its electrical output when the received field of IR light is changed by some threshold amount. Such a change occurs when an object moves within the sensor's field of vision. At this point in the process, two important events have occurred: there has been motion and the sensor has responded with an output signal. Has perception happened? No. We often assume that motion has been perceived when these two events occur in the

human system. But clearly, motion has not been perceived in our simple motion-sensing security light system. A signal has been sent but motion has not been perceived until our device interprets the signal as representing a motion event. The IR sensor is analogous to our eyes. A human's eye may receive visual input and generate output signals without sight or visual perception being implemented.

Also in our motion-sensing security light system there is a device which receives the IR sensor signal and interprets the signal as motion or not. This interpreter could be a modern integrated circuit device or a simple threshold trigger. Whatever the device is, it applies a logic to the signal. This logic must exist prior to the sensor signal being generated. The interpreter receives the signal and decides whether motion has occurred. In this way, our motion-sensing security light system perceives motion. Our simple-minded light system either perceives motion or does not. If motion is perceived, the spotlight is turned on. Perception requires both the sensing of motion and the interpretation of motion. If one or the other is missing, perception cannot occur.

perception in humans

Human sensors are eyes, ears, and skin; interpreters are neural cell masses, such as the brain. Our sensors are much more sophisticated than the IR sensor in a security light. Likewise, our interpreters are much smarter. In fact, we have programmable interpreters... we can learn new interpretations. No matter how sophisticated and smart we are, the two basic requirements for perception still apply. There must be a sensory signal generated, and an interpretation of the signal must occur. Without interpretation, perception cannot occur. Because we humans are sophisticated, our interpretations are sophisticated. Our interpretation are based upon concepts.

There is a sophistry in physics which poses the question, "If a tree falls in a forest with no one nearby to hear it, did it make a sound?" The idea behind the question is that sound is an interpretation of pressure distortions in the air. When a tree falls, pressure distortions are created; but pressure distortions are not sounds. There is really no question posed in this sophistry, just a matter of establishing definitions. However, there is no sophistry in the argument that perception requires both sensing and interpretation.

Humans may perceive unconsciously, much like the motion-sensing security light. Our sensing organs can send signals to interpreters where perception can occur without conscious awareness. Unconscious perception is crucial to our basic life functions. Unconscious perception enables our bodies to self regulate and to quickly adjust our movements and responses to our environment.

Humans are conscious beings. We can perceive consciously and unconsciously. Unconscious perception is basic to conscious perception. Consciousness is an adjunct to our unconscious minds. All sensory inputs are processed unconsciously before they can enter into our consciousness.

predictions derived from model

Without interpretation, there is no perception. At first thought this explanation of perception may seem obvious and trivial; however, its application to life experiences may seem counter-intuitive. We have many adages engrained in our thoughts about

perception such as "seeing is believing." In everyday experiences we function under the concept that if two people look at the same object, they will both perceive the same thing. Application of the sense/interpretation model of perception tells us that both persons may not perceive the same thing. If both have normally functioning eyes, they will both receive approximately the same sensory inputs to their brains. For ordinary objects, such as a book or chair, both people will probably have very similar perceptions. In this way, the concept of "seeing is believing" is a useful operating principle for ordinary objects. But what happens with extraordinary objects? In such a case, the two people, when asked later what object they had seen, may have drastically different answers. Imagine two people seeing a beanbag chair for the first time. Let us say one had heard them described before, and the other had never heard of them. The one who knew of beanbag chairs beforehand might have perceived the object as a chair, but it is highly doubtful that the other would have perceived it as a chair. This is a trivial example of differing perceptions. We may still think they both saw the same thing but just did not recognize its subtle characteristics.

Consider the case of a person sensing something completely different from anything ever before sensed. In such a case, the sense/interpretation model tells us that the person will not consciously perceive the thing. This must be so since the person has no pre-established concept of the thing. Even if the person unconsciously perceives it, the person will have no conscious perception of the object. Consider the stimulus is a short burst of sound waves that is very different from any sounds the person has ever encountered, but the frequency is within the audible spectrum. The first several times this burst occurs, the person will not consciously perceive it; the person will not even react to it. After more bursts, the person's unconsciousness will perceive the sound and the person may get a "feeling" that some noise has occurred but will not be able to describe it. Next, the person will consciously perceive the sound. If the burst is not repeated, the person will not be sure whether something was heard or not. With repeated bursts, the person's brain, probably very rapidly, will begin associating the sound with basic characteristics such as loudness, tone, and duration. The person will be constructing a conscious concept of the sound. More sophisticated associations will be formed. The more sophisticated the concept, the better the person will be able to hear the sound. This is the process whereby we construct our pre-established concepts which enable conscious perception. They grow from unconscious interpretations.

enhancement of perception

Unconscious interpretations can also grow. We are born with a set of unconscious, genetically-determined interpretations. These interpretations are analogous to the hard-wired logic of our hypothetical motion-sensing security light. However, we also have the genetically determined ability to learn. Thus, we are like the motion-sensing security light with programmable memory which has been preloaded with "fuzzy" logic software. Our security light can learn new interpretations of motion. Obviously, these new interpretations are unconscious since the light is not a conscious entity.

Once we have a sufficient knowledge base of interpretations/concepts we can expand our concepts through learning. Thus, we can quickly perceive our first beanbag chair without having seen one before if it has been adequately described to us.

perceiving what we wish or expect

After accepting that we perceive only what we already know from pre-established interpretations and concepts, it follows that we will be strongly biased to perceive what we wish or expect to be so. The classic case of perceiving what we expect is manifested in attempting to proof read our own compositions. We know what we intended to write (our concept), so when we read our own composition we fill-in missing words and overlook misspellings.

There are serious consequences to our perceptions being influenced by our wishes and expectations. These consequences are why scientific studies are often performed using double-blind protocols. Racial and ethnic expectations can influence eye-witness testimony. Modern advertising is largely based upon training consumers to perceive products as satisfying our wishes.

My writer who identified the Brown Snake as either a Rattlesnake or a Copperhead, even though he compared pictures of his snake with pictures of the two venomous species, perceived his snake to look like a Rattlesnake or a Copperhead because that is what he wished it to be.

End

<http://neoperceptions.com/futureperspective/futpers.htm>