Laboratory 11: Human Perception of Time

In today's lab we are going to explore the ways in which human perception is involved in what we think of as time.

A. PERCEPTION IS CONSTRUCTED

Visual illusions help us to understand that what is perceived by the mind does not always perfectly match the stimulus that was presented. In the accompanying slides there are a wide variety of different types of visual illusions.

A useful principle that helps us to organize our thinking around this is the constructivism principle:

"Individuals build their knowledge by making connections to existing knowledge; they use this knowledge by productively creating a response to the information they receive." E. Redish

The same sorts of things happen in hearing sounds and perceiving color.

B. EYE MOVEMENT AND TIME RECONSTRUCTION

When our eyes are in motion we do not store our visual perceptions. The fact that we cannot see our own eyes move when we shift from looking at one eye to looking at the other in a mirror is a nice example of this phenomenon.

However, we experience no gap in perception. This shows that our brain is able to fill in the missing perception. A nice example of this is the clock check. When you first shift your gaze to the second hand of a clock, you may perceive that the first tick of the hand takes longer than subsequent ticks. This is because your brain back fills the period while your eyes were moving with the first view of the clock.

C. ODDBALL EFFECT

Consider a sequence of slides displayed for equal periods of time. If one of the images is significantly different than the others, many observers will report that it was in view for a longer period of time.

D. TIME FLIES

We did three experiments to test our perception of the duration of tasks. In the 1st experiment you named as many words having to do with time as you could think of while Hal wrote them on the board. This proceeded for 3 minutes as measured by a stopwatch. You were then asked to record your best estimate of how long we had done the exercise and a rating from 1 to 10 of how fun it was.
In the 2nd experiment, you copied a list of compound words from a website onto a piece of paper silently. Again this was timed for 3 minutes. Again you were asked to record your best estimate of how long it took and rate how fun the task was on a scale from 1 to 10.
In the 3rd experiment we divided the group in half. Half the group stayed with Matt and wrote a short story. While they were told they would be timed for 5 minutes, in fact

they were stopped after only 3 minutes. They did not know this. The other half of the group went to another classroom with Hal, where they wrote a short story. Again they were told they would be timed for 5 minutes. They were stopped after 7 minutes. They did not know this. Both groups were asked to estimate how long they had been writing for and both groups rated the activity for how fun it was on a scale of 1 to 10. Statistical studies of these three experiments have found that experiences that are rated as more fun are estimated as having taken less time. Interestingly, the experiments like our 3rd experiment here have also shown that when an activity takes less time than you expected that activity is also rated as more fun.

E. MEMORY: WORKING, STORAGE, AND EARLIEST

Finally, there was a series of experiments that we ran out of time to do in lab, but which you can try if you would like to.

In the first set of experiments on working memory, try to memorize the strings of numbers in 20 seconds or less. You might find that the first two strings are harder for you to memorize than the last. You may also find that you are best able to memorize 7+/-2 digits of the strings.

In the second experiment try drawing three everyday objects. You may find that you draw these objects from a "canonical perspective". Most common is slightly above and to the right of the object. This shows that many objects are stored in memory as seen from a particular perspective.

Finally, recall one of your earliest memories and write it down including details. The saying "remember remembering" captures what we believe happens with very old memories. The idea is that you do not actually recall the events of the memory directly but instead call up the last time that you remembered the memory. This can lead to interesting effects like those of the game "Telephone" where slight changes in the recollection of the memory can be amplified and further distort it each time you rehearse the memory.

ANALYSIS AND LAB WRITE-UP

In lab you took data on your experiences of a wide variety of visual, auditory, and time duration experiences. Describe what these experiences tell you about how your perception works.

Give the best narrative account you are able to with the limited data you have of how perception affects how your experience of time. Use the data you have from these experiments to support the narrative you construct.

Use the brief discussions of memory from our last class meeting and from this lab to describe how memory works. (This will necessarily be a sketchy description because we have not discussed this much, that is okay.) Compare this cognitive model with your readings from Rovelli's book.