1) Monocular rivalry is when your internal percept switches back and forth between two superimposed images that is presented to both eyes. For example, in class we observed the famous optical illusion of two women, young and old, drawn as one. If you are aware of the two images, your perception will change back and forth between the two for as long as you’re looking. Binocular rivalry is when your internal percept switches back and forth from two different images that are presented in each eye. Instead of seeing the two different images in a superimposed manner, in binocular rivalry the two images compete for perceptual dominance between each eye.

2) Binocular rivalry is an important psychophysical paradigm for conscious awareness because it is through this phenomenon of being able to suppress a visual image from consciousness and back into consciousness that we are able to study how we attend to anything and everything in this physical world on a neural level.

3) When we talk about rivalrous figures in terms of strength, researchers observed that strong rival figures actually enjoy enhanced predominance due to its suppression periods being shorter rather than its dominance periods being longer. In contrast, when we talk about rivalrous figures in terms of visual context, enhanced predominance is due to a lengthening of the dominance period of a rival figure and not through the reductions in the durations of its suppression. For attention, Hermann von Helmholtz believed that one could hold a rival figure dominant for an extended period of time just by attending vigorously to its contours. This top-down attentional modulation operates by boosting the strength of the stimulus during dominance. These similarities and differences in modulation of dominance and suppression between stimulus strength, attention, and visual context implies that binocular rivalry relies on distinct neural processes, and are not generalized throughout the three.

4) Brown and Norcia (1997) came up with a method to tightly link the fluctuations in the visually evoked response amplitudes with shifts in dominance and suppression by repeatedly shifting the contrast of the two images at different rates during binocular rivalry. The observers also pressed buttons to record their alternations of dominance and suppression between the two images. By doing so, they ended up being able to track each grating’s VER waveform. These experiments showed that the fluctuations in amplitude were inversely related in that when the amplitude of one image was large, the amplitude of the other image was small. We see this visually captured in Figure 3 of the reading.

5) I believe that binocular rivalry involves the competition between the two rival images rather than the competition between the eyes. Even just looking at the experiment from Brown and Norcia, it is clear to me that the reason why we fluctuate in dominance and suppression between images during binocular rivalry is because there is some sort of enhancement of contrast that directs us towards either image. I don’t think that it’s the case that one eye is competing for dominance over the other eye. Your percept will always change between the two images but it’s the competition between the two images that makes binocular rivalry such a phenomenon to study.

6) The results of the experiment involving fMRI studies in the fusiform gyrus and the parahippocampus show that because there was no significant difference between the BOLD signals within the two areas during rivalry and those of non-rivalrous alternations of the same images, it must mean that rivalry is resolved before the signals arise within these higher visual areas. If it were to have been resolved after the fact,
then we would have seen the results of the BOLD signals to be significantly different suggesting that rivalry is resolved even later in the visual pathway.