Swaan Dekkers; 10437495

*Question: Ware describes bottom up and top down processing of visual information in the brain. Give a concrete and detailed example of how bottom up processing is influenced by top down processing, leading to a potentially wrong interpretation of “reality” by the viewer. Your example can include a screenshot, photo, or web site URL to refer to the scene that is being viewed.*

Ware describes two ways of processing of visual information in the brain: Bottom-up (driven by the visual information in the pattern of light falling on the retina) and Top-down (driven by the demands of attention, which in turn are determined by the needs of the tasks. I will shortly describe the two processes and then I will explain how bottom-up processing is influenced by top down processing and how this can lead to a potentially wrong interpretation.

**Bottum-up**

Bottom-up processing haves the following hierarchy:

Retinal image  features  patters  objects

First there is a visual field that shapes the retinal image. Then feature processing occurs after information arrives in the V1 cortex. Millions of features are processed simultaneously. Then at the in intermediate level of the visual processing hierarchy, feature information is used to construct patterns. This is the level at which space becomes organized and different elements become linked or segregated. Finally, the information that has been processed had been reduced and distilled trough the pattern-processing stage to a small number of visual objects. The most relevant objects are held in Visual Working Memory and can have both visual and non-visual (concepts) attributes.

**Top-down**

Top-down processes are driven by the need to accomplish some goal. The word attention is used to describe this process. Visual thinking consists of a series of acts of attention, driving eye movements and turning our pattern-finding circuits. These acts of attention are called visual queries. At the lower levels of feature and pattern analysis, top-down attention causes a bias in favour of the signals we are looking for.

**The influence of top-down on bottom-up processing**

I will discuss this topic by means of the following video: <https://www.youtube.com/watch?v=Ahg6qcgoay4>

There are two teams and you are asked how many times the white team passes the ball. I remember doing this experiment when I was around 17 years old and that I was flabbergasted when they told my at the end of the video that a gorilla was walking trough the screen all the time. When I looked the video for the second time I couldn't understand how I could have missed the gorilla as it passes by really obvious all the time.

This for my is a perfect example of how the top-down process can influence the bottom-up process. I was focussing on how many times the ball was getting passed around by the white team, this was my attention point and this constructed my visual queries. So the information that I saw and the features and patters developed in the bottom-up approach where biased in favour of the signals I was looking for (how many times does the ball get passed around). This caused that I totally missed the gorilla because it looked like a unimportant feature and pattern because my attention was not on it. So this leaded to a totally different (wrong) interpretation of the “reality” where there was no gorilla.