# **Mental Imagery**

There is currently an ongoing debate on whether mental imagery is an analogical or propositional process. Iachini (2011) summarizes the position of the two sides of the debate, and this summary will be used to fully understand the reasoning and analysis methods of different groups of researchers. The propositional position – according to Iachini (2011. p. 2) states that mental images are formatted just like sentences, while the analog model explains the process with an image-like representation, instead of a complex one. The author (Iachini, 2011) also confirms that the real debate among the researchers is not about how these symbols appear in the cognitive system of humans, but the process of their formation by the mind. There is a distinction that all scholars agree on between the format and the content. The below essay will look at some of the arguments used by researchers of both theories in order to decide whether mental imagery can be simply labeled as analogical or propositional.

**Analogical Approach**

According to this approach, the structure of the mental imagery is based on surface image/visual buffer. The portions of the representation need to always correspond to the object observed. The content of the cognitive perception is based on interpretation of shape, size, color, and other physical attributes, Kosslyn (1994) states that the activation of analogical representations is needed to decode the image and create a mental imagery. As Iachini (2011) states, analog representation of objects is “percept-like”. This also indicates that the mental representations of images resemble the actual images the person sees. Proponents of this idea have concluded experiments of mental scanning and mental rotation, claiming that the results showed a “structural and functional equivalence between imagery and perception” (Iachini, 2011, p. 4). Further, Kosslyn argued that the various parts of the image have their equivalent spatial representation.

**Propositional Approach**

The propositional approach does not focus on the image formation process, more importantly the cognitive processes involved in mental imagery. The proponents of this theory assume that the operations that are used to decode the image have an abstract format, similar to the language (Iachini, 2011, p. 3). The format is abstract, the structure is based on language, and image that is decoded is based on symbolic content. Pylyshyn (2002), the developer of the propositional representations perspective also argued that symbols, during the interpretation process, lose their connection with sensory perception, therefore, they become amodal. Amodal symbols can only be interpreted in a cognitive way, therefore, there is a need for a complex, abstract interpretation. A functional system, according to the author, supports the cognitive functions of the brain, therefore, the code is only possible to break on a cognitive level. The author also suggests that – as Iachini (2011, p. 3) confirms – “there is only one single code, expressed in a propositional format” supporting all cognitive functions: thinking, language, and memory.

**The Strengths and Weaknesses of the Two Theories**

The real debate between the two groups of researchers is whether cognitive processes are involved in mental imagery. Kosslyn (1994) states that the process is simply spatial, and has nothing to do with cognition. While the research concluded by the author does explain some of that most important questions related to orientation, scanning images from different distances and of different sizes, it does not explain how closely the mental images represent the real image. To know this, further research related to perception and brain processes might be necessary. While the researchers supporting the analogical theory state that imagery and perception are closely related, those who assume that cognitive processes are involved in the mental imagery process do not agree with this statement. Pylyshyn (2002) states that for decoding the images, there is a need for using cognitive processes, just like in decoding language. He argued that the mental imagery can occur in three dimensions, while some visual perceptional phenomena would not work in mental imagery. Further, he argued that the visual interpretation of images is difficult in some cases, therefore, other areas of the brain need to be activated, making mental imagery much more than a spatial task. Indeed, this statement is true, based on research of brain processes and imaging human brain cell activation during processing images.

**Conclusion**

Overall, the authors have found, based on the research of the related literature, that while some images can be interpreted plainly through a spatial process, most of them cannot. For example, when somebody sees a black and white image of a banana, they need to “fill in the blanks”. It is also possible that they would create a mental image of a yellow banana and associate memories with the image. Further, when somebody sees a banana with a brown dot right next to it, the cognitive process of the brain can be activated to try and work out what is hiding behind. In real life, it is more likely that people will meet images that need propositional mental imagery approach than images that can be decoded using spatial processes.

References

Iachini, T. (2011) Mental imagery and embodied cognition: a multimodal approach. Target Article. *Journal of Mental Imagery,* 35, 1-26.

Kosslyn, S.M. (1994). I*mages and the brain: The resolution of the imagery debate.* MIT Press, Boston: MA

Pylyshyn, Z.W. (2002). Mental imagery: In search of a theory. *Behavioral and Brain Sciences,* 25, 157-238.