The amount of visual information that enters our brain is too wealthy to completely be processed in detail. As a result, the brain needs to make a selection of this information by means of mechanisms that are collectively called 'visual attention'.

Traditionally in the study of attention two classes of attention are identified. First, attention is driven by external factors, such as a bright flash of light or a salient object such as a yellow sports car. Second, we can control what locations or features to devote our attention to: say, if we are looking for a particular brand of cereal in the super market, then our knowledge of its appearance can help us find it.

My thesis argues that a third class of attentional mechanisms plays a large, if not a dominant role for selection: that is, the memory we have of previous visual experiences will determine what we select and where we look. Importantly, experiences that are recent or experiences that have occurred frequently will strongly affect visual attention. Our work shows that as soon as a visual stimulus is perceived it will immediately affect the processing of future stimuli. Furthermore, repeatedly selecting the same stimulus can have profound effects on the deployment of visual attention far into the future. Moreover, we demonstrate that such memory-driven influences on visual processing and attention can occur automatically and often implicitly -- that is, without conscious awareness.