Behind the seen : unconscious perception of objects, faces and emotions

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SUMMARY
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How we distinguish faces from other objects (“face detection”) and how we extract the emotional signal from other people faces (“emotion recognition”) are still open questions. Most conventional models for face perception are proposing a hierarchical relationship between these stages in which face detection is the entry point for all further processing stages including emotion recognition. There is an increasing amount of evidence that processing of emotional expressions takes place separately from the other high-level processing stages of faces such as person identification. However, no other research has addressed if extracting the emotional information can be independent of the most primary processing stage of the current models which is detecting the stimulus as a face. This book is presenting the first evidence that emotion recognition can take place independent of face detection; in other words, we can recognize the facial expression without being able to detect the object as face in certain conditions.

In Chapter 2, the relationship between the face detection and emotion recognition was investigated in the context of explicit categorization of morphed stimuli between an object and emotional faces. For this, the explicit categorization of morphed stimuli between non-face objects and emotional faces were tested. The results showed that the underlying emotion information was still available for the stimuli that were categorized as non-face, suggesting a certain degree of separation between the two processes.

In Chapter 3, the effect of recent experience -known as adaptation- on face and object detection was tested. For this, the performance changes in face and non-face detection tasks due to recent exposure to face and non-face stimuli were measured. The results interestingly showed that face detection can be deteriorated by recent exposure to both faces and non-face objects, whereby object detection can only be influenced by adaptation to the same object category.

In Chapter 4 a new method for suppressing the face detection performance was introduced. The method was based on the saccadic suppression phenomenon which corresponds to the reduced visual awareness during fast eye movements (known as saccades). Then the same method was used in Chapter 5 to investigate if any emotion recognition can take place in the case of complete unawareness of the face stimuli where face detection is at chance. The results showed that the unconscious categorization abilities of the participants for such unseen faces were significantly above chance in emotion
categorization while the face detection task was at chance. This finding draws a serious doubt on the most commonly accepted models of face perception and suggests a much higher degree of independence between processing of faces within the face recognition framework and their emotion content.

Chapters 6 and 7 were focused on other aspects of unconscious perception. Chapter 6 presented a study on audiovisual association learning abilities in a human patient with the rare condition of a bilateral cortical lesion to primary visual cortex. The results showed that learning the association of the sound and the (unseen) visual stimuli can take place in the absence of the primary visual cortex. Furthermore, the results suggested that this effect was mediated by superior colliculus. Chapter 7 underlines some technical difficulties in unconscious perception research by addressing the difficulties of a recent study on metacognition abilities (the ability to distinguish between one’s correct and incorrect responses). The analysis of the original data showed that the authors’ findings were due to small sample size and inappropriate extension of the meaning of blindsight and “blind insight” to the group level.