

studies is the higher amplitude of female evoked potentials in different latency ranges. Orozco and Ehlers (1998) reported longer latency and higher amplitude in the P450 component to facial expressions. During a recognition memory task Guillem and Mograss (2005) recorded higher amplitudes of ERPs in female subjects. According to Hoffman and Polich (1999) male subjects produce smaller P200, P300 and N200 components during a classical oddball paradigm. Proverbio et al. (2006) published results on infant happy/distressed expression indicating much larger occipital P110 response in women compared to men. Karakaş et al. (2006) used auditory stimulation and found that the differences in gamma band are independent of gender. We have to note that none of these studies considered a simple physiological stimulation; they have been focused rather on facial expression, also reflecting emotional behavior, attention and working memory.

According to Fuster (1995) the phyletic memory is constituted by the structure of primary sensory and motor cortex at birth, which is common to all organisms of the same species. Phyletic memory would be the most basic of all memories, the genetic memory that the organism has formed in the course of evolution by interactions with the surrounding world. The genetically defined structures of primary cortex dedicated to analyzing elementary sensory features and to integrating elementary primitives of movement would form the basic template on which the memory of the individual would develop. In the light of Fuster's definition Başar (2004) emphasized that even "simple light" triggers sensory memory (iconic memory) and that all experiments related to sensory-cognitive processing are interrelated or interwoven with the sensory memory. This is a simple physiological consideration, which includes the necessity to use EPs as control signal. Accordingly, we have to filter out effects of simple light causation in analyzing responses to facial expressions, to attentive processes and also to various types of cognitive loads. In consideration of these facts, the most basic question in our discussion is: "Does simple light evoke differentiations in EROs in comparing female and male subjects? If responses to simple light are anchored with some basic physiological mechanisms, we have to use these results in order to be able to discuss perceptual processes such as face recognition or recognition of facial expressions and/or emotions in a more refined manner.

The results of this study also indicate that there are very important differences in the delta band and smaller differences in the beta and gamma frequency ranges.

The histogram results presented in Fig. 1A merit important attention. Firstly, we have to note that no differentiations are observed at frontal locations or in the theta frequency range. According to Klimesch et al. (2000) and Başar et al. (1999) a large number of cognitive functions occur in the theta frequency range and at frontal locations. Since we used here a simple light as stimulation, and the subjects did not perform any cognitive tasks, the absence of differentiation in the frontal theta is not surprising.

Two other aspects should be mentioned also here. In the vast literature on brain oscillations, the role of gamma oscillations has been mentioned as one of the most important functional key oscillations. In the present study, the gamma response depicts

only a differentiating role at the right occipital site. According to our results, the right occipital location is the area which is the most active indicating the differentiation between males and female subjects.

5. Conclusion

Based also on the results of our previous publications related to oscillatory brain dynamics, we come to the following conclusions: (1) The brain response is a construct in a "multi-dimensional state" incorporating amplitudes of oscillatory responses, topological coordinates, and changes in the time axis following presentation of the percepts, including delays and prolongations, and coherence between locations. Only a new Cartesian System embracing all these parameters can represent the dynamics of functionality in the brain. (2) It is also important to note that in order to analyze and interpret EROs it seems to be extremely important to consider several causal factors (Başar and Güntekin, 2007). Among these, gender differences should be considered as a fundamental causal factor in the search for functional correlates of EROs.

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