The Underlying Processes of Face Recognition

C.-C. Carbon[1], H. Leder[1,2]

[1]Freie Universität Berlin, Germany; [2]University of Vienna, Austria

E-mail: ccc@experimental-psychology.de

eXPerimental Psychology .de

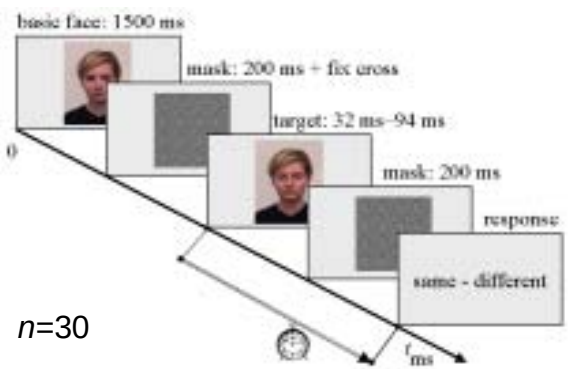
#P1-174

Purpose

There is still an ongoing debate, about the nature of processes underlying faces recognition. Two positions have been discussed: serial (microgenetic) or on parallel (holistic) processing. Faces differ from each other in respect of componential or local features, configuration, textures, etc. We investigated, whether there is a general difference in the temporal processing of configural and component information.

Method

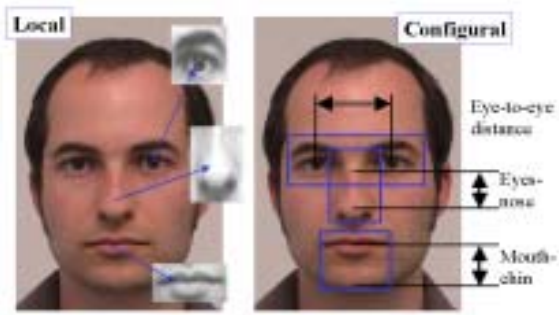
A stimulus-limitation technique via visual masking and a variation of presentation times (PTs) was used for locally as well as for configurally manipulated faces. A same-different sequential matching task was used. For each PT (32-94ms) the hit rate for every stimulus manipulation (as well the combinations of different manipulations) were analyzed using a weighted measure WOM.



n=30

Stimuli

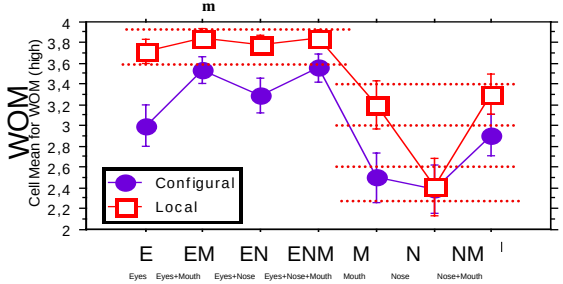
Unfamiliar faces were used for which either local or configural attributes were manipulated. Furthermore, low and high distinctive manipulations were realized (local distinctiveness: controlled by a pre-study; configural distinctiveness: more or less shifted regions). This yields a total of 2 [class] x 7 [manipulations] x 2 [distinctiveness] = 28 stimuli.



Results

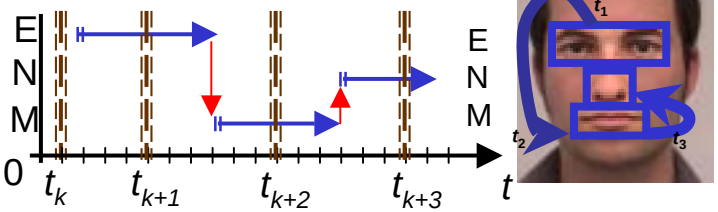
In order to test specific processing hypotheses all results are expressed in terms of a weighted order measure *WOM* (Carbon, 2003) that integrates the hit rates of all PTs in a single measure. This was done to strengthen the impact of recognition at shorter presentation times. The higher the WOM, the earlier the processes start.

$$\text{WOM} = \sum_{m}^{n(PT)} [(n-m+1)\cdot corr(PT_m)]$$

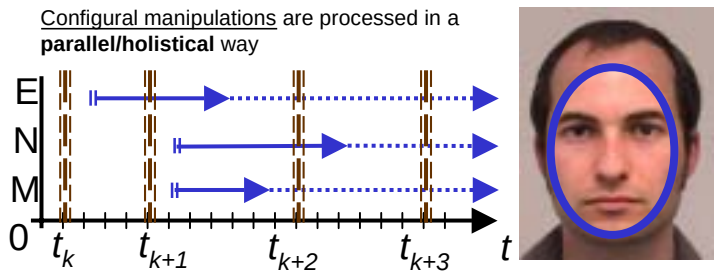


Conclusions

Local manipulations are processed in a strict **serial/microgenetic** way



Configural manipulations are processed in a **parallel/holistical** way



We found an obvious microgenesis of face recognition (cf.Siegler & Crowley, Am.Psych.46, 1991). The eye region was recognized prior to every other inner feature, with the mouth being second, temporally followed by the nose. Moreover, there were clear differences between „local“ and „configural“ processing, although the pre-experimental saliency between both manipulation classes did not differ from each other. Processing of component changes followed a serial process sequence with a self-terminating character (cf.Sergent, Brit.J.Psych.75,1984), whereas configural faces were processed in parallel or somehow *holistically* (Tanaka & Farah, QJEP 46A, 1993).

supported by the DFG (Le-1286)