The influence of pattern size on amplitude, latency and wave form of retinal and cortical potentials elicited by checkerboard pattern reversal and stimulus onset-offset

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Transient pattern electroretinograms (PERGs) and visual evoked potentials (VEPs) were recorded with checkerboard pattern reversal and equiluminance stimulus onset-offset, elicited by a high quality moving mirror stimulator. Different sized checkerboard patterns (0.35-4.2 c/deg) were used as stimulus patterns. The wave forms of the equiluminance stimulus onset responses were similar to ERGs evoked with luminance decrease and the stimulus offset PERGs were like ERGs elicited by luminance increase. The PERG c wave and the VEP showed spatial frequency tuning with pattern reversal and stimulus offset. Spatial frequency tuning was not detectable with PERG a and b waves. Pattern reversal and stimulus onset evoked PERGs had no major spectral components above 40 Hz; stimulus offset evoked PERGs contained components up to 55.3 Hz. Retino-cortical time--measured as a latency difference of the PERG b wave to VEP P100--was identical with pattern reversal and stimulus onset and about 12 msec longer with stimulus offset. Our results suggest that the 3 stimulation modes, reversal, onset and offset induce different types of processing at the retinal and cortical levels. PERG a and b waves to our high luminance/contrast stimuli contain no pattern specific information and the c waves are the sum of luminance and pattern specific responses.