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Hand Blink Reflex latency changes with age: Insights into physiological brainstem aging

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INTRODUCTION
Blink reflexes have been shown to be a valuable approach to explore age-related physiological changes in brainstem function. However, the Hand Blink Reflex (HBR), a subcortical defensive response that enhances when the stimulated hand is inside the face's peripersonal space, has not been studied in ageing context. Hence, the present study aimed to investigate age-related HBR modulation in healthy individuals.

METHODS
HBR was evoked by administering transcutaneous electrical stimulation to the median nerve at the wrists during bilateral electromyography (EMG) of the orbicularis oculi muscles in a sample of 25 young (Age: 25,5 ± 5,9 years; 17 F) and 25 older (Age: 66 ± 5,5 years; 12 F) healthy adults. The stimulation was administered with the stimulated hand either far or near to the participant's face.
EMG signals, filtered and rectified, were processed on MATLAB. To investigate the influence of age on HBR modulation, two ANCOVAs with age as covariate were performed for amplitude and latency of the responses in the two target positions.

RESULTS
Results showed that age significantly increased HBR latency ($F(1\text{-}48) = 10.7$; $p = .002$). In contrast, no significant effect of age was found on HBR amplitude, suggesting that the main age-related difference may concern physiological aspects, such as nerve conduction, rather than the processing of defensive peripersonal space.

CONCLUSIONS
Results indicate a significant age-related modulation of HBR latency, supporting the hypothesis of physiological brainstem aging. Monitoring age-related changes in HBR modulation may play a promising role in identifying specific alterations in clinical populations.

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