

further examined neural correlates of cognitive aging by analysing event-related brain potentials (ERP). As expected, younger participants showed faster responses for primed relative to unprimed faces. In addition, a clear N400 priming effect was observed, with more negative amplitudes for primed relative to unprimed targets, indicating facilitated access to domain-general person representations. Older participants revealed slower responses overall, and reduced behavioural priming. Moreover, the N400 priming effect was delayed and temporally restricted in the elderly, suggestive of less efficient processing at a domain-general processing stage. In conclusion, these findings provide novel evidence for specific deficits in person recognition associated with cognitive aging.

Interpreting facial expressions: Dissociating neural signatures of mentalizing and classifying

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‘Theory of mind’ studies have often used facial expressions to investigate mentalizing processes. However, it is not known whether perceivers in such circumstances process mental states or whether they engage in a more basic process of classification. The aim of this study was to investigate ERP components for both (mentalizing and classification) processing strategies. In the classification group, participants were asked to choose a photograph (using a forced choice judgment scale), which best represents the facial expression of a target person. In the mentalizing group, perceivers were asked to guess which photograph (using the same judgment scale) targets were looking at, a task that we suppose involves ‘retrodictive mentalizing’ (Gallese & Goldman, 1998). In the classification task, perceivers showed more prevalent ERP components at N170, P200 and P300-600. In later components between 800-1000 ms, there was an interaction between group and hemisphere: Activity in the mentalizing group was sustained over the right hemisphere while activity in the classification group started returning to baseline. These findings suggest that participants do not engage in full-blown mentalizing when merely classifying facial expressions. Instead, such processing might have been reserved for when participants were asked to infer the cause of the target’s expression.

Gallese V., & Goldman A. (1998) Mirror neurons and the simulation theory of mind-reading. *Trends in Cognitive Sciences*, 2(12), 493-501.

The rewarding properties of C-tactile afferents revealed through evaluative conditioning

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The rewarding sensation of touch in affiliative interactions is hypothesised to be underpinned by a specialised system of nerve fibres called C-tactile afferents (CTs), which respond optimally to slowly moving, gentle touch, typical of a caress. In the current study we employed evaluative conditioning to examine whether CT activation carries an innate reward value. Participants rated the approachability of faces pre and post-conditioning. During conditioning, a subset of each participant's most neutrally rated faces was paired with robotically delivered touch to their forearm. For half the faces touch was delivered at CT-optimal speed, 3cm/second. For the other half touch was delivered at a faster, CT-non-optimal speed, 30cm/second. Heart-rate was recorded during conditioning. A significant touch by time interaction was found. Whilst rated equally approachable pre-conditioning, post-conditioning faces that had been paired with CT-optimal touch were judged significantly more approachable than those paired with CT-non-optimal touch. CT-touch also caused greater heart-rate deceleration than CT-non-optimal touch, during conditioning. The results offer empirical evidence that CT-touch carries affective value which can be imbued to socially relevant stimuli. Our findings support the theory that CT-touch can reduce arousal levels, perhaps underpinning the role of CTs in social support.

Observation of individual versus joint actions: An EEG study

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The functional role of the mirror neuron mechanism (MNM), which becomes active during both action execution and action observation, is still unclear. We investigated the onset and development of power reductions in the sensory-motor alpha band (8-13Hz; mu rhythm), which were taken as an index for MNM activity, to explore whether MNM activity was differently modulated by dyadic versus individual actions. EEG recordings of 25 typically-developed participants were made during the observation of video clips depicting one or two actors playing a card game governed by a rule, which allowed to predict upcoming actions. Four types of clips were presented: (1) social action involving two acting agents, (2) social action with one acting agent, (3) private action performed by one agent, and (4) no action. The results demonstrated a significant mu reduction in the three action conditions compared to the no-action condition, but the onset did not reveal evidence for MNM activity related to the anticipation of the upcoming actions. Dyadic actions resulted in a somewhat increased mu reduction compared to the individual actions, suggesting a possible modulatory role for the individual versus dyadic nature of observed actions.

Reducing itch using brain stimulation

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