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8 A 2007; 3 2007

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Ke w d :

I d c

The human brain is equipped with the cognitive control system to deal with conflicting information that we encounter every day. Neuroimaging studies, typically employing the Stroop, the flanker or the global/local interference tasks, show the neural activity in the anterior cingulate cortex (ACC) and the dorsolateral prefrontal cortex when different components of the stimulus activate simultaneously conflicting response representations [1]. Whether the conflict between different perceptual representations also activates these brain regions is, however, controversial [2–5]. In brain potentials, it is found that an event-related potential (ERP) component N2, whose generator is likely to be the ACC, is related to the presence of response conflict, whereas another component, the error-related negativity, which also arises from the ACC, is associated with the detection of response errors [6]. Evidence concerning the manner in which perceptual conflict manifests in brain potentials is, however, divergent. On the one hand, there are studies showing that the conflict between perceptual representations for simultaneously presented components of the stimulus induced an N450 [7]. On the other hand, using a matching task in which the features of two sequentially presented visual stimuli were compared, several studies observed an N270 for the featural

S1 and S2 have the same color. If different perceptual representations for S1 and S2 induce conflict and if the FRN is sensitive to this perceptual conflict, an FRN effect will be observed between S1 and S2 pairs whether or not they have the same colors. Moreover, the correctness of guessing and the sameness of color might interact, such that the FRN effect for the correct / incorrect guesses is augmented by the perceptual conflict, if the two effects share the same cognitive / neural processes.

they were correct (M=535±24 ms). No other effects were significant (Fig. 1).

The 2*2*5 ANOVA on the average amplitudes of the FRN observed a main effect of the correctness of guessing, $F(1,13)=23.38$, $P<0.001$, indicating the FRN was more negative for negative feedback (7.86 μV) than for positive feedback (10.10 μV). Importantly, the main effect of color was significant, $F(1,13)=12.52$, $P=0.004$, indicating that S2, when differing from the color of S1, induced a more negative-going FRN (8.10 μV) than S2 with the same color as S1 (9.86 μV). The main effect of electrode was significant, $F(4,52)=5.23$, $P=0.001$, with the FRN amplitudes decreasing gradually from the Cz to the frontal and posterior sites.

The interaction between the correctness of guess and the sameness of color was significant, $F(1,13)=10.12$, $P=0.007$. Further tests showed that the FRN effect was larger when S1 and S2 had the same color (2.94 μV, $F(1,13)=37.15$, $P<0.001$) than when S1 and S2 had different colors (1.53 μV, $F(1,13)=7.99$, $P<0.05$). By contrast, the FRN effect for the color conflict was larger when the guess was correct (2.46 μV, $F(1,13)=20.56$, $P=0.001$) than when the guess was incorrect (1.05 μV, $F(1,13)=3.71$, $P=0.076$). The interaction between correctness of guess and electrode and the interaction between the sameness of color and electrode were significant, $F(4,52)=4.87$, $P=0.002$; $F(4,52)=9.35$, $P<0.001$, indicating that the sizes of the FRN effect varied over

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