Opposite aftereffects for different face views

LLM Welling (University of Aberdeen) · LM DeBruine (University of Aberdeen) · PEG Bestelmeyer (University of Aberdeen) · AC Little (University of Liverpool) · BC Jones (University of Aberdeen)

Background While fMRI[1] and electrophysiological[2] studies have revealed different neural populations that are broadly tuned to respond optimally to different face views, it is unclear if these neurons also code other aspects of face shape. Recent studies have demonstrated significant face aftereffects when adapting and test faces were shown in different views, although these effects were weaker than when adapting and test views were the same[3,4]. This partial transfer of aftereffects across views was interpreted as evidence for either view-specific coding of face shape[3] or that the locus of adaptation is in face coding mechanisms that are relatively robust to changes to view[4]. To establish whether dissociable mechanisms code face shape for different views, here we tested if it is possible to simultaneously induce aftereffects in opposite directions for different face views.

Hypothesis 1 Opposite aftereffects for different face views would suggest that neurons that code face view can also code other aspects of face shape.

Hypothesis 2 No opposite aftereffects for different face views would suggest that the locus of adaptation is in face coding mechanisms that are robust to changes in face view.

Methods

Raised · Lowered · Raised · Lowered

Stimuli Mouth position was manipulated by a fixed amount using Psychomorph software to ensure that the magnitude of the change for raised mouth was equal to that for lowered mouth. Different identities were used in test and adaptation phases.

Pre- and Post- Adaptation Tests Participants (N=54) chose the more normal face from 4 pairs that had been manipulated in mouth position. The images in each pair showed the same individual in the same view and differed only in mouth position.

Adaptation 32 faces (16 front, 16 left view) were presented for 3 seconds each. Half the participants saw left views with raised mouth and front views with lowered mouth, while half saw left views with lowered mouth and front views with raised mouth.

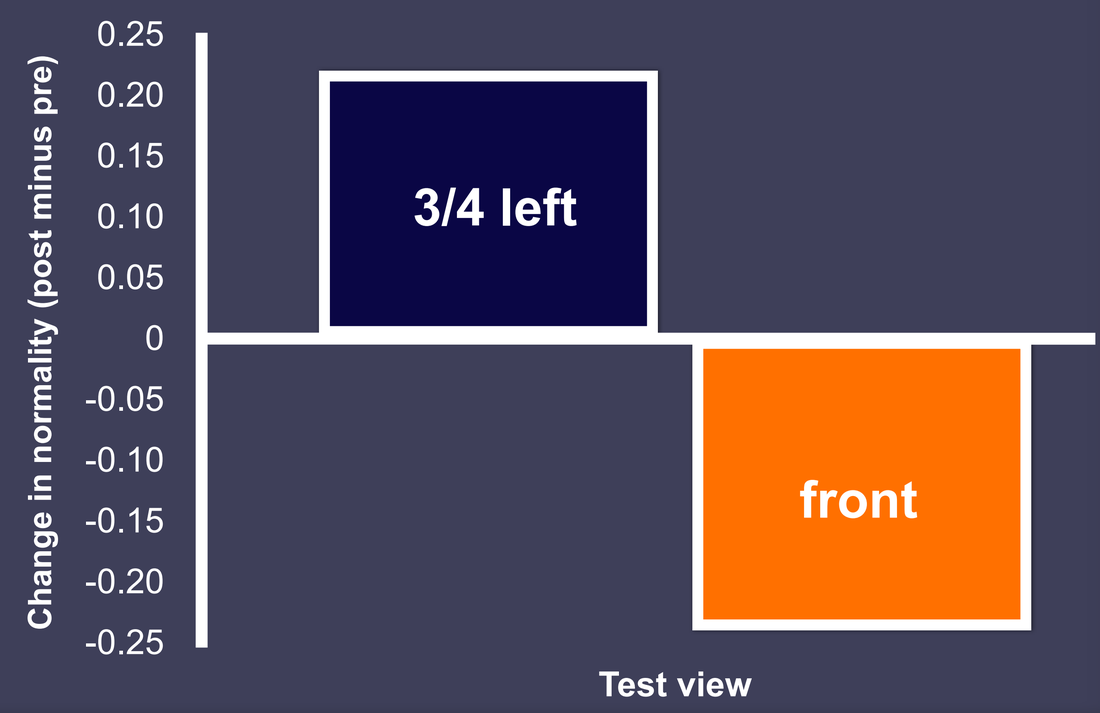
Results

Responses were analyzed using a mixed-design ANOVA.

The dependent variable was the change in the normality of the manipulation that was seen in conjunction with the 3/4 left view during the adaptation phase (post-test minus pre-test).

The within-subject factor was test face view (3/4 left, front) and the between-subjects factor was adaptation condition (mouth up in 3/4 left view and mouth down in front view, mouth down in 3/4 left view and mouth up in front view).

Consistent with Hypothesis 1, our analysis revealed a main effect of test face view ($F=5.01$, $df=1, 52$, $p=.03$). There were no other significant effects (both $F<2.3$, all $p>.13$).



Conclusions Our findings for view-contingent face aftereffects demonstrate that it is possible to simultaneously induce aftereffects in opposite directions for 3/4 left and front views of faces. Such view-contingent face aftereffects support the proposal that some neurons that code face view can also code other aspects of face shape[3]. Together with the partial transfer of face aftereffects when adapting and test faces are shown in different views[3,4], our findings for opposite aftereffects for different views suggest that some neural populations that code face shape respond optimally, but not exclusively, to certain face views.

References [1] Grill-Spector et al. (1999) *Neuron*, **24**, 187-203. [2] Perrett et al. (1991) *Experimental Brain Research*, **86**, 159-173. [3] Jeffery et al. (2006) *Psychological Science*, **17**, 501-505. [4] Jiang et al. (2006) *Psychological Science*, **17**, 493-500.

To contact the authors email faceresearch@abdn.ac.uk or visit http://www.facelab.org