

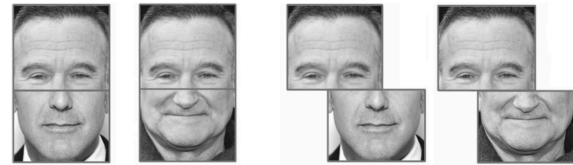
# Eye-movement pattern modulates holistic processing of faces: evidence from the composite face effect and the inverted face effect

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## Introduction

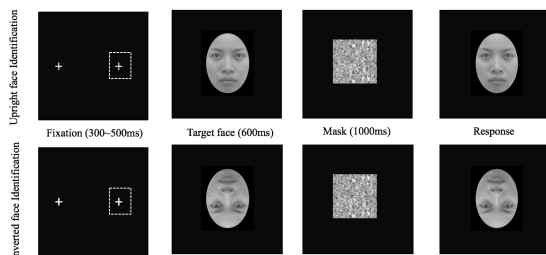
- People are hard to identify the features or parts of faces isolated but perceive the entire face as a whole. It is the so-called holistic processing of faces. The composite face effect and the face inversion effect are two of the representative effects of the holistic processing (Tanaka and Gordon, 2011)
- Eye-movement patterns on faces are discrepant across individuals but consistent within individuals. (Chuk, Chan, & Hsiao, 2014;). However, no previous studies, as we known, have taken the role of the individual differences of eye-movement pattern into account the holistic processing of faces.



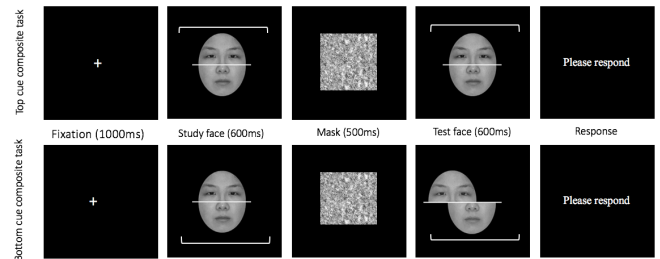
An example of the composite face effect. When aligned with different lower halves, it is difficult to recognize that the upper regions of the two composites are identical (left pair). When misaligned, the difficulty dramatically reduced (right pair).

Question: whether eye-movement pattern modulates the holistic processing of faces?

## Method (56 participants did all four tasks below)

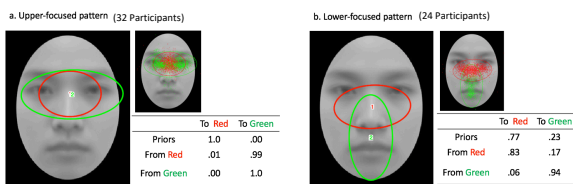


Upper (Bottom) row is the time course of a trial of the upright (inverted) face identification task. Participants were asked to judge whether the sequential faces in a trial were same or different.



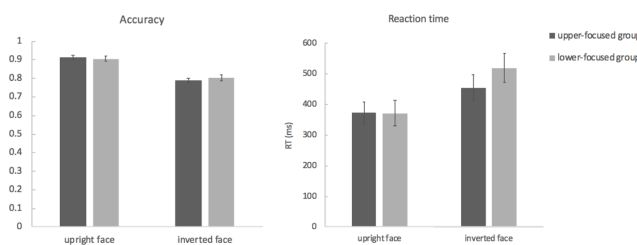
Upper (Bottom) row is the time course of a trial of the top (bottom) cue composite face task. Participants were asked to judge whether the cued halves of the sequential faces in a trial were same or different.

## Result

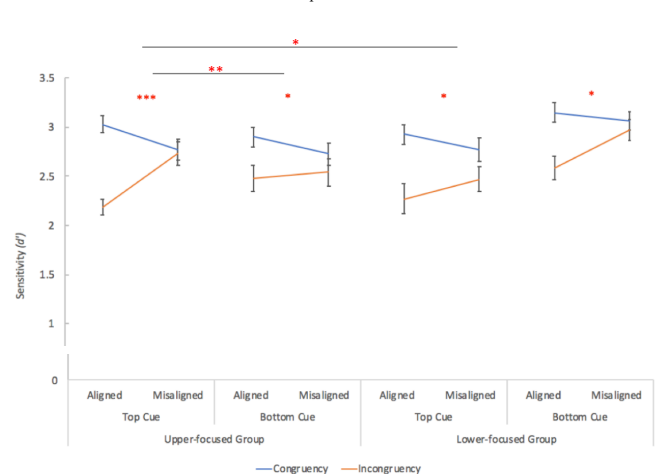


The representative eye-movement patterns generated from the upright face identification task using the Eye Movement Hidden Markov Model (EMHMM, Chuk, Chan, & Hsiao, 2014).

### Face identification tasks



### Composite face tasks



- Two representative eye-movement patterns generated from the upright face identification task. It is consistent with previous studies (An, Hsiao, 2020; Chuk, Chan et al., 2017; Chan et al., 2018).
- No significant differences in the face inversion effect were found between eye-movement groups.
- The upper-focused group showed a stronger composite effect in top cue condition than bottom cue condition, but the lower-focused group showed equally strong composite effect in two conditions.