Gender average heads and categorical perception

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1   INTRODUCTION

Our visual system uses a sophisticated mechanism called categorical perception to discriminate between highly similar objects. Small perceptual differences are enhanced, thus creating clear boundaries between groups of similar items. Here, we investigate whether perception of face gender shows evidence of a categorical effect. Earlier studies (1, 2, 3) have revealed the presence of a categorical effect for morphs of facial expression and identity. In contrast we found no evidence of a categorical effect for gender perception (4, 5). In previous studies, the stimuli we used all showed change in identity beside change in gender. Here we introduce new stimuli which build a gender continuum without identity change.

2   PROCEDURE

For experiment 1 we used 6 males and 6 female 3D heads (hair removed) obtained with a 3D head–scanner (Cyberware). 3D–Morphs (Fig. 1) were created between male and female faces using an algorithm which automatically finds corresponding pixels between 3D–images of faces (6). In experiment 2, the participants were familiarized with the original faces prior testing. For the third experiment, we used the same method to generate an average face from 100 male and 100 female faces. From this face we created morphs between an average female and an average male face (Fig. 2). For experiment 4 we used male (and female) 3D heads and operated a similar transformation of the facial features as for the averaged face series, thus creating a gender continuum based on the facial features of a single face (Fig. 3). THerefore the stimuli in experiments 3 and 4 do not show a change in identity.
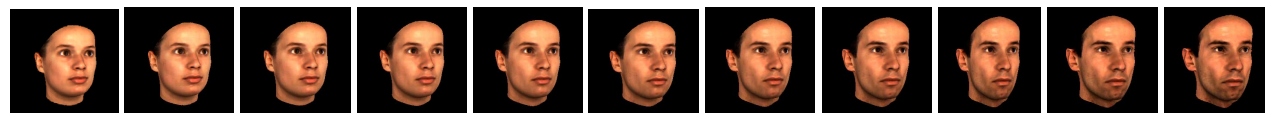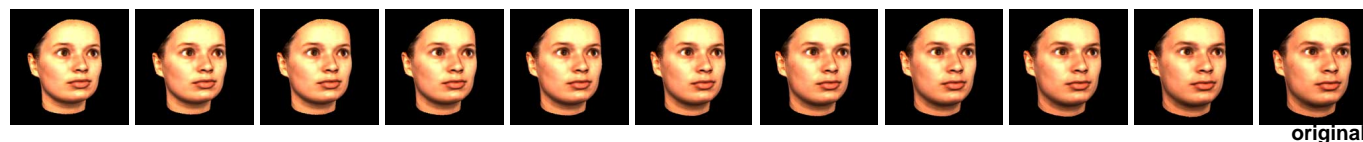
4   RESULTS

Categorization and Discrimination

1. unfamiliar faces

15 Ss

2. familiar faces

Mean categorisation and obx plot

15 Ss
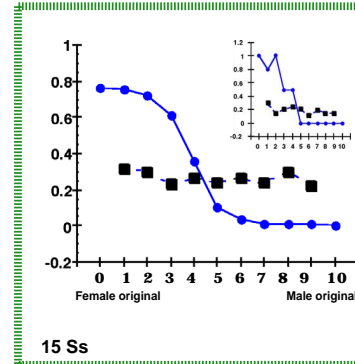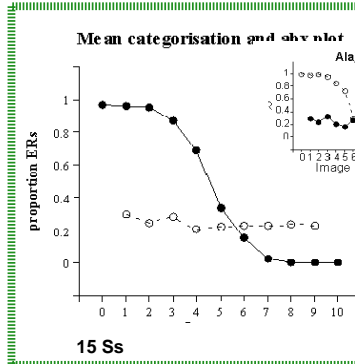
3. "averaged" faces

15 Ss
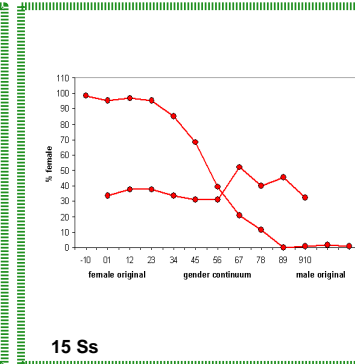
Categorization only with reaction time

4. "gender variation" faces

10 Ss
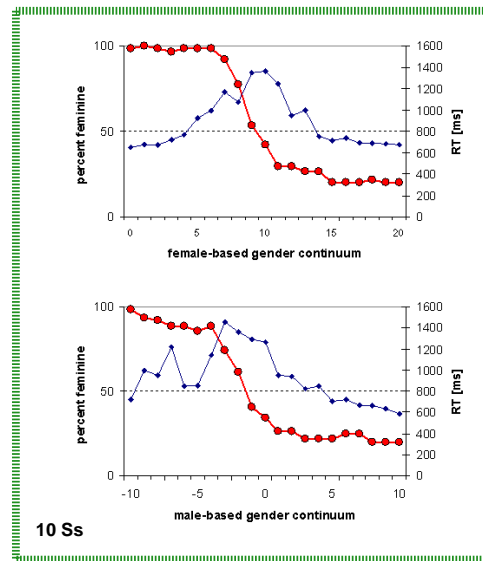
A1. Discrimination task.: XAB Participants were asked which of a pair of images matched the first face presented in the trial.
A2. Judgement task: AB Participants were asked which image of the pair was more feminine.
B. Categorization task. Participants had to categorize each face image as male or female.
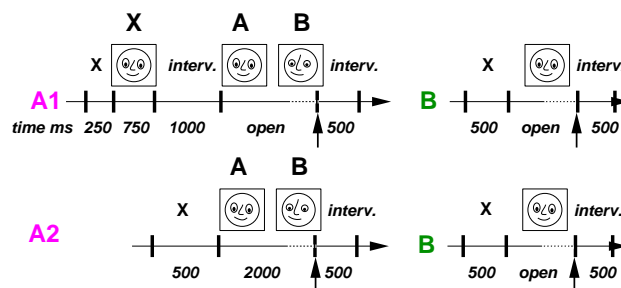
5   RESULTS SUMMARY

In all experiments the participants could categorize all faces by their gender in the categorization task (characteristic step function). Prior familiarization with the endpoint faces or the use of averaged faces lacking individual features did not induce a visible categorical effect for the perception of gender; participants did not discriminate more easily between face images straddling the category boundary.

6   GENERAL DISCUSSION

The results confirm our previous studies indicating that we do not perceive the gender of a face categorically. Under most circumstances other cues (like hair line, hairdo, make–up, and expression) might be sufficient to determinet the gender of a person.

7   REFERENCES

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3   STIMULI

Fig. 1

Fig. 2

Fig. 3 female–based

original

Fig. 3 male–based

original