

1 INTRODUCTION

Burt & Perrett (1997) showed that subject's judgment of gender, age and expression were more influenced by the left than by the right side of the face (viewer's perspective). Also in similarity studies it was shown that a left composite face was rated as more similar to the original than a right composite face (Gilbert et al., 1973, Rhodes, 1985).

Is this asymmetry an asymmetry in perception or in coding?

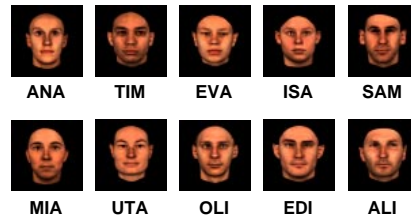
We investigated whether recognition performance differs for faces rotated in depth to the right or to the left.

Note: Left and right are used here always from the viewer's perspective.

2 METHODS

Training

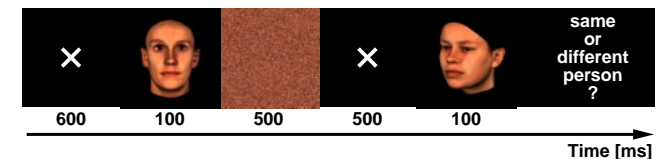
In the learning stage, subjects were asked to study 10 frontal views of 3D-Cyberware head scans with their respective names for ten minutes.



Immediately after they were tested in a naming task, where a face was shown on the computer screen and subjects had to press the corresponding name key on the keyboard. When their error rate was lower than 5% over the last 30 trials they continued with the actual experiment. At that stage they had named each face at least three times.

Testing

In a delayed-match-to-sample task subjects were presented a frontal view of a face for 100 ms, followed by a mask for 500 ms, and finally a side view (+/- 30 and 60 deg) of a face for again 100 ms.



The task was to assess whether the two views depicted the same person or not.

Subjects were asked to respond as fast as possible and their response time and errors were recorded.

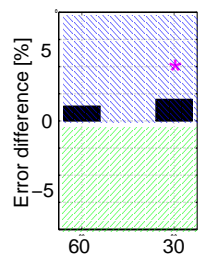
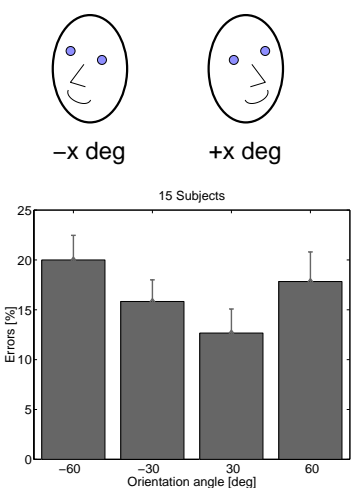
3 RESULTS

Experiment 1

Q: Is there a difference in performance between left and right in depth rotated faces?

Normal Faces

Factors: Familiarity (familiar, unfamiliar), Orientation (-60 deg, -30 deg, +30 deg, +60 deg)
N = 15



- Subjects make more errors the further the face is rotated away from the frontal view.
- Subjects make more errors when the face is turned to the left side.

$E(-x \text{ deg}) - E(+x \text{ deg})$
 < 0 more errors to the right
 > 0 more errors to the left

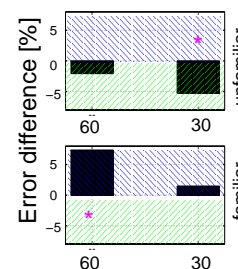
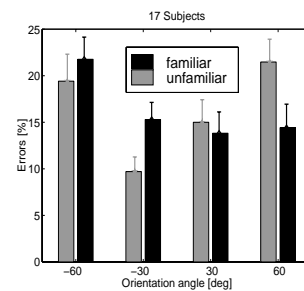
Experiment 2

Q: Is the asymmetrical performance due to the slight asymmetry in the face?

->We made all faces symmetrical.

Symmetrical Faces

Factors: Familiarity (familiar, unfamiliar), Orientation (-60 deg, -30 deg, +30 deg, +60 deg)
N = 17



- For symmetrical faces subjects' performance show different results for familiar and unfamiliar faces.
- For familiar faces subjects show the same behavior as for normal faces: they make more errors when the face is rotated to the left.
- For unfamiliar faces the behavior is reversed to the contrary: Subjects make more errors when the unfamiliar symmetrical face is turned to the right.

3 RESULTS

Experiment 3

Q: Is the effect due to the location of presentation in the visual field?

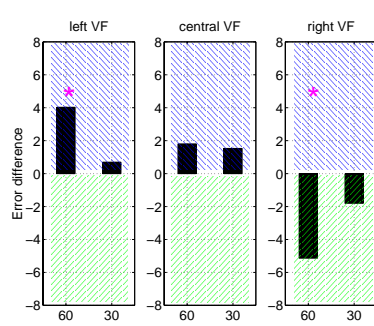
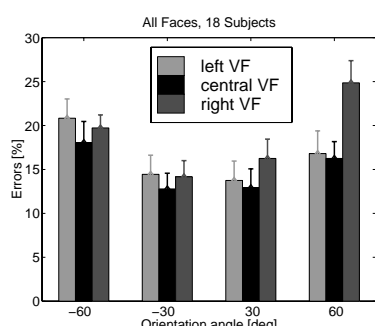
->The rotated face is presented in the left, right, or central visual field (+/- 2.6 deg).

Q: Is the selection of faces biased?

->Two groups of subjects learned a different set of ten familiar faces.

Visual Field

Factors: Group (Set 1, Set 2), Familiarity (familiar, unfamiliar), Visual Field (central, left, right), Orientation (-60 deg, -30 deg, +30 deg, +60 deg)
N = 18



- There was no effect of the set of faces used.
- When faces are presented in the central visual field, subjects make less errors than when they are presented in the left or the right visual field and there is a tendency that presentation in the right visual field leads to a lower performance than a presentation in the left visual field.
- Subjects make more errors for left rotated faces when they are shown in the central and left visual field. In the right visual field however subjects make more errors for right rotated faces.

4 CONCLUSIONS

- From Experiment 1 we conclude, that there is indeed a difference in our ability to recognize a person depending on the side of the face we see. In accordance with Burt and Perrett's results that perception of faces is biased to the left side of a face our results show that people make more errors when they cannot see the left side of the face (-x deg rotation).
 - From Experiment 2 we conclude, that the asymmetry per se in a face is not the origin of the asymmetrical performance but rather that the analysis of familiar and unfamiliar faces differs.
 - From Experiment 3 we conclude that the right hemisphere is the specialized face processing hemisphere since presentation of faces in the left visual field results in the same behavior as presentation of faces in the central visual field.
 - Subjects make more errors for right rotated faces when they are either unfamiliar or presented in the right visual field.
 - It is still not clear whether a symmetrical object is coded asymmetrically.
- Since the effect in general is quite small can we get more significant results for the observed asymmetries with more subjects?
- Is there a difference in the task for familiar and unfamiliar faces because the coding of the faces is different?

References:

- Burt, D. M. and Perrett, D. I., 1997, *Neuropsychologia* 35, 685-693.
 Rhodes, G., 1985, *Brain and Cognition* 4, 197-218.
 Gilbert, C. and Bakan, P., 1973, *Neuropsychologia* 11, 355-362.