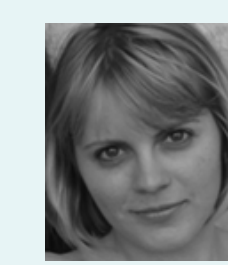
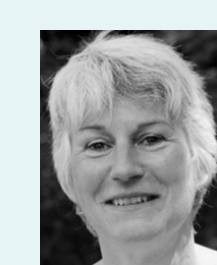




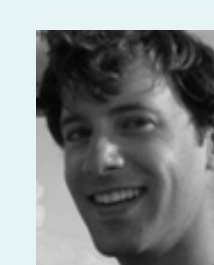
The role of featural and configural information for perceived similarity between faces – A stimulus set



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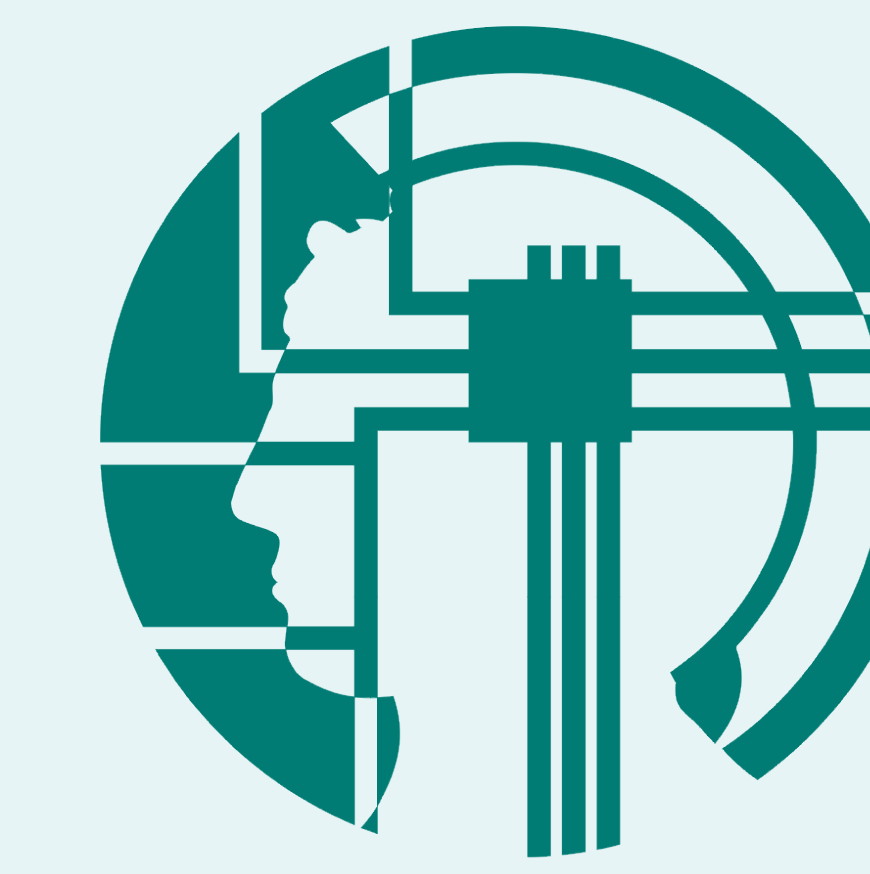
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Motivation for the stimulus set

- Featural and configural information are important for face perception [1].
- We want to create a face stimulus set with which we can directly compare participant sensitivity to changes of featural or configural information.
- Therefore we created a 3D face stimulus set with controlled parametric changes in features and configuration.
- We plan to use this stimulus set to test populations for which we expect different sensitivities to features and configuration. (e.g. Prosopagnosics, other race effect)

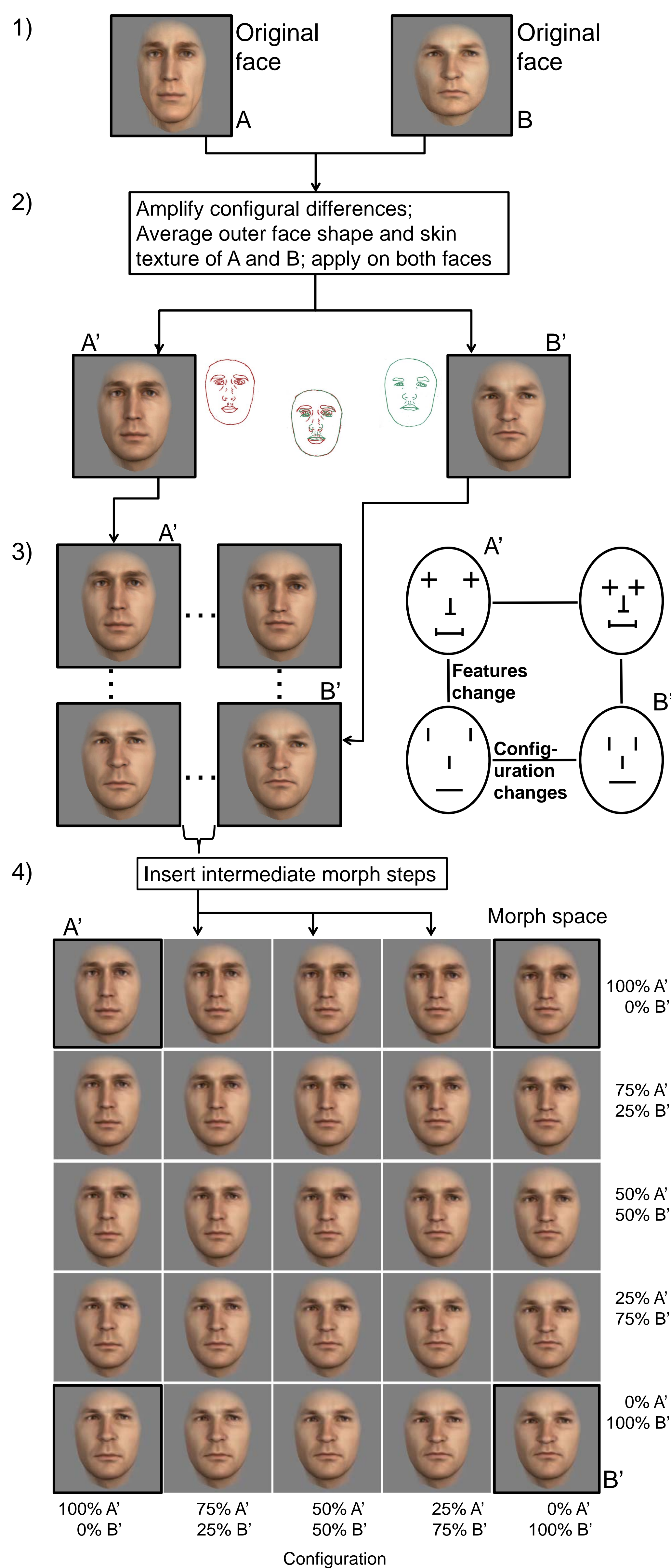
Features of the stimulus set

- 8 pairs of male 3D faces.
- Both faces in a pair share the same face shape and skin texture.*
- Faces in each pair differ only in internal features and their configuration.*
- No facial hair, glasses, jewelry or make-up.
- Parametric control over changes of features and configuration.*
- Rotation in all planes in all possible angles.*
- Different lighting conditions and fading of borders.

* These are differences to another database created by Van Belle et al [2]:

A stimulus set of 15 pairs of male-face stimuli in 7 in-depth orientations for investigating configural versus featural mechanisms of face processing.

Stimulus creation



- For each pair **two original faces** (A and B) of our 3D face database [3] were used.
- Configural differences were amplified**, because faces which differ in configuration are perceived as more similar than faces with different features [1].

Additionally **face shape and skin texture were averaged** between both original faces. Now A' and B' just differ in internal features and their configuration.

We were careful to stay within limits of naturalness. (see box “Naturalness verification”)

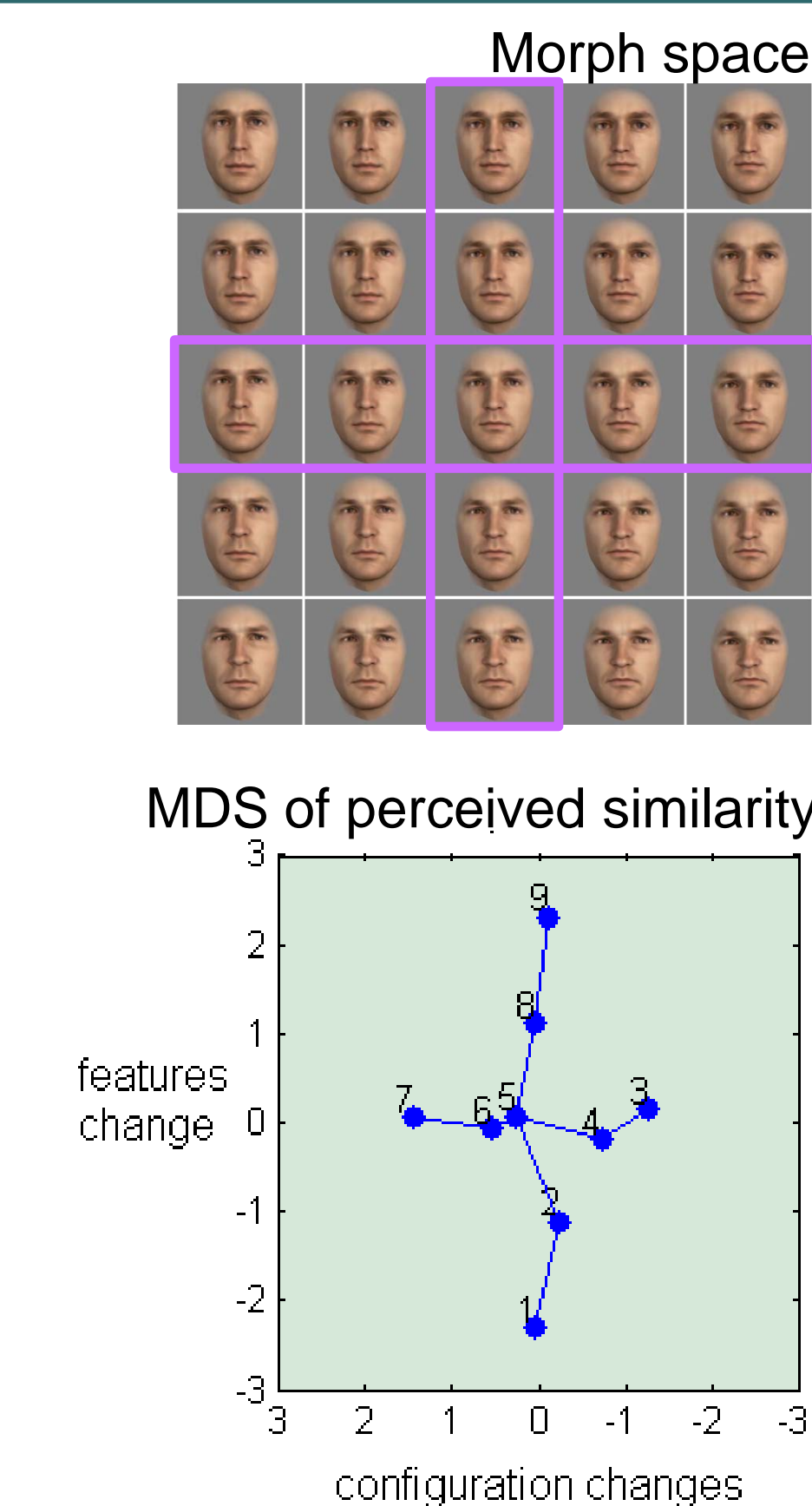
- Based on A' and B' we **created two “mixed” faces** which either have the internal features of A' and the configuration of B' or vice versa.
- After these “end point” faces were created, we spanned a **morph space with intermediate steps** of parametrical changes of features, configuration or both.

References

- The role of featural and configural information for face perception: [Tanaka and Farah, 1993]; [Yovel and Duchaine, 2006]; [Rotshtein et al, 2007]
- Paper about another stimulus set: [Van Belle, De Smet, De Graef, Van Gool, and Verfaillie 2009]
- Face database of the MPI: [Troje and Bühlhoff, 1996]; [Blanz and Vetter, 1999]

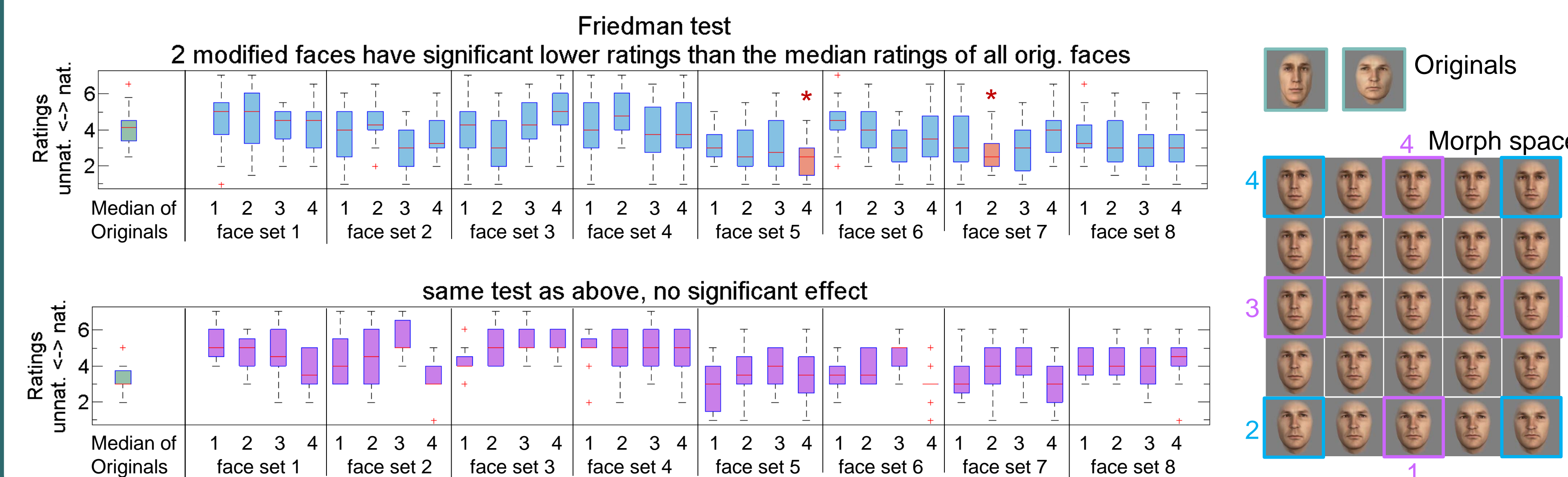
Experiment: configuration vs. features

- Goal:** to test the sensitivity of humans to featural and configural information in faces of the stimulus morph space.
- Task:** For all 8 face sets 24 participants rated the pair wise similarity of some chosen faces on a Likert scale from 1 (most dissimilar) to 7 (identical).
- Results:**
 - All changes in our stimulus set were perceived.
 - For our stimulus set changes in features were perceived to be greater than changes in configuration.



Stimuli: Naturalness verification

- Goal:** to verify that the modified faces are still perceived as natural despite the changes of configuration, face shape and skin texture.
- Task:** For all 8 face sets participants rated the naturalness of the 2 original faces and the 4 “end point” faces or the 4 outer middle faces of the morph space. A Likert scale from 1 (unnatural) to 7 (natural) was used.
- Results:** Most of our created face stimuli were rated as natural as the original faces.



Conclusions

- The vast majority of the created **stimuli are perceived as natural**.
- Participants could perceive the differences in configuration and features.
- Participants were **less sensitive to configural changes** of our stimuli than to featural changes.