



The contribution of texture and shape to face after-effects for identity and age

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INTRODUCTION:

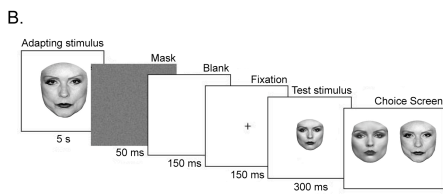
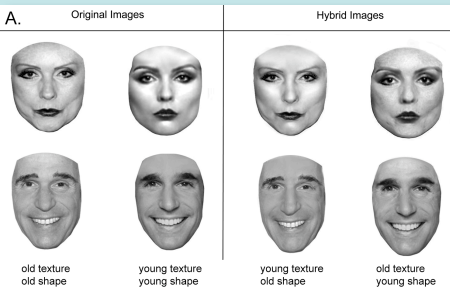
Faces have both shape and texture. Evidence from reflectance maps and laser-scanned head shapes show that both can support identity judgments. Aging also imparts both shape and skin changes.

QUESTION: What is the *relative* contribution of shape and texture to the representations we encode of different types of face information (age, identity)?

STRATEGY: COMPONENT ADAPTATION

TECHNIQUE - compute aftereffects generated by contrasts between two faces that differ in one aspect (e.g. shape) but hold the other constant (e.g. texture), and vice versa.

Need to make **HYBRID IMAGES** for this:



EXPERIMENT 1: AGE AFTER-EFFECTS

14 subjects

2 faces: Debbie Harry, Harry Winkler
Real young and old faces across years

4 adapting conditions:

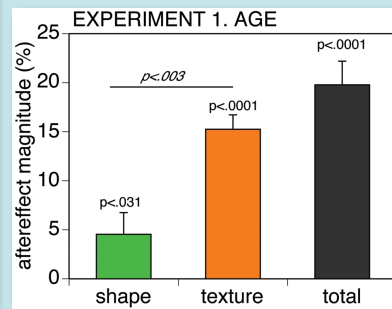
- Young texture / young shape
- Old texture / old shape
- Young texture / old shape
- Old texture / young shape

SUBTRACTIONS:

Total aftereffect = a-b
Texture aftereffect = $0.5 * [(a-d) + (c-b)]$
Shape aftereffect = $0.5 * [(a-c) + (d-b)]$

RESULTS:

77% due to texture
23% due to shape



EXPERIMENT 2: IDENTITY AFTER-EFFECTS

14 subjects

2 faces: young and old Julie Andrews, Jane Fonda

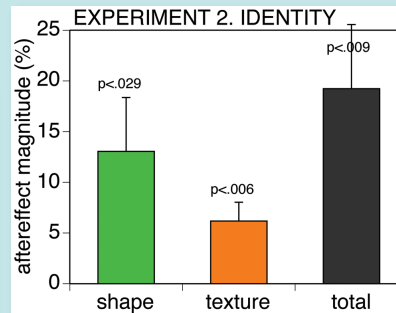
4 adapting conditions

- Andrews texture / Andrews shape
- Fonda texture / Fonda shape
- Andrews texture / Fonda shape
- Fonda texture / Andrews shape

RESULTS:

32% due to texture
68% due to shape

Difference between Exp 1 and Exp 2 significant ($t_{(13)} = 3.65, p < .006$)

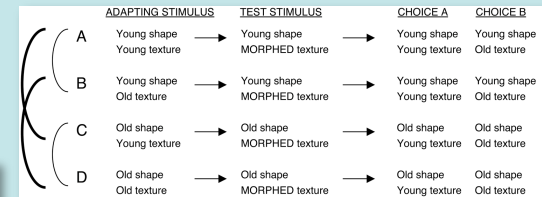


EXPERIMENT 3: TRANSFER BETWEEN TEXTURE & SHAPE

QUESTION: can texture create aftereffects for shape and vice versa? If so, this would suggest that the two are integrated in a common representation.

STRATEGY:

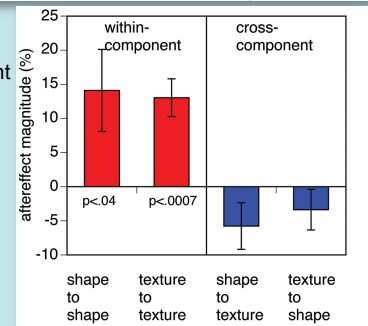
- use test stimuli that are morphed in only one of texture or shape (c.f. Exp 1 and 2).
- Keep the unmorphed dimension constant across test and choice display faces.
- Subtractions reveal within- and cross-component aftereffects:



RESULTS

1. Significant within-component aftereffects

2. No cross-component aftereffects



CONCLUSIONS:

- Texture and shape contribute differently to representations of age and identity
- Texture dominates for age representation
- Age aftereffects arise at a level where texture and shape are represented independently