The use of facial motion and facial form during the processing of identity

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Presented by: Yinan Fan 2007-3-29

Face

- Static?
- Dynamic? =>facial motions

Facial Motion?

- Two Hypothesis:
  - Representation enhancement
    - Help build 3D faces
  - Supplemental information
    - Idiosyncratic signature of independent source of information
- Dependent factors:
  - Type of facial motion
  - Degree of familiarity with the faces
  - Viewing condition

Weighted factors?

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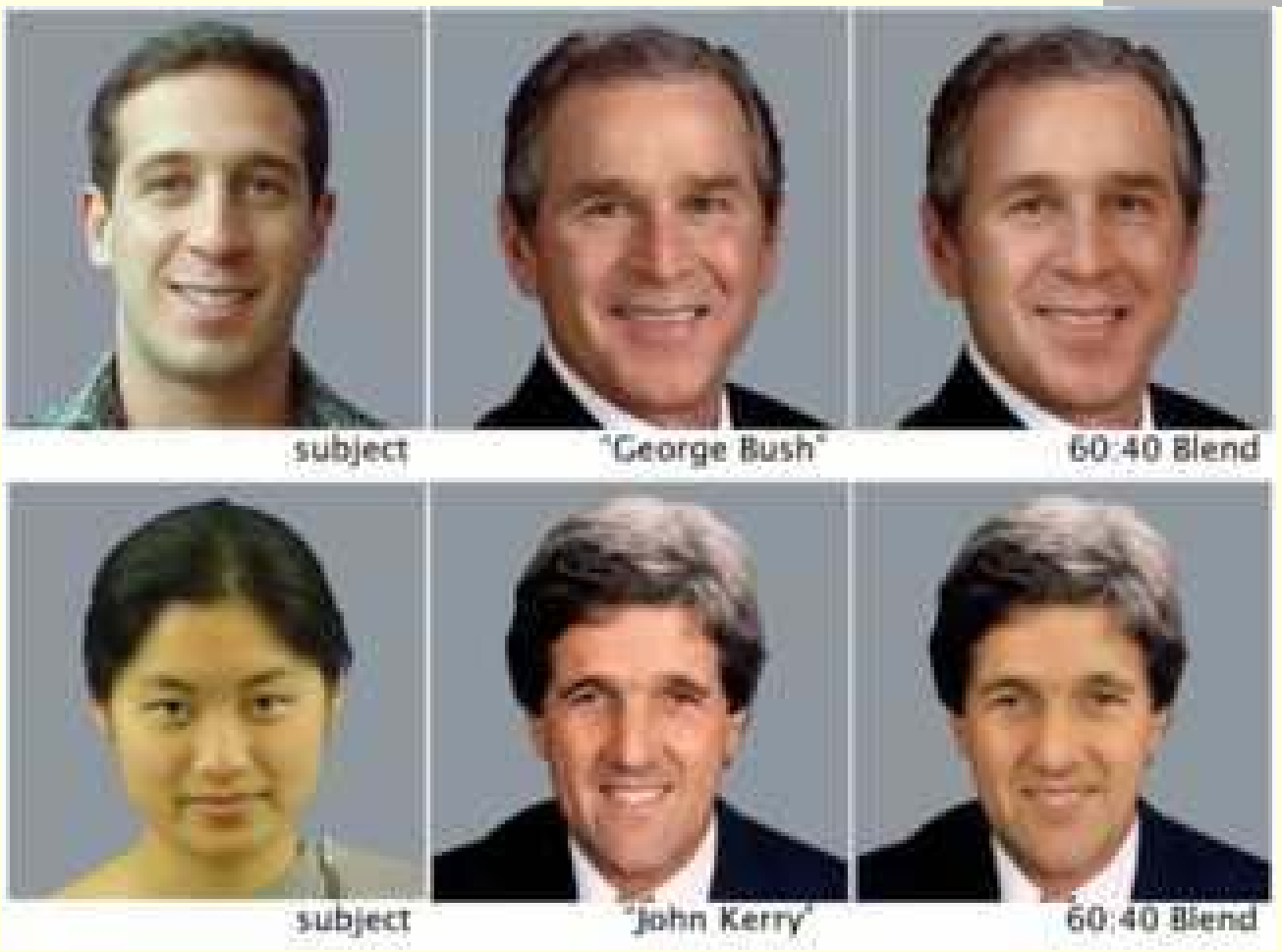


Facial Motion

- Two categories
  - Rigid motion
  - Non-rigid motion
- Facial Form:= unchangeable aspects

  Facial Motion:=deformable over time
- Investigate the integration of facial motion and facial form, the relavance of form cues

General Methods

- Participants
- Laser scanned heads and morphing techniques
- Motion capture and animation
- Training Procedure
- Testing Procedure

General Methods

- Participants
  - Exp1: 16m/13f
  - Exp2: 12m/15f
  - Exp3: 7m/9f
  - Exp4: 7m/9f
  - No repetition

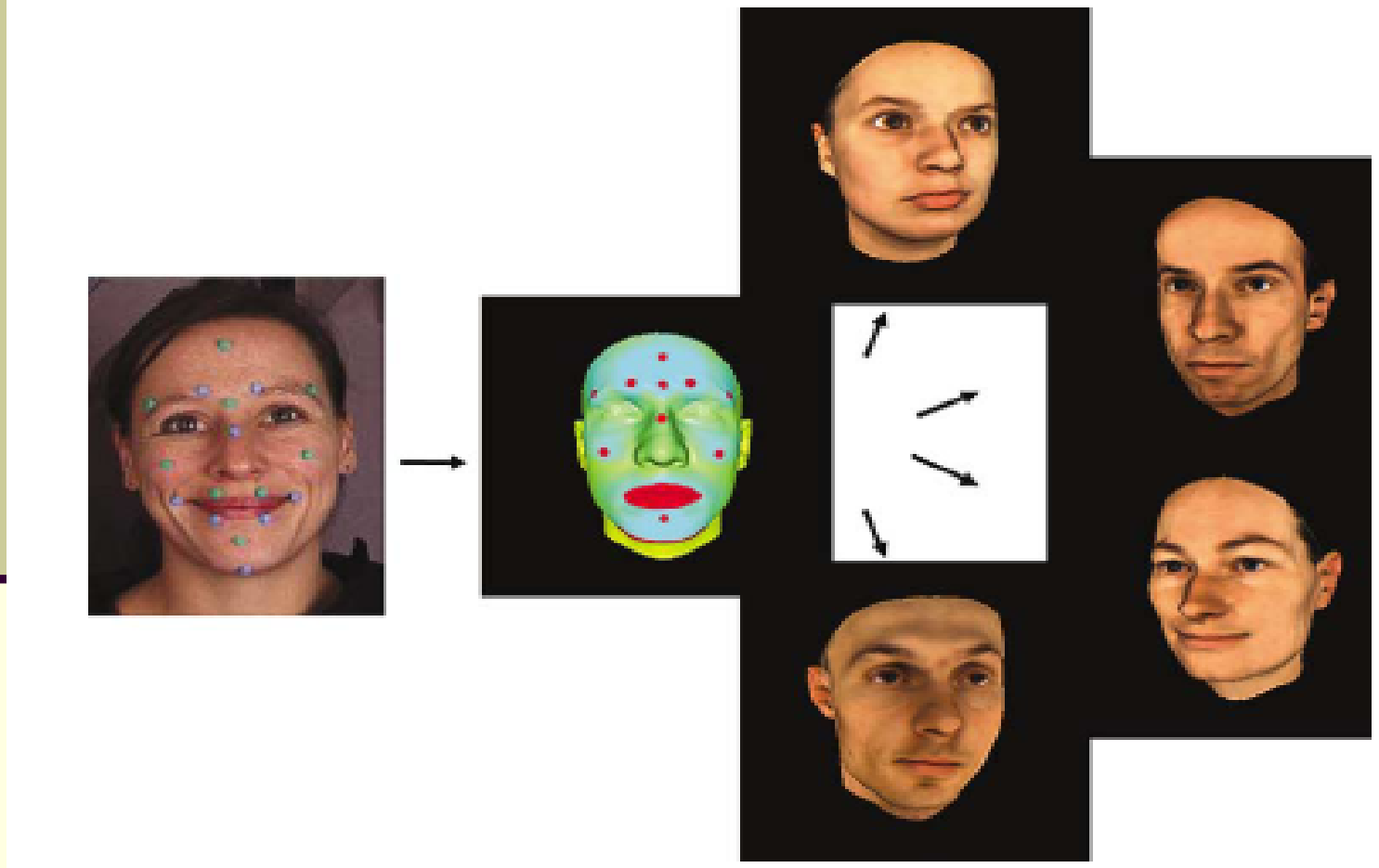
General Methods

- Participants
- Laser scanned heads and morphing techniques

General Methods

- Participants
- Laser scanned heads and morphing techniques
- Motion capture and animation
  - Real actors trained for facial expression
  - Markers tracked from 25f/s clilps (by famous3D Pty. Ltd :)
  - Motion patters applied to 3D models of human faces

Animation Techniques



General Methods

- Participants
- Laser scanned heads and morphing techniques
- Motion capture and animation
- Training Procedure
  - Questionnaire assessing personality traits

General Methods

- Participants
- Laser scanned heads and morphing techniques
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Experiment 1

- Purpose
- Stimuli and Procedure
- Results
- Discussions

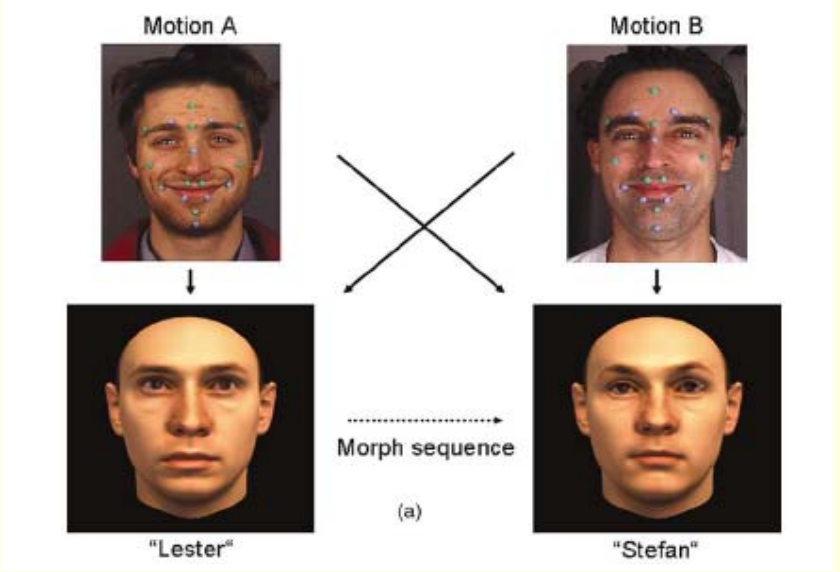
Experiment 1

- Purpose:

  establish whether incidentally learned facial motion patterns would bias perception

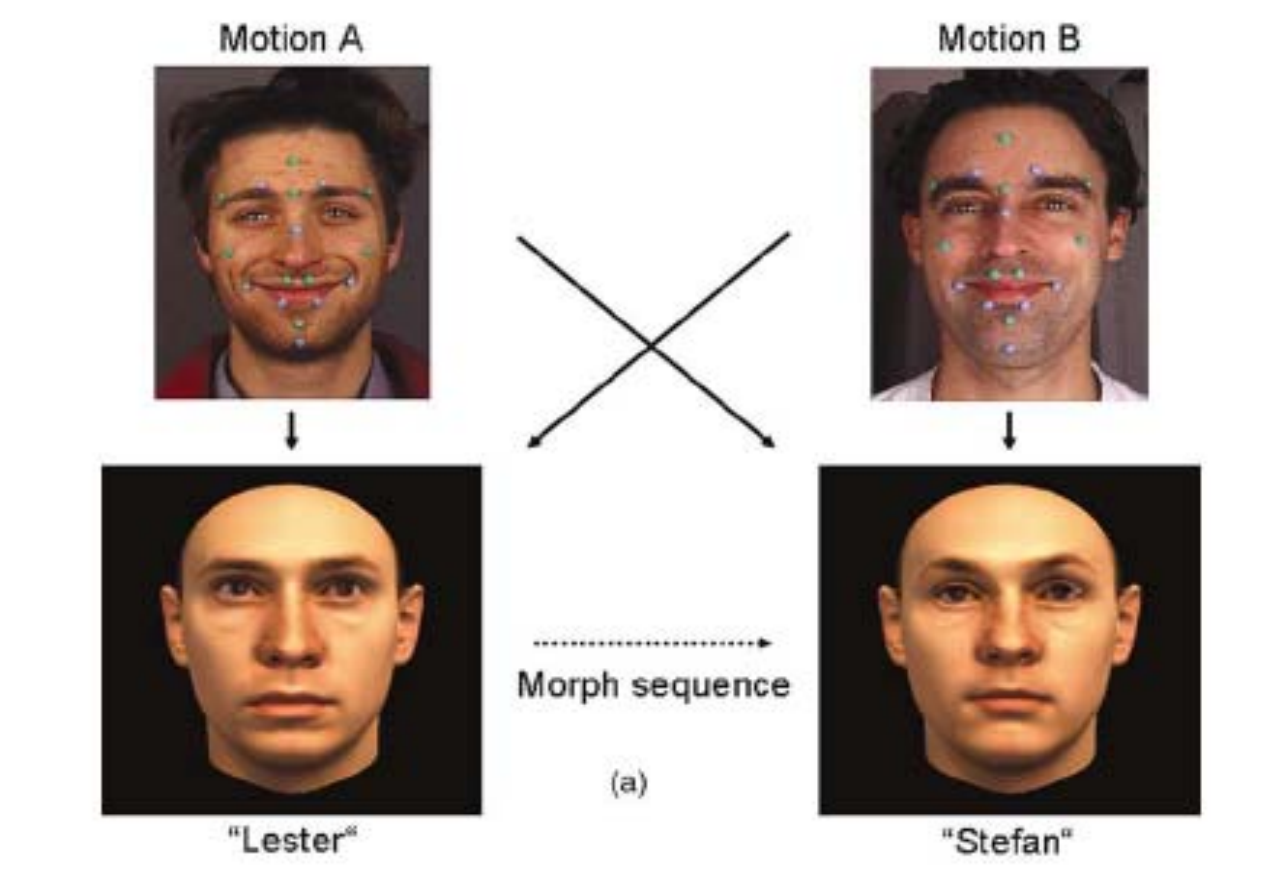
Experiment 1

- Purpose
- Stimuli and Procedure



Simuli

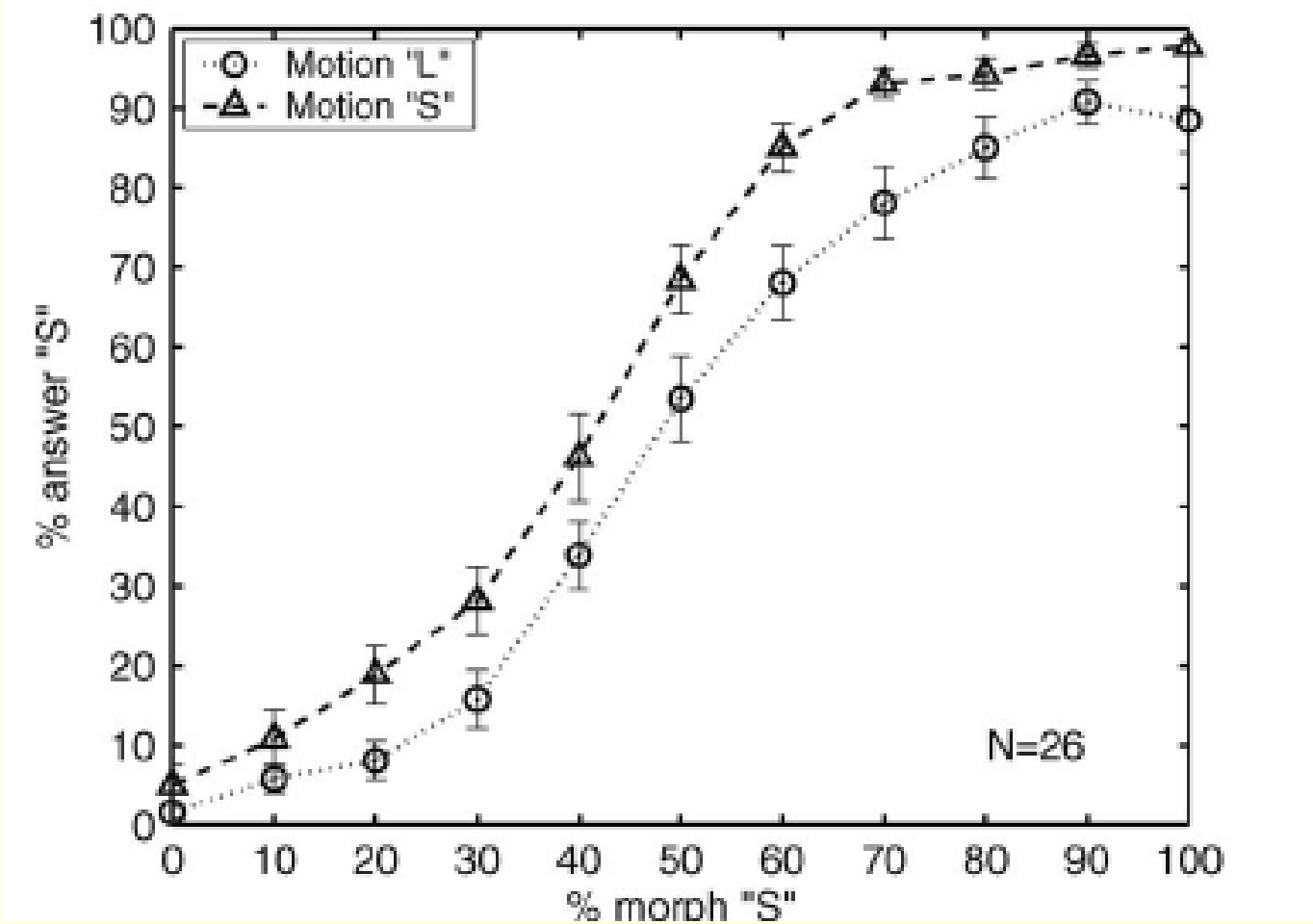
Procedure



Experiment 1

- Purpose
- Stimuli and Procedure
- Results

Results


Motion "L"
Motion "S"
% answer "S"
% morph "S"
N=26
0
10
20
30
40
50
60
70
80
90
100

Result

Table 1

Experiment 1: Mean PSE, P25, P75 values (% form from face "S" in the morph) collapsed across observers for male and female face pairs

Face pair		Motion "L"	Motion "S"	Difference	*t*	*df*	*p*
Male	P25	34.9 (SE 3.2)	20.9 (SE 5.2)	14.1	1.9	11	0.0409
	PSE	53.2 (SE 5.1)	36.2 (SE 3.3)	17.0	2.3	11	0.0225
	P75	71.5 (SE 7.6)	51.5 (SE 2.8)	20.0	2.5	11	0.0140
Female	P25	39.6 (SE 3.4)	25.4 (SE 7.0)	14.2	1.5	13	0.0745
	PSE	54.5 (SE 4.3)	41.1 (SE 3.0)	13.4	2.0	13	0.0310
	P75	69.4 (SE 5.9)	56.8 (SE 2.7)	12.6	2.8	13	0.0082
Collapsed (male and female)	P25	37.4 (SE 2.3)	23.3 (SE 4.4)	14.2	2.4	25	0.0123
	PSE	53.9 (SE 3.3)	38.8 (SE 2.3)	15.1	3.1	25	0.0024
	P75	70.3 (SE 4.7)	54.4 (SE 2.0)	16.0	3.7	25	0.0006

Experiment 1

- Purpose
- Stimuli and Procedure
- Results
- Discussions

Experiment 2

- Purpose:

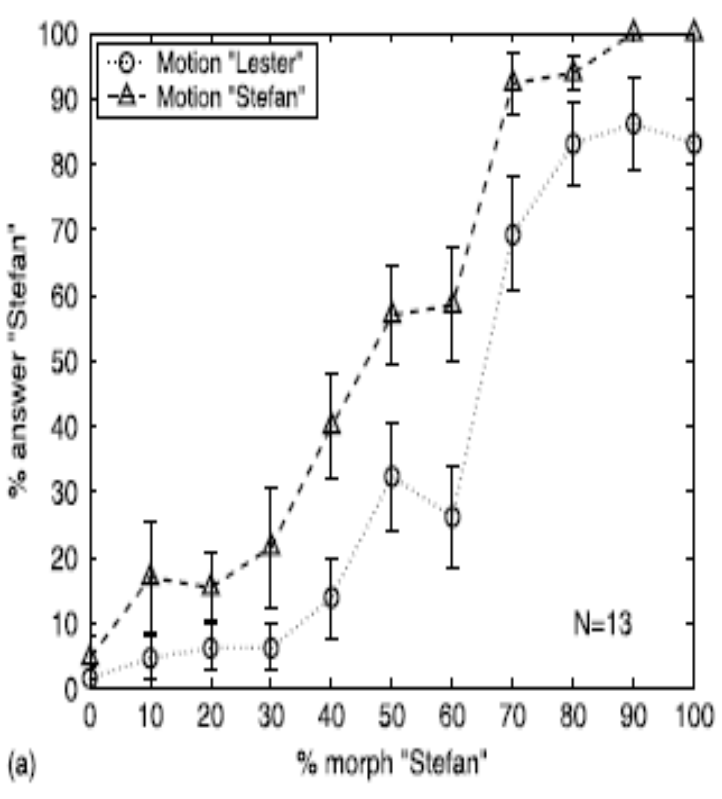
  More natural conditions

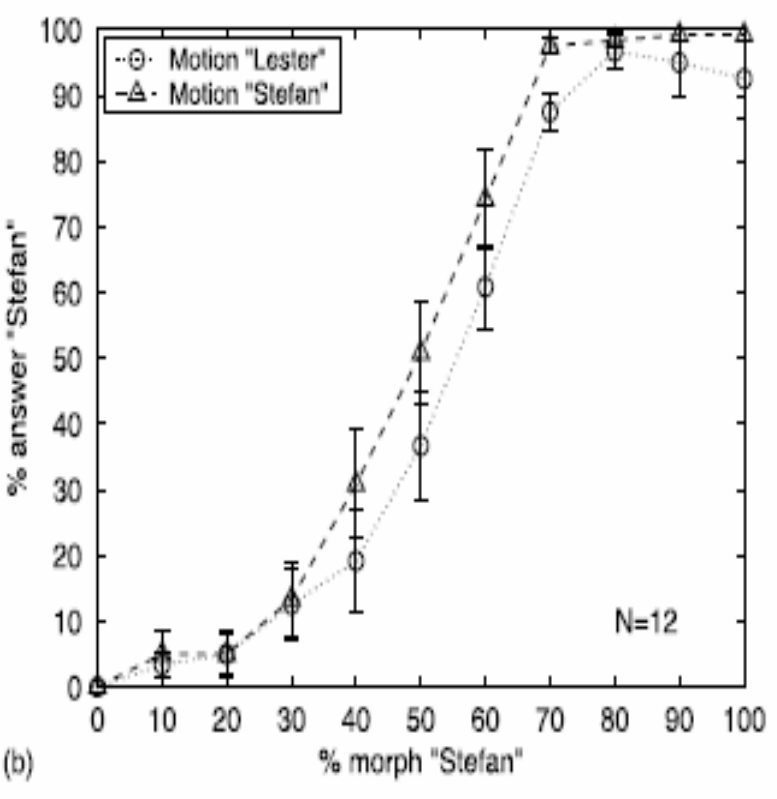
  Exp2a: Original inner features

  Exp2b: Indivisual skin texture applied

- Stimuli and Procedure:
  - Each morph only five times

Results


Motion "Lester"
Motion "Stefan"
% answer "Stefan"
% morph "Stefan"
N=13
(a)


Motion "Lester"
Motion "Stefan"
% answer "Stefan"
% morph "Stefan"
N=12
(b)

Results

Experiment 2a: Mean PSE, P25, P75 values (% form from face "S" in the morph) collapsed across observers

	Motion "Lester"	Motion "Stefan"	Difference	$t(12)$	p
P25	51.3 (SE 5.6)	28.6 (SE 7.2)	22.7	2.3	0.020
PSE	66.8 (SE 5.9)	42.9 (SE 5.0)	23.9	2.4	0.016
P75	82.3 (SE 7.6)	57.2 (SE 3.8)	25.1	2.5	0.015

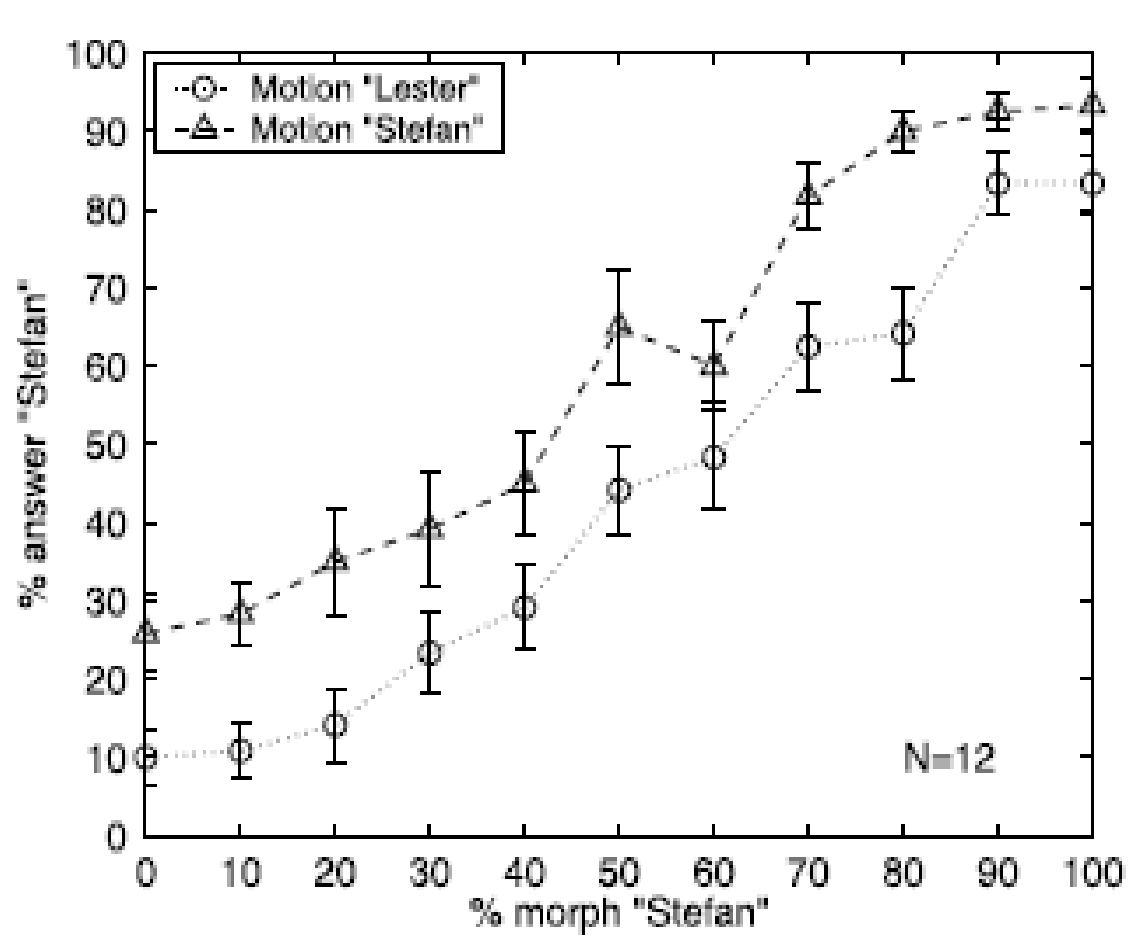
Experiment 2b: Mean PSE, P25, P75 values (% form from face "S" in the morph) collapsed across observers

	Motion "Lester"	Motion "Stefan"	Difference	$t(11)$	p
P25	42.7 (SE 3.4)	38.8 (SE 3.9)	3.9	1.95	0.038
PSE	55.3 (SE 3.6)	47.7 (SE 2.9)	7.7	1.88	0.044
P75	68.0 (SE 6.3)	56.5 (SE 2.2)	11.4	1.71	0.058

Experiment 3

- Purpose
  - Upside down face
- Simuli and procedure
  - Trained as in Exp2, tested upside down

Results


Motion "Lester"
Motion "Stefan"
% answer "Stefan"
% morph "Stefan"
N=12
0
10
20
30
40
50
60
70
80
90
100

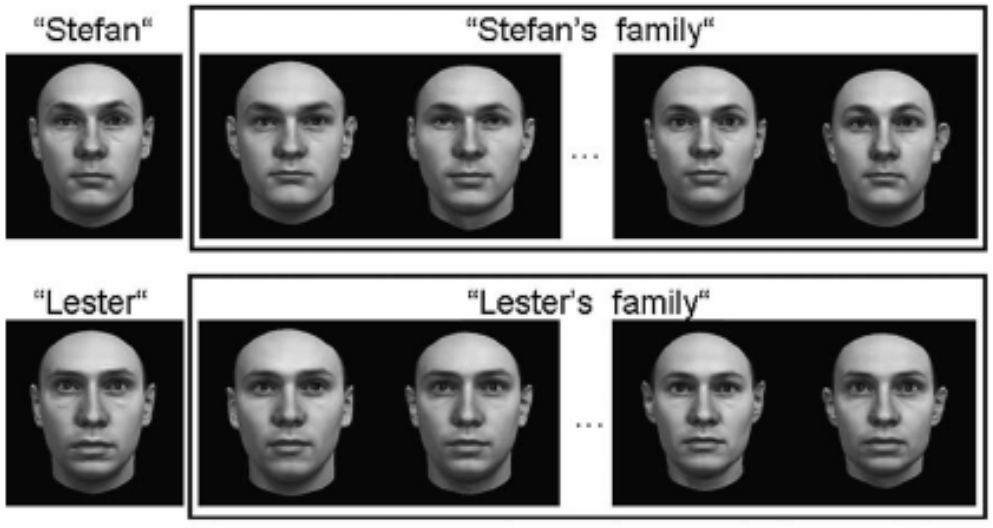
Results

Experiment 3: Mean PSE, P25, P75 values (% form from face "S" in the morph) collapsed across observers

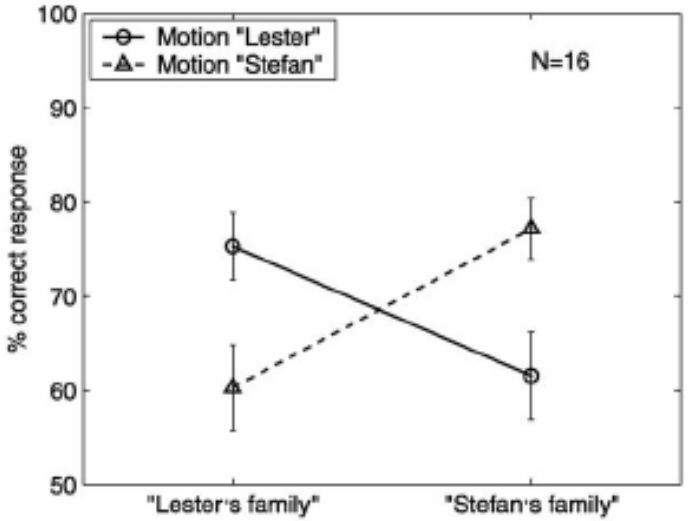
	Motion "Lester"	Motion "Stefan"	Difference	$t(11)$	p
P25	29.3 (SE 7.8)	10.6 (SE 4.4)	18.7	2.1	0.033
PSE	59.3 (SE 4.2)	37.1 (SE 4.7)	22.2	2.9	0.007
P75	89.3 (SE 5.8)	63.7 (SE 6.2)	25.7	3.2	0.004

Experiment 4

- Purpose:
  - “Family resemblance” task
  - To eliminate effects on subtle features in the animated face
- Stimuli and Procedure



Results



(b)

Experiment 4: Family resemblance

Facial form	Facial motion "Lester"				Facial motion "Stefan"			
	% Correct	SE	$t(15)$	p	% Correct	SE	$t(15)$	p
New + 50% "Lester"	75.3	3.6	7.1	$p < 0.001$	60.3	4.6	2.3	$p = 0.038$
New + 50% "Stefan"	61.6	4.7	2.5	$p = 0.026$	77.2	3.3	8.3	$p < 0.001$

Percent correct responses (i.e. response "Lester's family" when facial form was morphed with "Lester") averaged across observers ($n = 16$). The t-values were calculated to asses whether performance was above chance level (50%).

Finally…

- Conclusion:
  - Non-rigid facial motion biased observer's perception of identity

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- Discussion?