


CONCLUSIONS

(i) Our results suggest whole (real) faces are processed in part before the processing of local facial features

Local feature search asymmetry is determined by facial context

Face inversion adversely affects search speeds

(ii) Phenomenologically more distinct stimuli may not result in faster search

(iii) Facial expression requires serial search

(iv) Our minimal cartoon faces are fundamentally different than real faces

Facial context does not affect feature search

Face inversion has no effect
(i) CONTEXT IN CARTOON FACES HAS NO EFFECT ON SEARCH

No asymmetry between search for upright and inverted mouths.

(ii) ORIENTATION OF CARTOON FACES HAS NO EFFECT

Search times for upright and inverted cartoon faces do not significantly differ.


(iii) SEARCH IS FASTER WITHOUT CARTOON FACE CONTEXT

The addition of facial context slows search times.

No difference between upright and upside down cartoon faces.

Suggests it is not the face per se that slows search, but the extra lines.
No asymmetry between an upside-down smiling [C5] or frowning [C6] cartoon face (p > 0.17).

Search in upside-down cartoon faces [C5 & C6] is slower than isolated cartoon mouths [C1 & C2] (p < 0.0006), but not upright cartoon faces [C3 & C4] (p > 0.272).
No asymmetry between a smiling [C3] or frowning [C4] cartoon face (p > 0.76).

Search in upright cartoon faces [C3 & C4] is slower than for isolated mouths [C1 & C2] (p < 0.006).
No asymmetry searching for an normal [C2] or an inverted cartoon [C1] mouth in isolation (p > 0.98).
EXPERIMENTS: CARTOON FACES

(i) MOUTH ALONE [Experiments C1 & C2]

Target: NORMAL MOUTH

Distractor: INVERTED MOUTH

(ii) UPRIGHT FACE [Experiments C3 & C4]

Target: NORMAL MOUTH in UPRIGHT FACE

Distractor: INVERTED MOUTH in UPRIGHT FACE

Inverting mouth in cartoon faces alters appearance of entire face less than for real faces.

(iii) UPSIDE-DOWN FACE [Experiments C5 & C6]

Target: NORMAL MOUTH in UPSIDE-DOWN FACE

Distractor: INVERTED MOUTH in UPSIDE-DOWN FACE

Inverting mouth in an upside-down cartoon does not alter appearance of entire face.
CARTOON FACES

- Experiments run with cartoon faces
- Much less complex than real faces
- Altering of local feature (mouth) alters perception of face as a whole much less than for real faces (See PANEL 9 - ⭐).
(ii) FACIAL EXPRESSION FAILS TO POP OUT

- Upright faces **phenomenally** more different than isolated mouths (See PANEL 2)
- **Visual search** with faces is slower than with isolated mouths
- Suggests overall facial expression requires attention
  
  *Purcell, Stewart & Skov (1996) also report no pop-out for facial expression*

(iii) SEARCH IS FASTER FOR UPRIGHT FACES

Search in upright faces is faster (agrees with Tong & Nakayama, 1996)

A upright face facilitates search as a normal letter does (*i.e.* \( \mathfrak{H} \) vs. \( \mathfrak{N} \))
(i) LOCAL FEATURE SEARCH (MOUTH) IS ALTERED BY CONTEXT (FACE)

(A) SEARCH FASTER WHEN NORMAL STIMULUS IS DISTRACTER

Search is faster:

[Richards & Reicher (1978) and Wang & Cavanagh (1994)]

• Distractor: Normal (e.g. Looking for an H in N’s)
• Target: Abnormal

‘Normal’ for our mouths can be defined 2 ways:

• Relative to gravity
• Relative to the face

(B) CONTEXT DETERMINES SEARCH ASYMMETRY

Search faster when distractor’s mouth is inverted relative to the face, not to gravity

The importance of facial context:
Result holds for upright and upside-down faces
Asymmetry between an upside-down normal-mouth [F5] or inverted-mouth [F6] real face (p > 0.013).

Search with upside-down real faces [F5 & F6] is slower than for isolated real mouths [F1 & F2] (p < 0.0001) and for upright faces [F3 & F4] (p < 0.002).
Asymmetry between a normal [F3] or inverted-mouth [F4] real face (p < 0.038).

Search with upright real faces [F3 & F4] is slower than with isolated real mouths [F1 & F2] (p < 0.0006).
Normal [F1] vs. inverted [F2] isolated real mouth target (p > 0.32).
EXPERIMENTS: REALISTIC FACES

(i) MOUTH ALONE
   [Experiments F1 & F2]
   
   Target: NORMAL MOUTH
   Distractor: INVERTED MOUTH

(ii) UPRIGHT FACE
    [Experiments F3 & F4]
    
   Target: NORMAL MOUTH in UPRIGHT FACE
   Distractor: INVERTED MOUTH in UPRIGHT FACE

   Inverting mouth alters appearance of entire face, enhancing phenomenal difference between target and distractor. (Notice the eyes)

(iii) UPSIDE-DOWN FACE
     [Experiments F5 & F6]
     
   Target: NORMAL MOUTH in UPSIDE-DOWN FACE
   Distractor: INVERTED MOUTH in UPSIDE-DOWN FACE

   Inverting mouth in an upside down face does not alter appearance of entire face.
INTRODUCTION

Does enhancing the *phenomenal difference* between a target and distractor necessarily *facilitate* visual search?

*Real Faces* seem to be processed as a unit:

- Inverting the mouth of a smiling face changes perception of other features - e.g. the eyes appear to be glaring (See PANEL 2 - )
- Upside-down faces are processed slower than upright faces

Results aren’t as clear for *Schematic Faces*:

- Suzuki & Cavanah (1995): Upside-down face processed slower

Our experiments probe:

- The effects of global context (real and schematic faces) on search for a local feature (mouth orientation).
- The equivocal results for schematic faces.