Idiosyncratic Visual Information Strategies do not Abolish the Face Inversion Effect

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Face recognition: we are all quite good at it
The recognition of faces is disproportionately impaired by inversion relative to the recognition of most mono-oriented objects:

**the Face Inversion Effect** (FIE - Yin, 1969)
But why…

• **Qualitative explanation**: Inversion disrupts the holistic face processing (Farah, Drain & Tanaka, 1995; Tabaka & Farah, 1993 & 2003)

• **Quantitative explanation**: Processing of upright and inverted face are the same except less efficient for the inverted faces (Sekuler et al., 2004)

Still an ongoing debate…
Culture shapes how we look at faces

Modified from Miellet et al., 2012
Dynamic Spotlight

- A gaze contingent technique first employed by Miellet et al. (2013).
Different information sampling

Miellet et al., 2013
Dynamic Spotlight

• A 2° Gaussian aperture with a zero alpha value (complete transparent) at the center was centered on the observer’s fixation.

• The expanding rate is 1° of visual angel every 12 ms while the fixation lasts.
Delayed Matching Task

Trial Procedure:
- 300ms
- 200ms
- 1100ms
- 600ms

Options:
- Natural Viewing
- Expanding Spotlight

Until Response:
- Natural Viewing
- Expanding Spotlight
Behvioural Results

N=40
Eye Movement Results

Upright

Inverted

Contrast

N=40
Flexible eye movement strategy

- Modulated by culture and not nature
- Modulated by the location of the first fixation (Hybrid – Miellet, Caldara & Schyns, Psych Sci 2011)
- As effective for Face Recognition
Flexible eye movement strategy
A Bayesian Generative model
Defining Global/Local strategies

- Calculate the global-local index for each subject in the natural viewing upright condition.

- Using K-means to cluster all subjects into 2 groups (global & local)
Similarity of eye movement pattern

Global (40%)

Local (60%)
Accuracy: Global vs. Local

Global Group

Local Group

N=16

N=24
Global Group

Upright  Inverted  Contrast

N=16

Qualitative shift
Local Group

Upright

Inverted

Contrast

Quantitative shift

N=24
Conclusions

• The face recognition system relies on flexible information sampling strategies to achieve effective face recognition (Global vs Local)

• The Face Inversion Effect is insensitive to idiosyncratic visual information sampling strategies

• Fixation density maxima showed both qualitative (global) and quantitative (local) changes in the information sampling

• Decrease of information use during face inversion
Thanks!
strategy change in Inversion

Scale changes

Original LG scale