The Facespan: Isolating the perceptual span for face recognition

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The Perceptual Span in reading

Faces are one of the first stimulus processed by newborns.

How much can be read in a single fixation?

Woodworth (1938)

What minimal quantity of information is needed at each fixation in order to reach a normal

McConkie & Rayner (1975)
The Perceptual Span in reading

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The Perceptual Span in reading
The Perceptual Span in reading
Les visages sont un des premiers stimulus visuel traité par le nouveau-né.
What about faces?

- Research in face processing has mainly focused on the nature and computation of the face representations (featural, configural, holistic).
- Few is known about the quantity of information extracted during face recognition at each fixation.
Current project

• What minimal quantity of information is needed at each fixation in order to reach a normal face recognition performance?

the Facespan
Spotlight
Gaze-contingent moving window for faces
Spotlight
Gaze-contingent moving window with faces
Gaze-contingent
Old-New task

Natural Vision

Spotlight

Recognition (28 faces)
14 old & 14 new

Learning
14 faces
Preliminary results (120 participants)

No modulation of Spotlight on Fixation Pattern

Spotlight

Natural Vision

Average Face 9° 10° 11° 12° 13° 14° 15° 16° 17° Natural Vision

Cohen's d

Effect of Spotlight on performance in function of Spotlight Size

Preliminary results (120 participants)
Preliminary results over 120 participants

Effect of Spotlight on performance in function of Spotlight Size

Cohen's d

Spotlight Size

H0
Reconstruction

Reconstruction

Statlight

Natural Vision

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Statistical Pixel test (RFT) showed Area significantly preserved from Natural Vision with a 17° Spotlight
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Reconstruction

6.5° of estimate preserved information from natural vision with a 17° Spotlight
Conclusion

• A 6.5° Facespan allows to sample all internal features from cumulative fixation on eyes and mouth

• Benchmark to study how the quantity of information intake is modulated by multiple contraints such as culture, development, or neurological disorders
Thank you for your attention!
And Bon appétit !
17° Gaussian Aperture