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The Facespan: Isolating the perceptual span for face recognition

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The Perceptual Span in reading

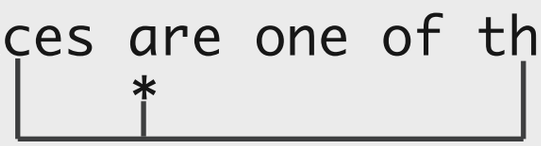
Faces are one of the first stimulus processed by newborns.

How much can be read in a single fixation ?
Woodworth (1938)

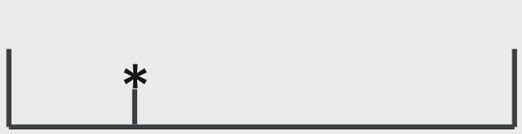
What minimal quantity of information is needed at each fixation in order to reach a normal

McConkie & Rayner (1975)

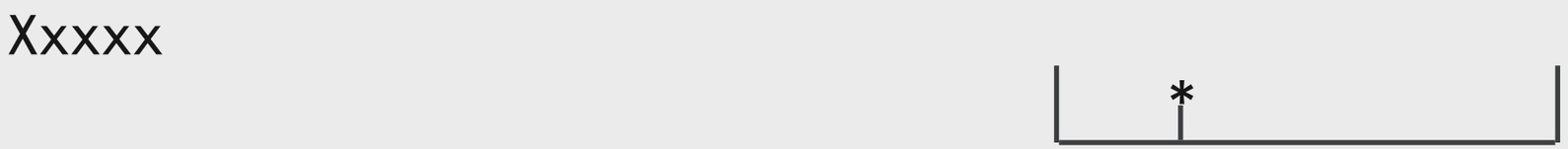
The Perceptual Span in reading



The Perceptual Span in reading



The Perceptual Span in reading



The Perceptual Span in reading

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Les visages sont un des premiers stimulus visuel traité par le nouveau-né.

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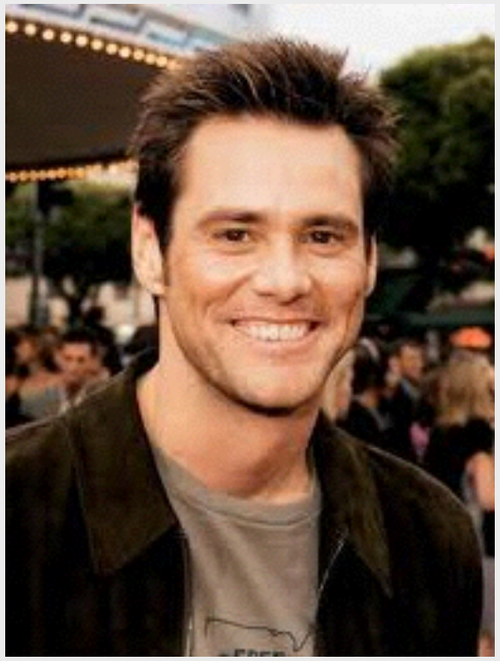
What about faces ?



- 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

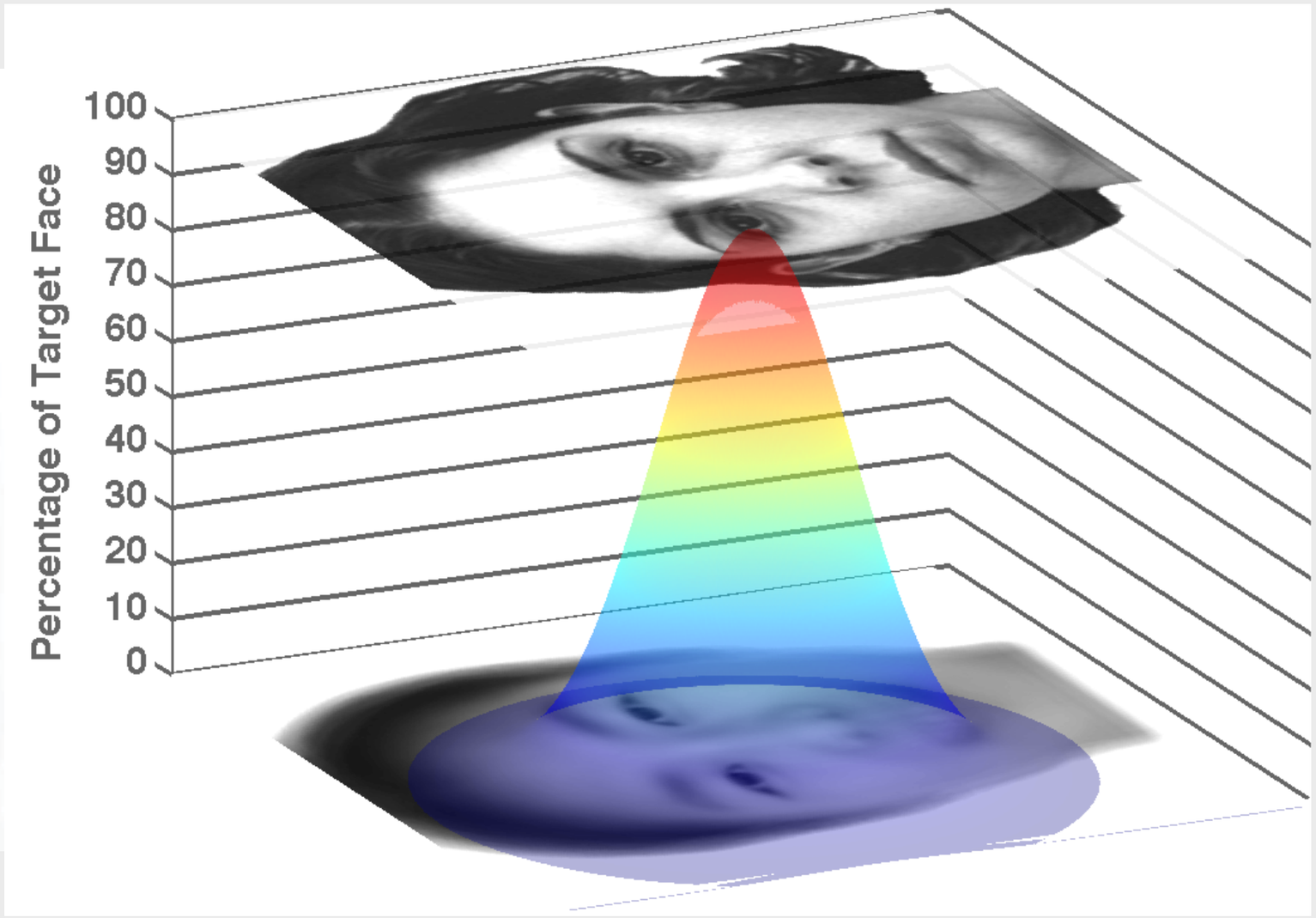
Current project

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

the Facespan

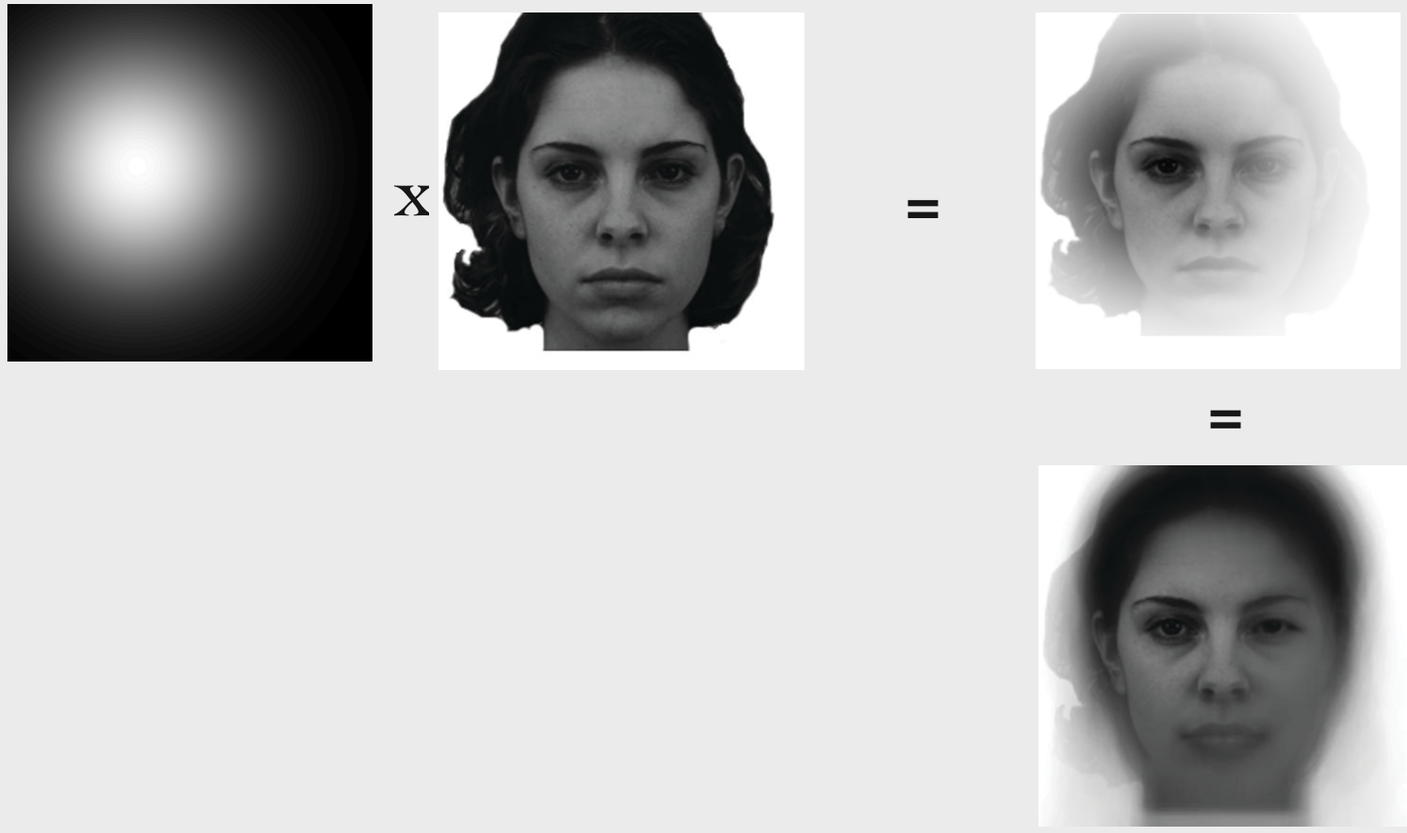
Spotlight

Gaze-contingent moving window for faces



Spotlight

Gaze-contingent moving window with faces



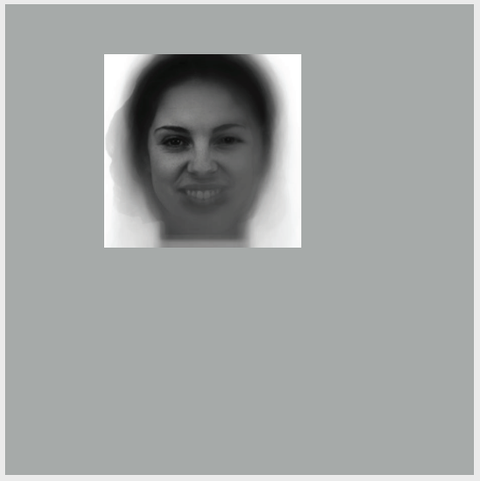
Gaze-contingent

Old-New task

Natural Vision

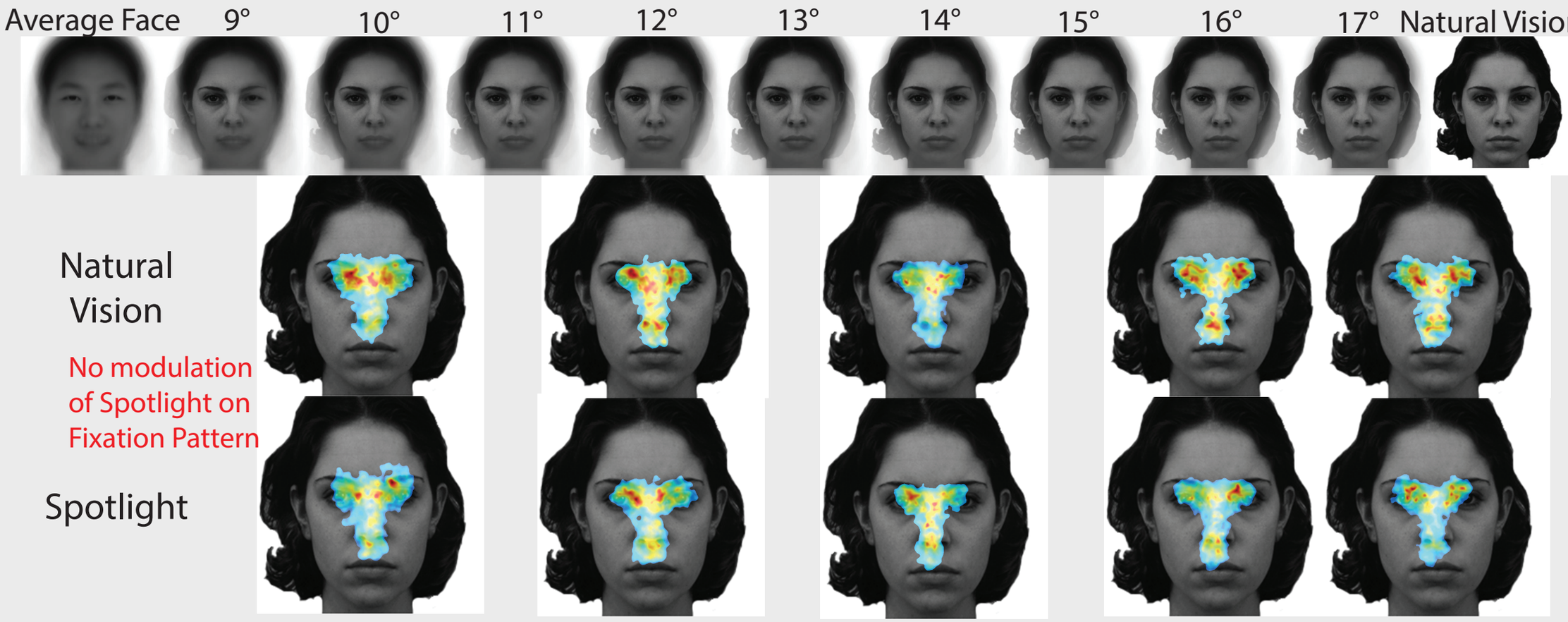
Spotlight

Recognition (28 faces)
14 old & 14 new

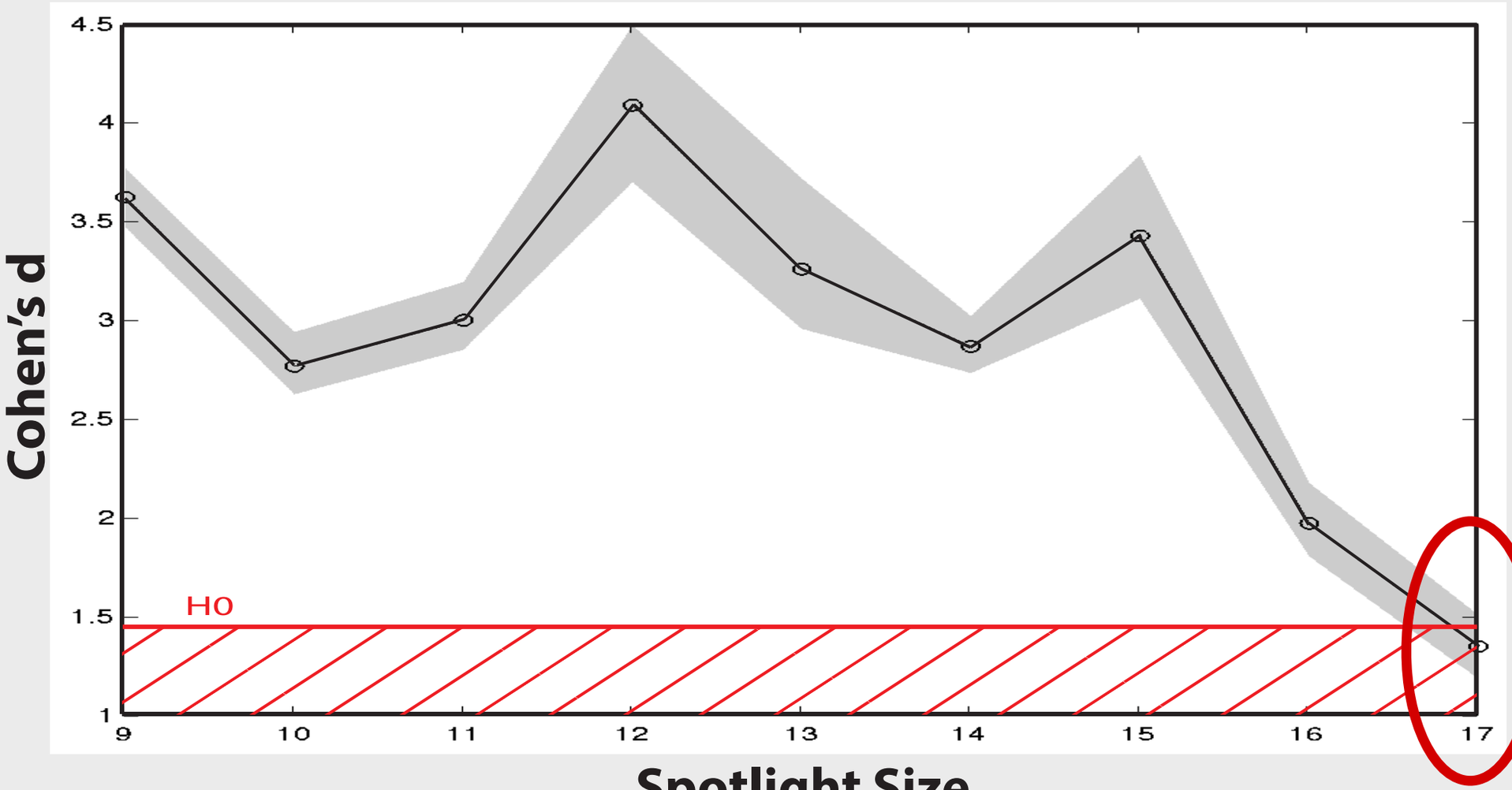


Learning
14 faces

Preliminary results (120 participants)

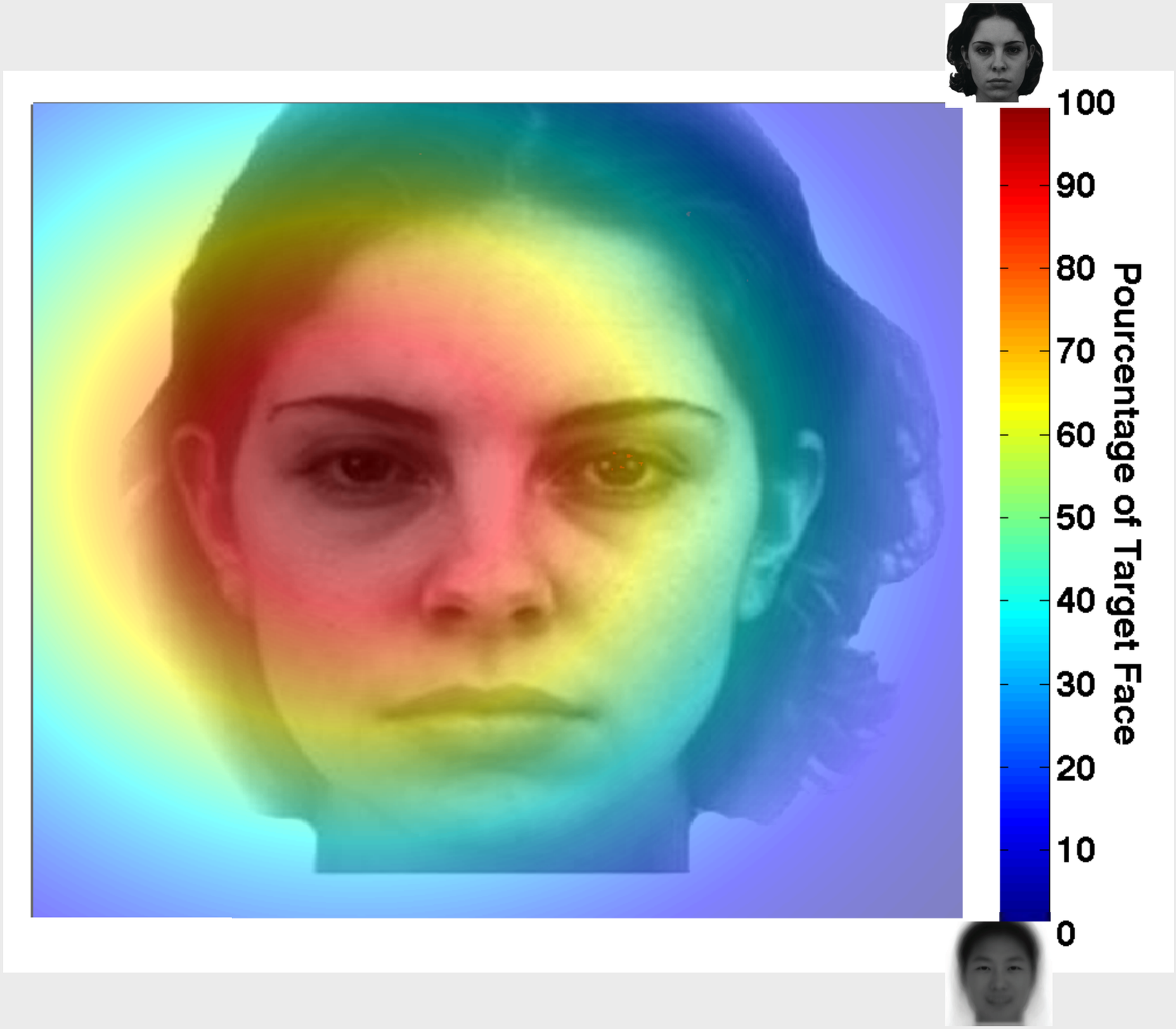


Preliminary results over 120 participants



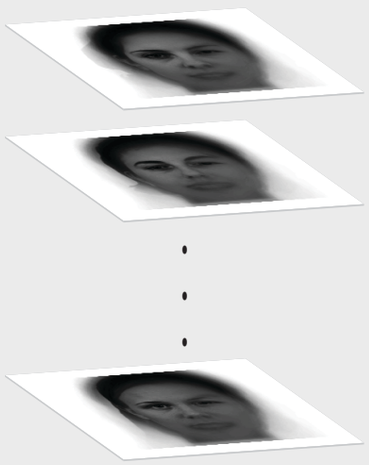
Effect of Spotlight on performance in function of Spotlight Size

Preserved information ?

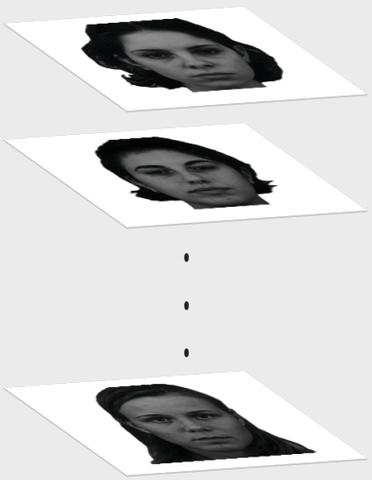


Reconstruction

Spotlight



Natural Vision



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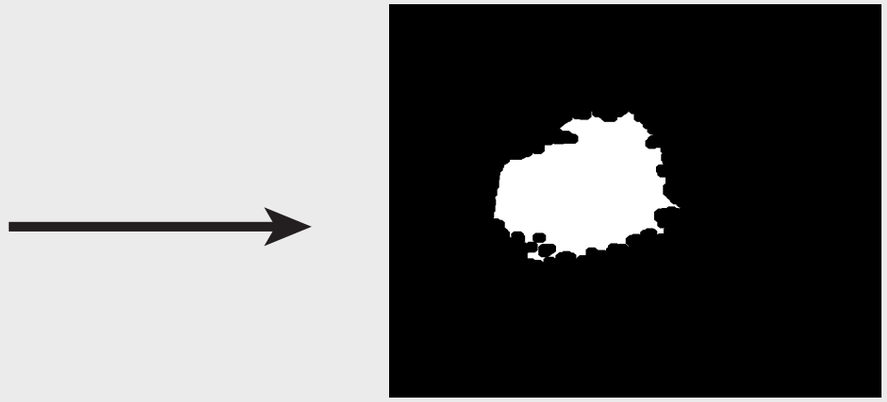
Reconstruction

Spotlight **Natural Vision**



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

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

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Thank you for your attention !

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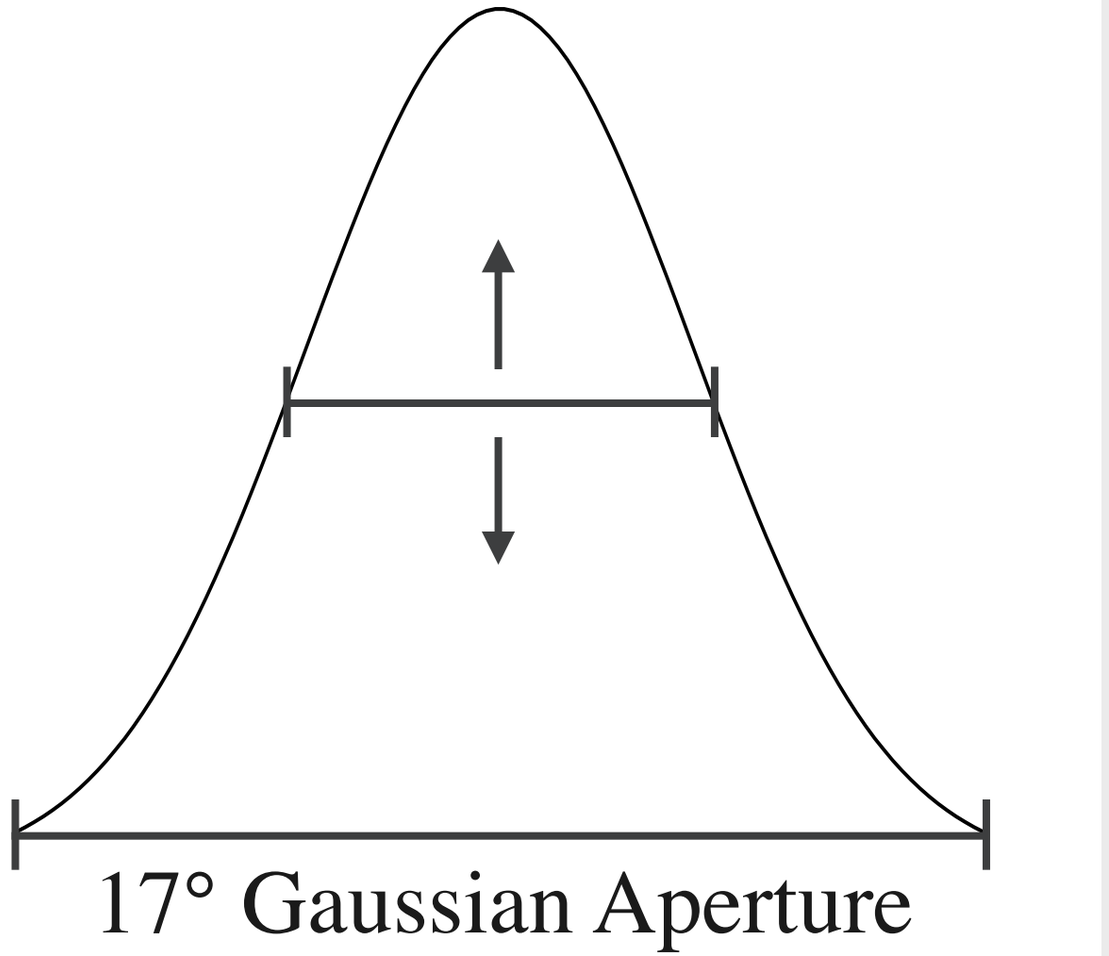
And Bon appétit !


17° Gaussian Aperture