University of Essex

Attention during social interaction…

SCIENTISTS FOR EU.UK

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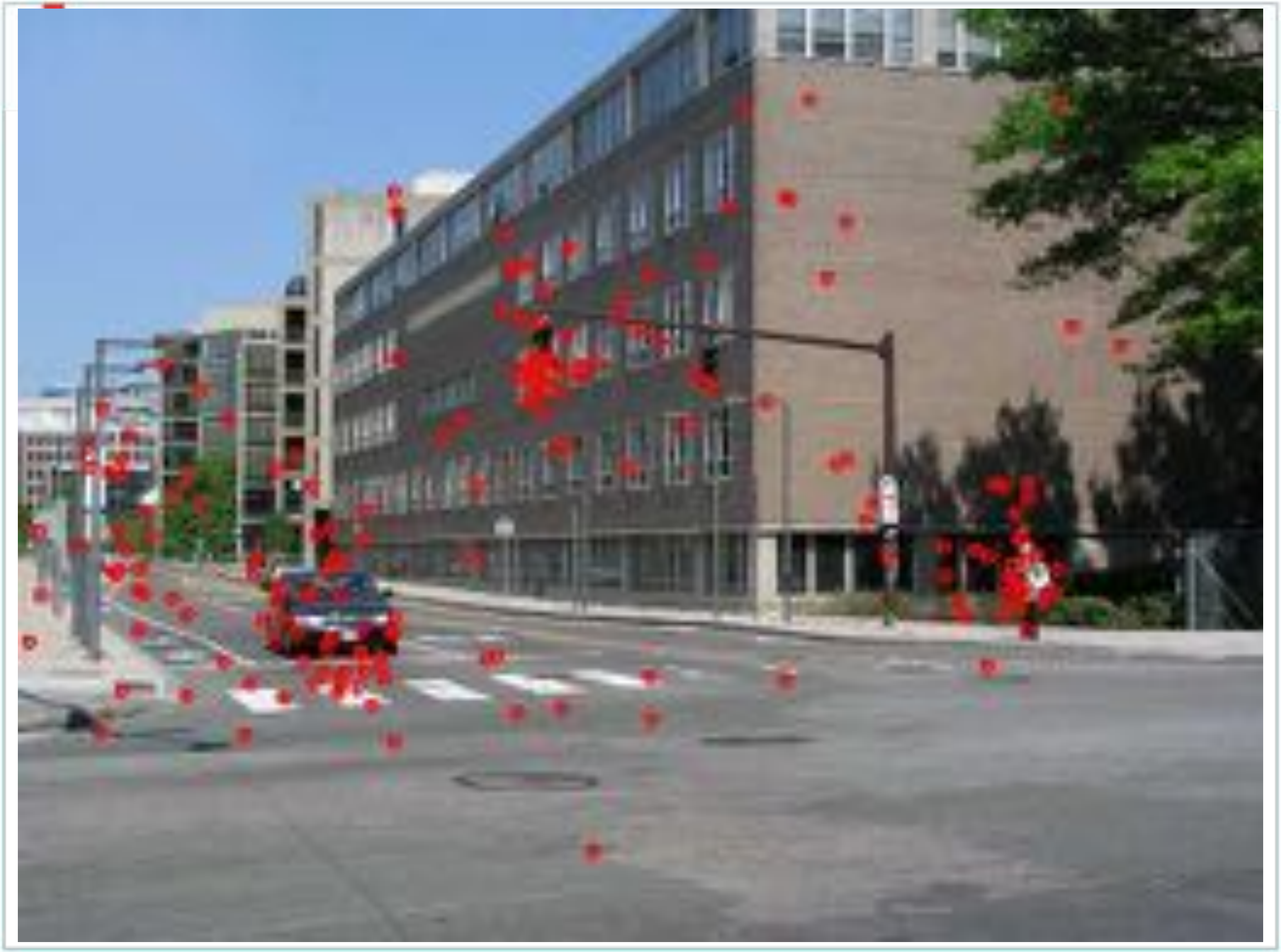
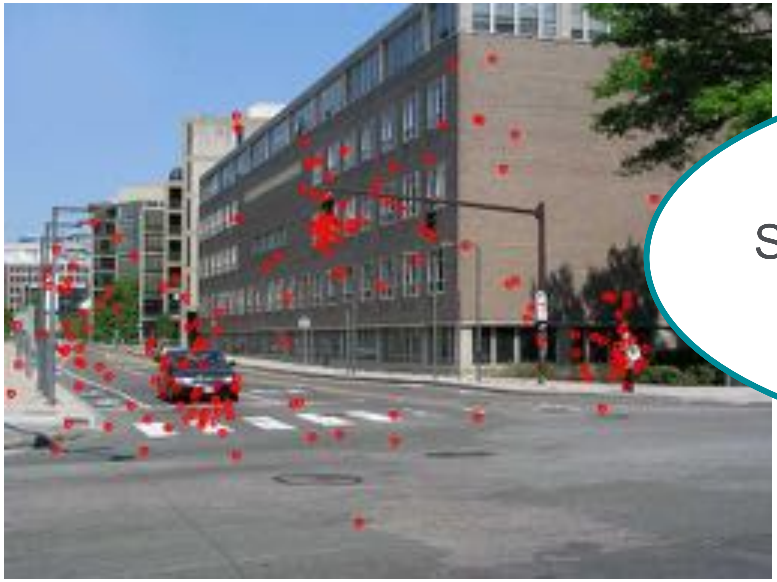




Active Vision

Sampling important regions

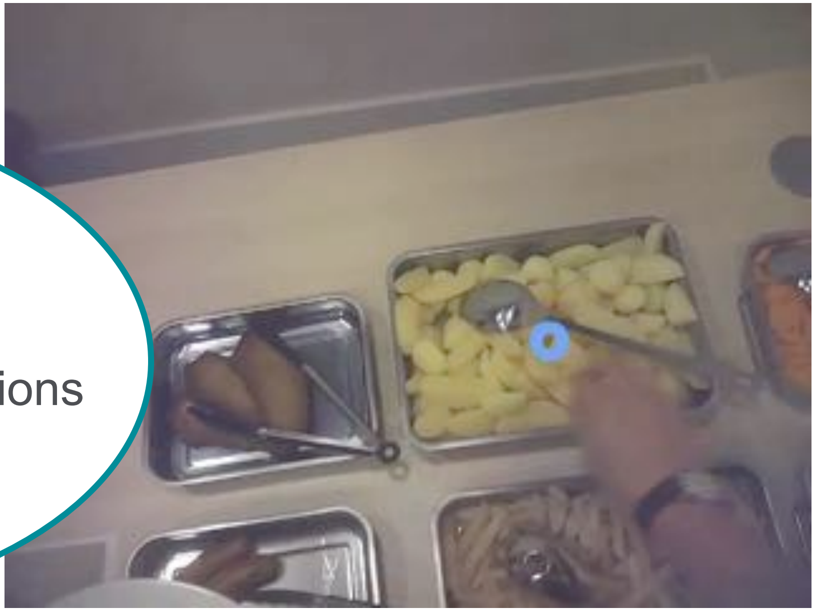
“Saliency”?

Active Vision

Gaze is part of action

Gaze serves different functions

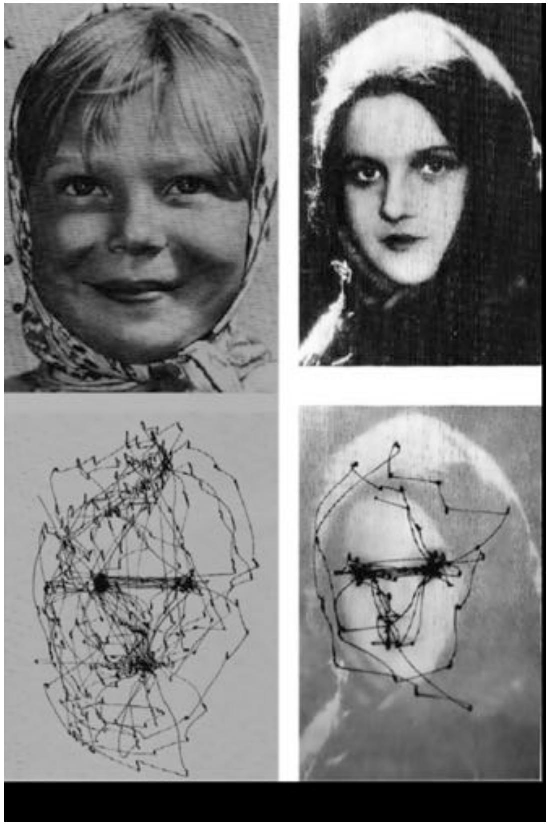
Timing is critical



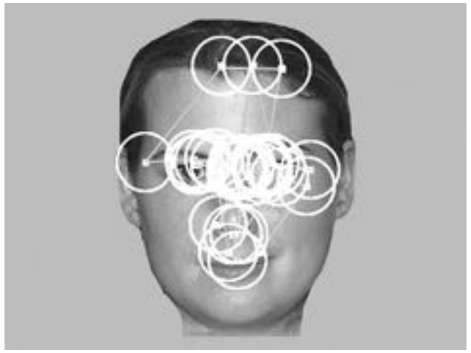
Outline

- Social attention in static scenes
- Social attention in dynamic scenes
- Social attention in “real” situations
- Social signalling

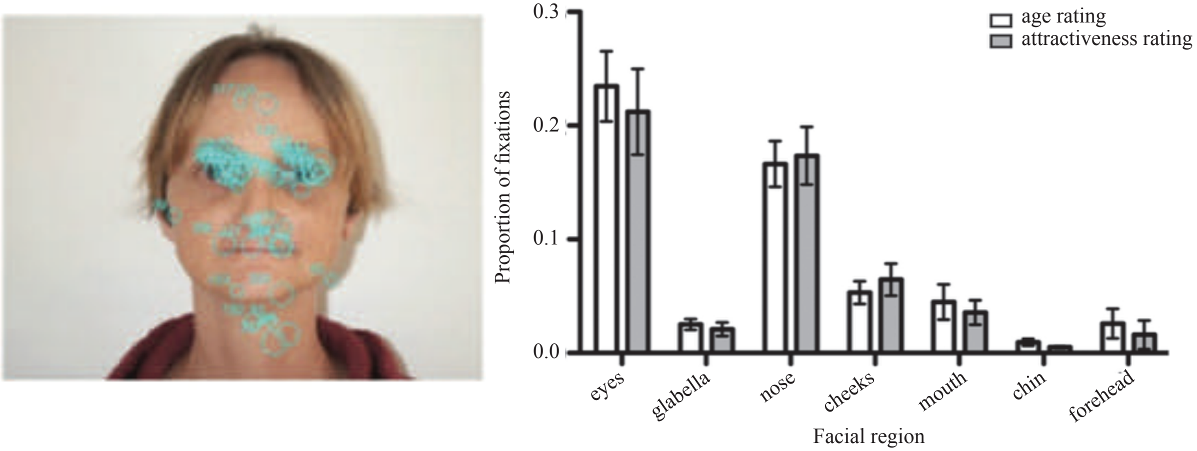
We select the eyes within social stimuli



Yarbus (1967)

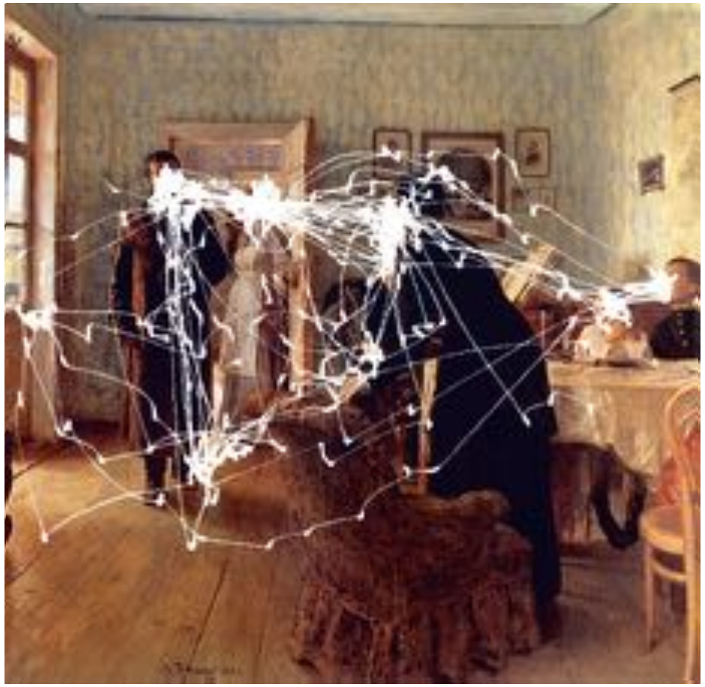


Henderson, Williams & Falk (2005)



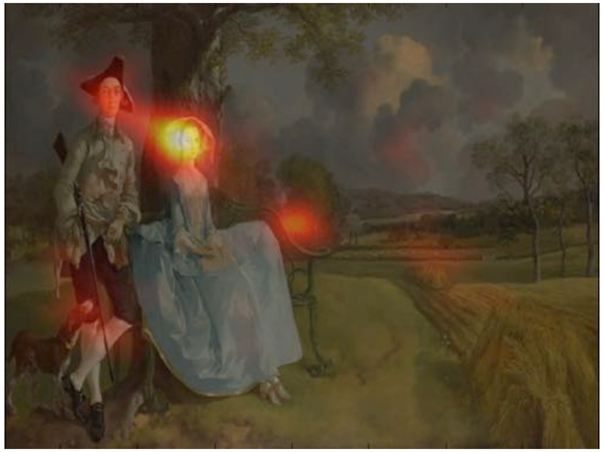
Kwart, Foulsham & Kingstone (2012)

We select the eyes within social stimuli



Yarbus (1967)

Bindemann et al. (2010)



We selectively attend to individuals in complex dynamic scenes

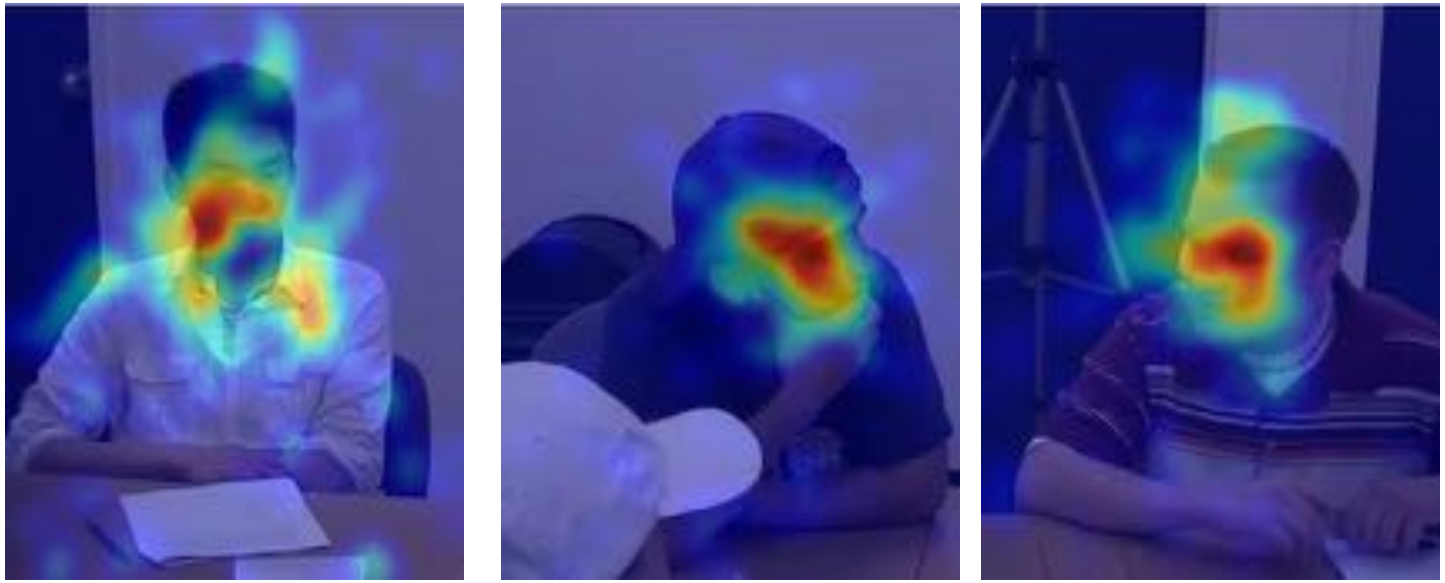
Attention in a dynamic social scene

Logan
Hanson

Attention in a dynamic social scene

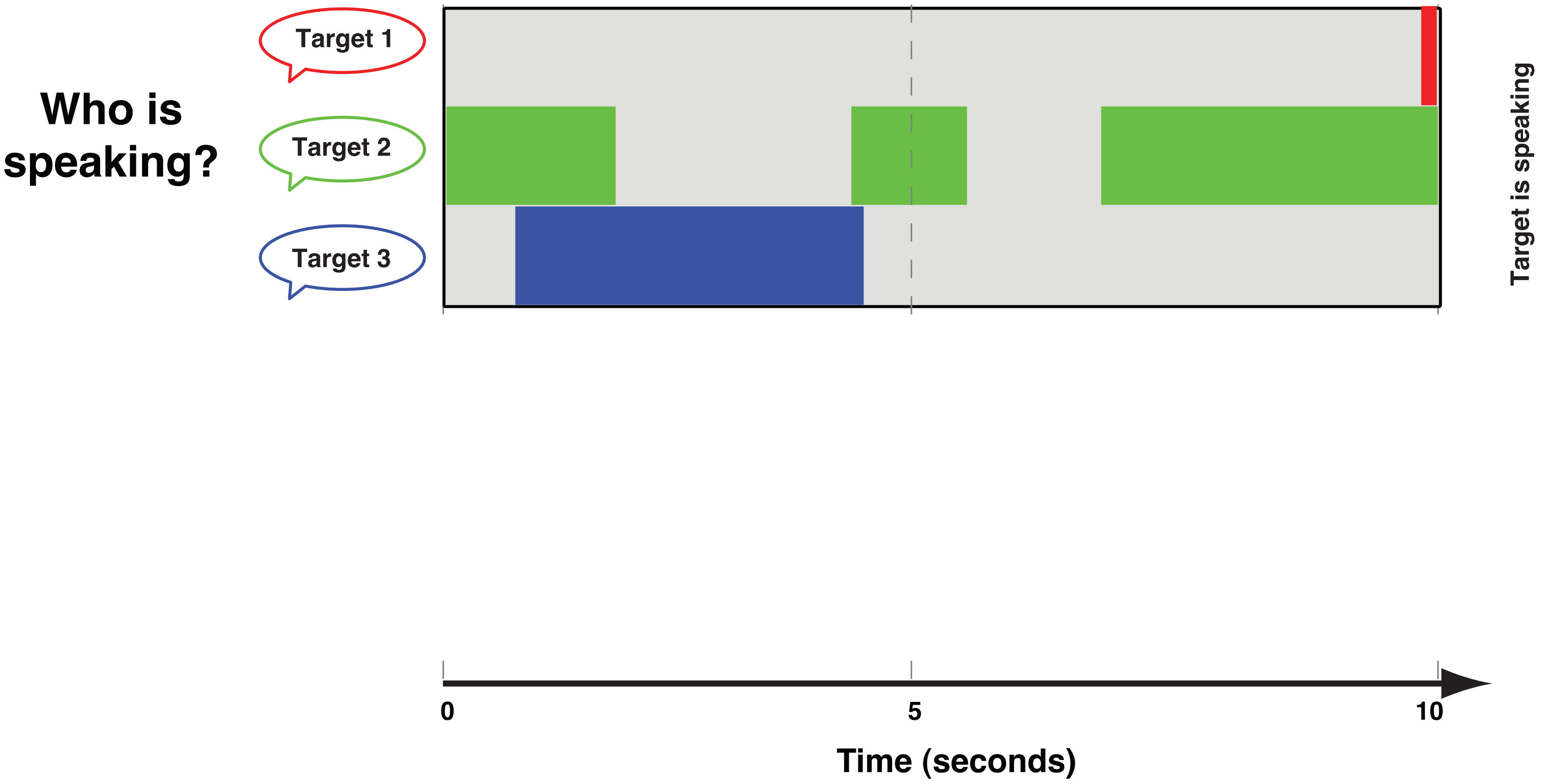
79% of fixations are on a person

54% are on the eyes



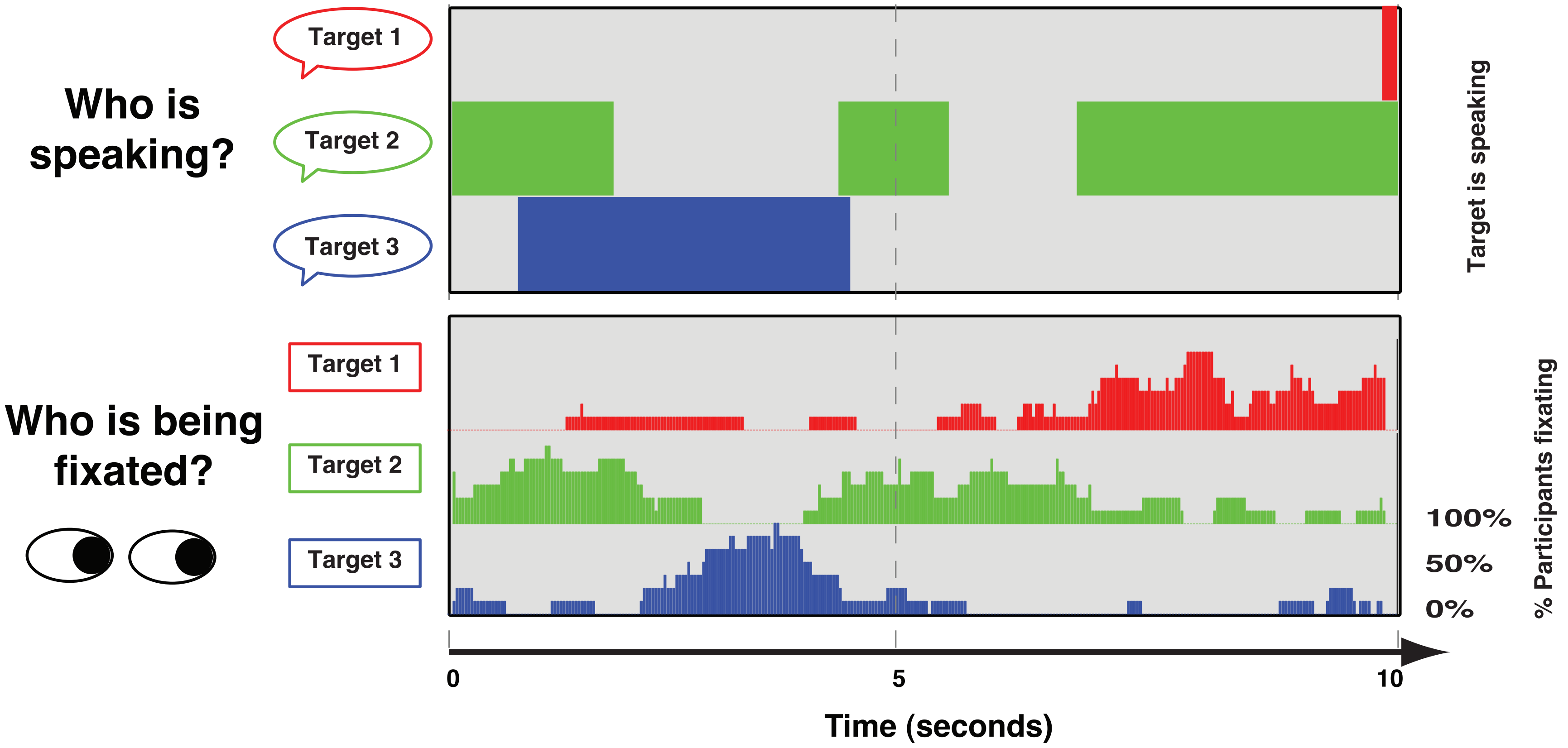
Attention in a dynamic social scene

Gaze is sensitive to the conversation



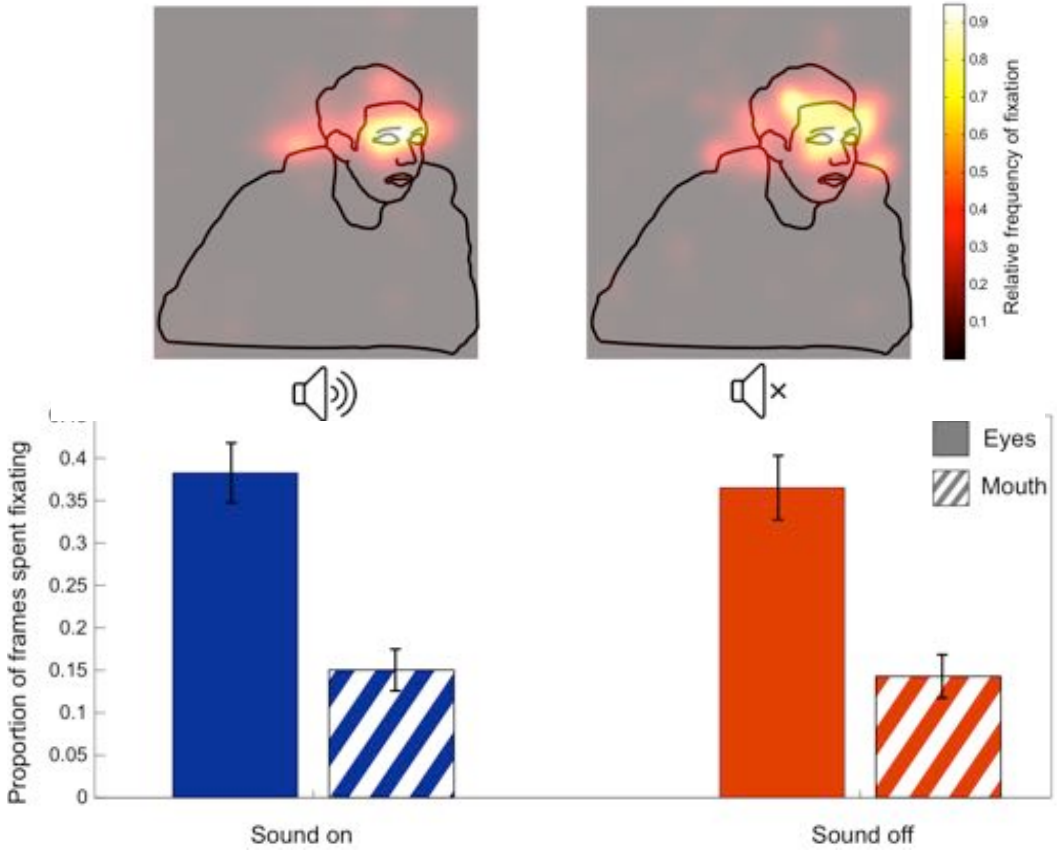
Attention in a dynamic social scene

Gaze is sensitive to the conversation



Attention in a dynamic social scene

Sound doesn't change the bias to look at the eyes

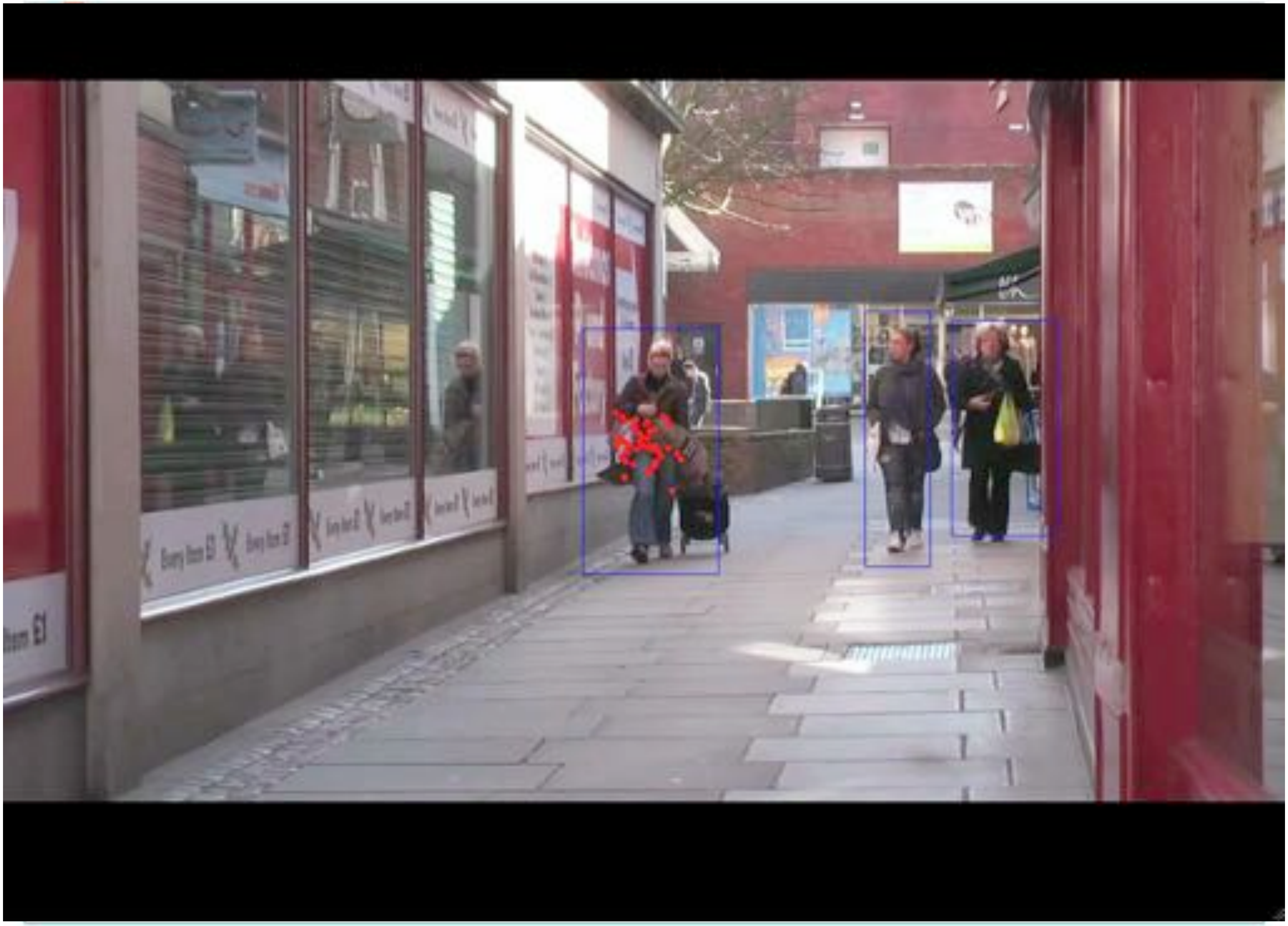


Foulsham & Sanderson (2013). *Visual Cognition*

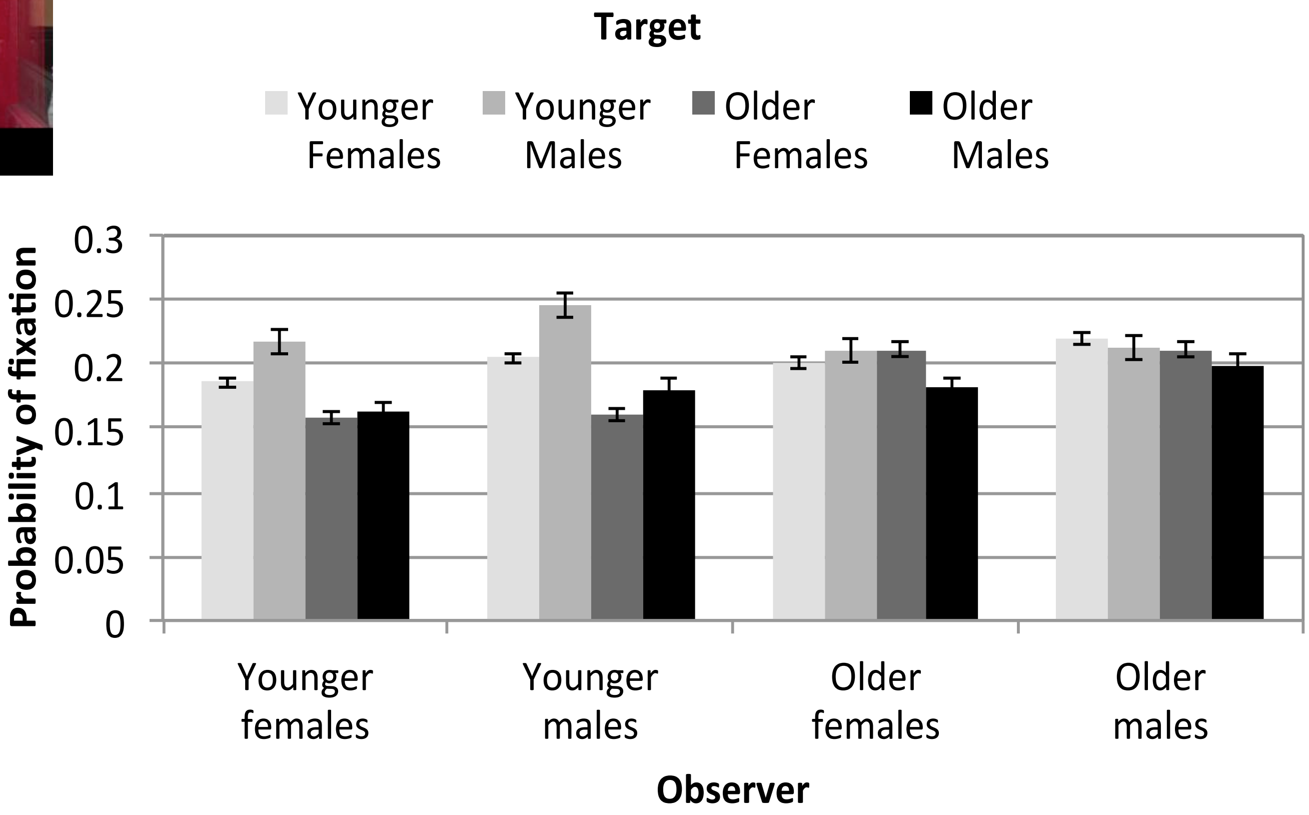
Looking at crowds

Who gets looked at in a crowd? Are older people "invisible"?

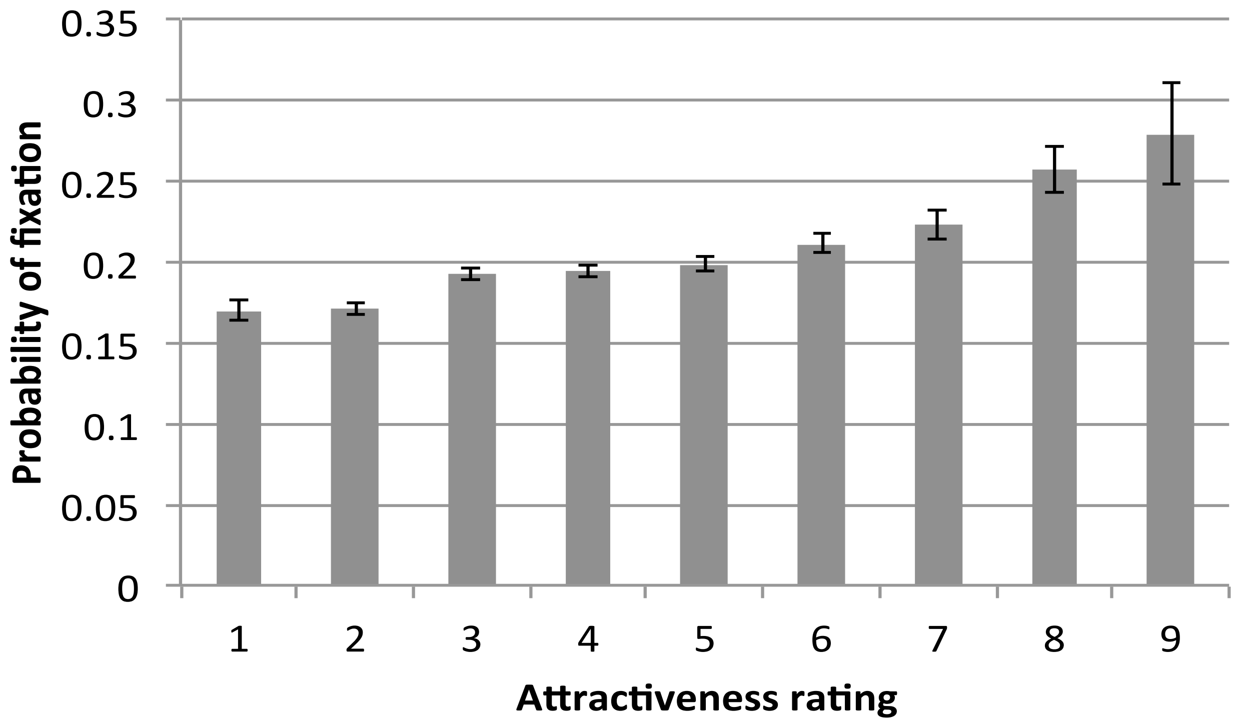
CALENDAR CLUB
First Choice


Every Item £1
Item £1

Looking at crowds



Looking at crowds



Significant, positive correlation between attractiveness and attention

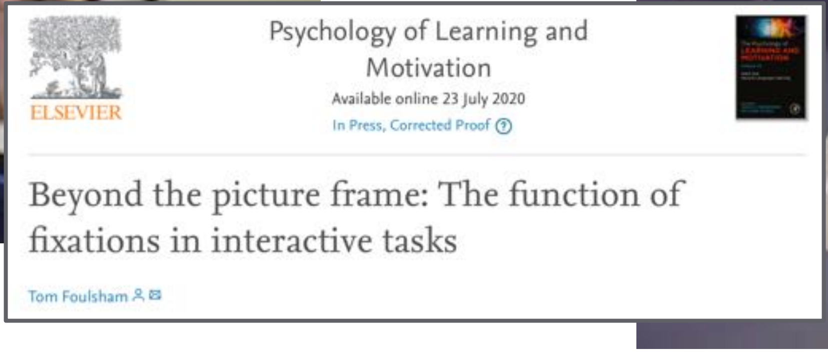
Attention in a dynamic social scene

Dynamic scenes reveal how we select social cues in a complex, multimodal situation and within a group

…but these are still *images* of people who can’t look back and may not provide a real context

We change our gaze when looking at real people

Get real!



ELSEVIER

Psychology of Learning and Motivation

Available online 23 July 2020

In Press, Corrected Proof

Beyond the picture frame: The function of fixations in interactive tasks

Tom Foulsham

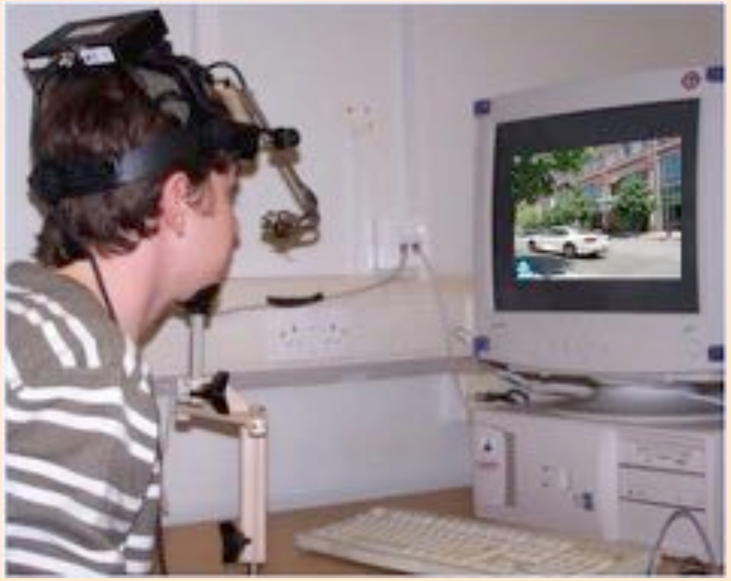
Get real!

Session 1

Walk to the SU, buy a coffee and walk back

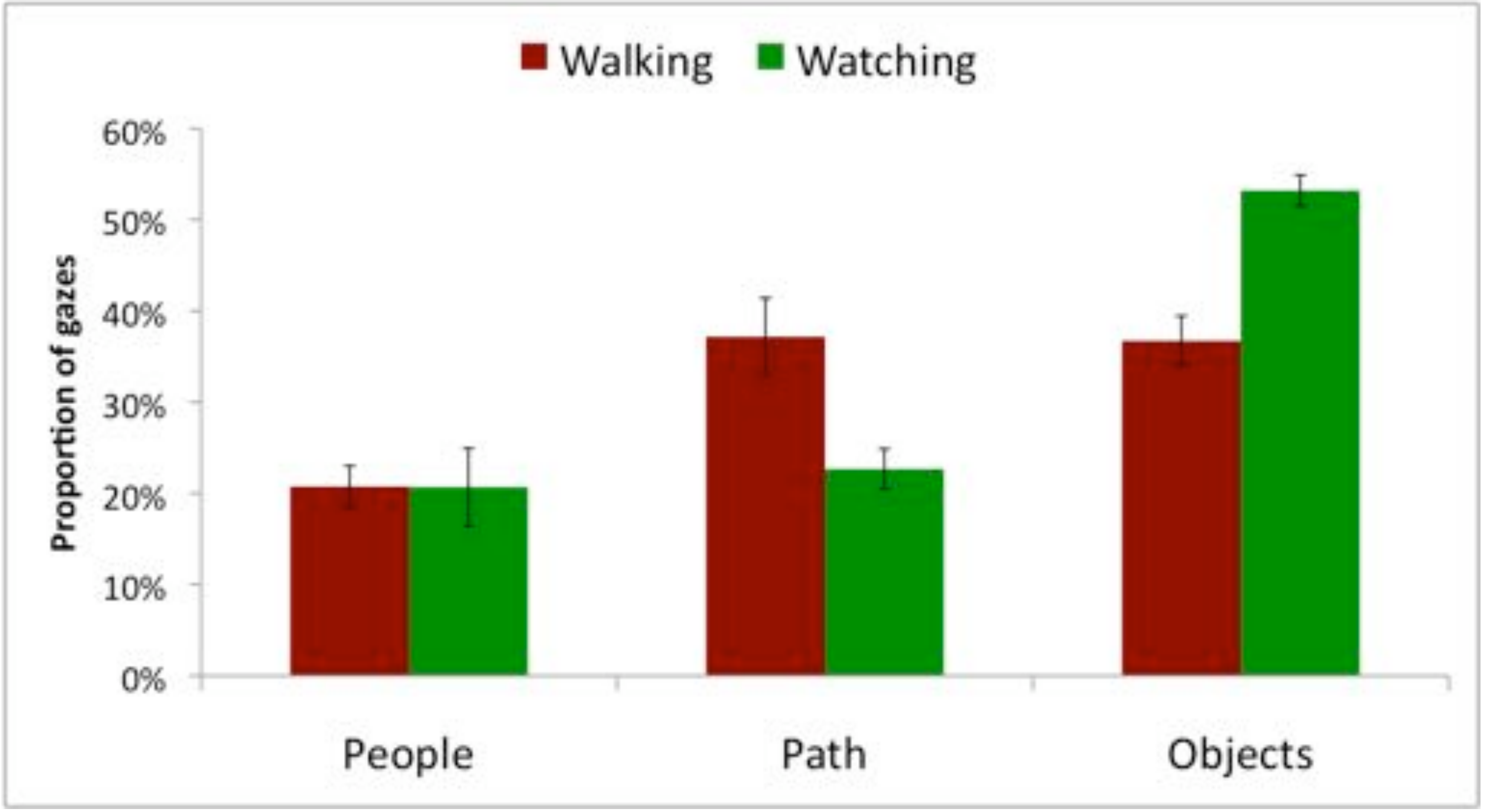
Session 2

Watch first-person video clips of the walk in the lab

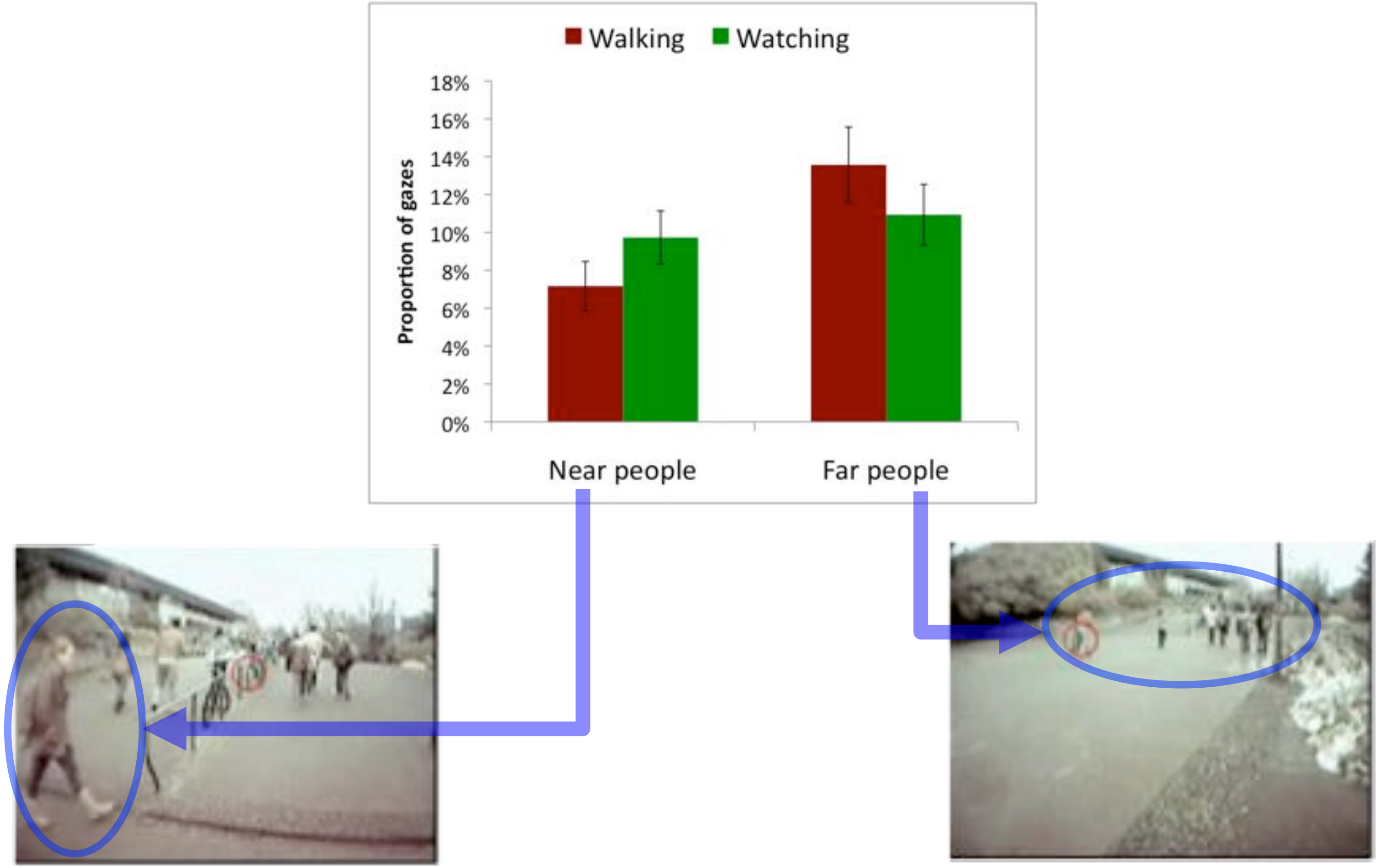


Foulsham, Walker & Kingstone (2011). *Vision Research*

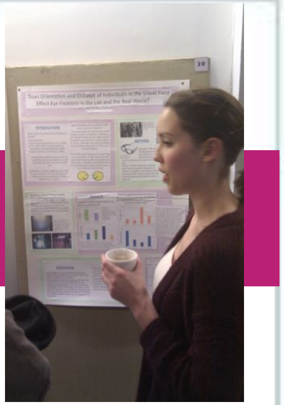
What do people look *at*?

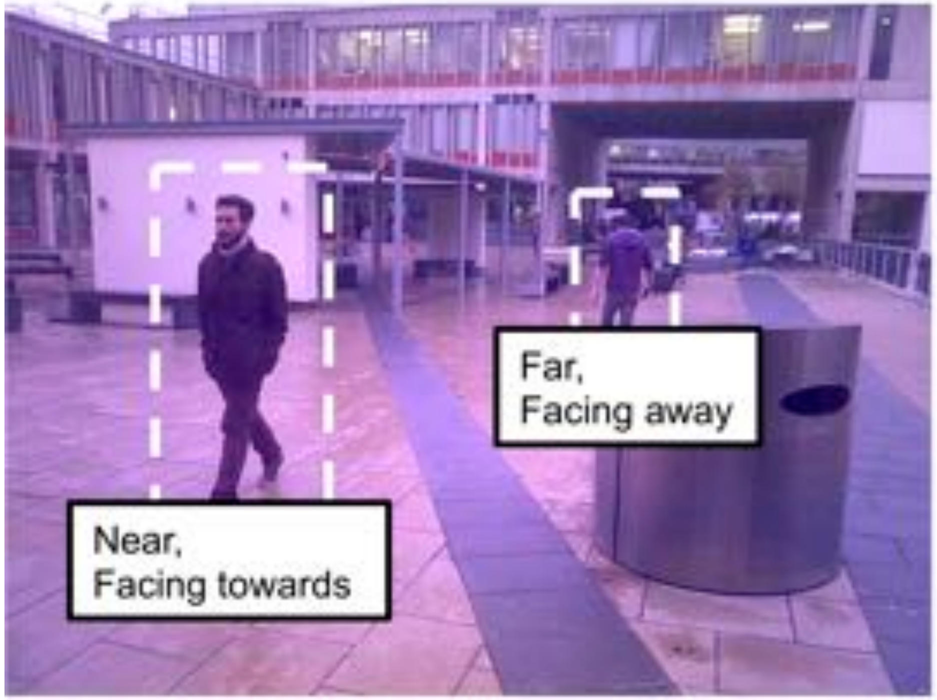


Get real!

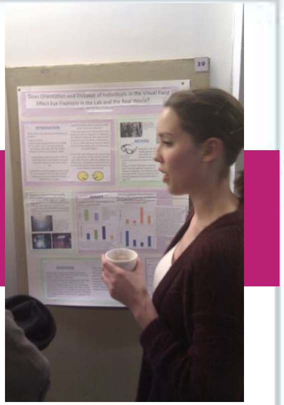

Walking
Watching
Proportion of gazes
18%
16%
14%
12%
10%
8%
6%
4%
2%
0%
Near people
Far people

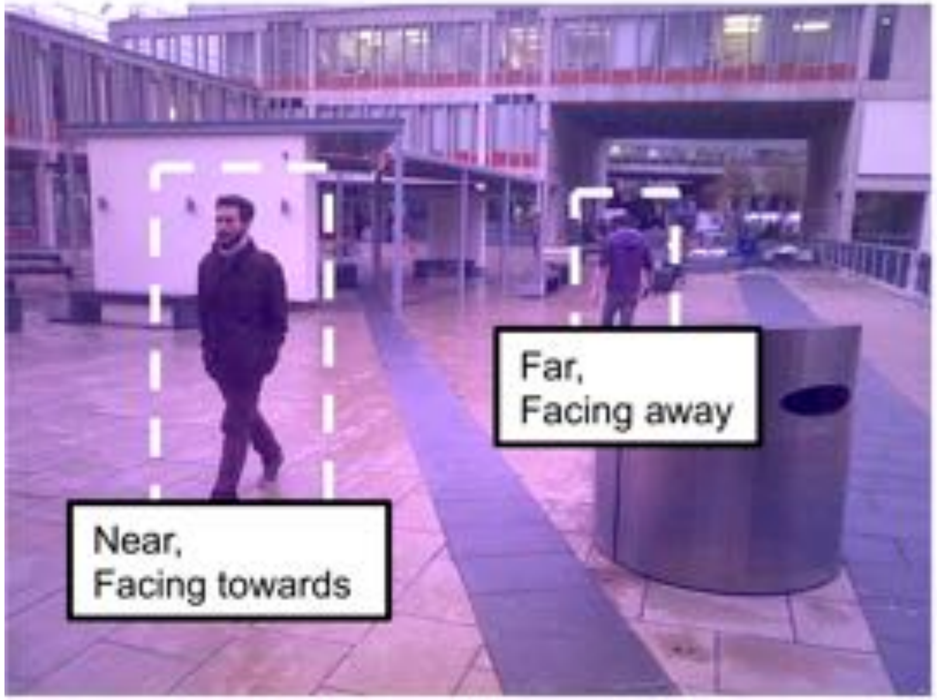
Looking at (real) people

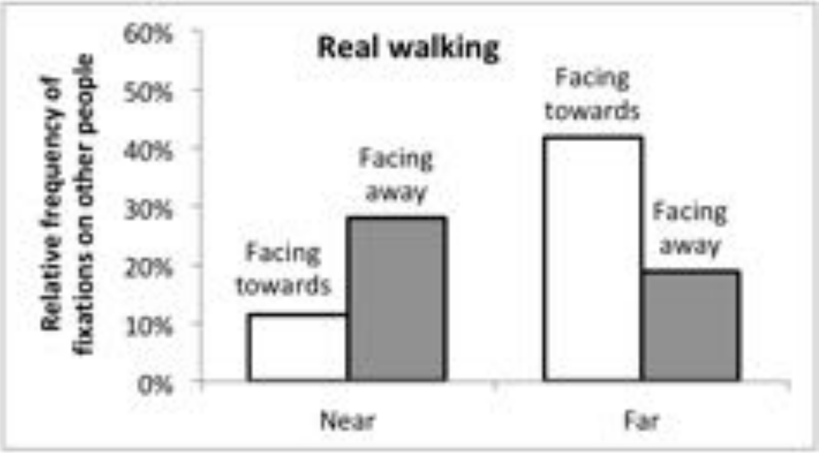


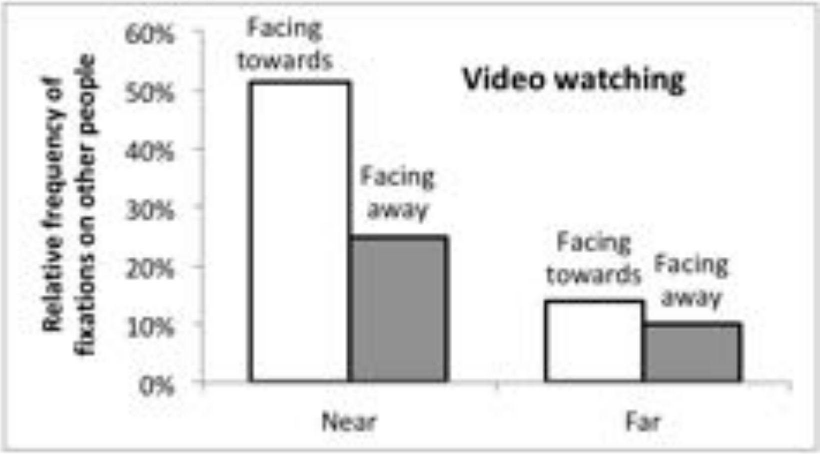

Far,
Facing away
Near,
Facing towards

Looking at (real) people




Near,
Facing towards
Far,
Facing away





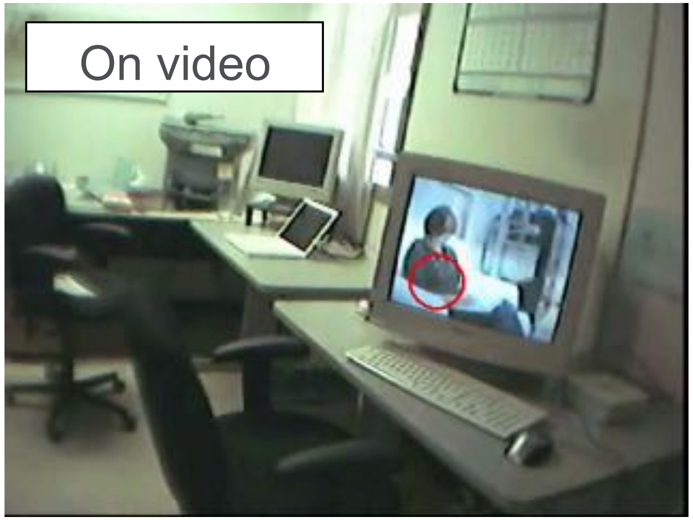
Get real!

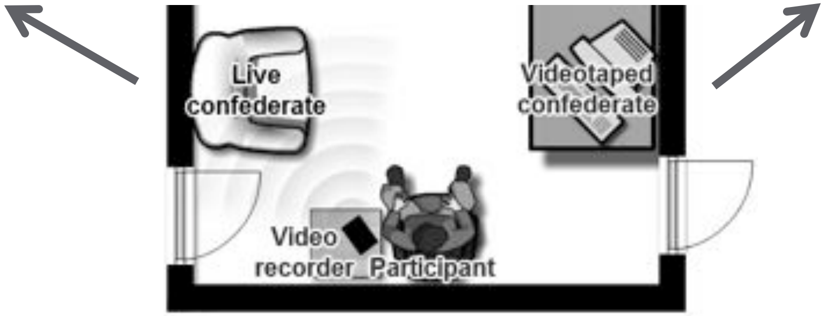
What we look at, and when, is different when there is a real context

…this is particularly true for social stimuli

Do people look at other people?

In real life

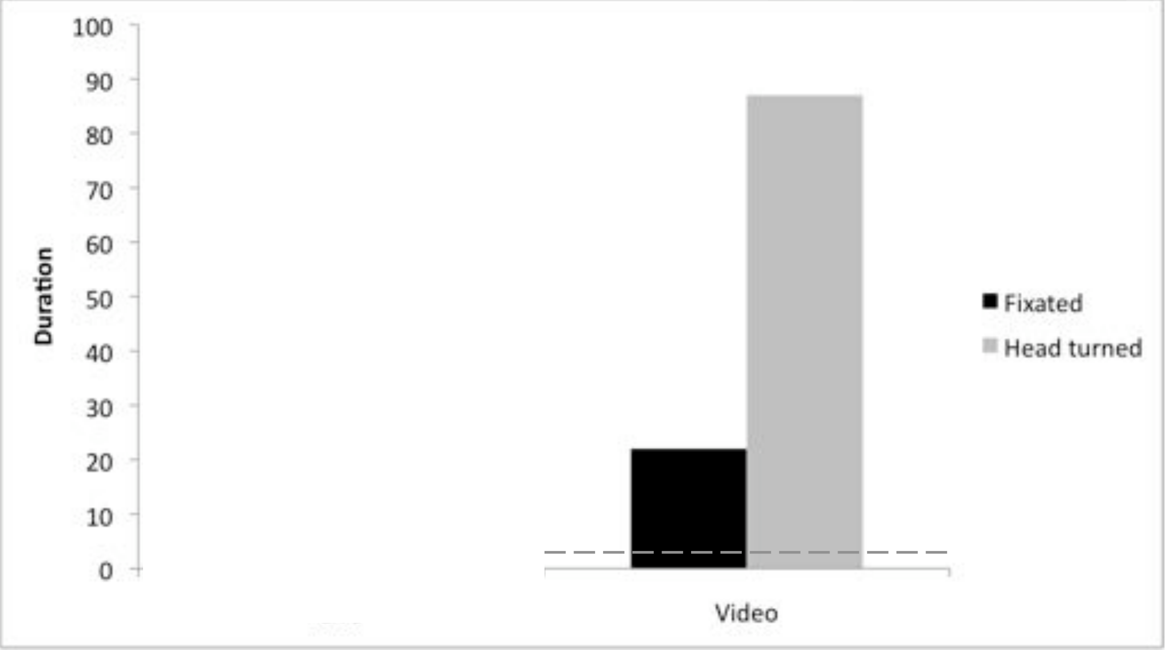

On video


Live confederate
Videotaped confederate
Video recorder
Participant

Laidlaw, Foulsham, Kuhn & Kingstone (2011). *PNAS*

Do people look at other people?

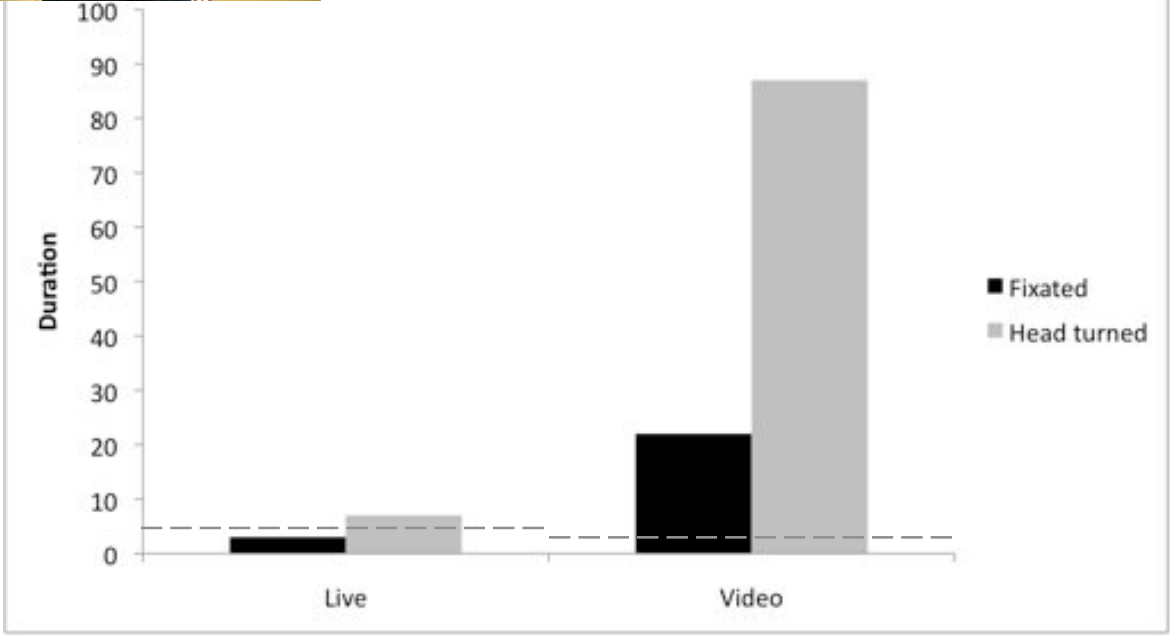
On video



Do people look at other people?

In real life

On video



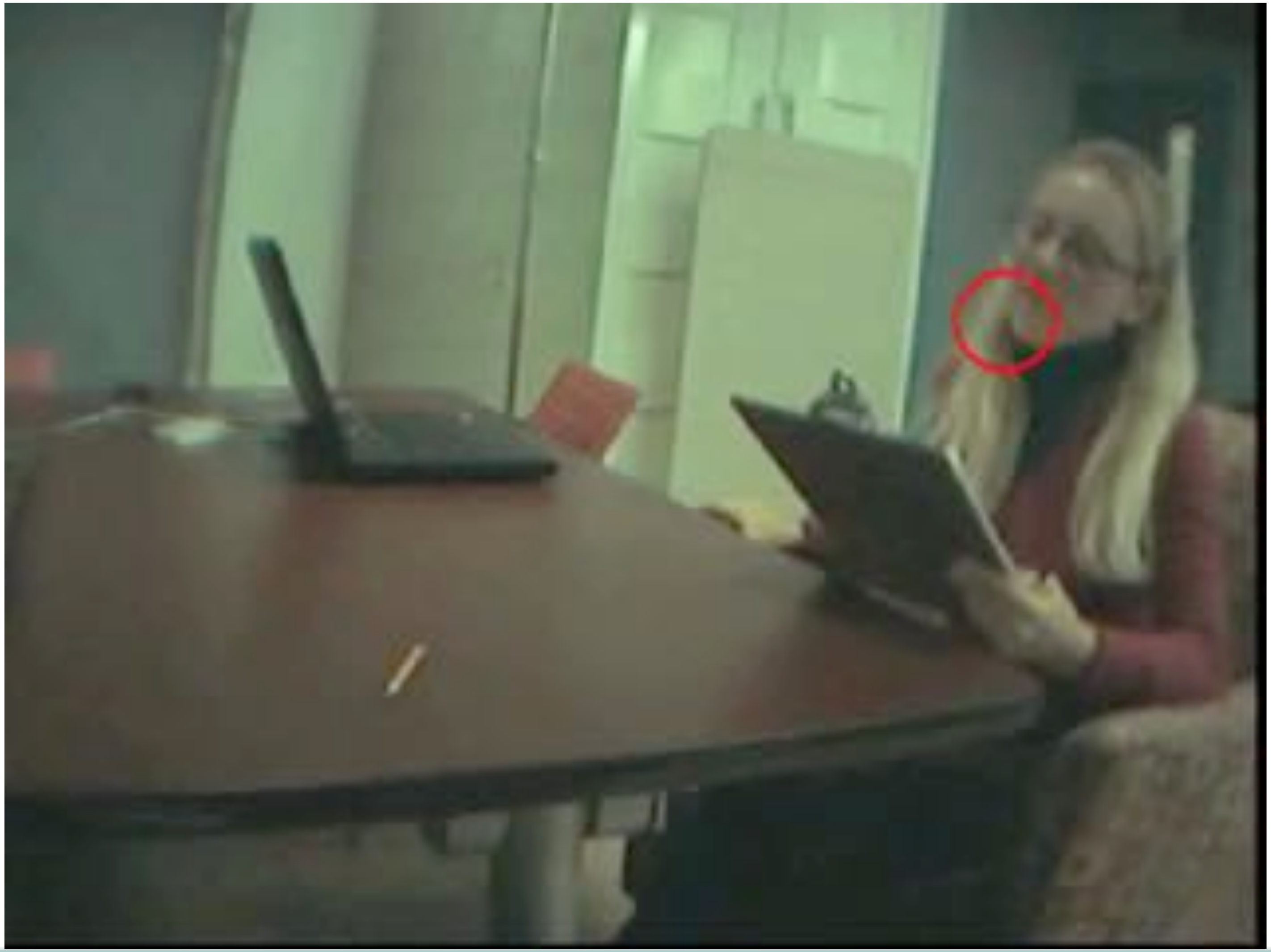
Attention changes in the presence of others

In the real world, we do not look at people in the same way as in an image

This is likely because gaze is a communicative signal

…studying this process requires measuring both sides of an interaction

Gaze during an interview



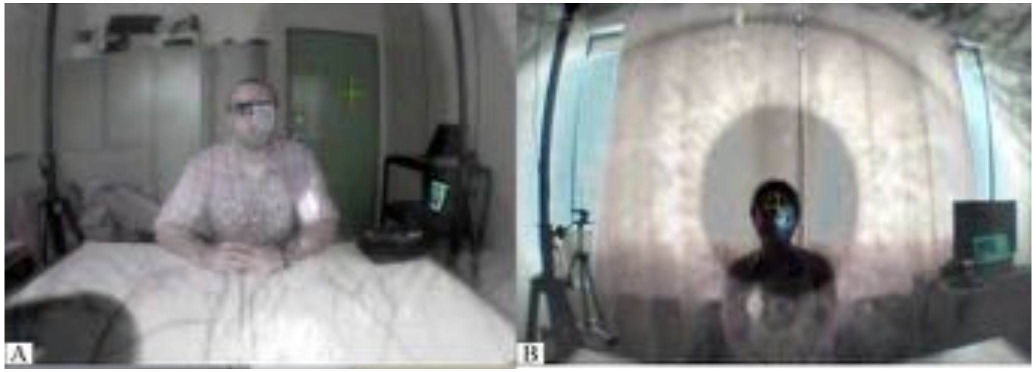
Real conversation

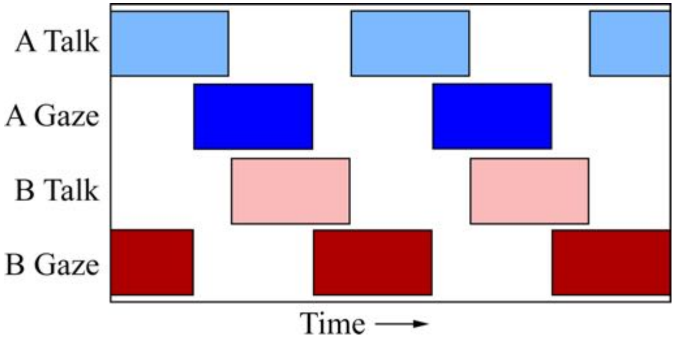
Ho, Foulsham and Kingstone (2015)

Eyetracking both parties in a real conversation.

Speaking and Listening with the Eyes: Gaze Signaling during Dyadic Interactions

Simon Ho[1]*, Tom Foulsham[2], Alan Kingstone[1]

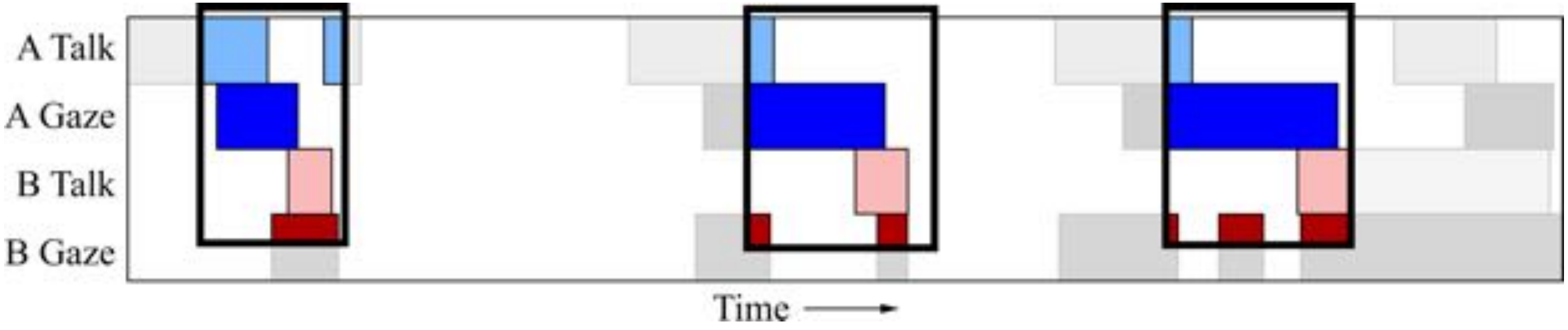



A Talk
A Gaze
B Talk
B Gaze
Time →

Real conversation

Ho, Foulsham and Kingstone (2015)

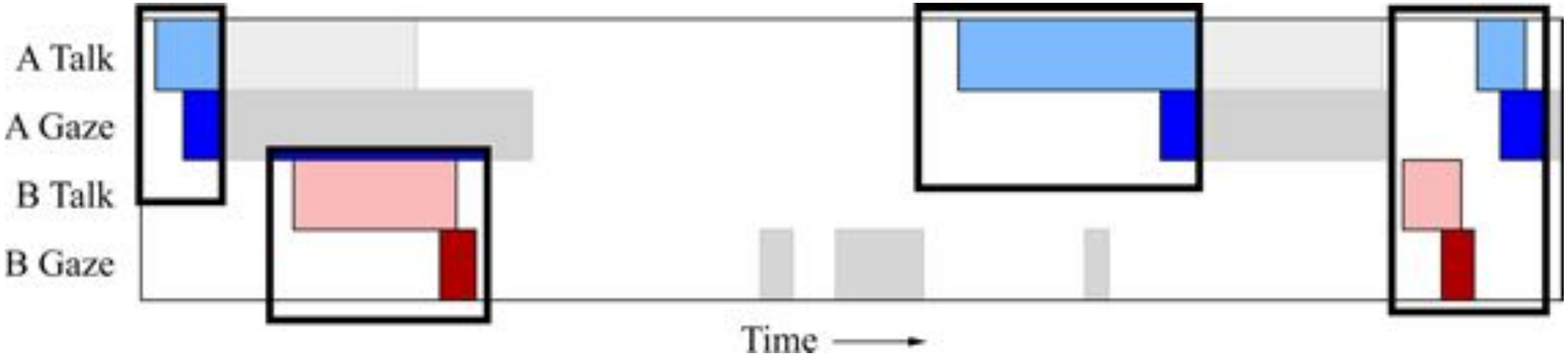
Participants gaze at their partner to signal a switch in who is talking.



Real conversation

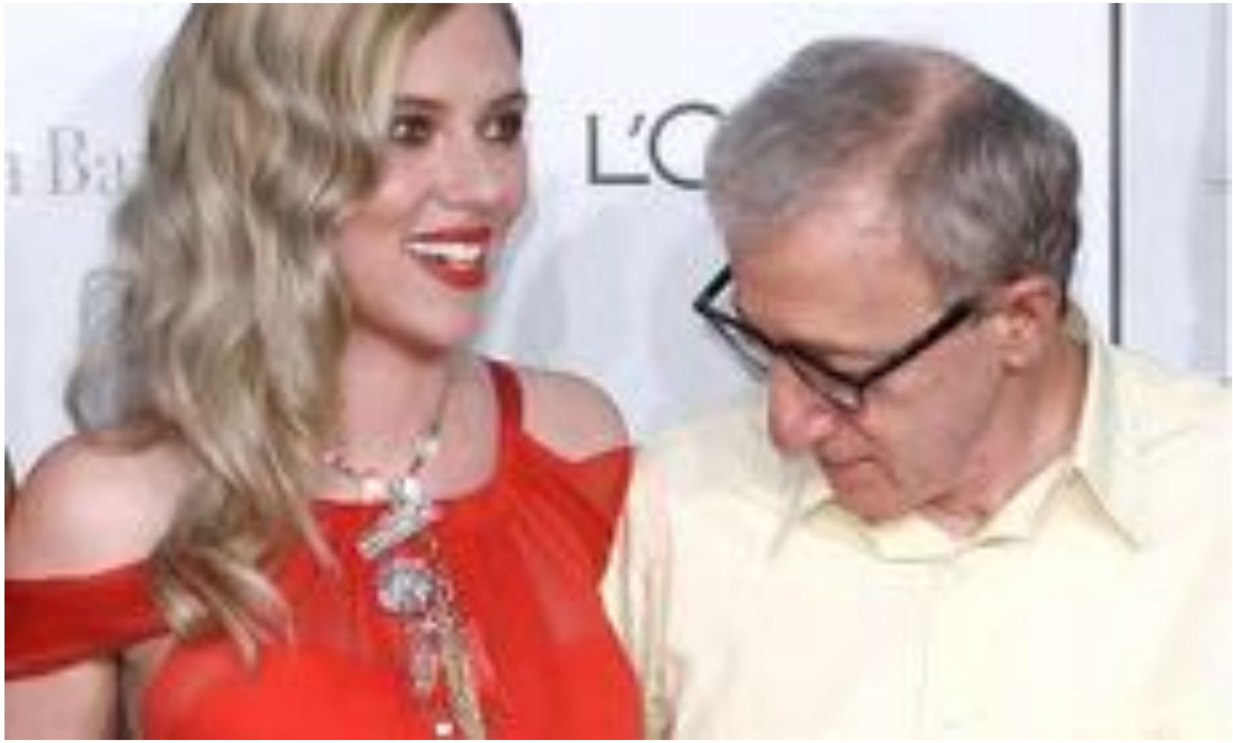
Ho, Foulsham and Kingstone (2015)

Participants avert their gaze at the beginning of their own speaking turn.

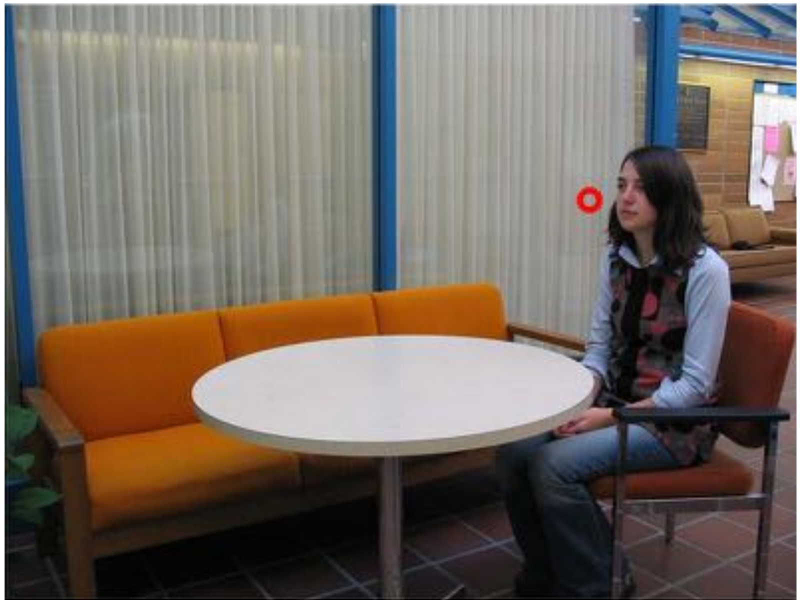


We can study gaze signalling by investigating how people interpret the gaze of others

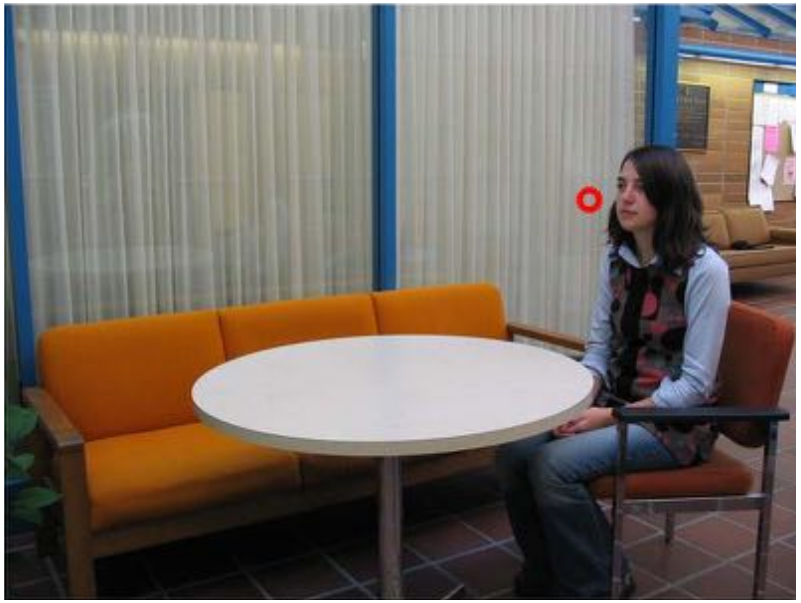
Gaze following

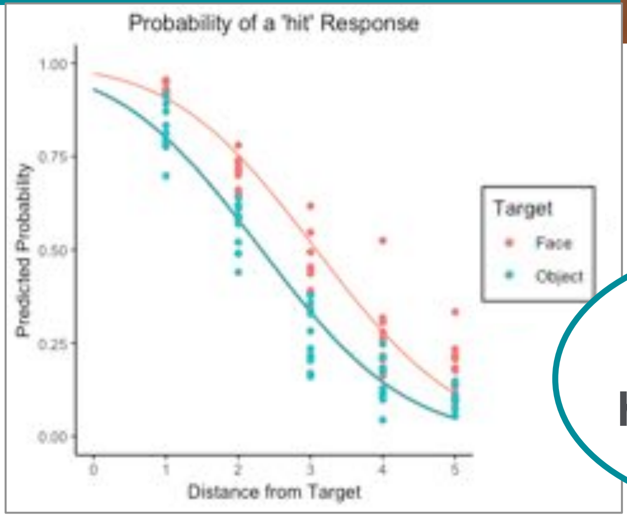


Gaze interpretation

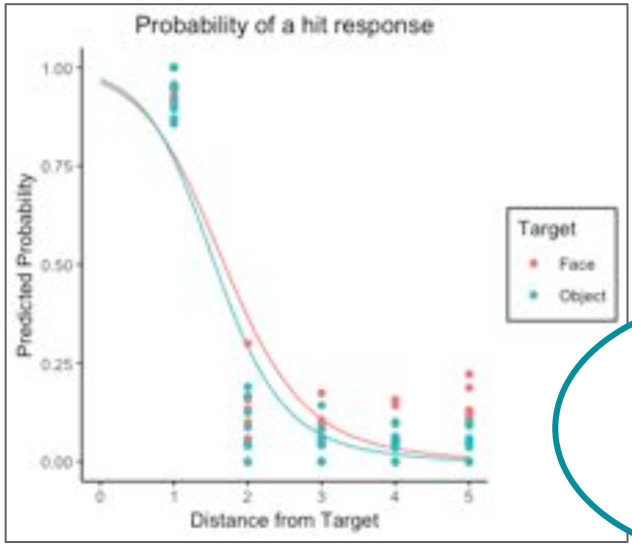


Gaze interpretation





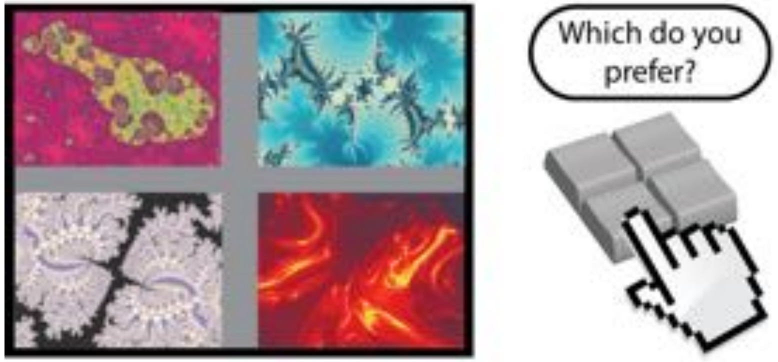
Cursor is human gaze



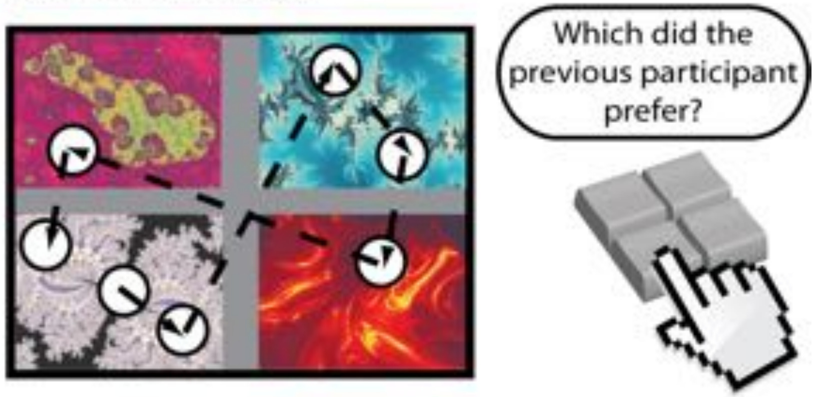
Cursor is "computer algorithm"

Inference from gaze

1. Preference task ("Truth")


Which do you prefer?

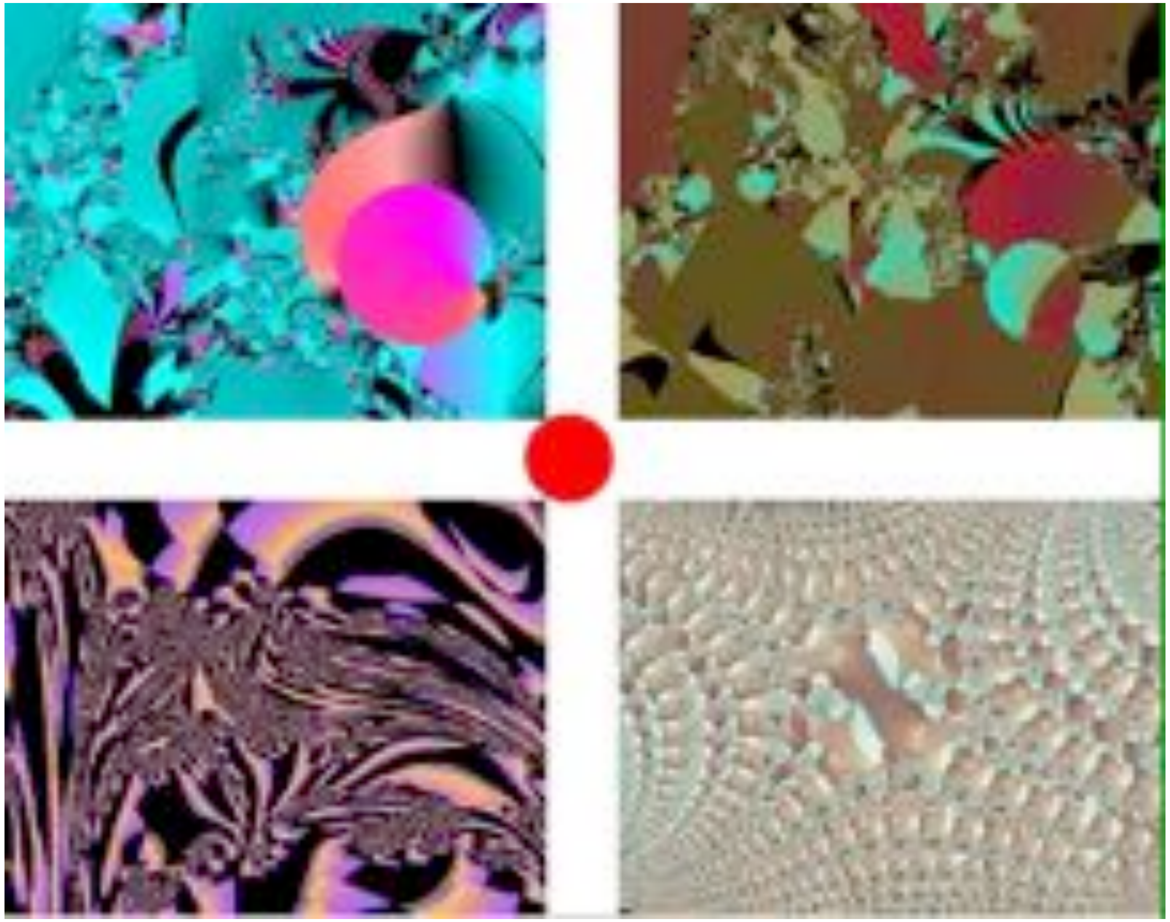
2. Guess task


Which did the previous participant prefer?

Observer

Guesser

Which pattern did the Observer prefer?



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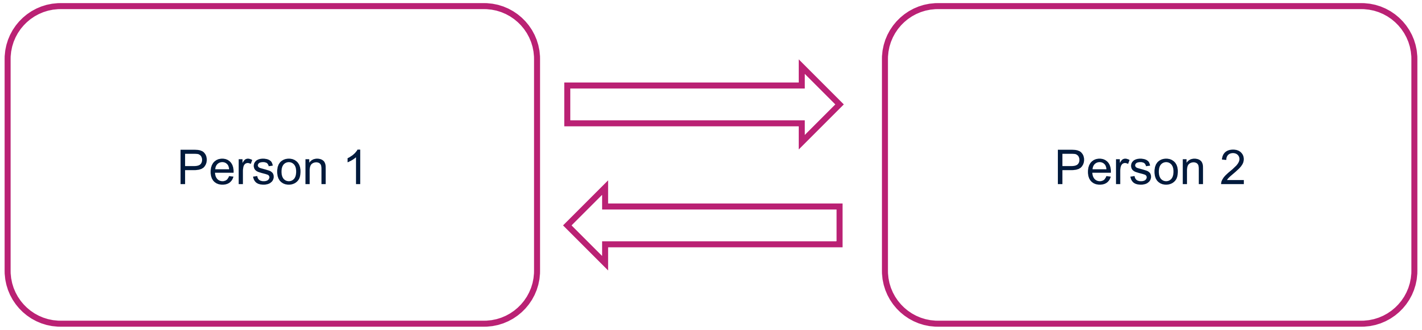
Interactive gaze

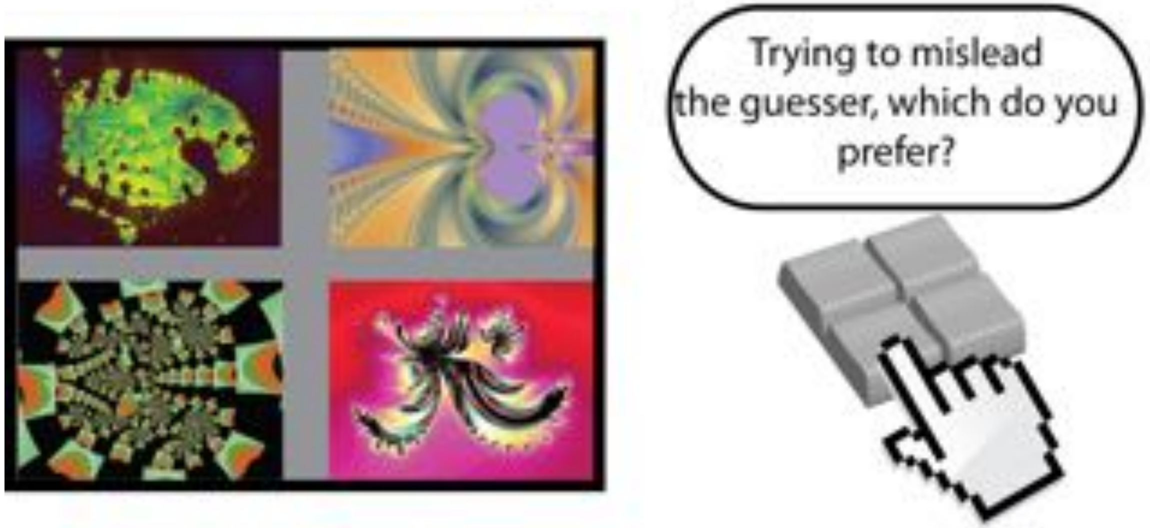
Behaviour during a two-way interaction


Person 1
Person 2

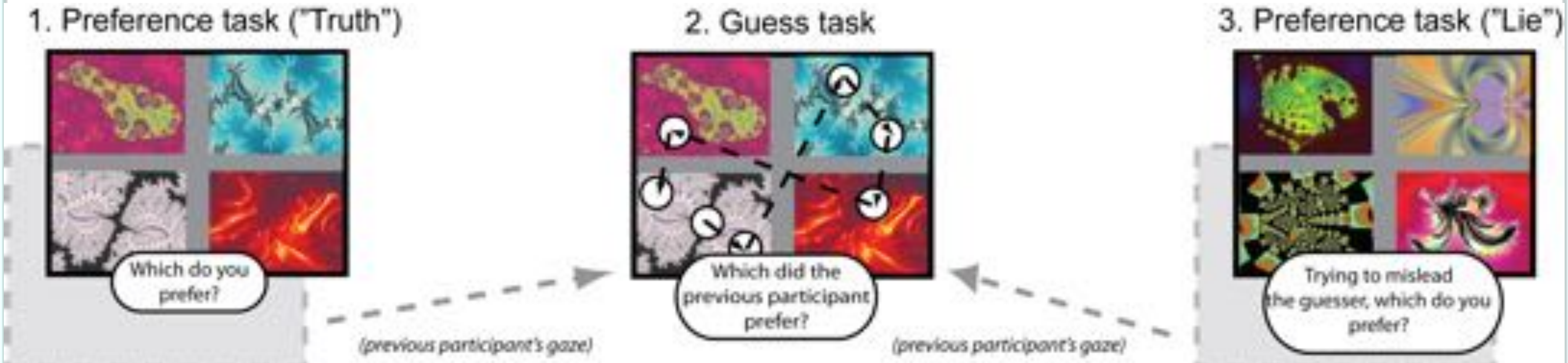
Do participants *change* their gaze according to an observer?

Lying with the eyes

3. Preference task ("Lie")


Trying to mislead
the guesser, which do you
prefer?

Social gaze in a preference task


1. Preference task ("Truth")
Which do you prefer?
(previous participant's gaze)
2. Guess task
Which did the previous participant prefer?
(previous participant's gaze)
3. Preference task ("Lie")
Trying to mislead the guesser, which do you prefer?

Can participants spontaneously make inferences based on the location of gaze?

Guesses should be above chance and better than control trials.

Do participants change their gaze according to an observer?

Lie trials should be harder to guess.
Eye movements should change with condition.

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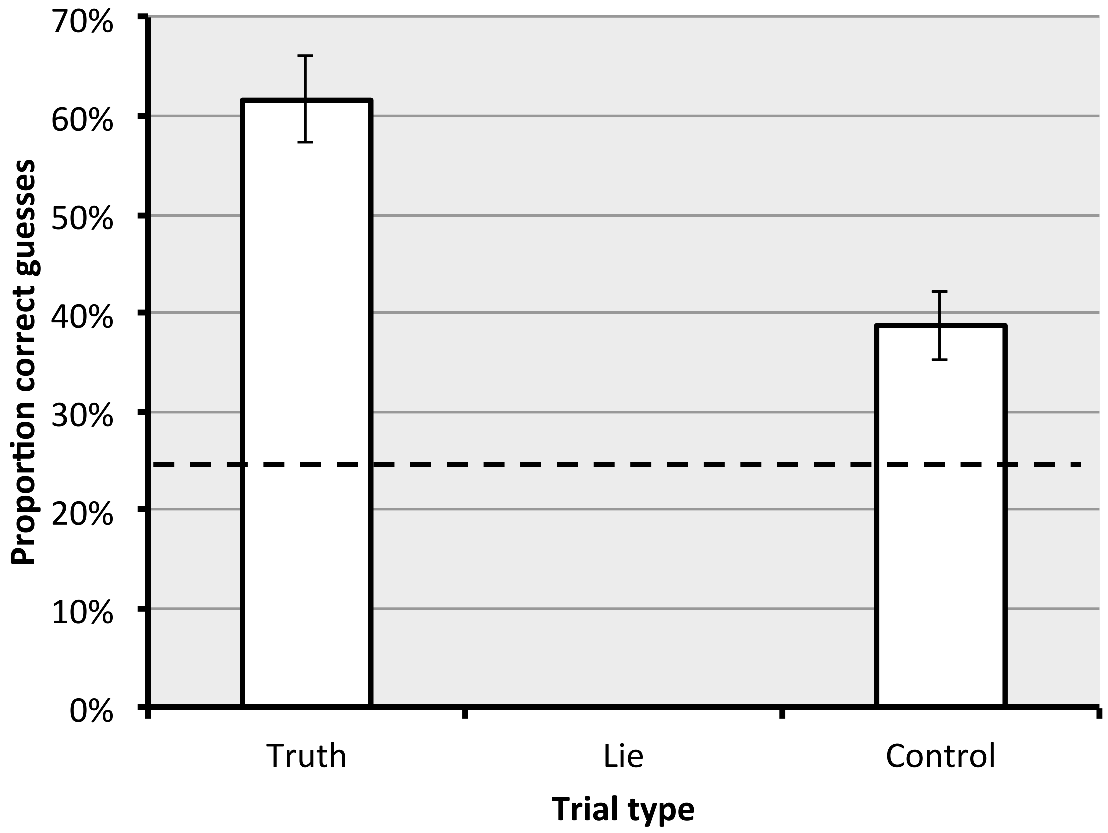
Guess results



Participants can guess a person's preference from their eye gaze

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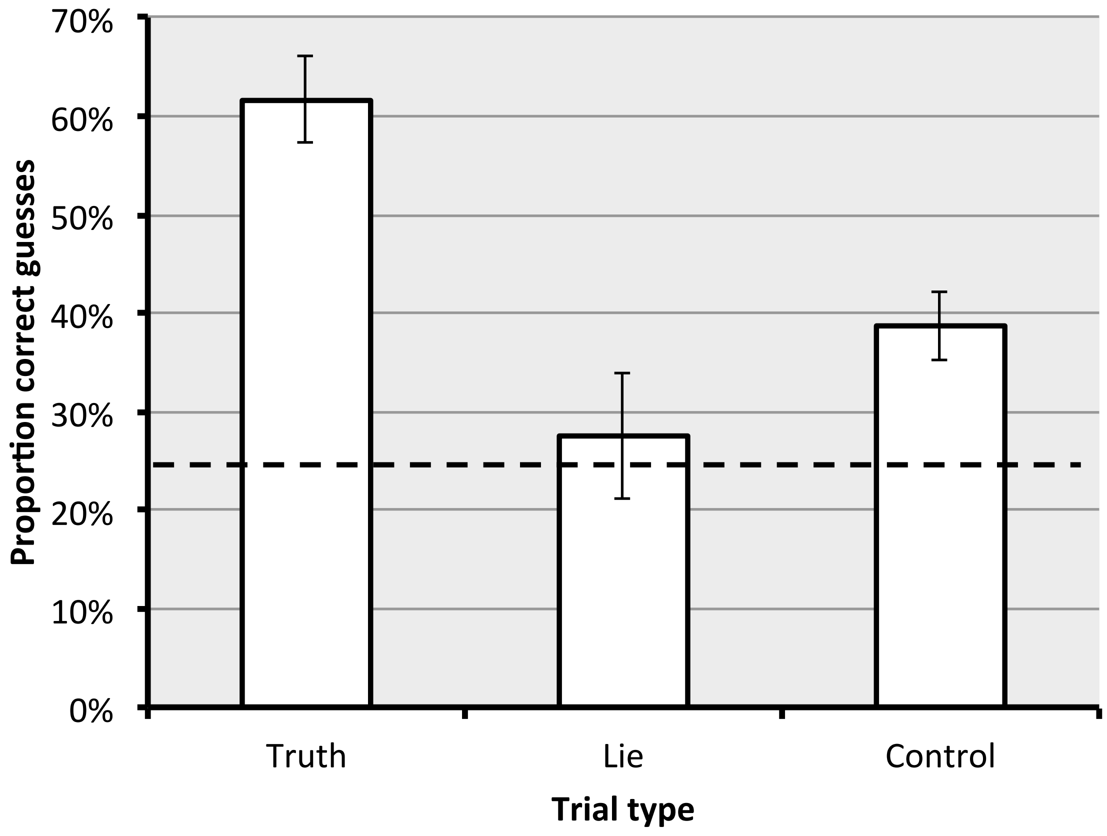
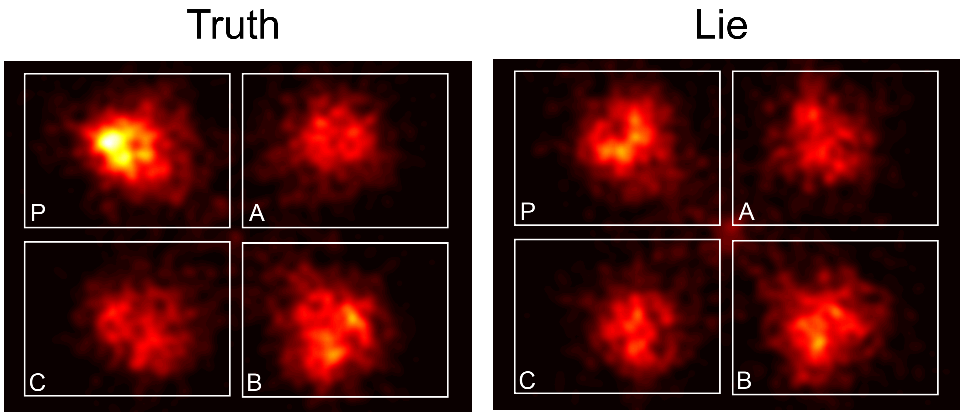
Guess results

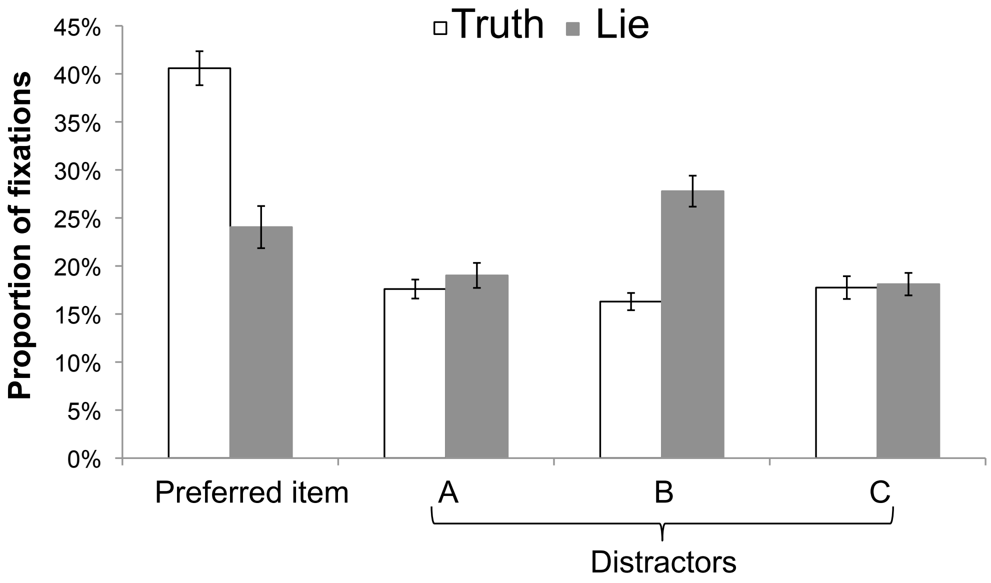


Participants can guess a person's preference from their eye gaze

Observers can modulate their attention in order to deceive

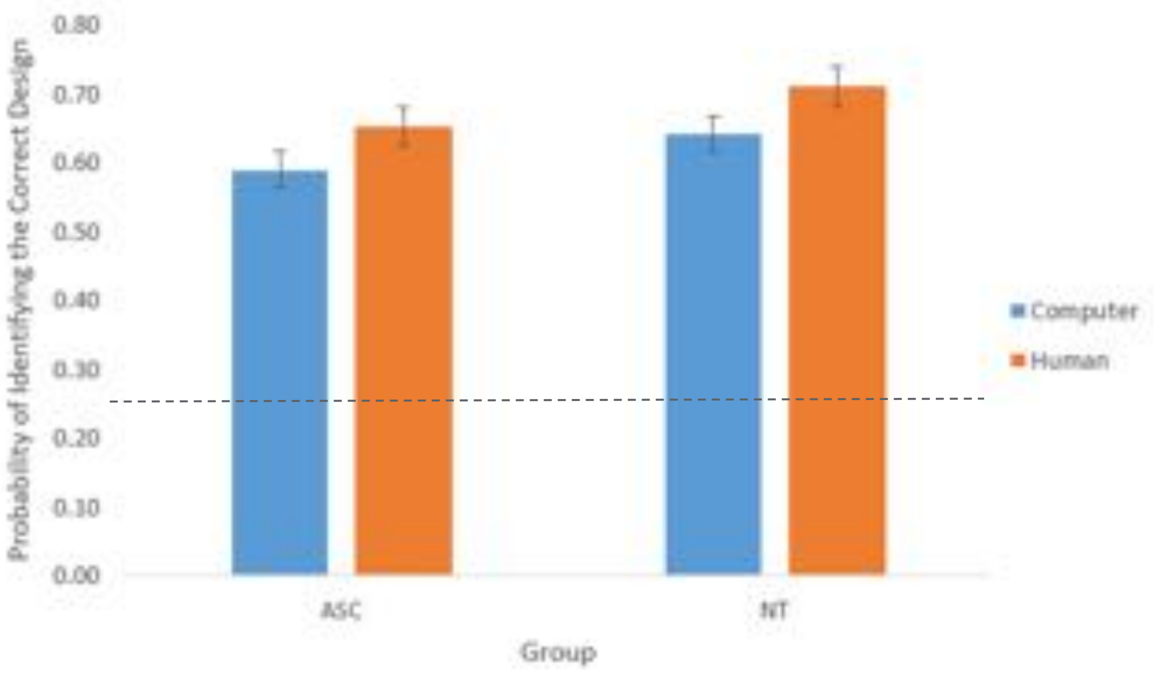
Eye tracking results





Reading and misleading gaze

Participants are better at reading attention when they are told it is human gaze…



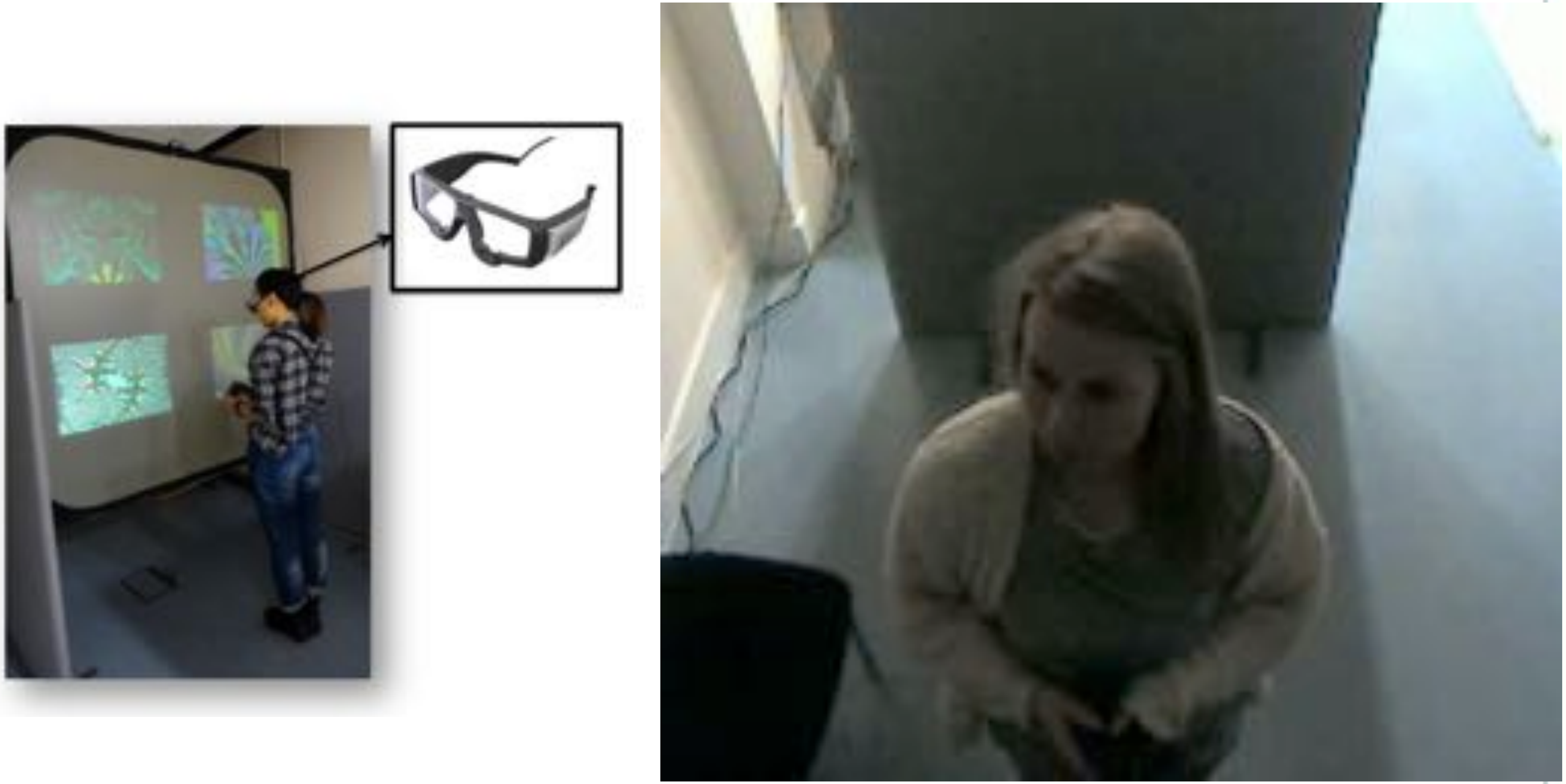
Reading and misleading gaze

We can spontaneously make inferences based on gaze location

…but we can also change our attention to mislead another person

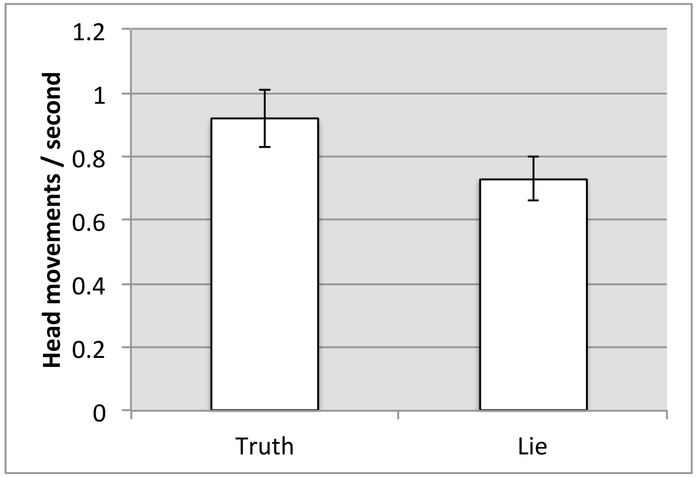
We can study "social" gaze interactions without complex social stimuli

Reading head movements



Reading head movements

- Does lying change their eye head coordination?
  - Participants take longer and make more eye and head movements during the lie block
  - However, **the rate of head movements decreases** when trying to mislead



What is “Social“ Attention?

From “social” stimuli…

to multi-way social interactions and attributions

Attending to (images of) other individuals

Selecting cues within a social group

Taking part in a multilateral interaction between group members

Involving social roles, communication, attribution…

Thank you!

Collaborators

Alan Kingstone	Jessica Dawson
Rick O'Gorman	Emma Morgan
Kaitlin Laidlaw	Megan Freeth