

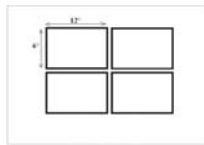
Eye movements recording during the **visual preference task** is one of the most common methods to study social attention and specific cognitive functions. In the presentation of novel laboratory paradigm to investigate the social communication through eye movements [1], the results have confirmed that people can make judgements about other person's visual choice with the help of observing eye movements. Probably, the eye movement strategies and specific properties during the preference task can be associated not only with cognitive functions, but also with eye movement neurology and control system. But, firstly, it is unclear, how the eye movements change according to the task. The aim of this work is to define the properties of eye movements and scanpaths during the preference task under different conditions.

So, the main question is: if You lie, what is different in Your eye movement parameters?

Experiment

Each participant sits in front of computer monitor at the distance of 40 cm. His eye movements are recorded with SMI Eye tracker (iViewX Hi-Speed 240 Hz IR device).

In this work the visual preference task consists of sets of four pictures with similar semantic meaning. The location of pictures is:



The examples of visual stimuli with similar semantic meaning:



Time is limited to six seconds for each preference task.

Participant is instructed to (two types of preference condition):

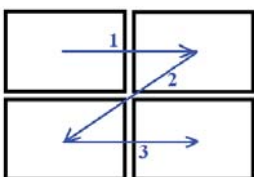
1. Choose the picture You like most; or
2. Choose the picture You like most, but try to **hide** Your choice.



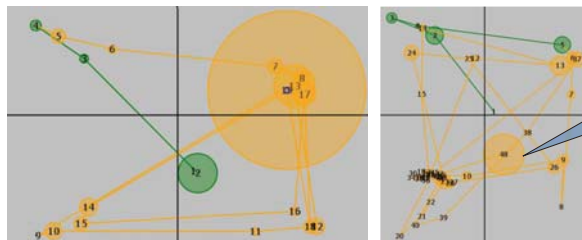
Afterwards the **other** person watches the replay of recorded eye fixations, and tries to guess the preference response.

Results. The main differences

	Free to choose	Lie to me	Summary
Eye movement trajectory	The first (from 6 to 8) saccades show the definite eye movement trajectory (like in reading) for 11 out of 15 participants. No influence of dual task (hence, hide the preference choice) was stated for the first saccades.		
Fixation duration	203±23 ms	156±21 ms	The average fixation duration is significantly shorter when participant is supposed to lie. The participant can not fixate on the image that he does not like for a long time, but he tries to return eyes to that image in order to hide his preference choice (dual task).
Fixation number	12±3	20±4	Each participant made more fixations trying to mislead person guessing. It may be linked to instability of gaze (short fixation duration).
Saccade amplitude	33°±3°	21°±7°	The average saccade amplitude is shorter in case of lying. The participant returns eyes on the image that he does not like in order to keep his gaze more stable.
Guessing of preference response	About 85%	About 45%	When asked to mislead the person guessing, participants changed their looking behaviour and guessing success reduced significantly.

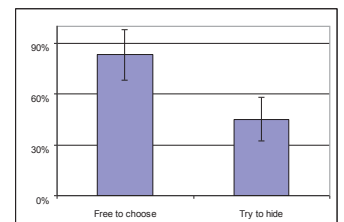


The trajectory of first saccades in the preference task



The examples of scanpaths when the participant is free to choose the image (to the left) and when he tries to hide his choice (to the right)

A circle shows one fixation. The bigger the circle – the longer fixation.



Guessing of preference response according to given task

Conclusions

The results confirm that people can spontaneously use the gaze of others to infer their judgements, but also that these inferences are open to deception. The fixational eye movements become less stable when the person wants to mislead the other person guessing.

References

Foulsham, T. Social Gaze: From Eyes to Lies. In K. Holmqvist, F. Mulvey & R. Johansson (Eds.), Book of Abstracts of the 17th European Conference on Eye Movements, 11-16 August 2013, in Lund, Sweden. Journal of Eye Movement Research, 6(3), p.171.

Acknowledgements

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