DYNAMIC AND STATIC EXPRESSIONS OF EMOTION ARE RECOGNIZED WITH EQUAL EFFICIENCY

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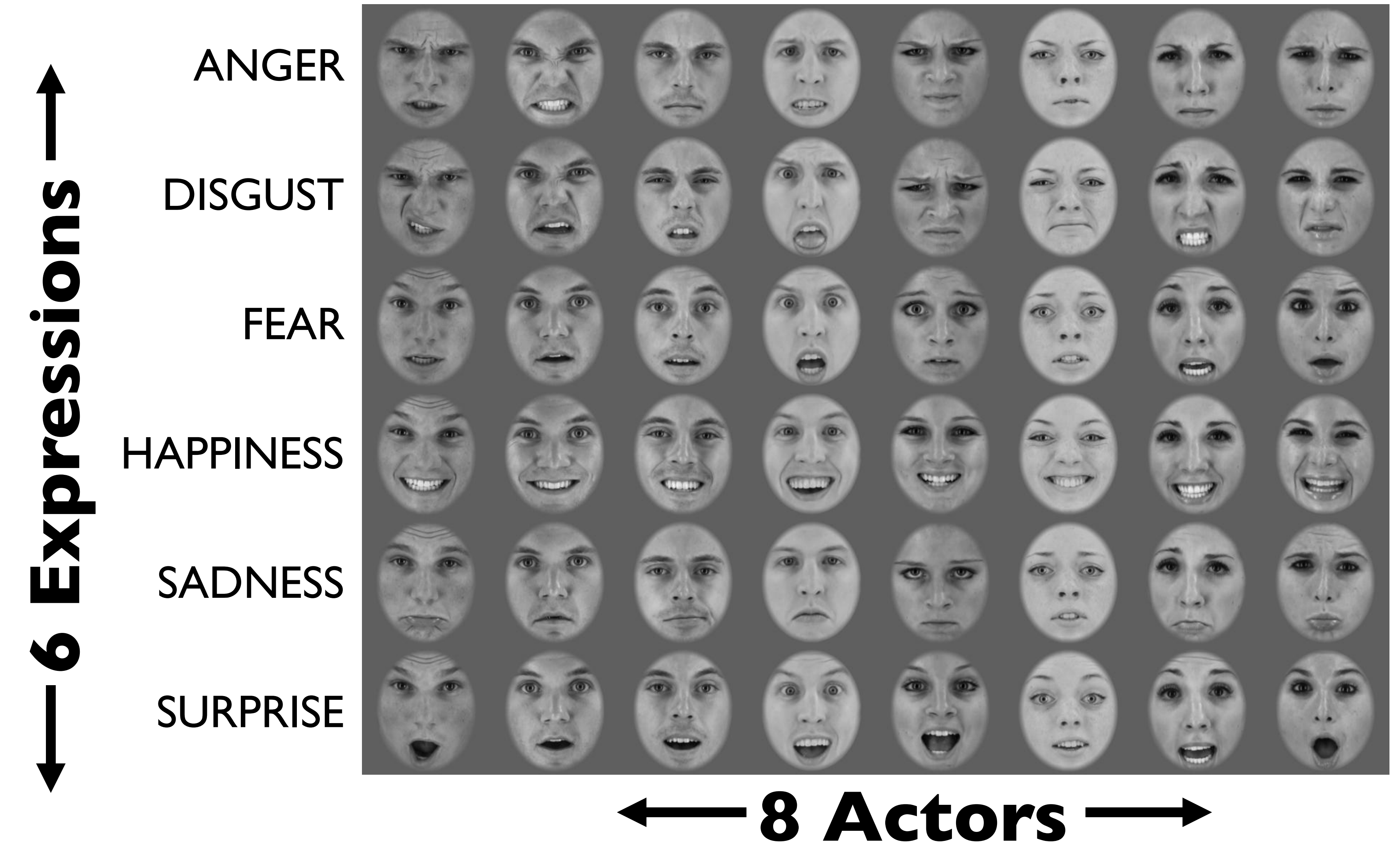
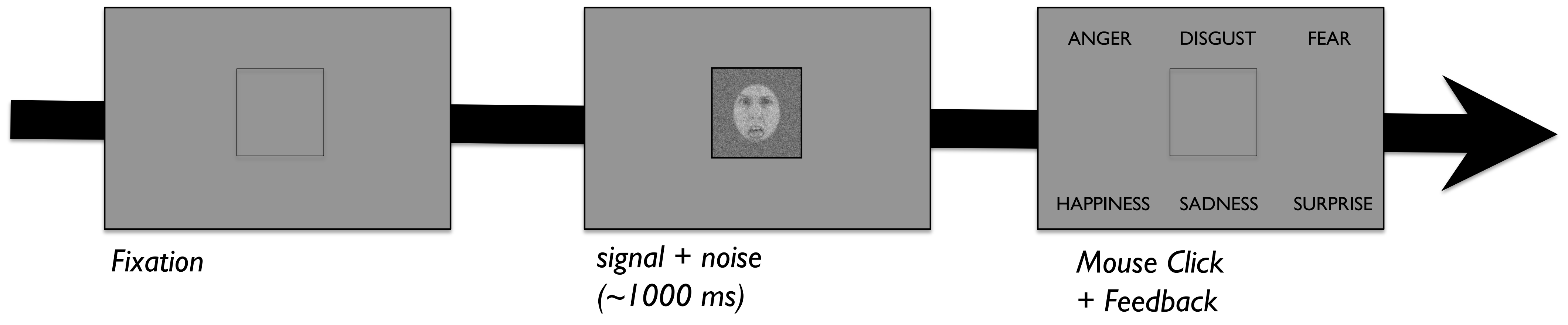
Is there a 'dynamic advantage' for recognizing facial expressions of emotion[1-4]?



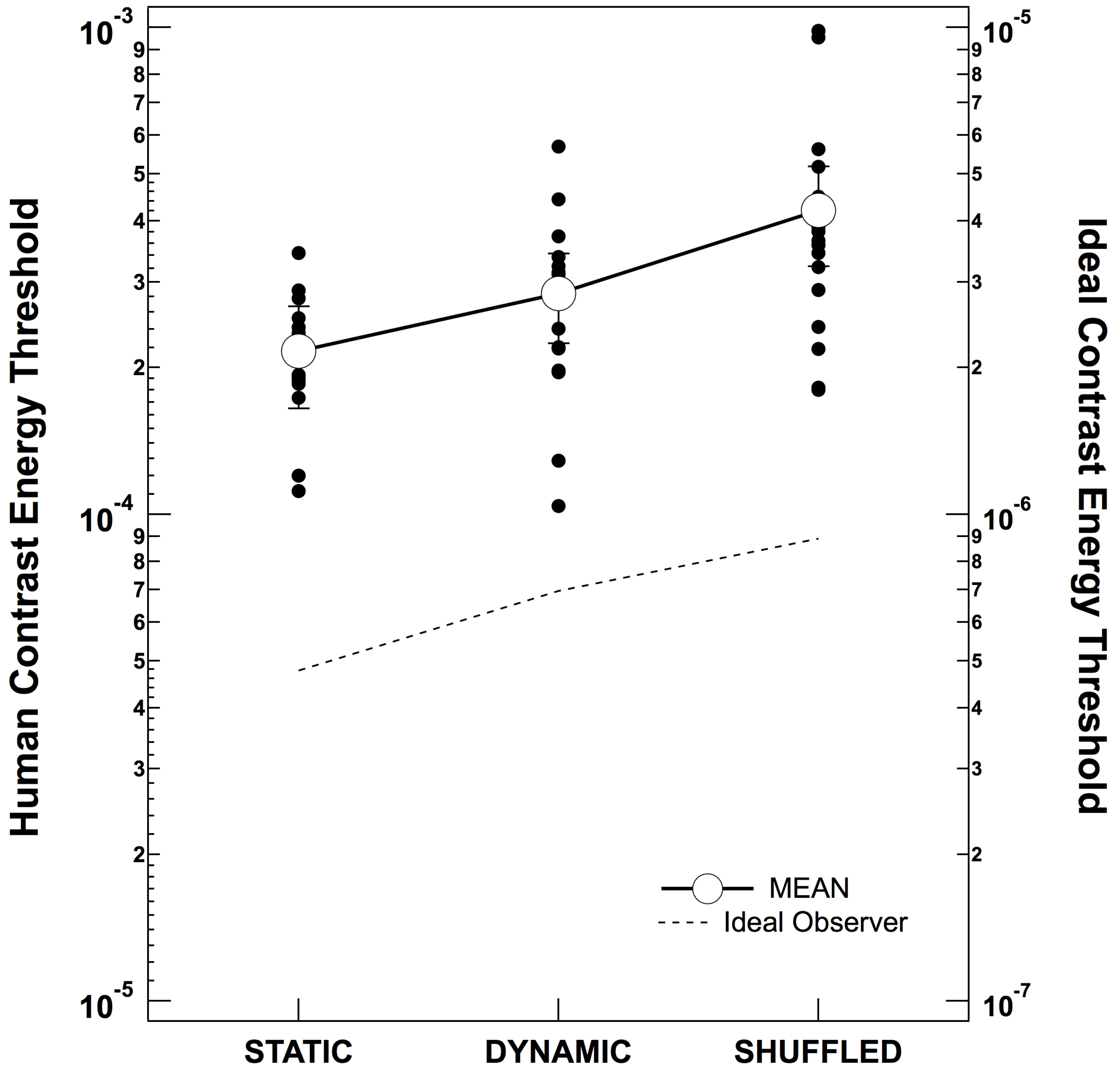
- Measured 50% correct contrast energy thresholds for identifying the facial expression (1 of 6 identification, chance = ~16%) of a randomly chosen actor
- 16 human observers (10 naïve) & the ideal observer[5]
- 3 Conditions (blocked, counterbalanced, within subjects):
  - **Dynamic Faces**: 30 frames of the evolution of a facial expression, starting from neutral to the full expression, shown in dynamic Gaussian white noise
  - **Static Faces**: 30 repeated frames of the final frame of the dynamic stimulus (full expression), shown in dynamic Gaussian white noise
  - **Shuffled Dynamic Faces**: all 30 frames of the dynamic stimulus shown in dynamic Gaussian white noise, but with the frames randomly shuffled in time; 10 different random frame permutations applied to all actors and expressions



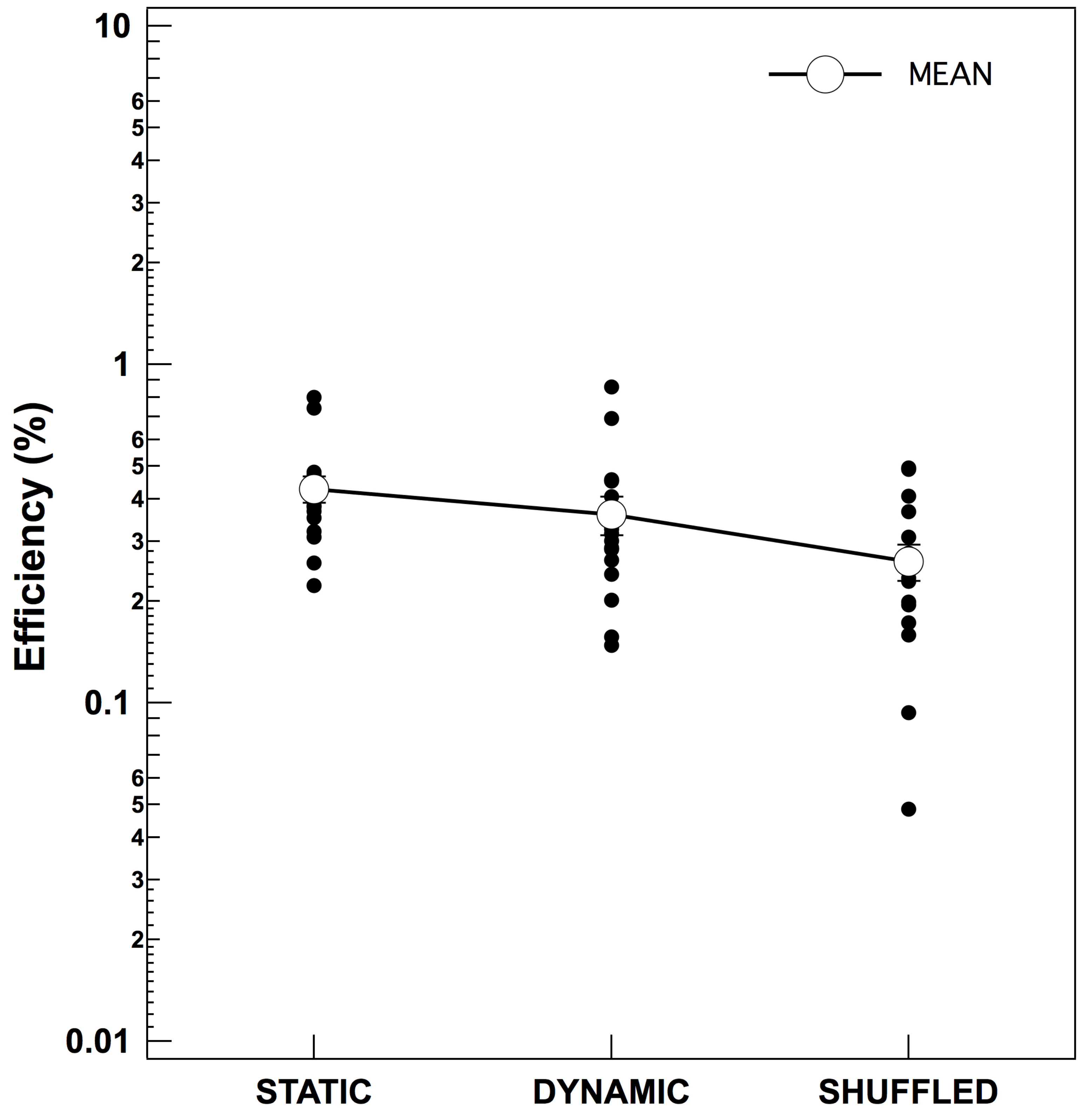
Fixation

signal + noise (~1000 ms)

Mouse Click + Feedback

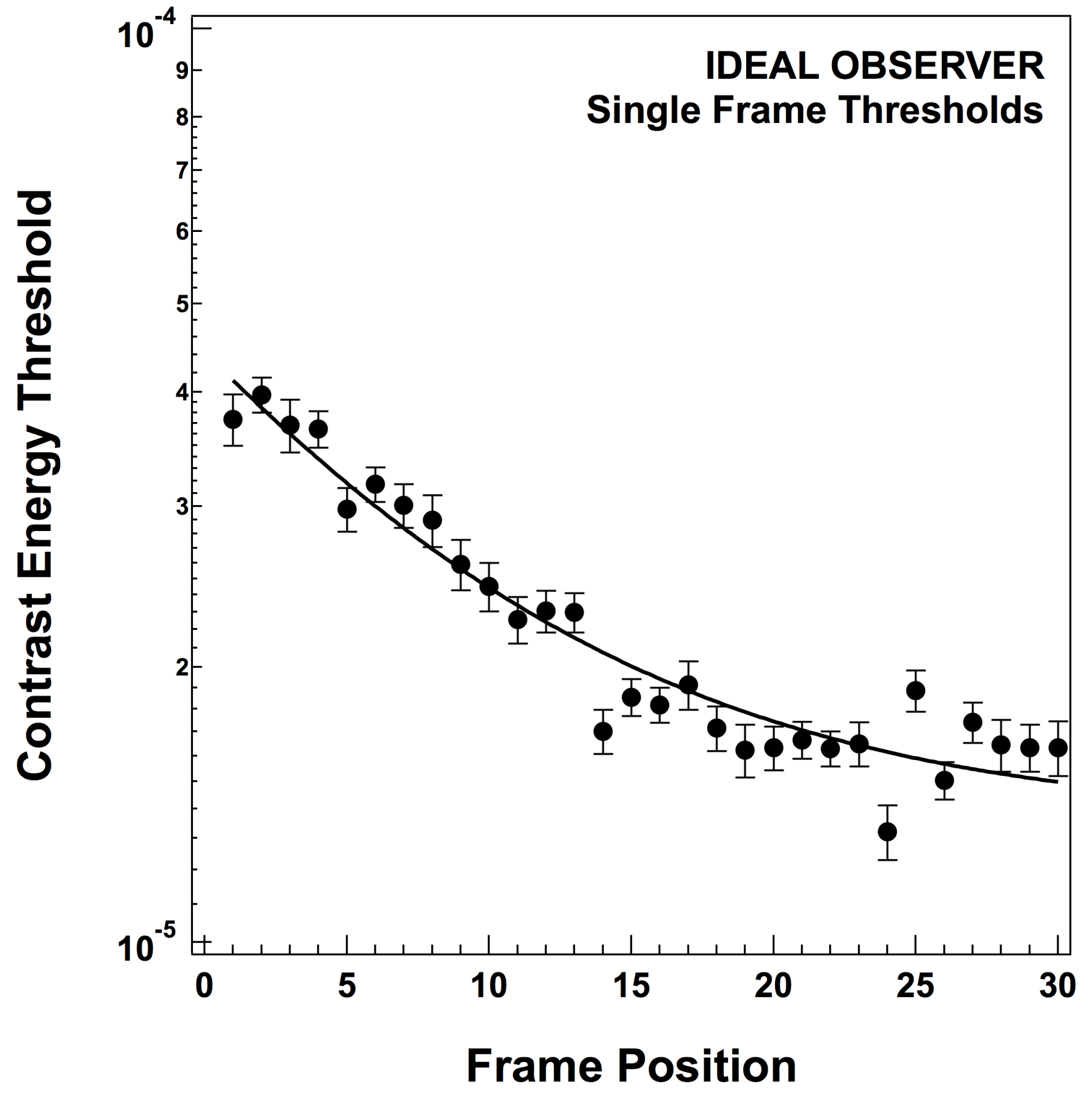


Thresholds



Efficiencies

(ideal/human thresholds)



Ideal observer thresholds for individual frames of the dynamic face stimuli

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• Results & Conclusions

○ Ideal observer thresholds were lower for static than dynamic expressions, indicating that fully expressed static emotions actually carry more information than dynamically evolving expressions

○ Single-frame ideal observer thresholds decreased systematically from the first to the last frame, indicating dynamic expressions become progressively more informative over time

○ Surprisingly, human observers were no less efficient with static than dynamic expressions, and were nearly as efficient with shuffled dynamic expressions

○ Thus, there appears to be no 'dynamic advantage' for the recognition of facial expressions of emotion

• References

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[2] Edwards, K. (1998). The face of time: temporal cues in facial expressions of emotion. *Psychological Science* 9(4), 270-276.

[3] Knight, B. & Johnston, A. (1997). The role of movement in face recognition. *Visual Cognition 4*(3), 265-273.

[4] Fiorentini, C. & Viviani, P. (2011). Is there a dynamic advantage for facial expressions? *Journal of Vision 11*(3):17, 1-15.

[5] Gold, J.M., Tadin, D., Cook, S. C. & Blake, R. (2008). The efficiency of biological motion perception. *Perception & Psychophysics 70*(1), 88-95.