

Describing faces: Conventionalizing ontologies through dialogic interaction

Nicolas Davidenko^{1,2} and Gregory Mills^{1,3}
¹ Stanford University, ² UC Santa Cruz, ³ University of Edinburgh

INTRODUCTION

- Although we are highly efficient at recognizing faces, we find it remarkably difficult to describe them to others, posing a challenge for forensic sciences.
- This difficulty stems in part from the problem of expressing configural information about faces in words.
- Previous research has shown that when interlocutors encounter a domain for which they have only vague descriptions, they rapidly conventionalize ad-hoc ontologies that enable efficient and systematic communication.

QUESTION

- Can interlocutors conventionalize ad-hoc ontologies for describing faces?

METHOD

We present a novel collaborative, computer-based face matching task played by pairs of participants seated in separate rooms.

Participants and stimuli

- 4 pairs of Stanford University undergraduates (4 males; ages 18–21).
- Parameterized face profiles were constructed to vary along 12 face dimensions, generating hundreds of unique faces.

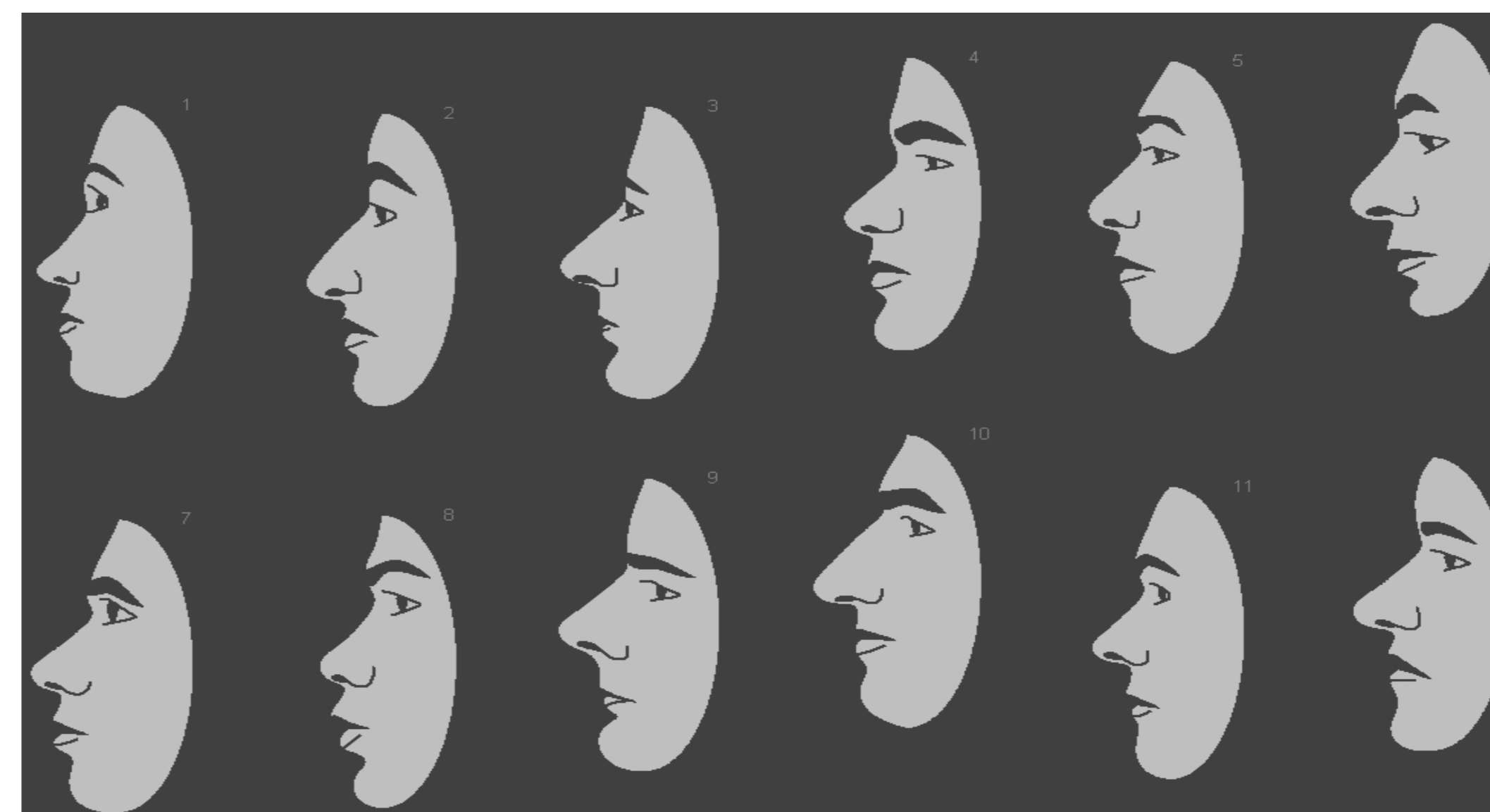
Task

- Participant dyads seated in separate rooms completed 3 parts of a face matching game via an online chat window.
- In each trial, one participant was assigned to be the *director*; the other participant was assigned to be the *matcher*.
- The director was instructed to describe a single face to the matcher; the matcher tried to select the target face from among 10 random faces.

Director's view:



Matcher's view:



Phase 1: pre-training test

- Each participant first acted as director for 7 faces and subsequently as matcher for 7 faces (based on partner's descriptions).
- This phase lasted ~10 minutes and there was no communication between participants.

Phase 2: training

- Participants took turns being director and matcher.
- Incentivized by a system that encouraged speed and deducted points for incorrect guesses, dyads attempted to match faces as efficiently possible.
- This phase lasted ~35 minutes and participants were free to communicate via the chat window.

Phase 3: post-training test

- Identical to Phase 1 but with new faces.

RESULTS

Example descriptions from Phase 1

	Dyad 1	Dyad 4
Face 1	Plain face, somewhat large nose, nothing very distinguish[able]	grey colored, well chiselled nose and eyebrow
Face 2	Mouth and lips jut out a bit, upward slant to entire face. Large, defining lower lip, very large nose. Plain expression	thick lips, more of afro-american face
Face 3	Very, very large and defining nose. Mostly straight face without slant, plain expression, small lips and chin. Thin upper lip	slightly pointed nose, thinner lips...eyebrows
Face 4	Face looks somewhat sad, chin sticks out from forehead plane. Large lower lip but not extremely large	mouth open, medium lips, bulging mouth

Example dialogue from Phase 2

Participant	Typed chat text
P1	thin straight eyebrows that barely slope
P2	veeery thin? or is the upperlip slightly fuller
P2	?
P1	curve* not slope
P1	no i think they're evenly full
P2	is her nose big, straight until the end where is curves
P2	?
P1	but both thin
P2	could it be a woman face?

Example descriptions from Phase 3

	Dyad 1	Dyad 4
Face 8	Thin face, tiny eyes, turning away, thin lips long nose	eyebrow touch forehead, lips almost negligible biting lips, nose jutting forward.
Face 9	His eyebrows almost touch	eyebrow top touching forehead...open mouth
Face 10	Smaller eyes, eyebrows just barely touch the background big nose	lower lips jutting out...brow touches...neutral
Face 11	Large, bushy eyebrows that almost touch the left of his portrait. Large nose that juts out, mouth almost just out as much as his nose	lower lips point down, prominent nose, eyes look down...eyebrow end and end

Sample co-ordination problems faced in the task

Featural : What counts as a “big” or “average” nose? How close do eyes have to be to count as “sunken”? Is a chin “sticking out” if the reason why it sticks out is because the nose is short? How big is a “big forehead”?

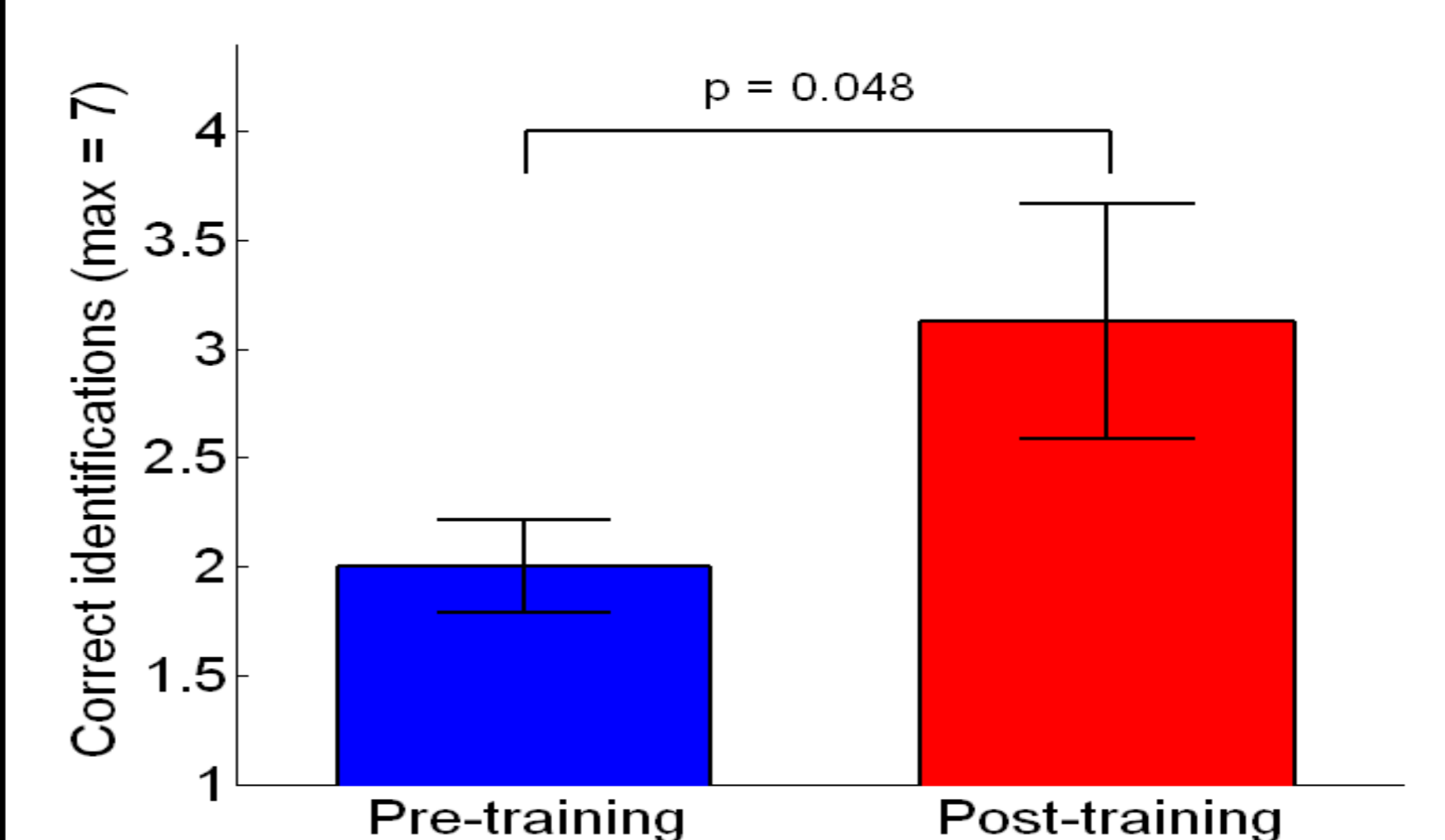
Holistic: What is an “untrustworthy”, “hopeful”, “determined”, or “average” face? What is a “plain” or “interesting” expression?.

→ Dyads interactively conventionalize the solutions to these semantic problems (via clarification sequences)

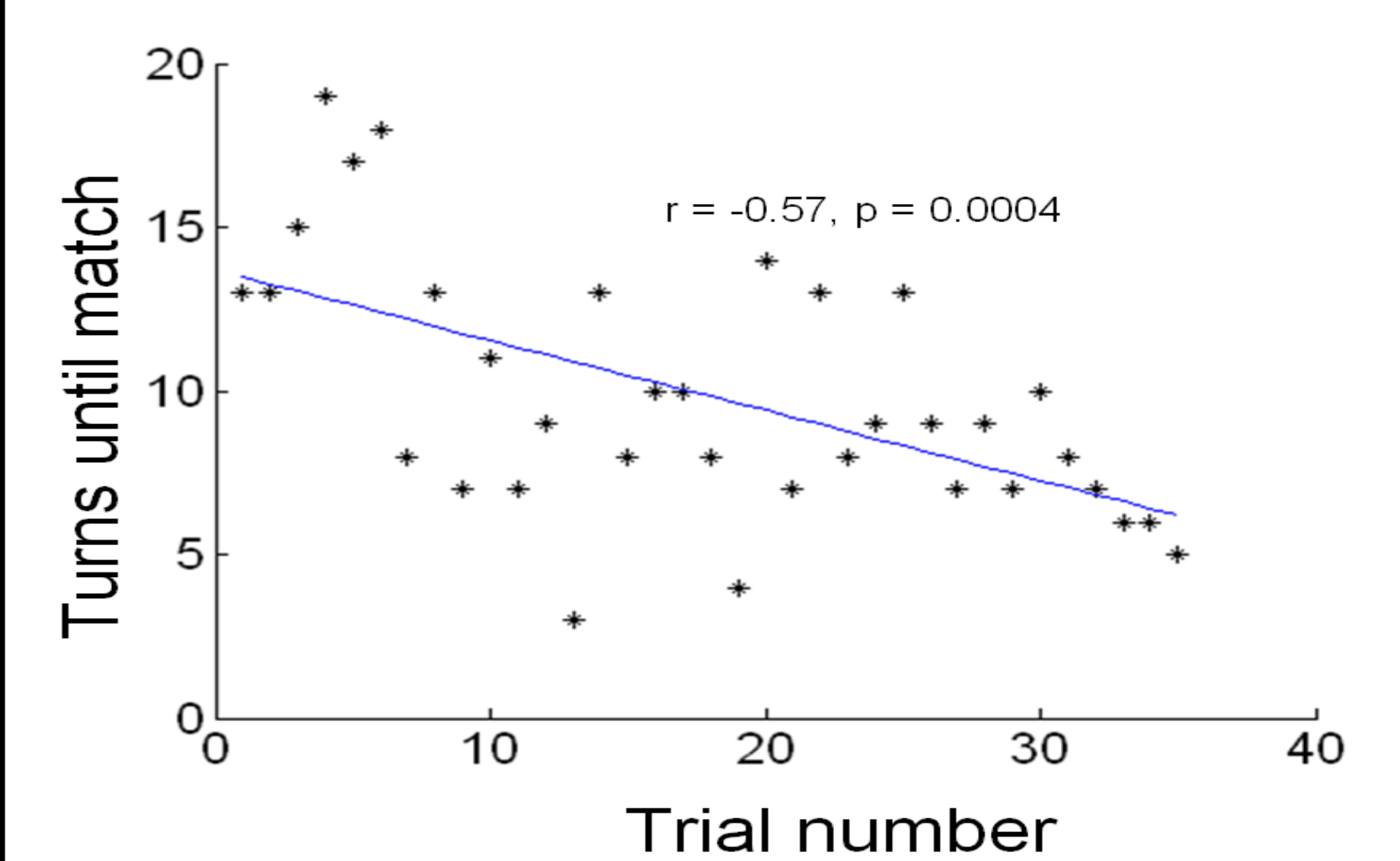
CONCLUSIONS

- Our data provide evidence of dyads conventionalizing ontologies for describing faces.
- As participants resolve instances of miscommunication, they develop more efficient and reliable descriptions.

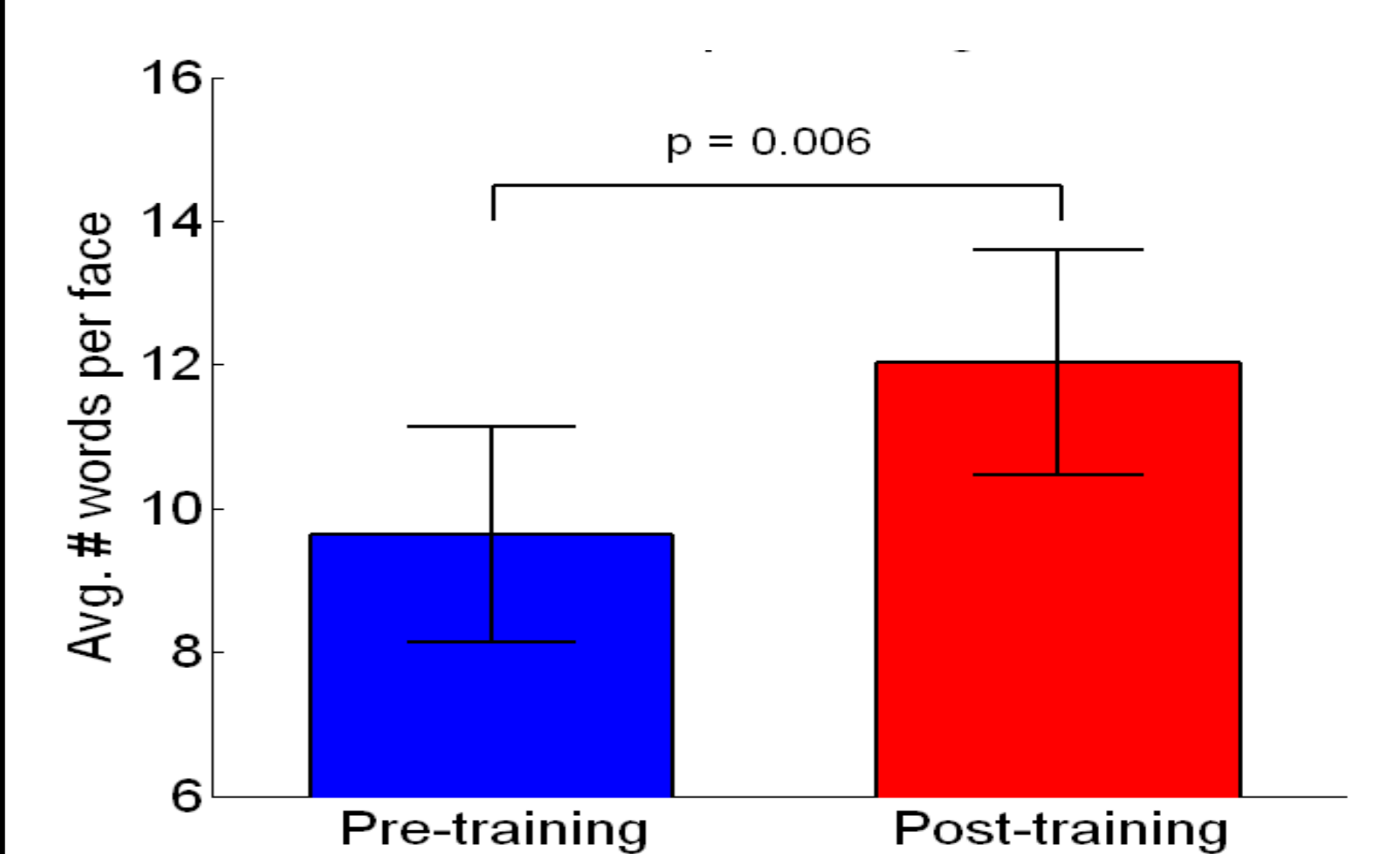
Performance improved after training



No. of turns decreased throughout training



No. of words increased after training



ACKNOWLEDGMENTS

This work was partly funded by Marie Curie IOF (PIOF-GA-2009-236632-ERIS)