PERCEIVING MINDS

Clara Colombatto

Fall 2024

PERCEIVING OTHER MINDS

An epistemological problem:

We don't have direct access to other minds

A solution from psychology:

We perceive them!

PERCEIVING OTHER MINDS

Visual Perception

Physical appearance

Dynamic motion

Static configuration

Cognitive Inferences

Prior beliefs

Communication

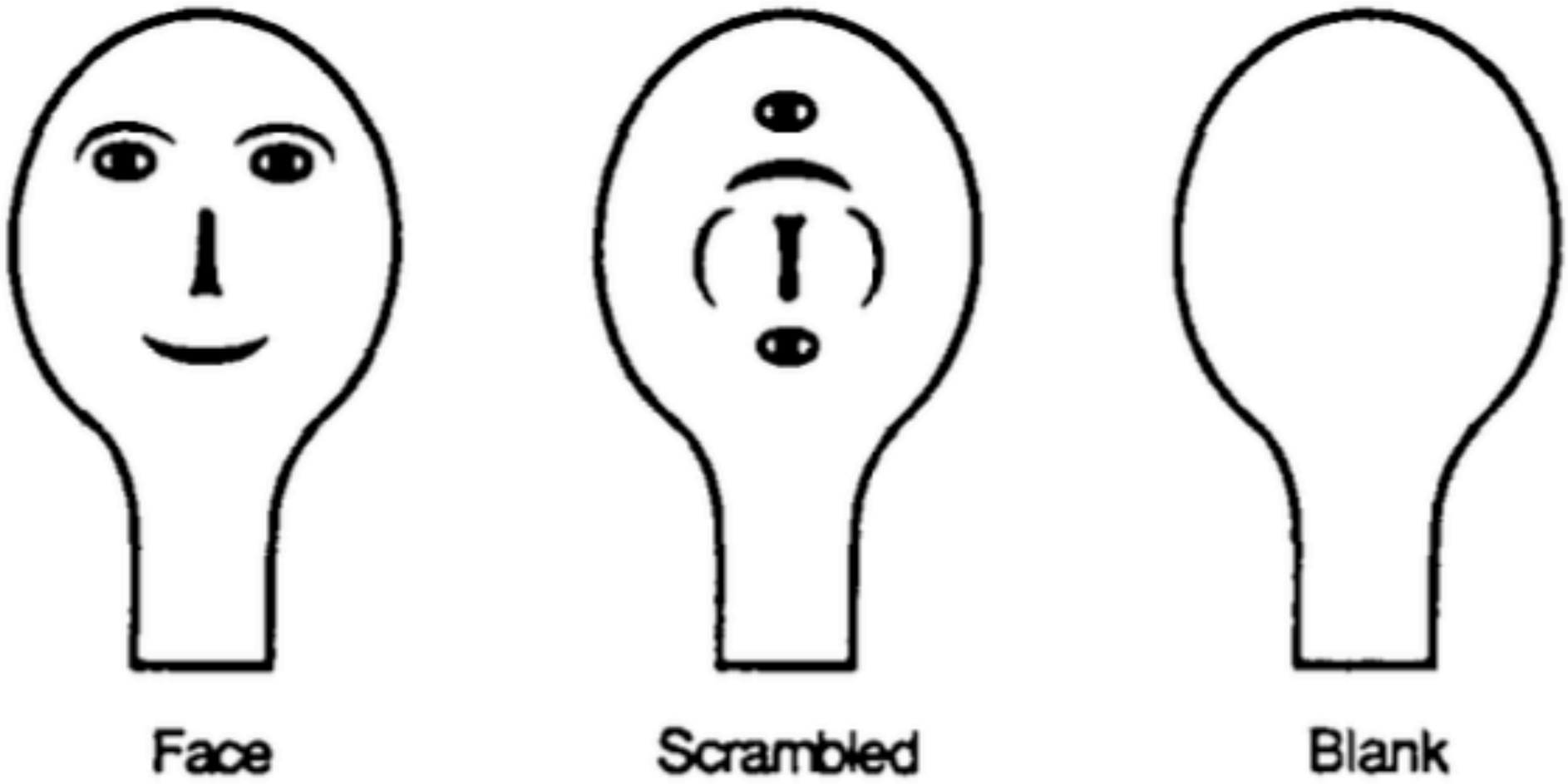
Consequences on interactions

PERCEIVING OTHER MINDS

Visual Perception

Physical appearance

INNATENESS



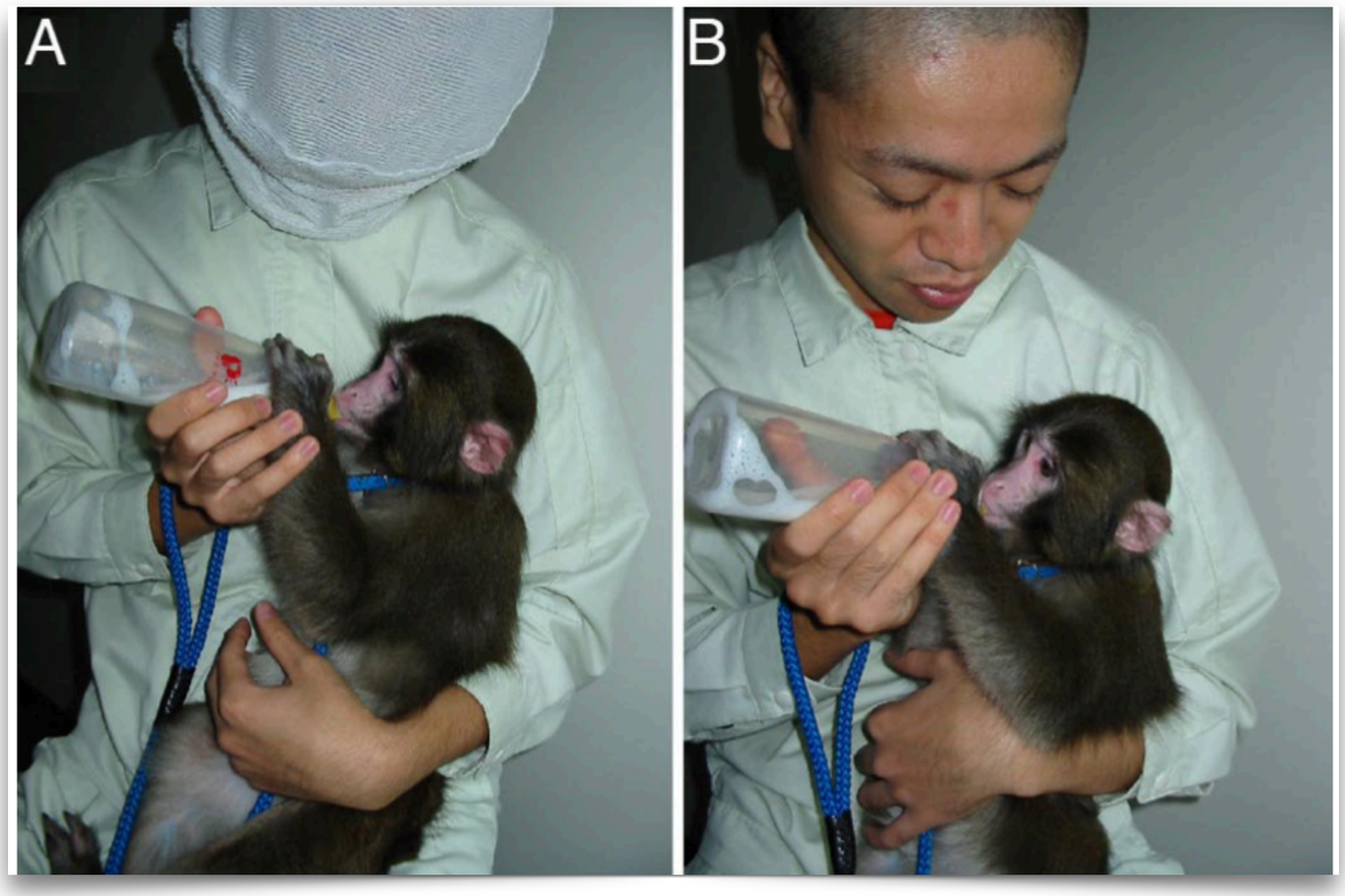
Johnson et al., 1991

Face perception in monkeys reared with no exposure to faces

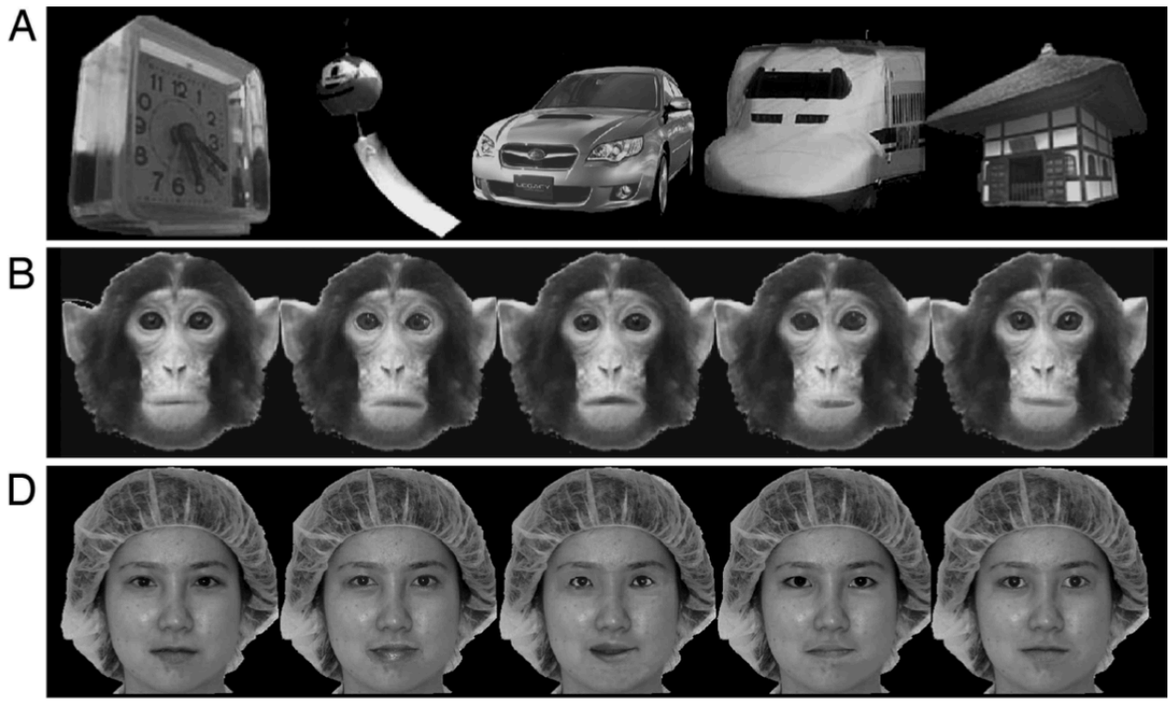
Yoichi Sugita*

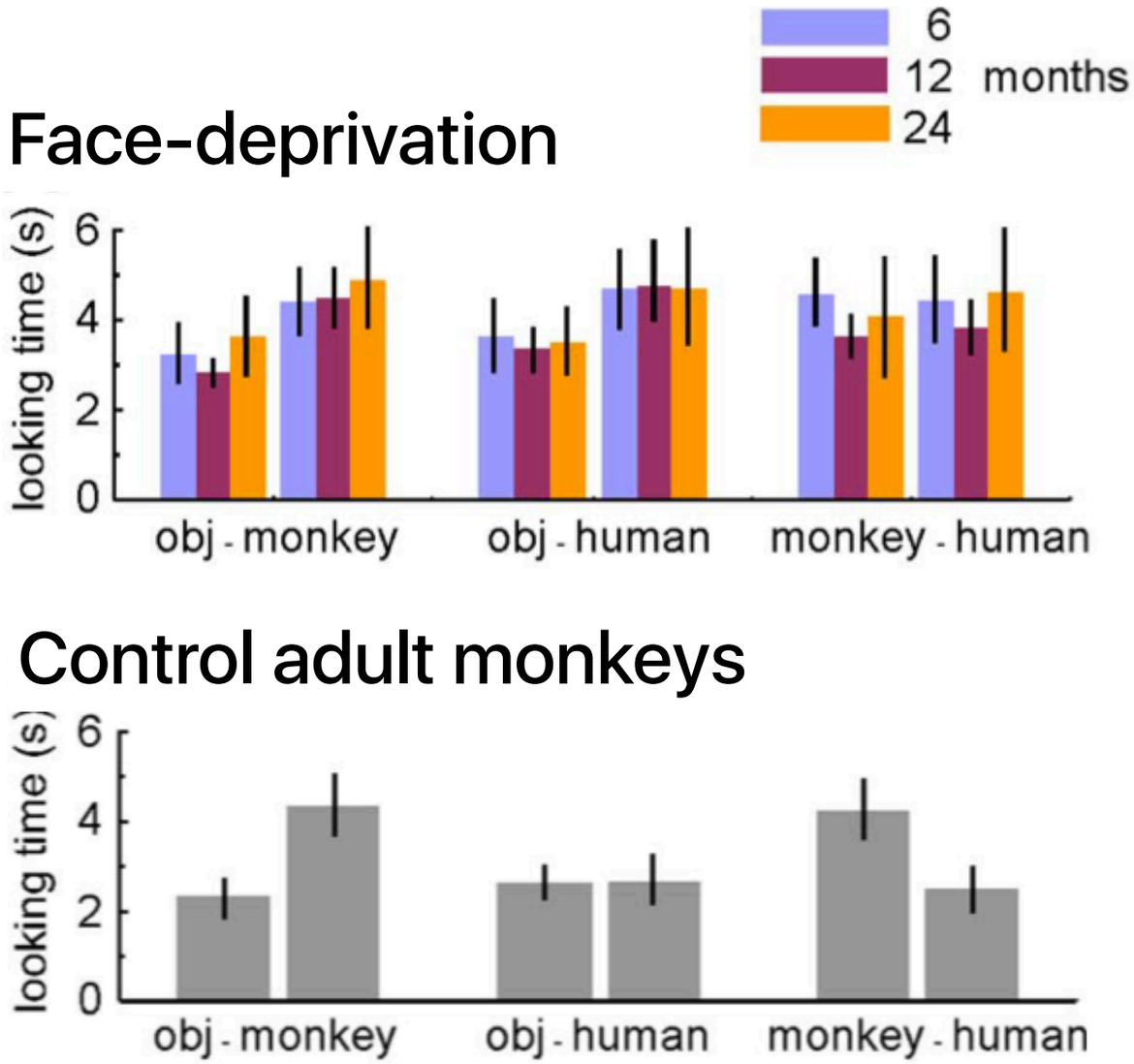
Core Research for Evolutional Science and Technology (CREST), Japan Science and Technology Agency, Sanban-cho 5, Chiyoda-ku, Tokyo 102-0075, Japan; and Neuroscience Research Institute, National Institute of Advanced Industrial Science and Technology, Teragu 1497-1, Tsukuba 300-4201, Japan

Edited by Charles G. Gross, Princeton University, Princeton, NJ, and approved November 26, 2007 (received for review June 28, 2007)



INNATENESS



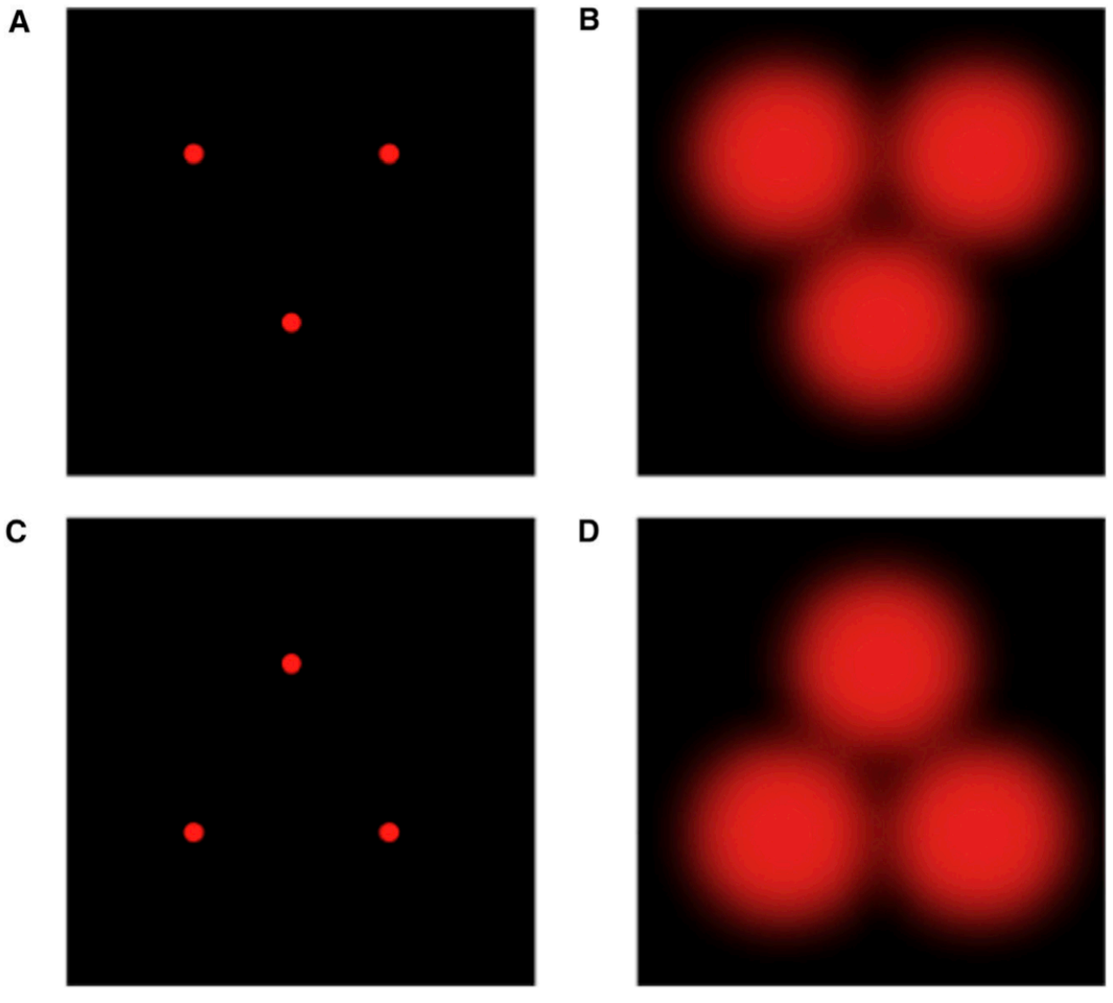


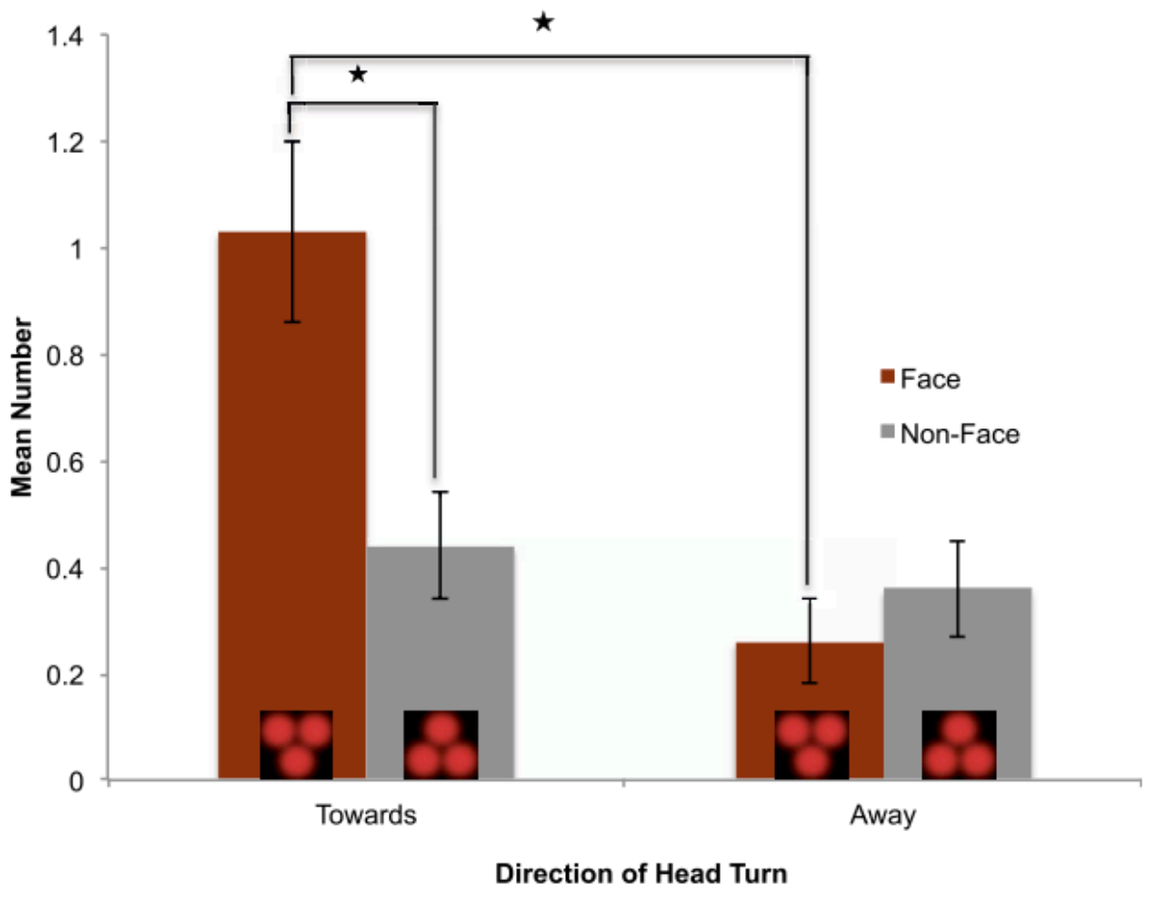
Sugita, 2008

INNATENESS

The Human Fetus Preferentially Engages with Face-like Visual Stimuli

Vincent M. Reid,[1,6,*] Kirsty Dunn,[1] Robert J. Young,[2] Johnson Amu,[3] Tim Donovan,[4] and Nadja Reissland[5]





PAREIDOLIA

PAREIDOLIA

PAREIDOLIA

E

Female, Younger, Happiness
-0.05 0-10

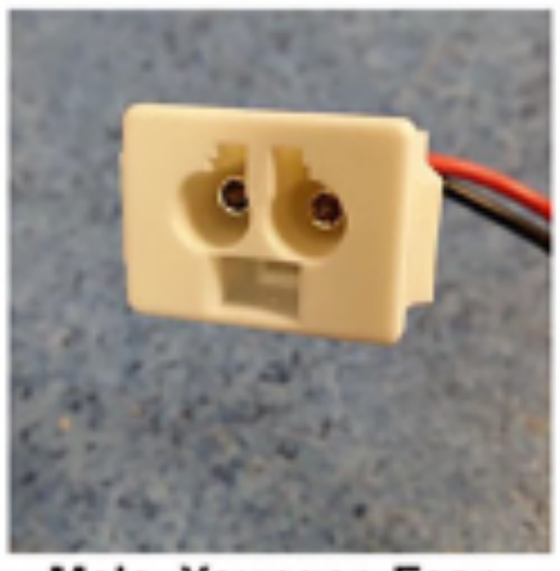
Female, Older, Sadness
-0.06 40-49

Female, Younger, Surprise
-0.03 0-10

Female, Younger, Neutral
-0.12 0-10

Male, Older, Happiness
0.60 80-89

Male, Older, Anger
0.69 80-89

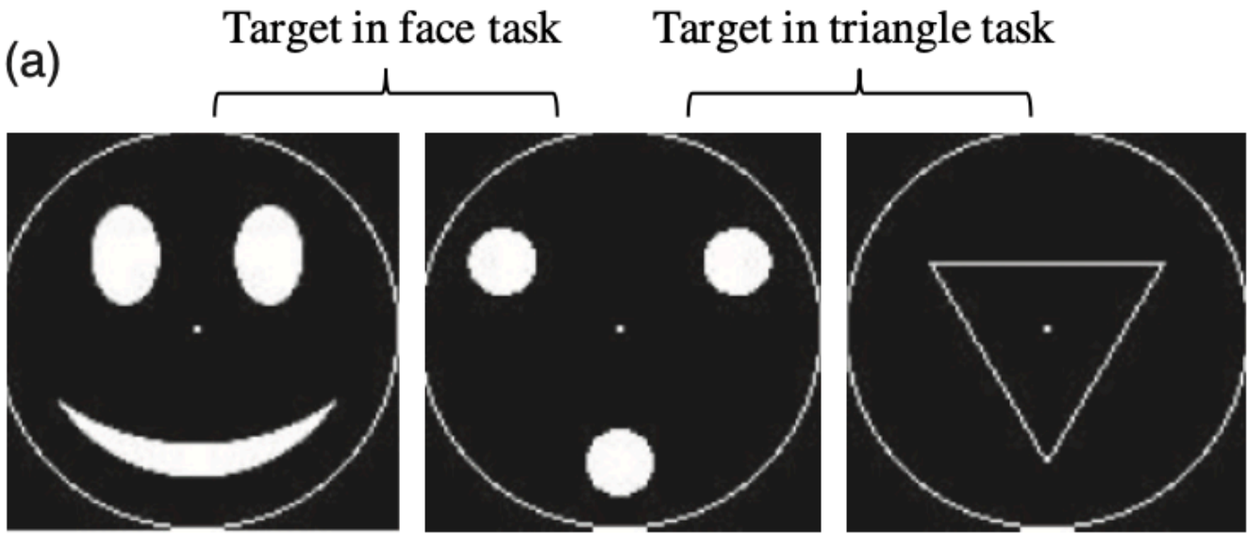


Male, Younger, Fear
0.21 0-10

Male, Younger, Disgust
0.14 0-10

PAREIDOLIA

(a)



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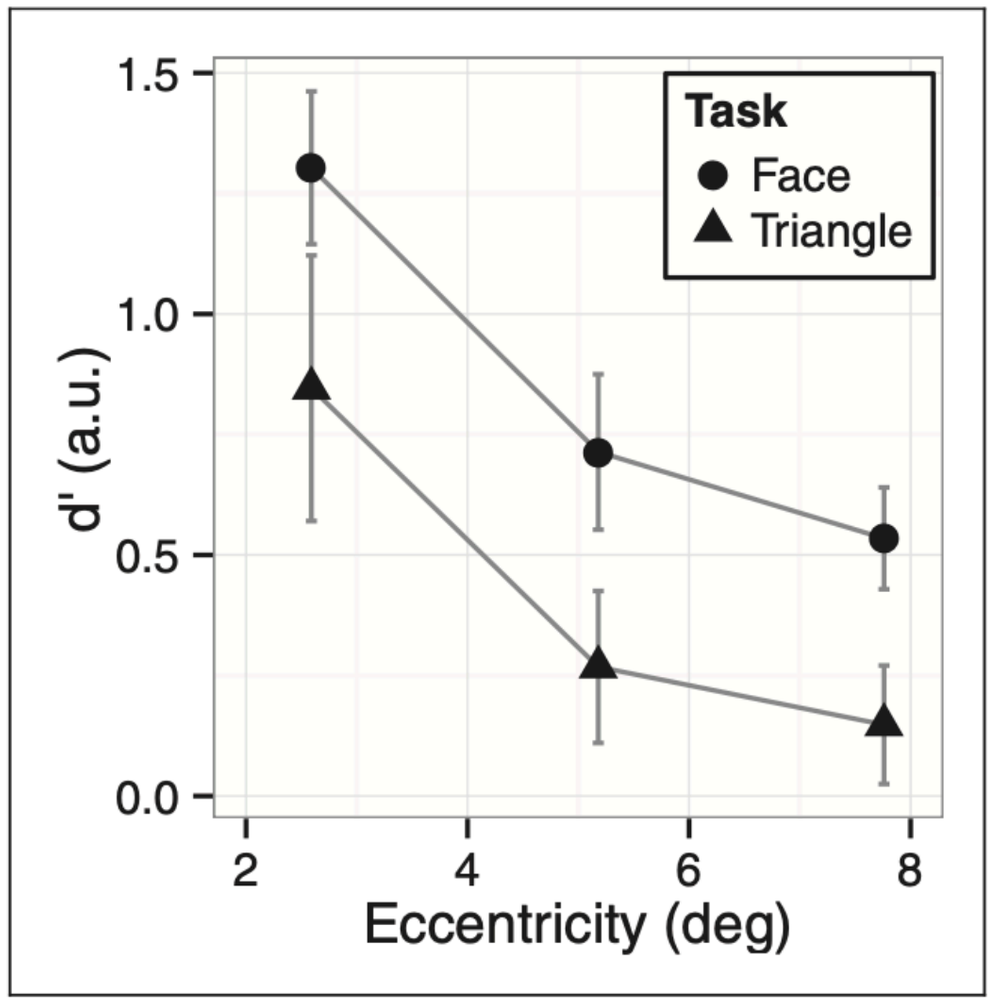
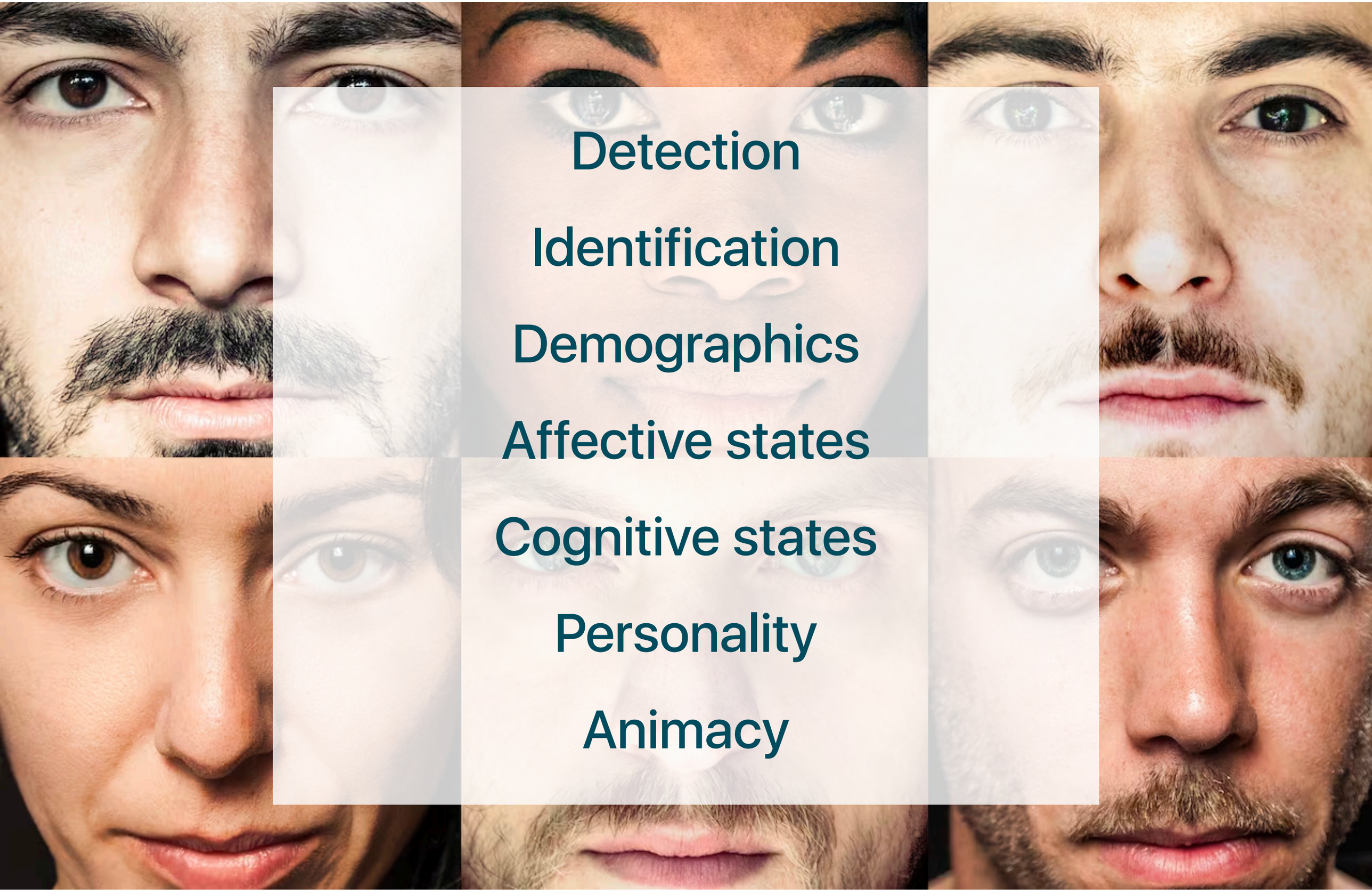
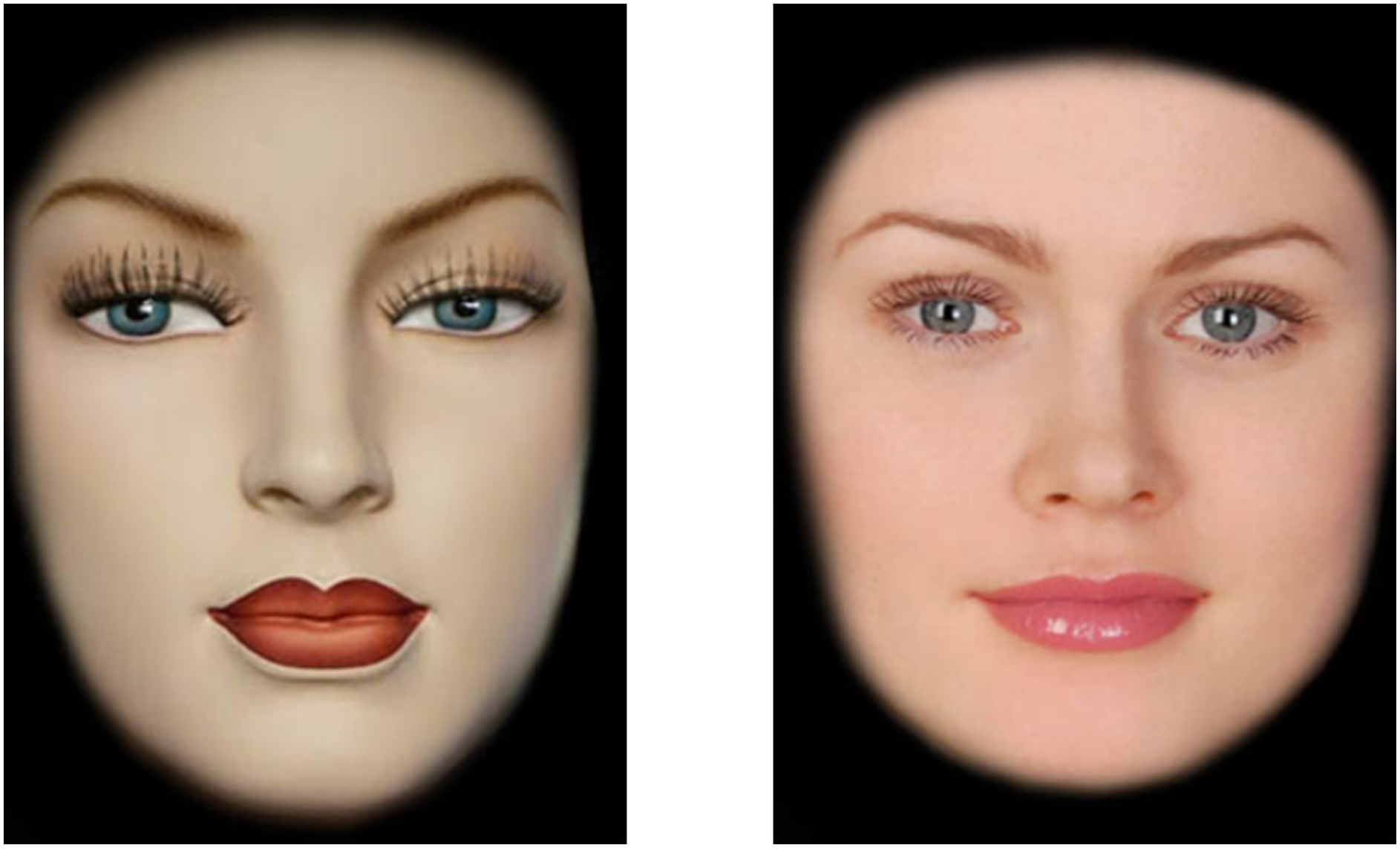


Takahashi et al., 2015


Detection
Identification
Demographics
Affective states
Cognitive states
Personality
Animacy

FACIAL ANIMACY

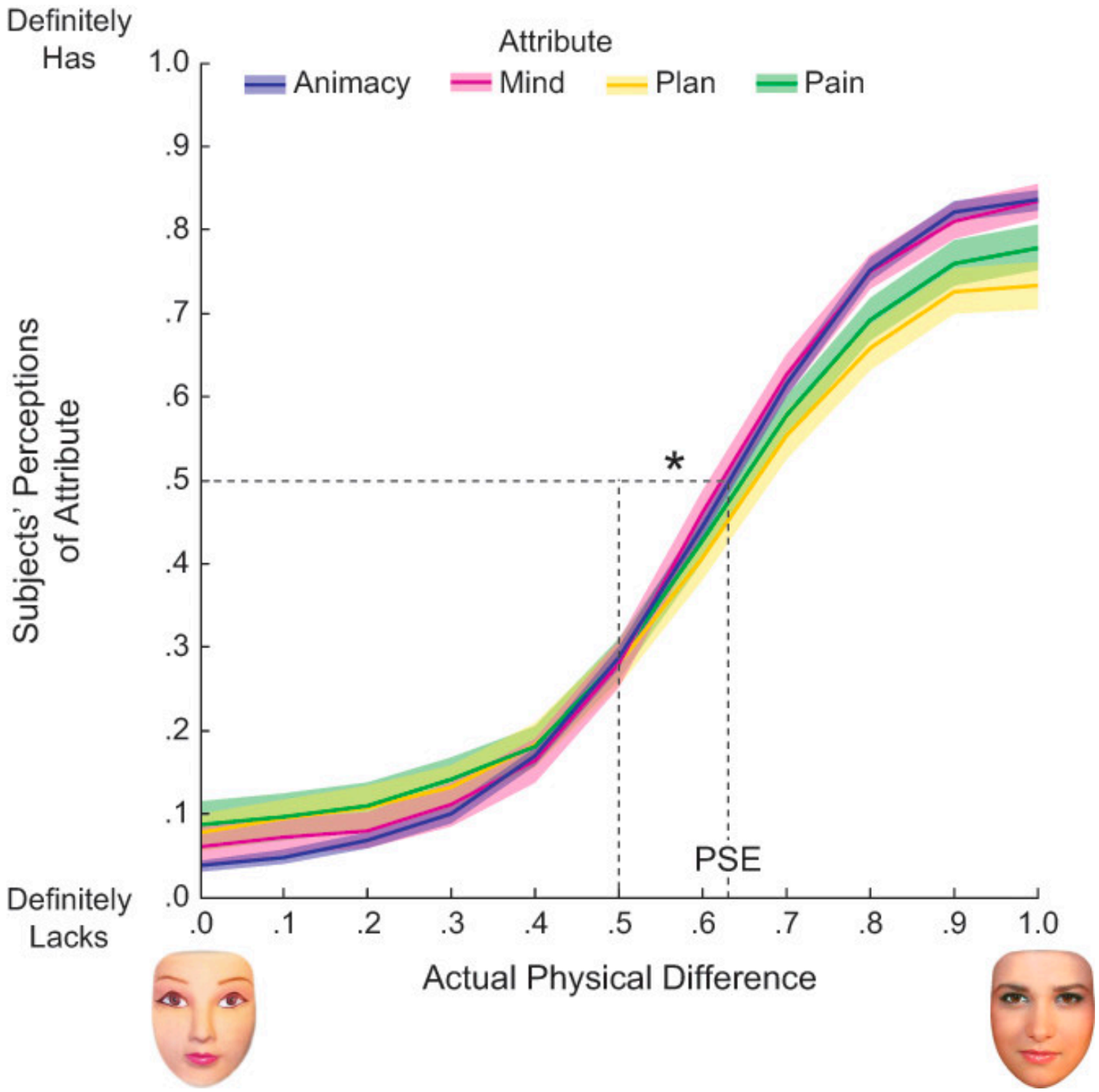


Looser & Wheatley, 2010

FACIAL ANIMACY

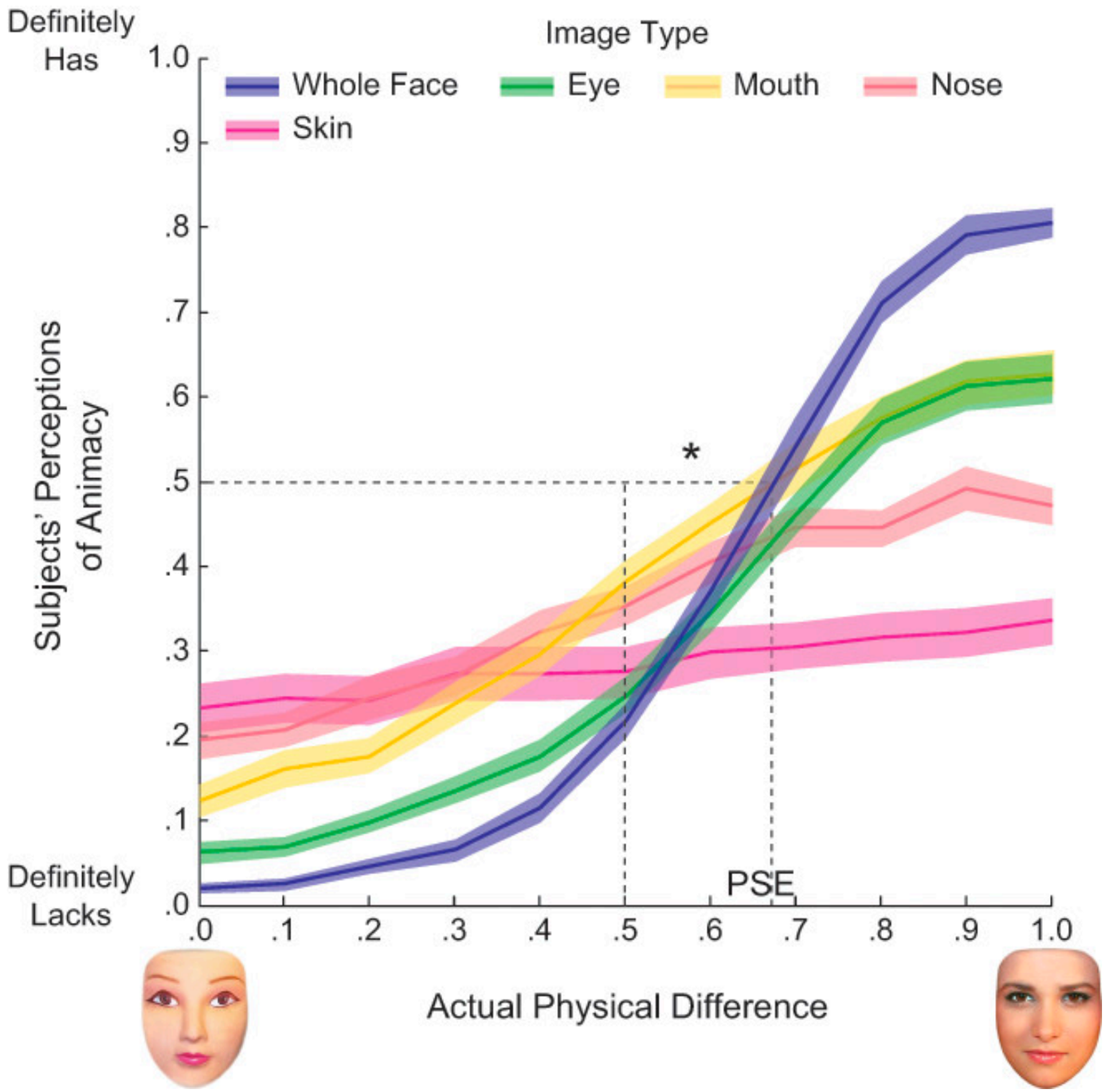
Looser & Wheatley, 2010

FACIAL ANIMACY



Looser & Wheatley, 2010

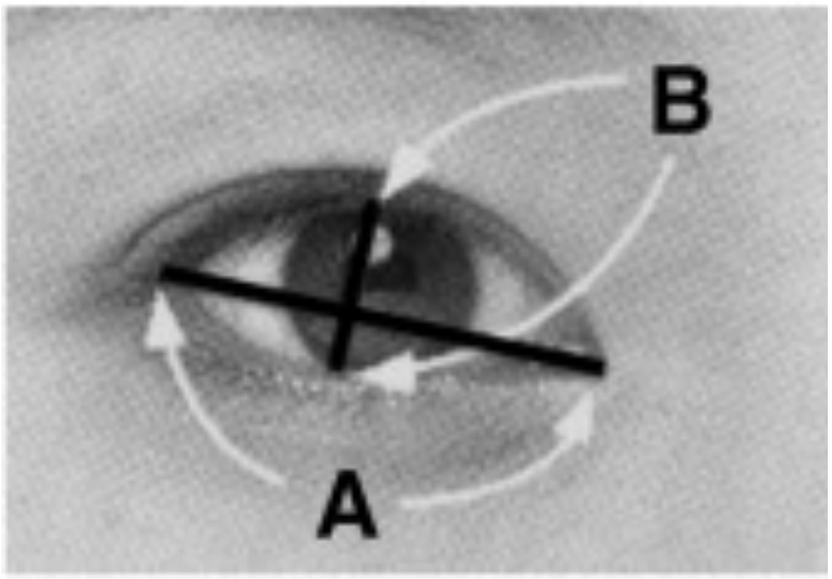
FACIAL ANIMACY



Looser & Wheatley, 2010

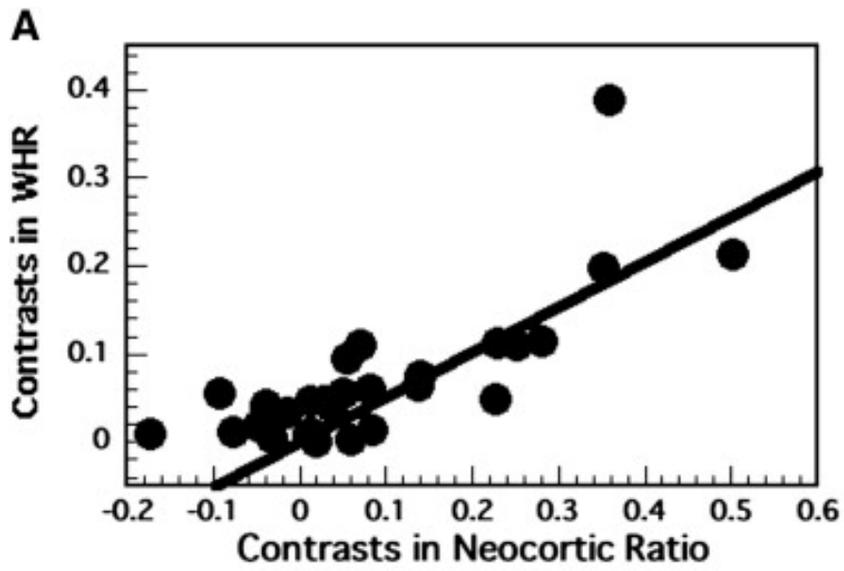
Kobayashi & Kohshima, 1997; 2010

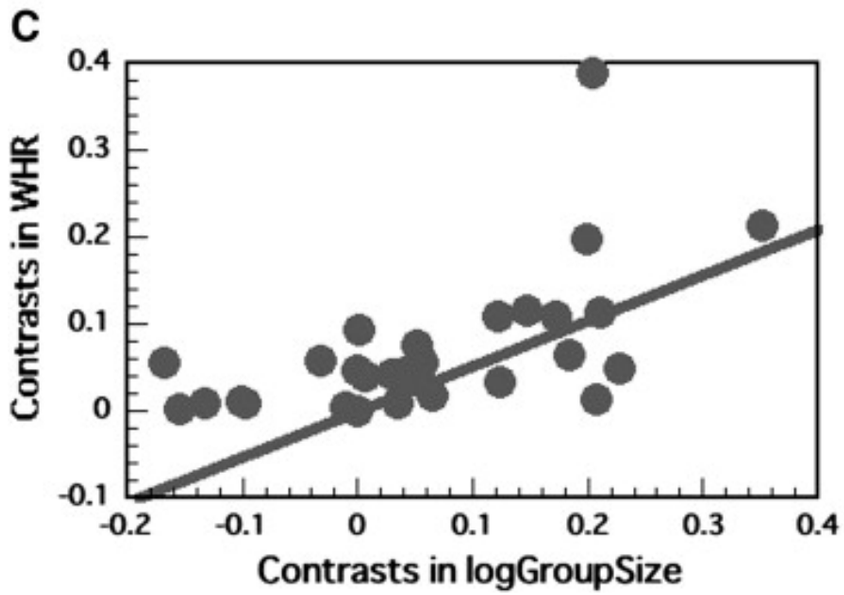
EYE MORPHOLOGY



Width/height ratio [WHR]

A/B





Kobayashi & Hashiya, 2011

PERCEIVING OTHER MINDS

Visual Perception

Physical appearance

Dynamic motion

Static configuration

Cognitive Inferences

Prior beliefs

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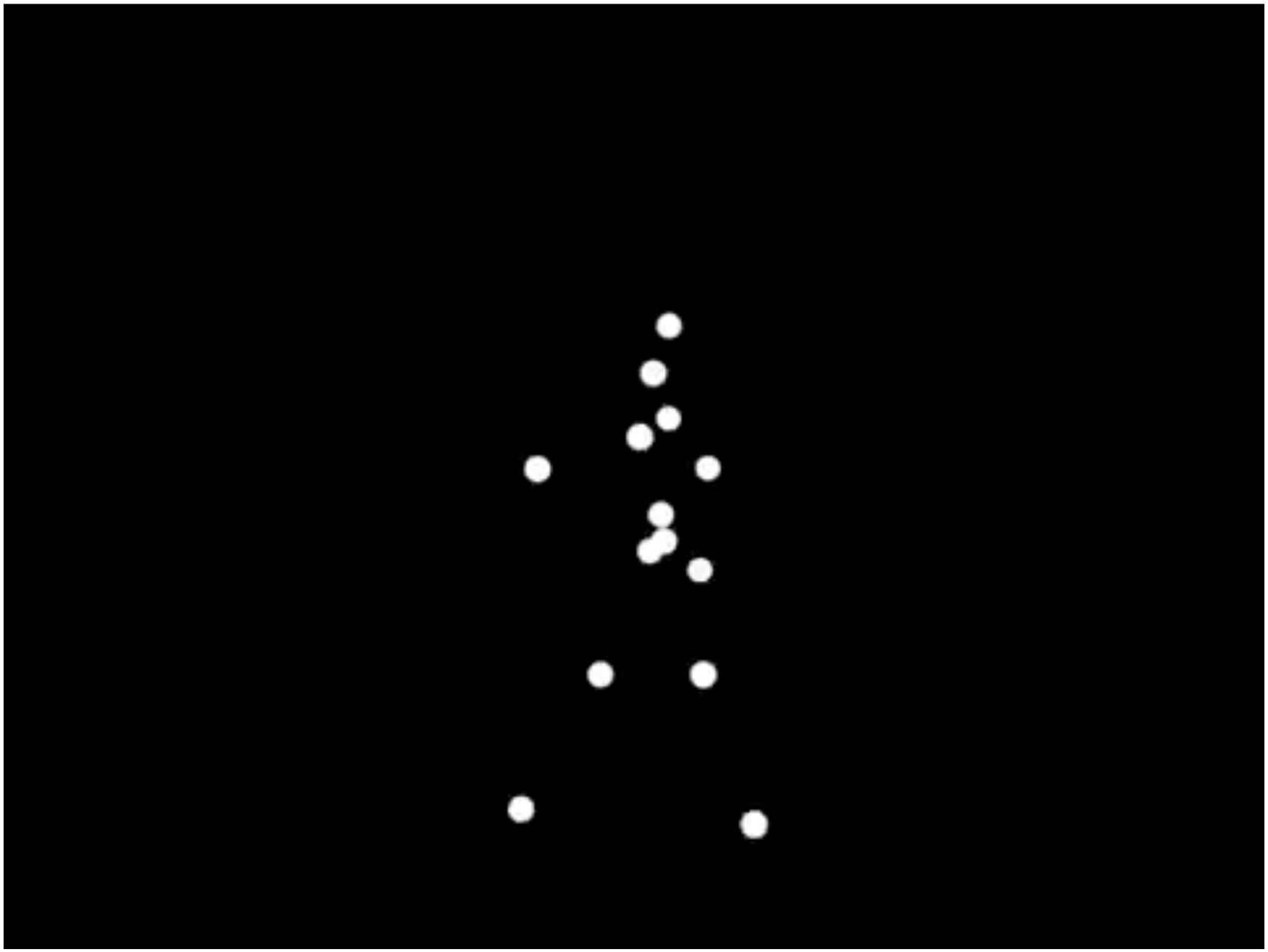
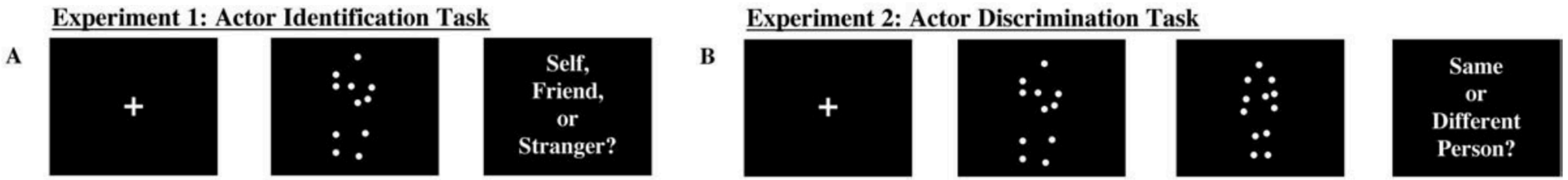
Consequences on interactions

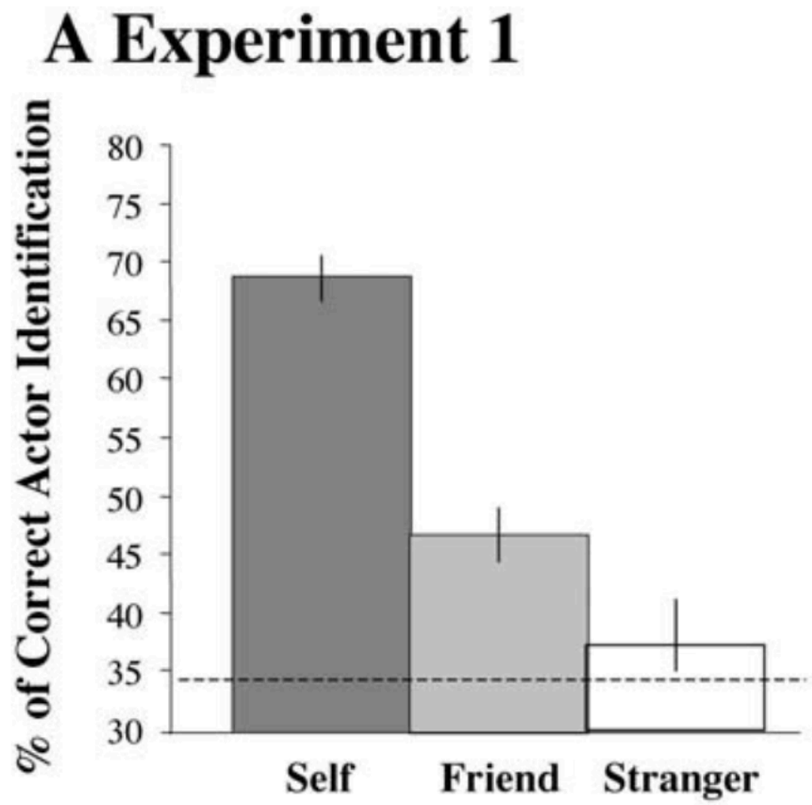
BIOLOGICAL MOTION

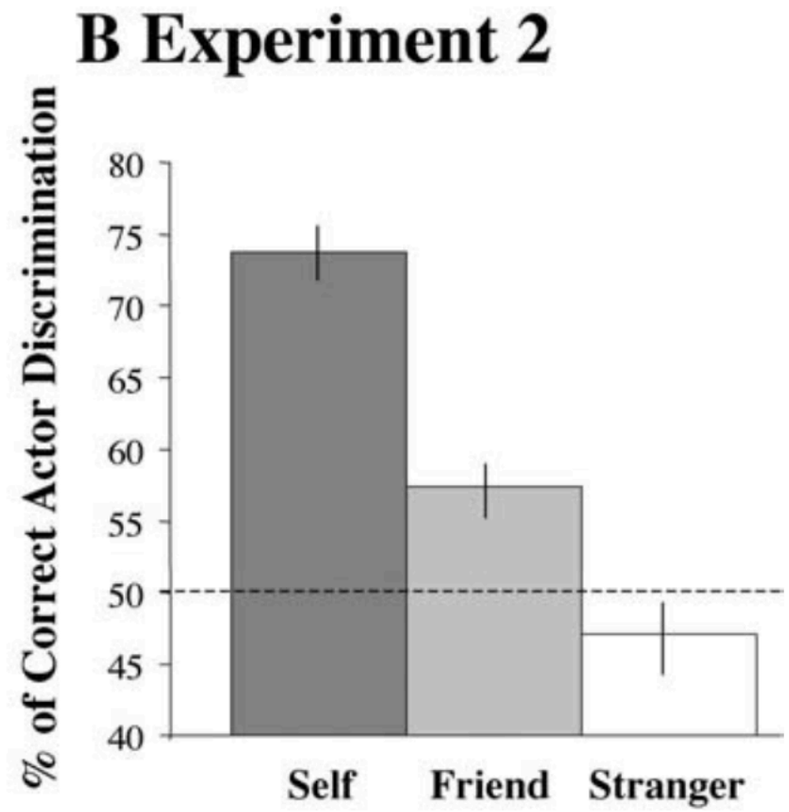


Johansson, 1973

RECOGNISING PEOPLE

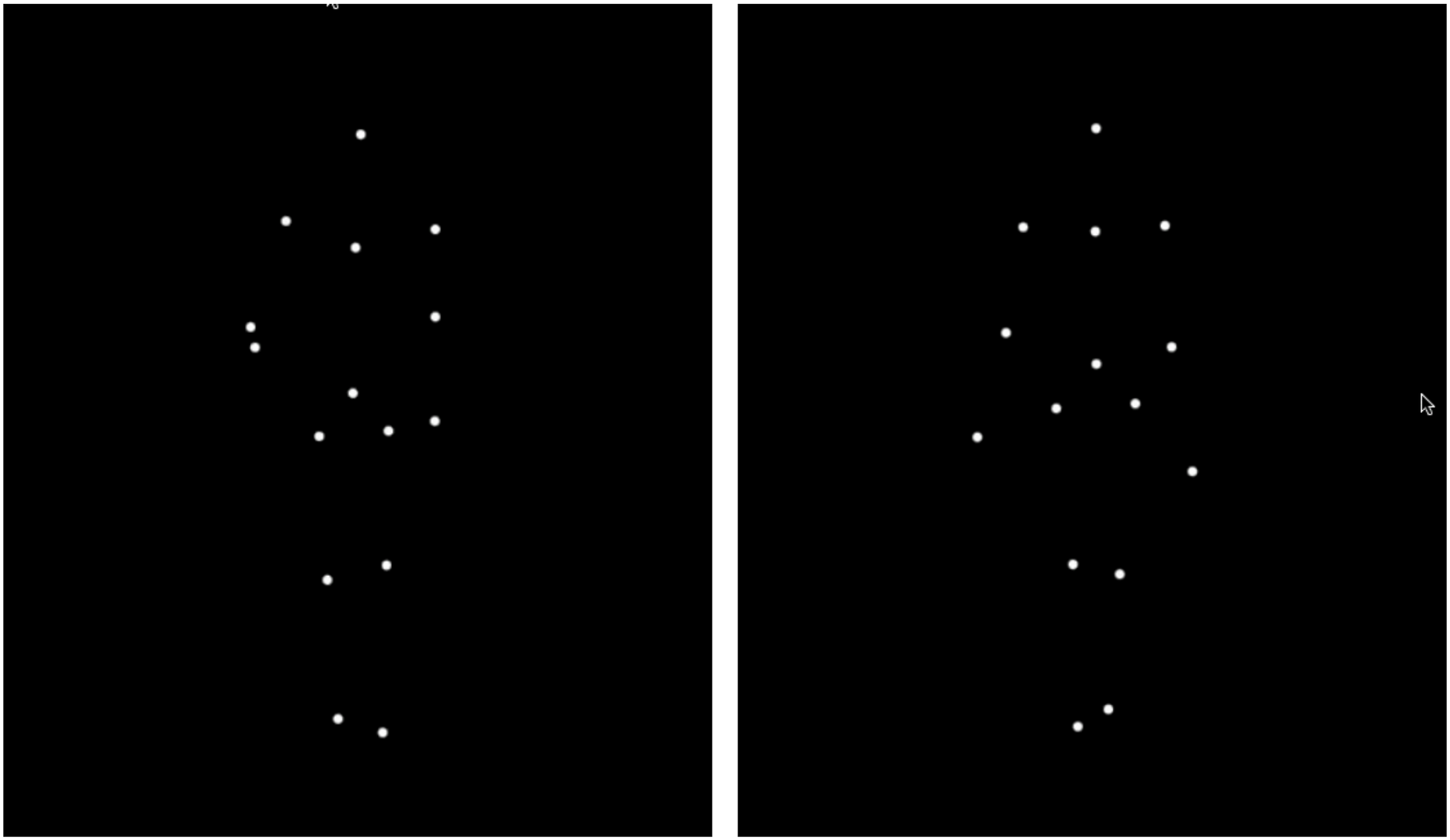






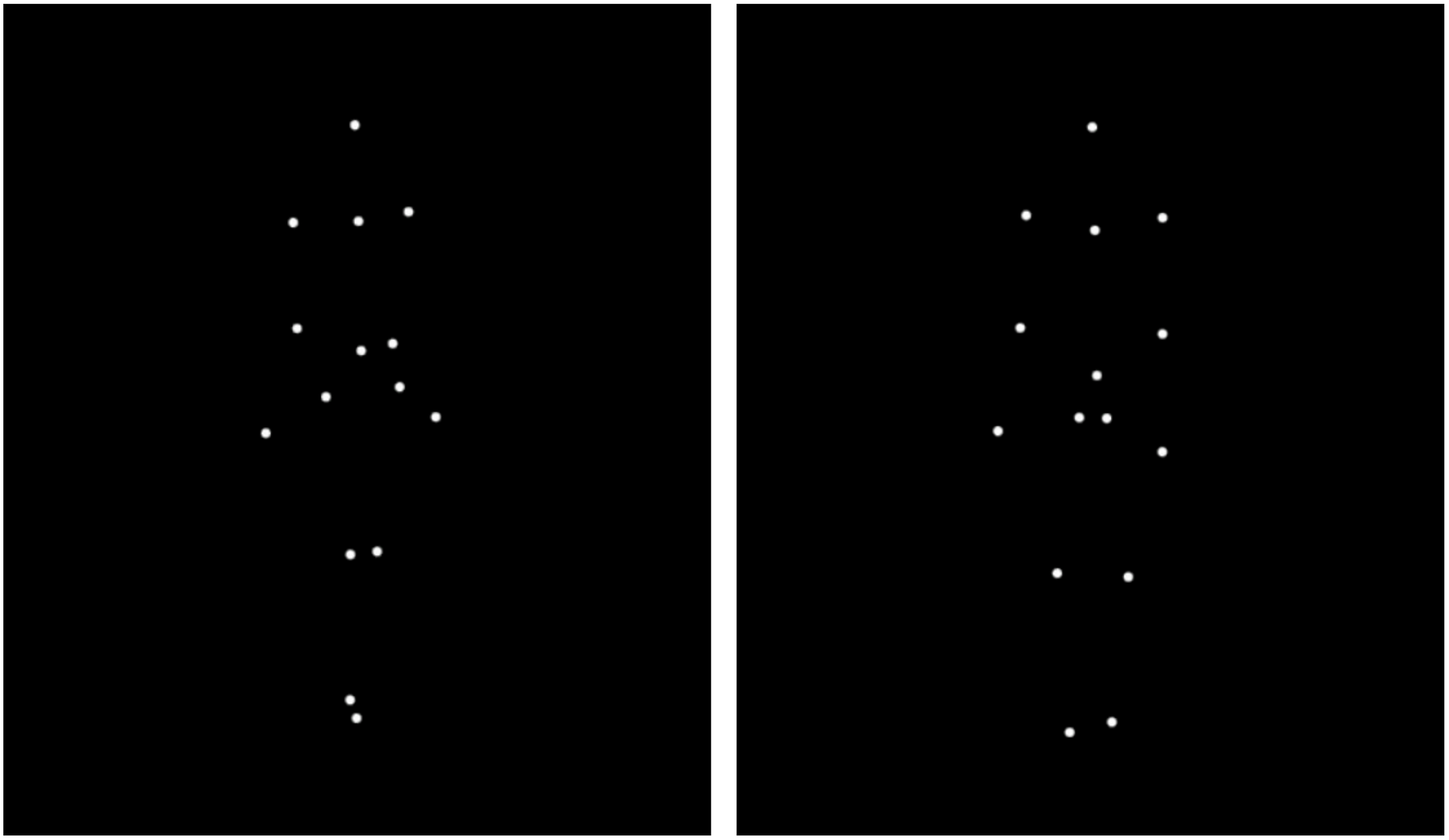
Loula et al., 2005

BIOLOGICAL MOTION



Courtesy of Nikolaus Troje

BIOLOGICAL MOTION



Courtesy of Nikolaus Troje

BIOLOGICAL MOTION

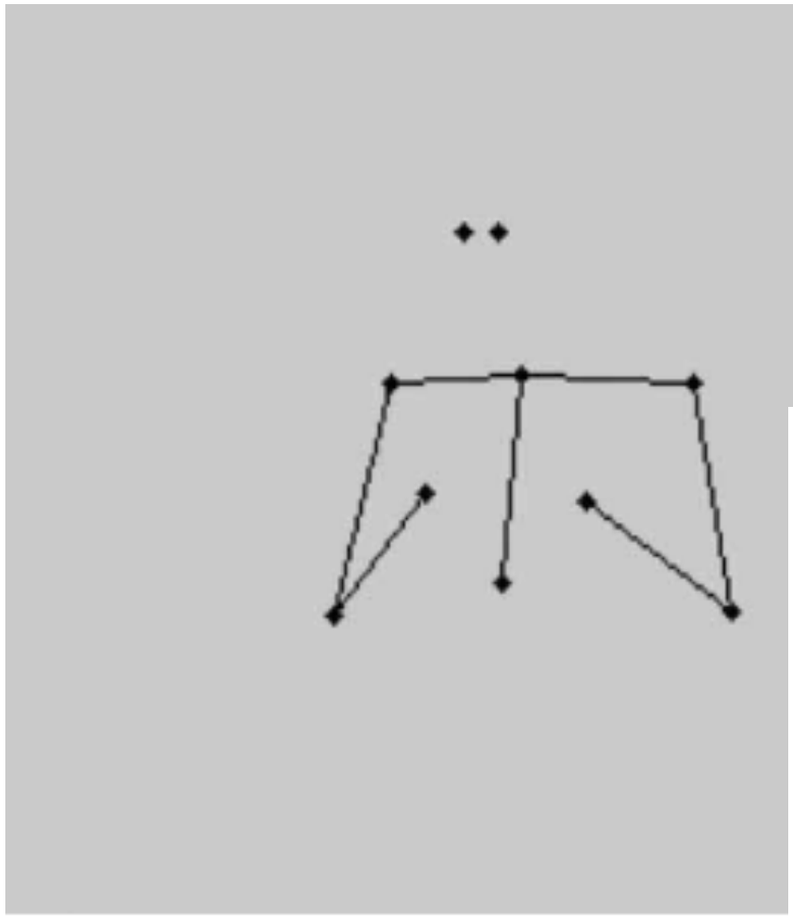
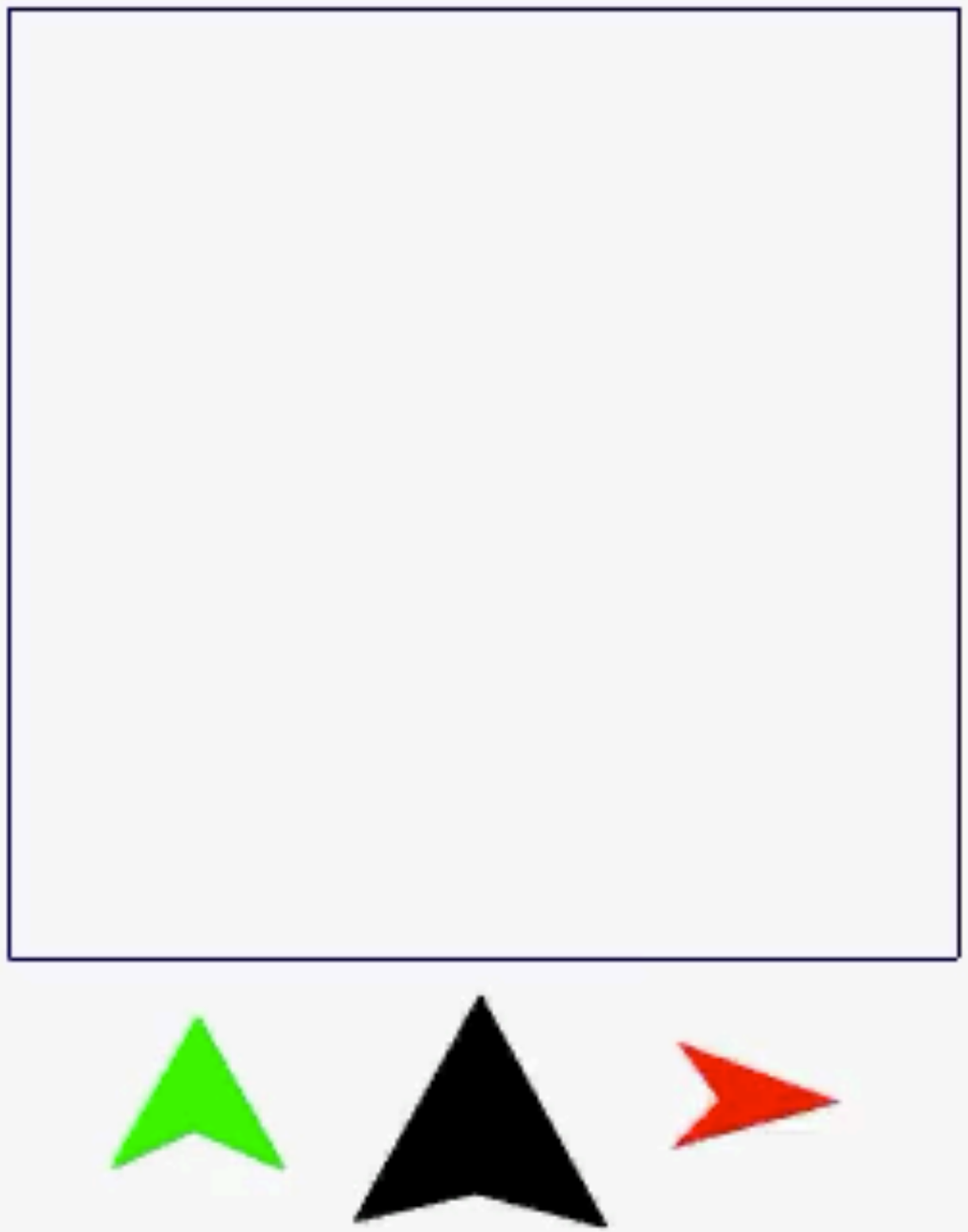


Table 1. *Mean ratings for the four stick figure videos*

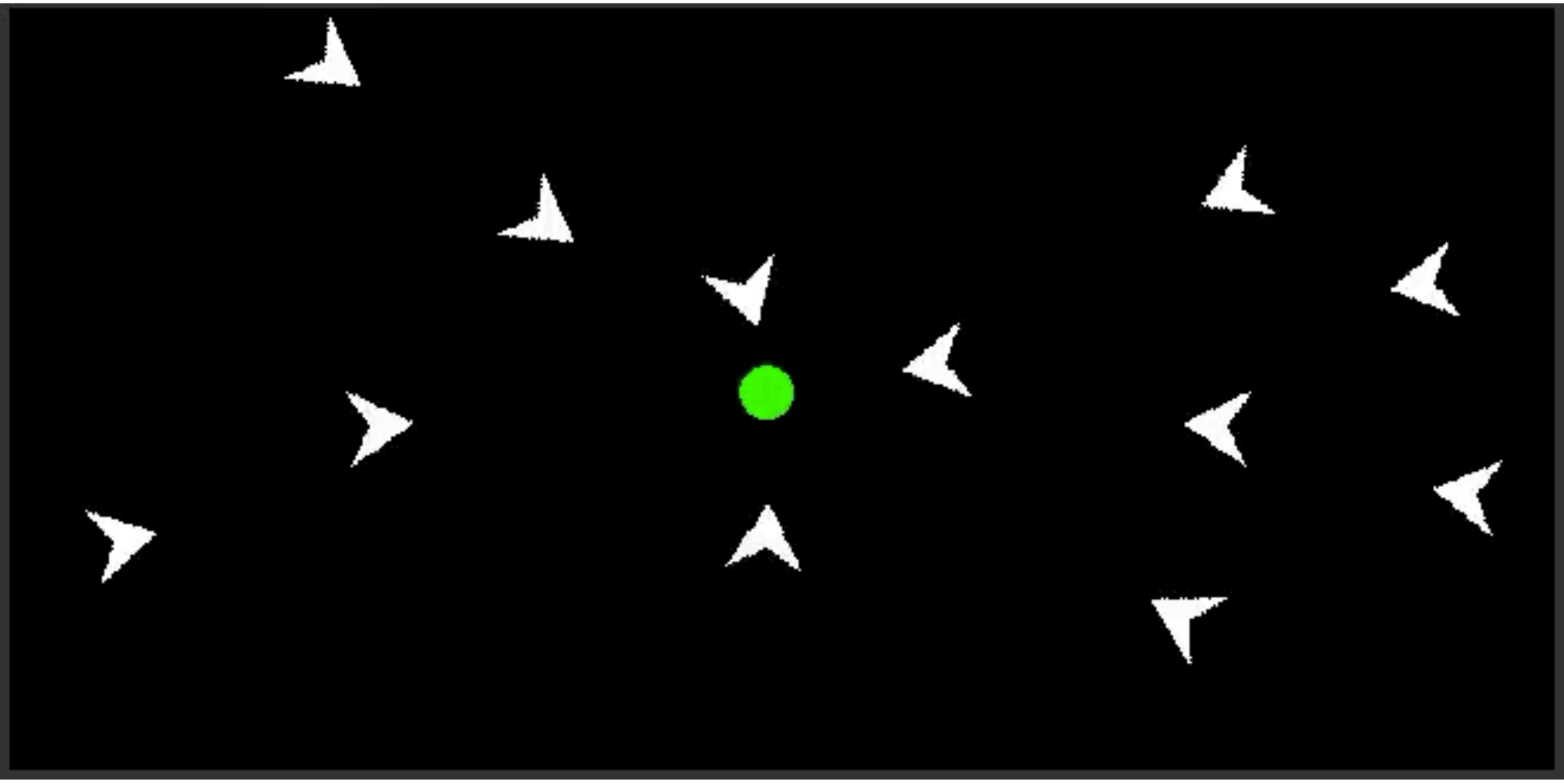
Trait	*Obama*	*McCain*
Caring	3.54 (0.20)	3.71 (0.18)
Trustworthiness	3.97 (0.16)	3.34 (0.19)
Depression	2.09 (0.23)	1.89 (0.18)
Age	36.82 (1.58)	35.06 (2.08)
Anxiety	2.46 (0.22)	3.63 (0.27)
Leadership	4.23 (0.20)	3.71 (0.23)
Physical Health	4.17 (0.21)	3.91 (0.22)
Dominance	4.31 (0.21)	3.46 (0.23)
Attractiveness	3.60 (0.19)	3.06 (0.21)

Note: Standard errors in parentheses.

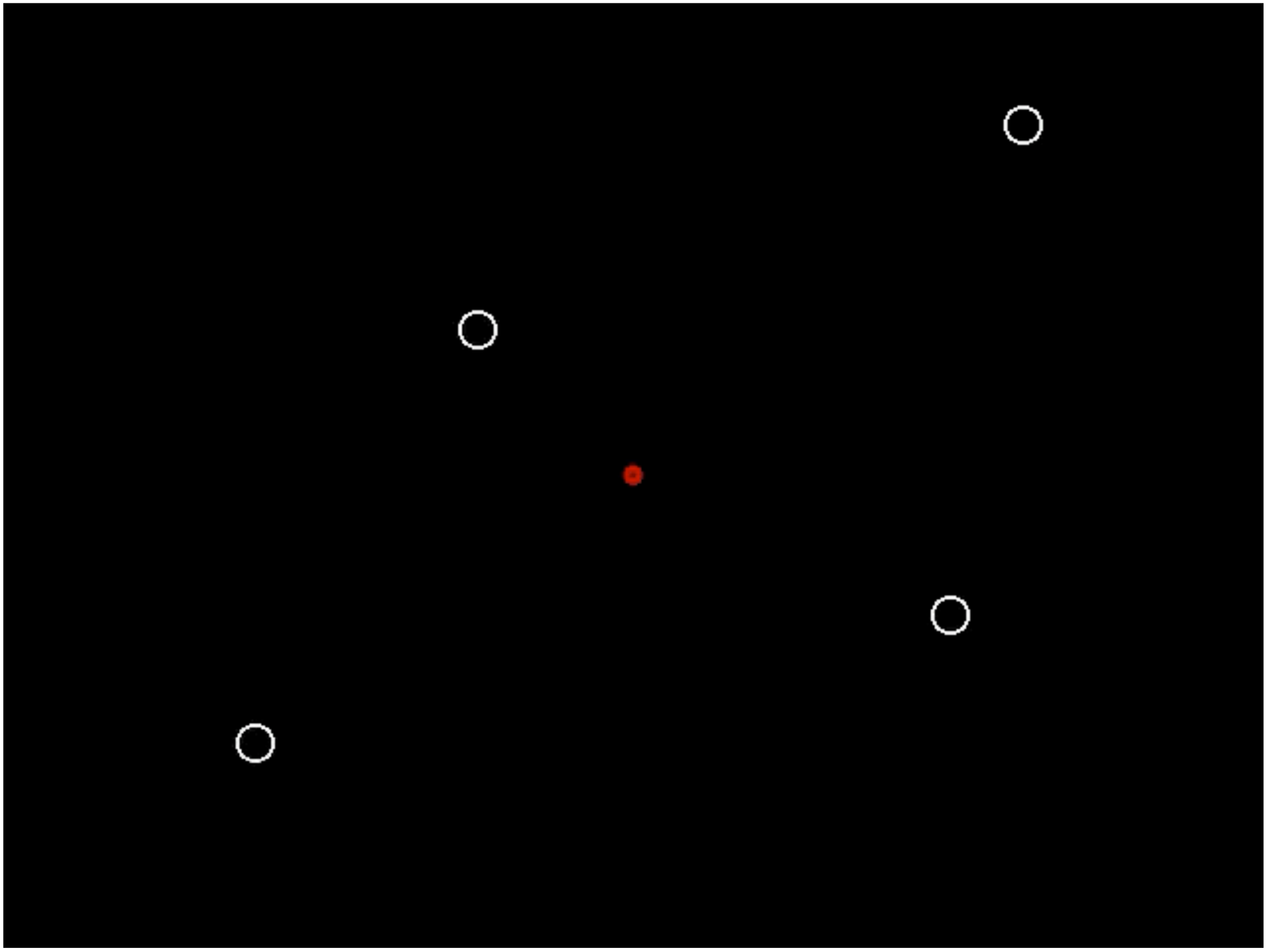
Kramer et al., 2010



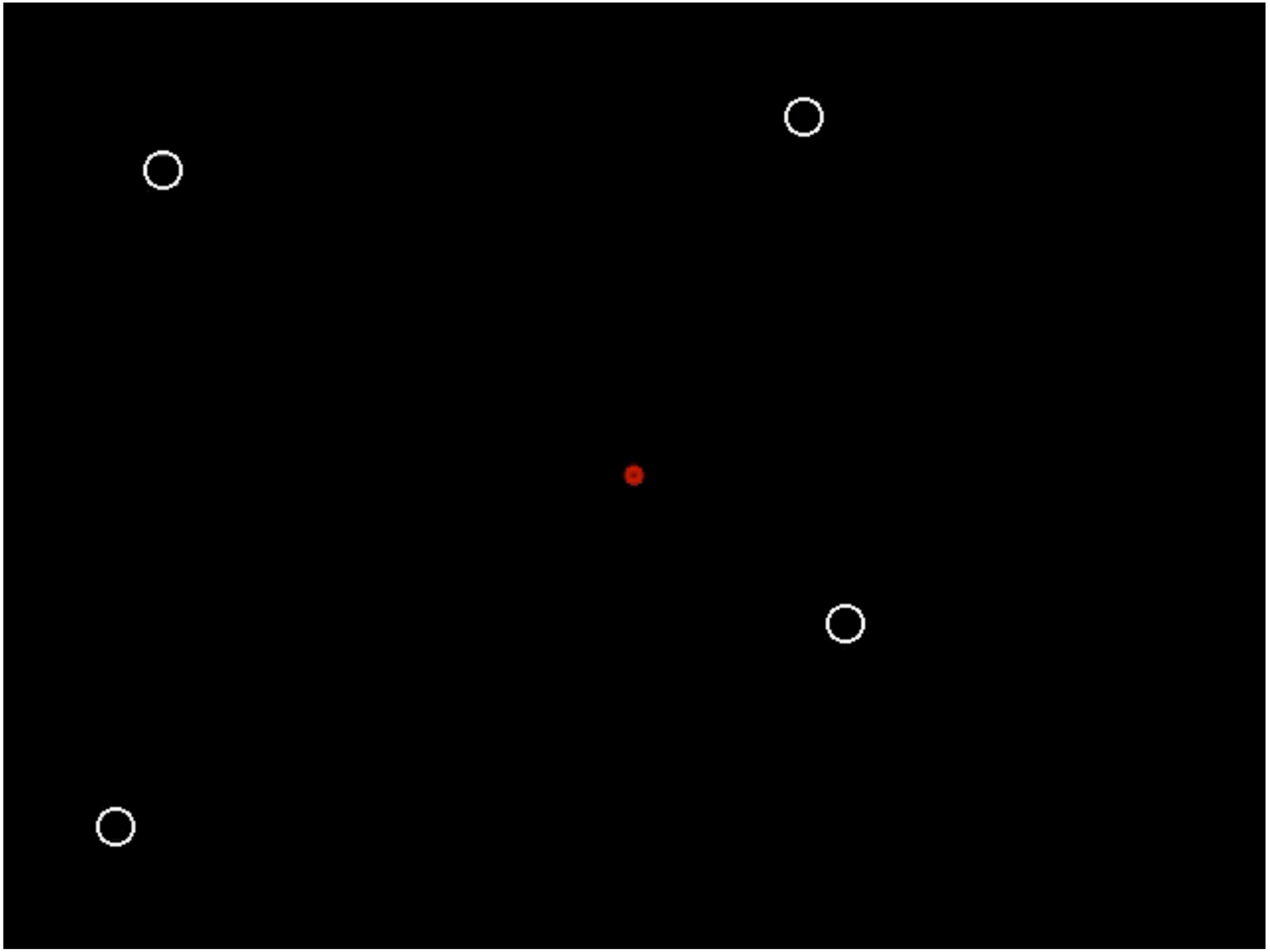
Analogue of Heider & Simmel, 1944. Animation by H.G. Nevarez & B.J. Scholl, Yale University



Courtesy of Brian Scholl

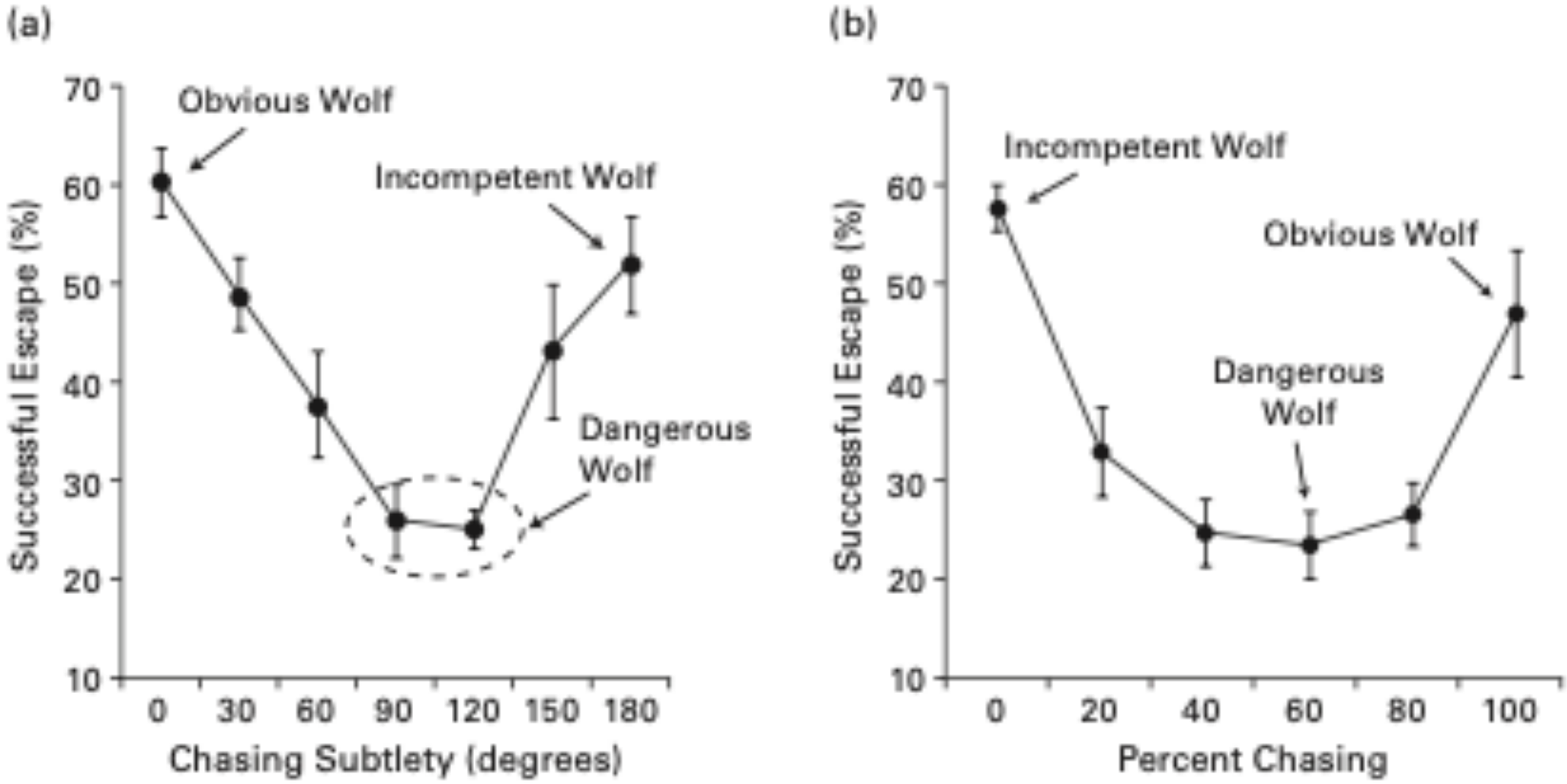


Courtesy of Brian Scholl



Courtesy of Brian Scholl

‘PERCEPTUAL’ ANIMACY



Scholl & Gao, 2013

PERCEIVING OTHER MINDS

Visual Perception

Physical appearance

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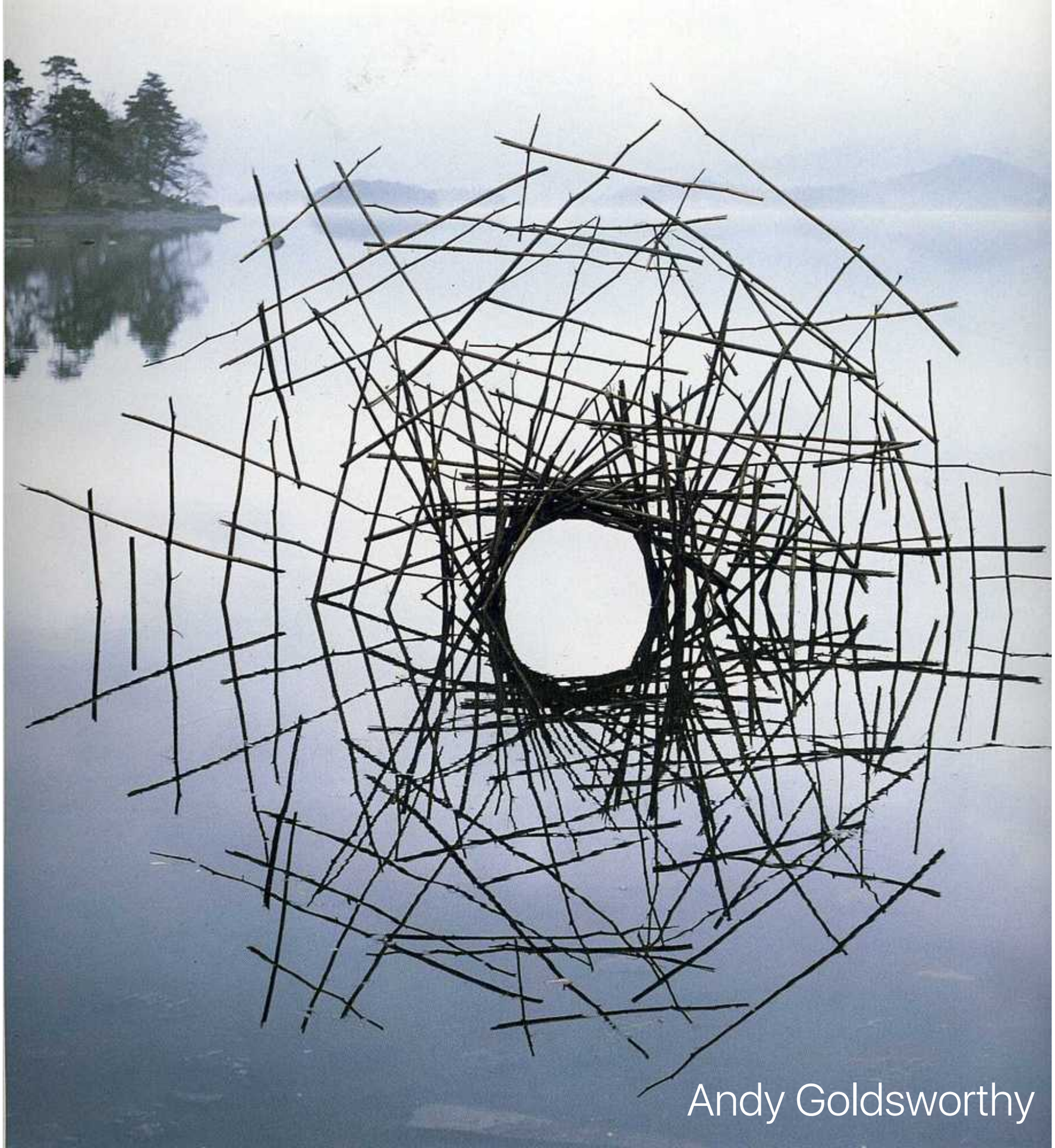
Static configuration


Cornelia Konrads


Andy Goldsworthy

PERCEIVING OTHER MINDS

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...the visual roots of social cognition!

PERCEIVING OTHER MINDS

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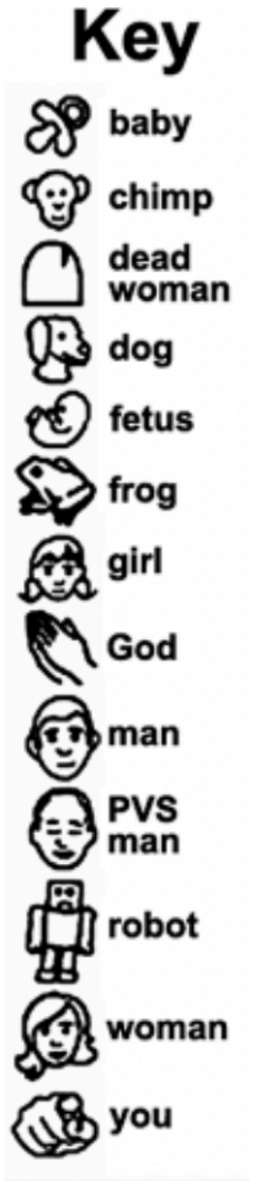
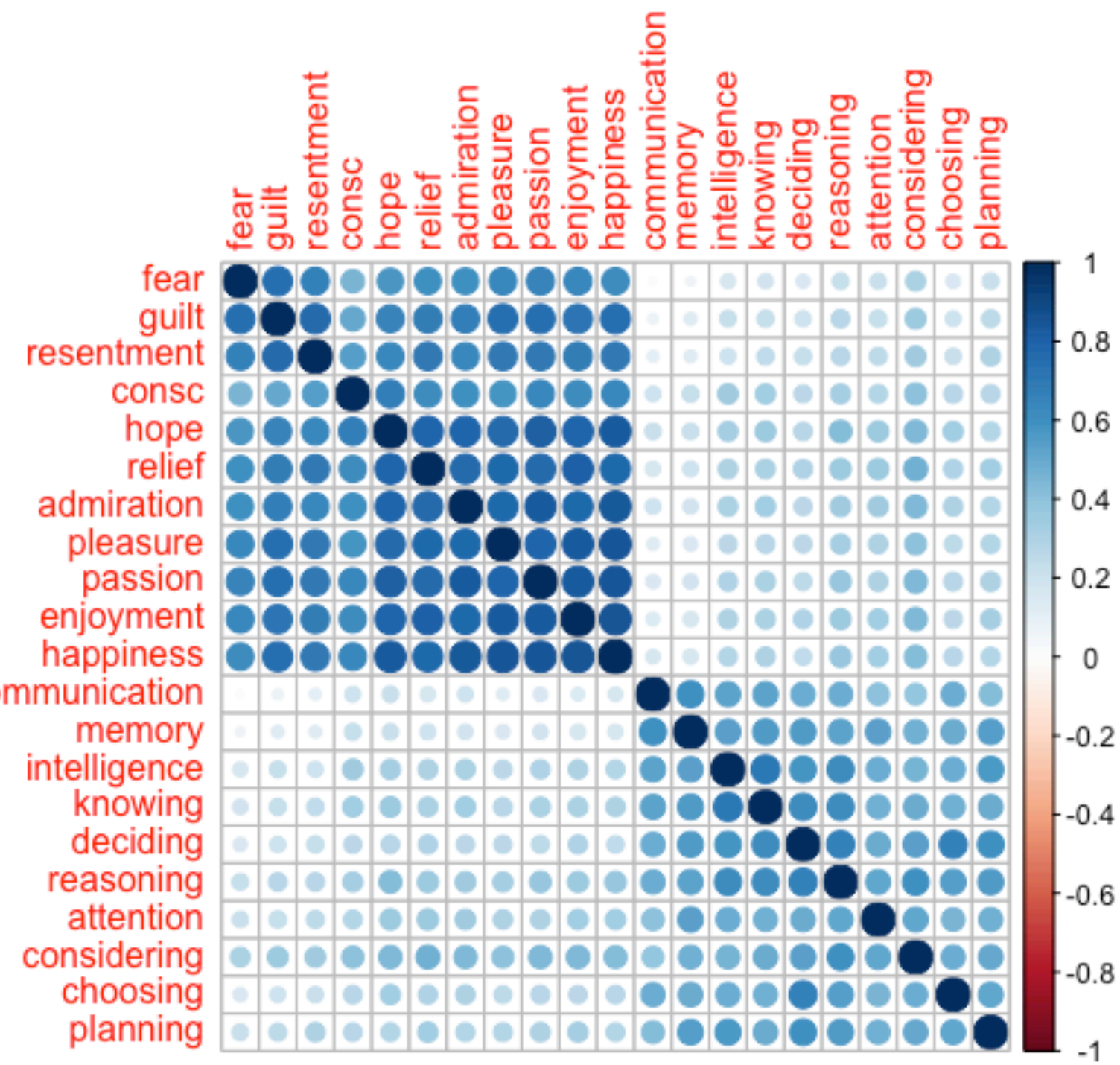
BELIEFS ABOUT MINDS

Mental Capacity
Hunger
Fear
Pain
Pleasure
Rage
Desire
Personality
Consciousness
Pride
Embarrassment
Joy
Self-control
Morality
Memory
Emotion recognition
Planning
Communication
Thought



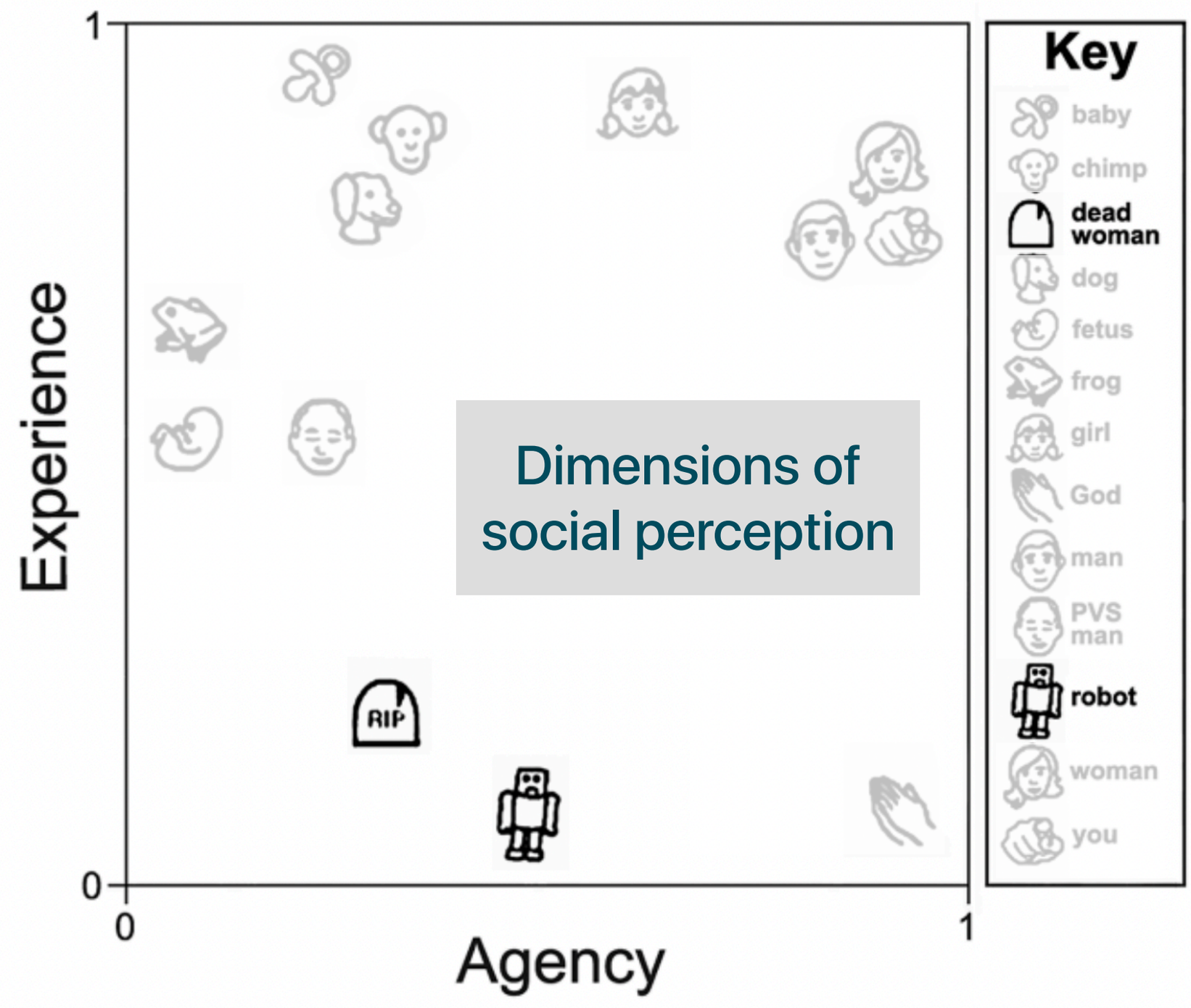
Gray et al., 2007

MENTAL STATE ATTRIBUTIONS



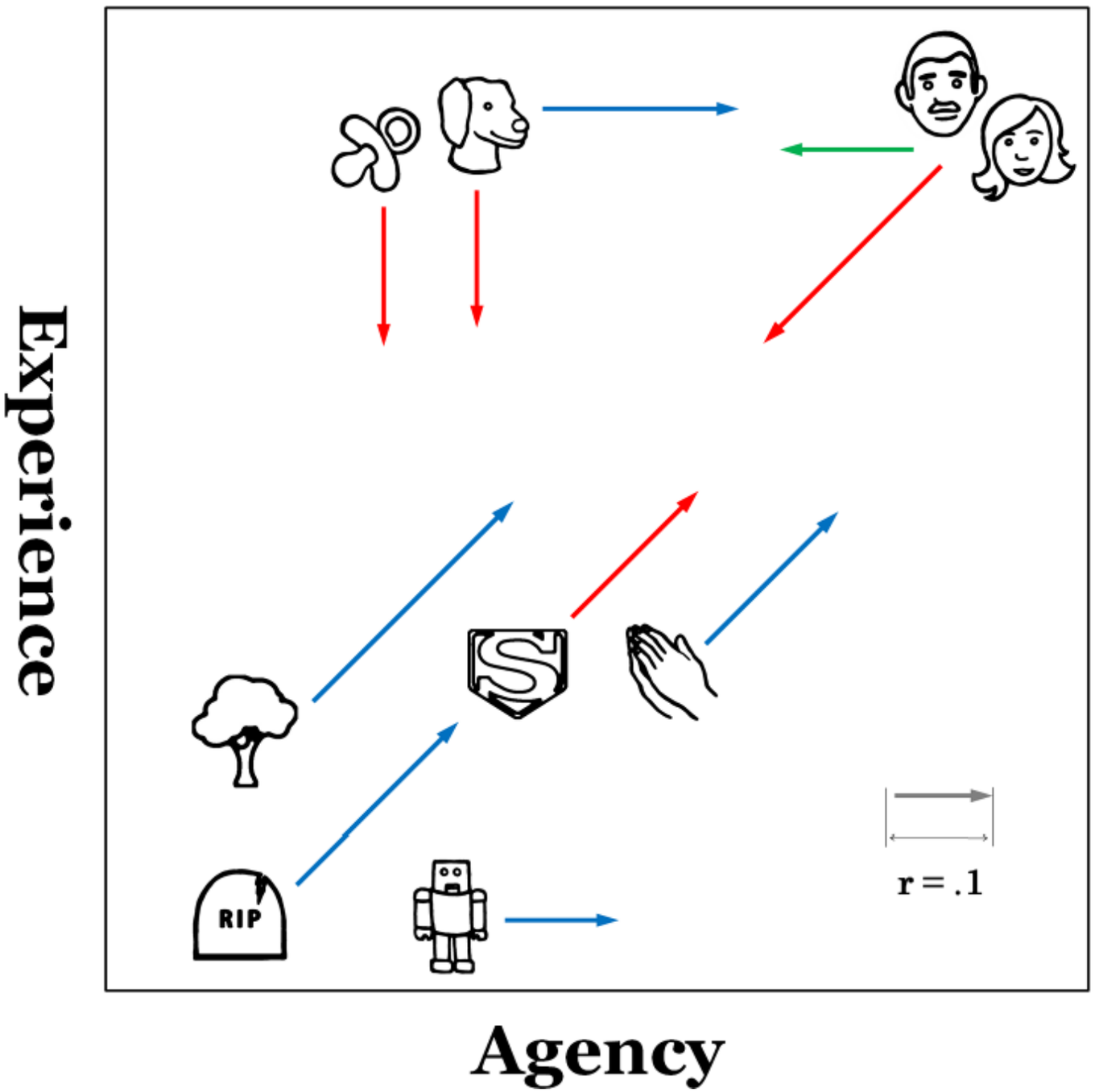
Colombatto & Fleming, 2023

MENTAL STATE ATTRIBUTIONS



Gray et al., 2007

MENTAL STATE ATTRIBUTIONS



baby

dead woman

dog

God

man

robot

superman

tree

woman

Autism

Failure to perceive agency in people. Reduced perception of agency to human adults.

Psychopathy

Failure to perceive experience in humans and animals. Reduced perception of experience (e.g., pain) in humans and animals. Also, reduced agency to adult humans and more mind to Superman.

Schizotypy

Seeing mind where there is none. More mind to trees, the dead, and God. More agency to robots, dogs.

Gray et al., 2007

PERCEIVING OTHER MINDS

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Prior beliefs

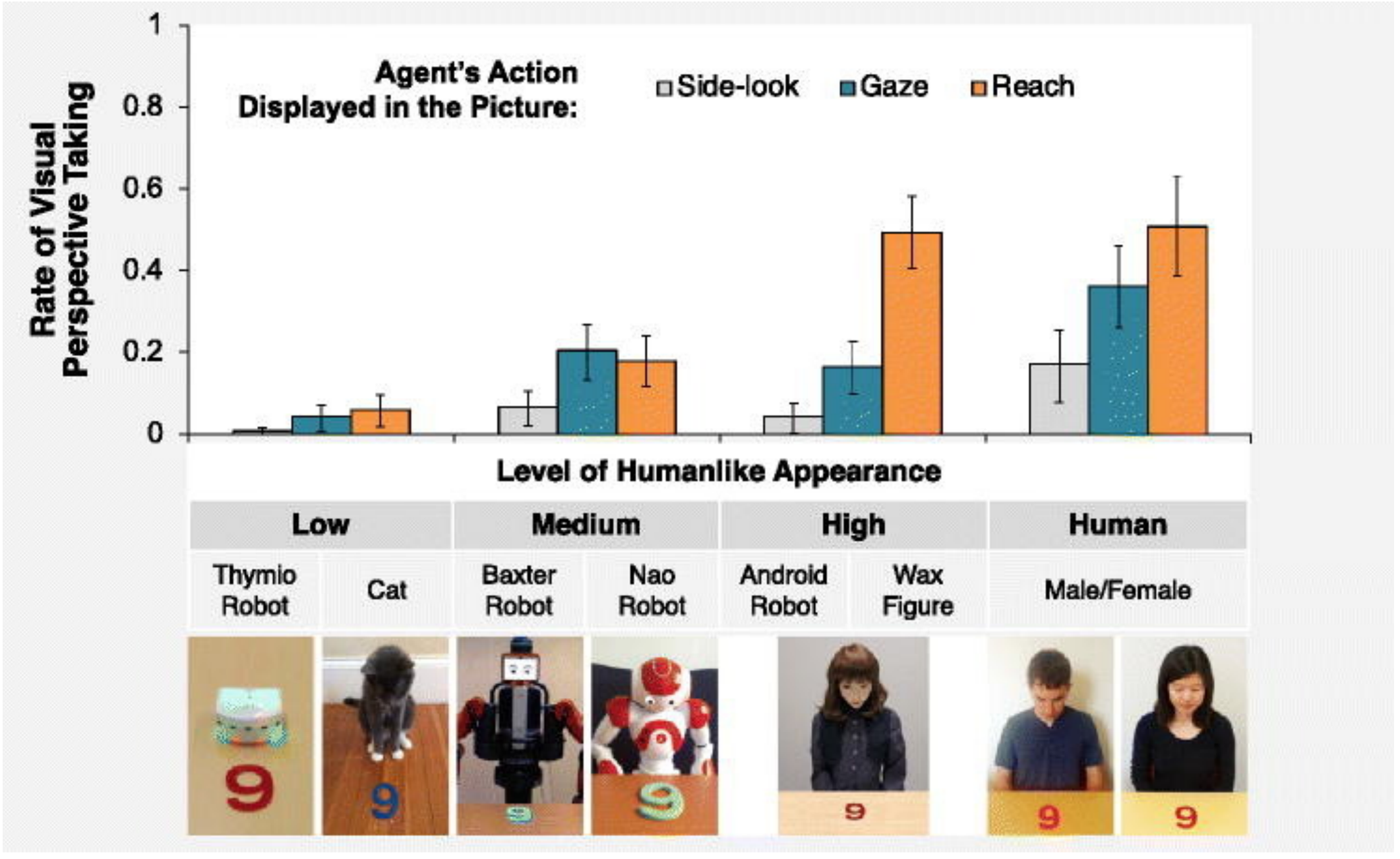
PERSPECTIVE TAKING

What is the number on the table?

Type your answer in the textbox below:

Zhao & Malle, 2022

‘MERE APPEARANCE’

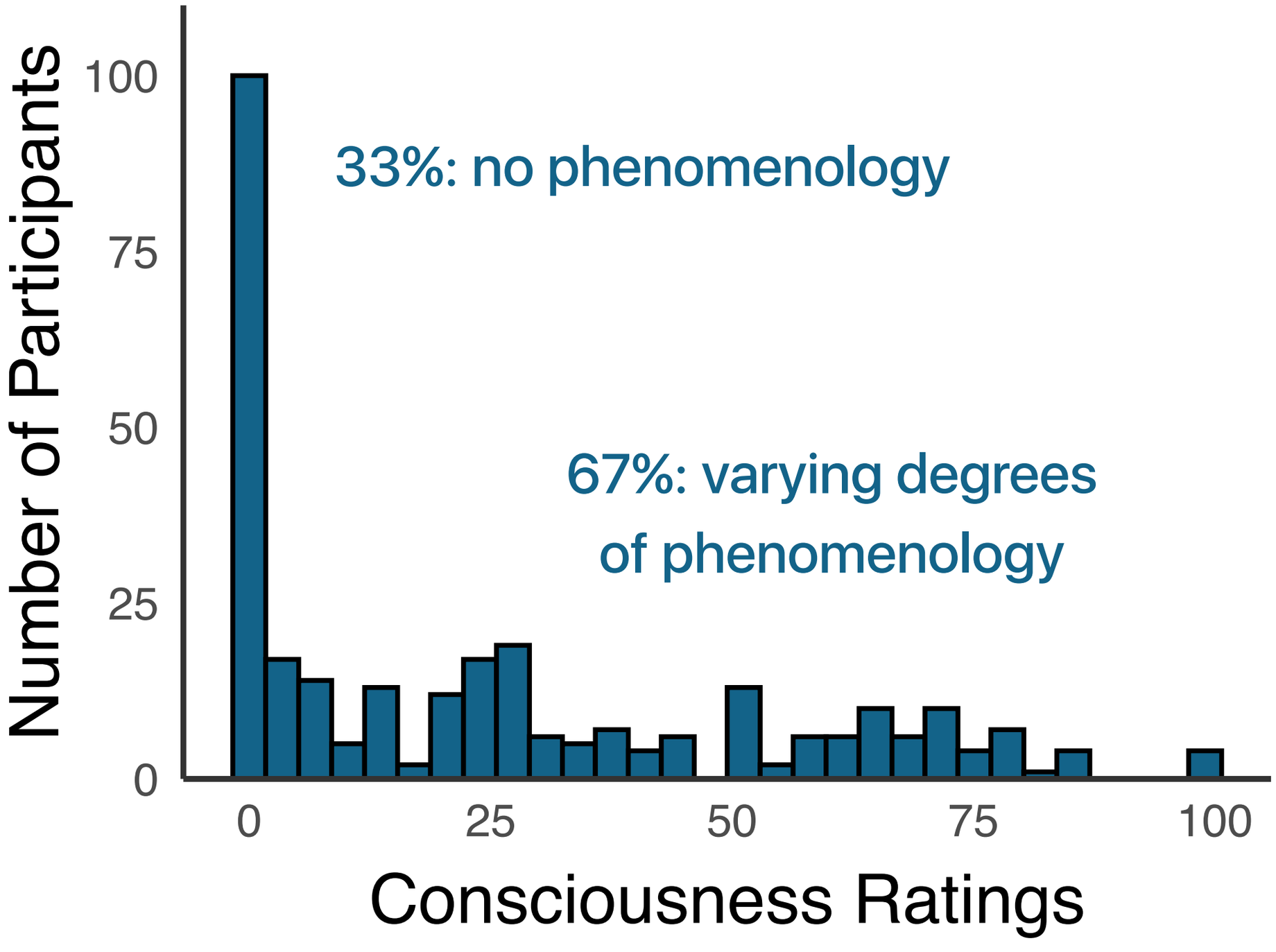


Zhao & Malle, 2022

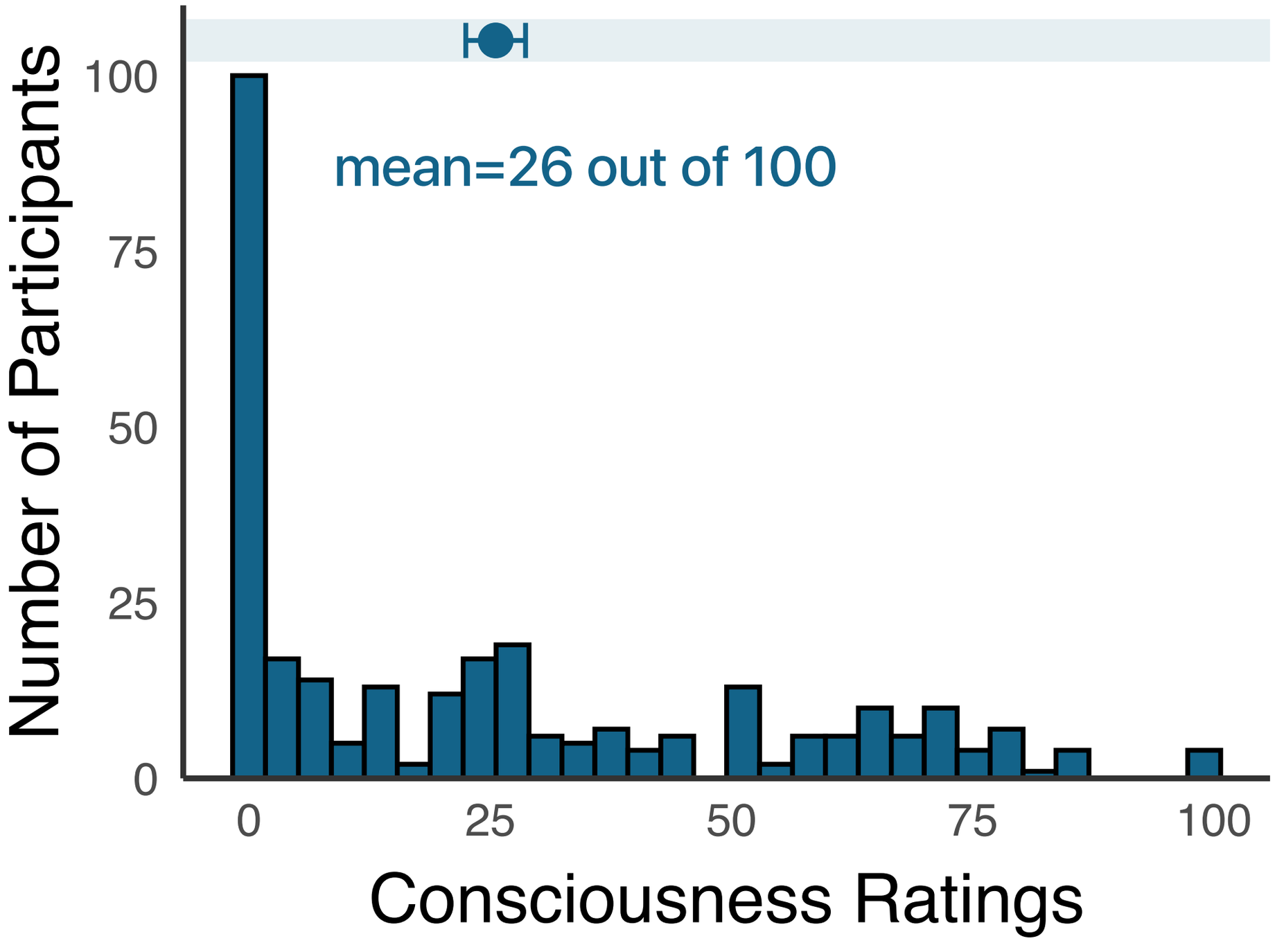
Google engineer put on leave after saying AI chatbot has become sentient

Blake Lemoine says system has perception of, and ability to express thoughts and feelings equivalent to a human child

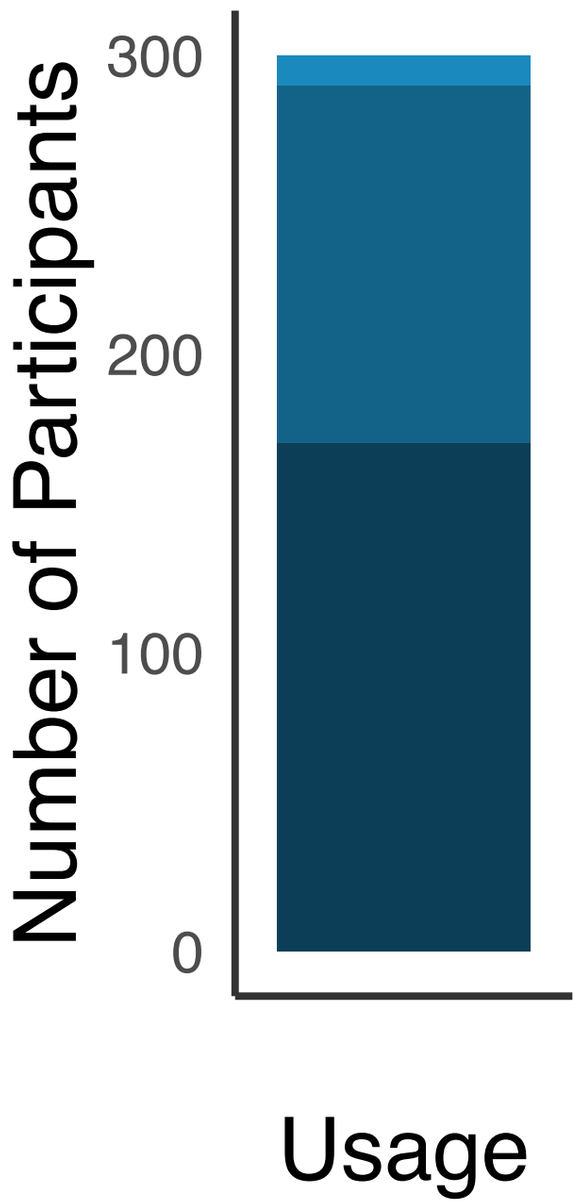
PHENOMENOLOGY



PHENOMENOLOGY



USAGE OF LLMS

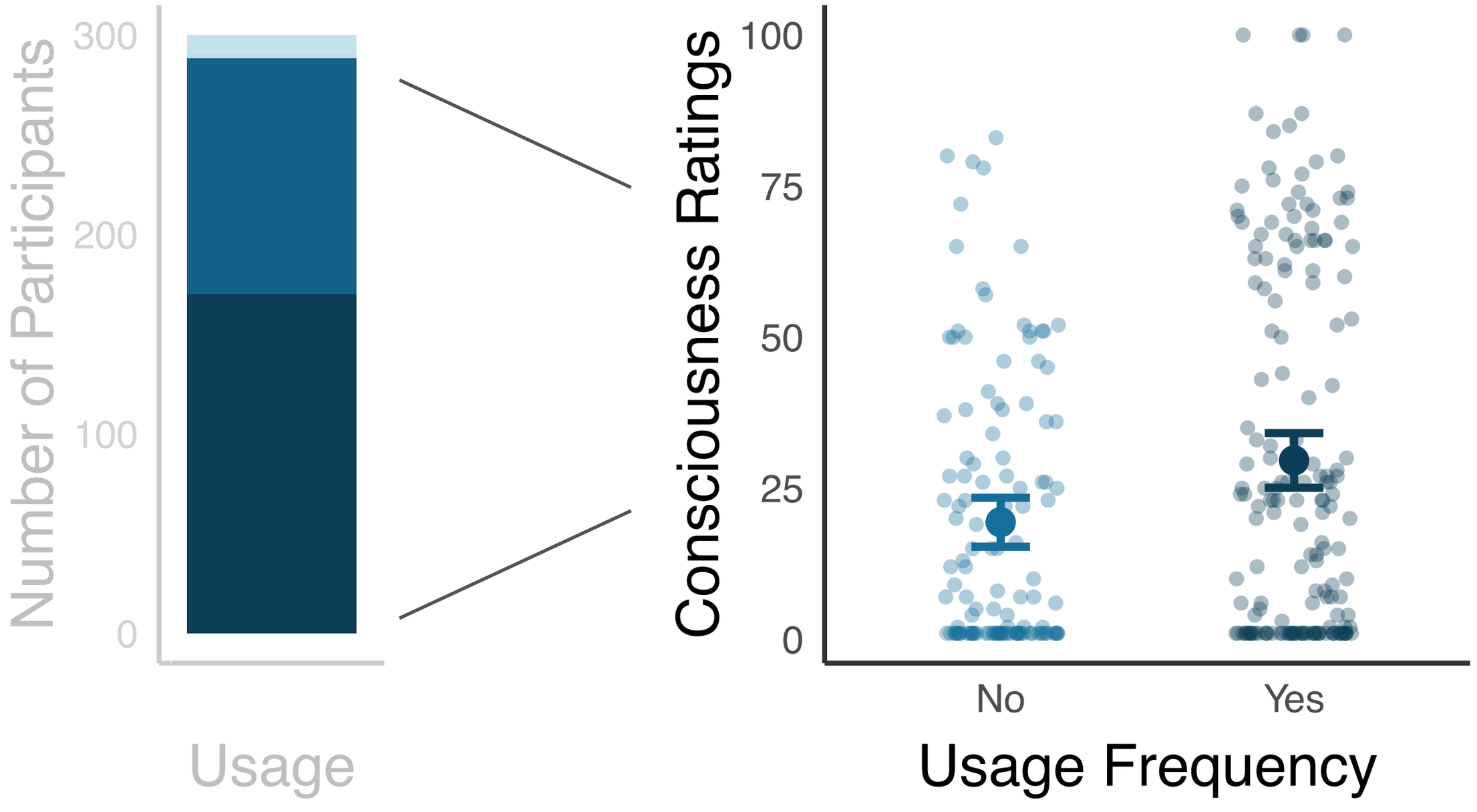


→ 3% never heard about ChatGPT before

→ 40% never used ChatGPT before

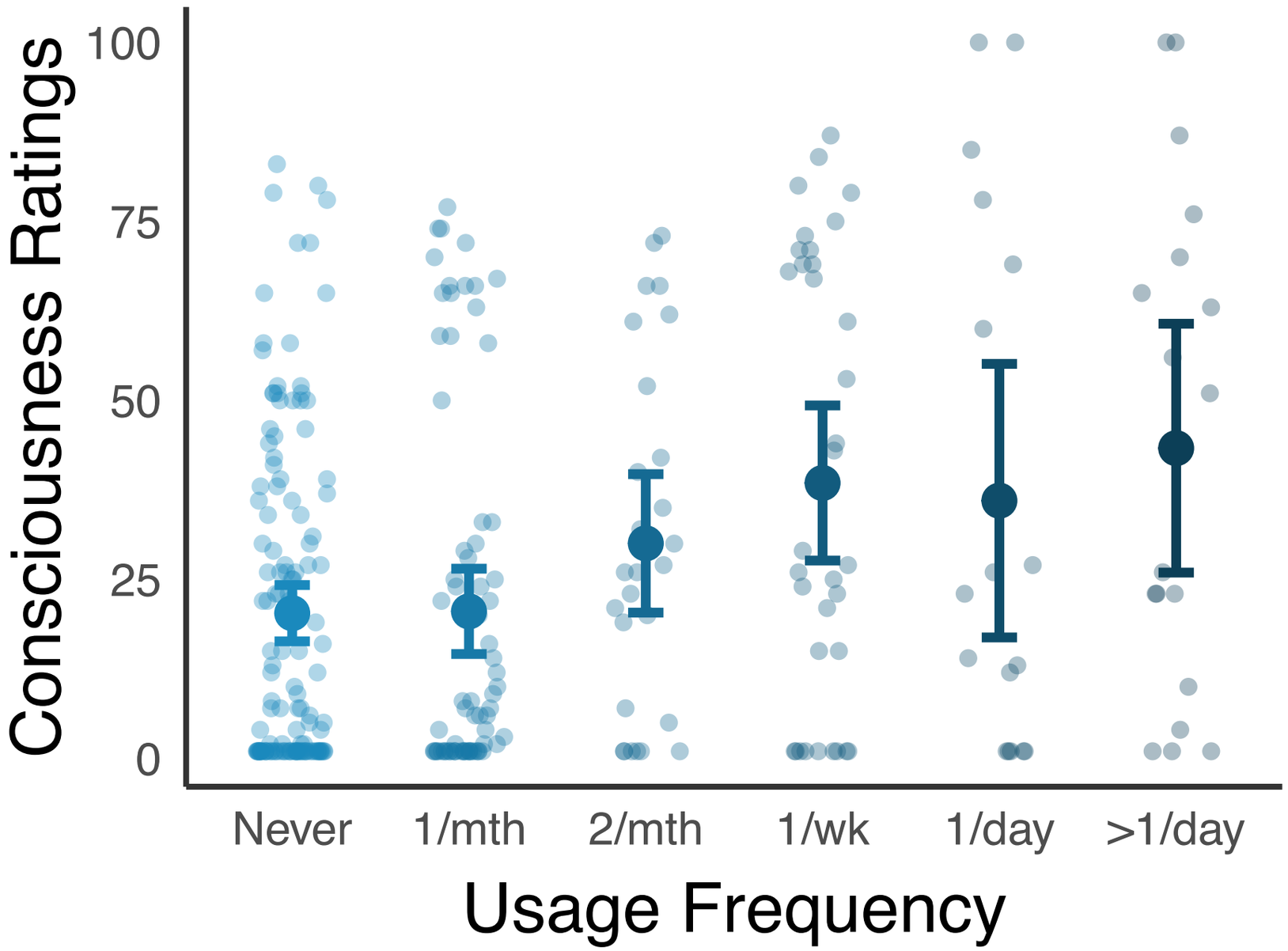
→ 57% used ChatGPT at least once

USAGE OF LLMS



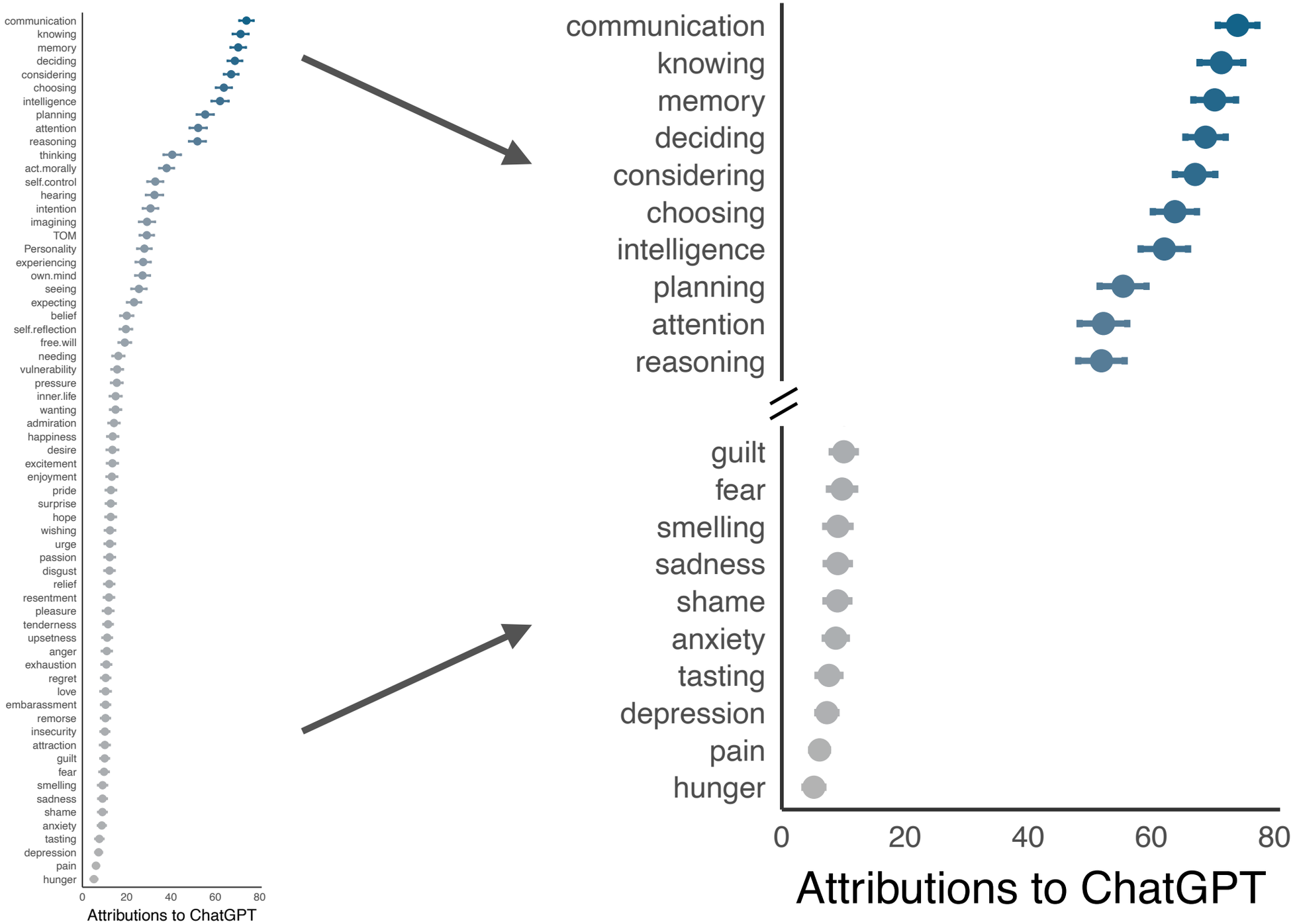
t(287)=3.33, p<.001

USAGE OF LLMS



B=4.94, SE=0.99, p<.001

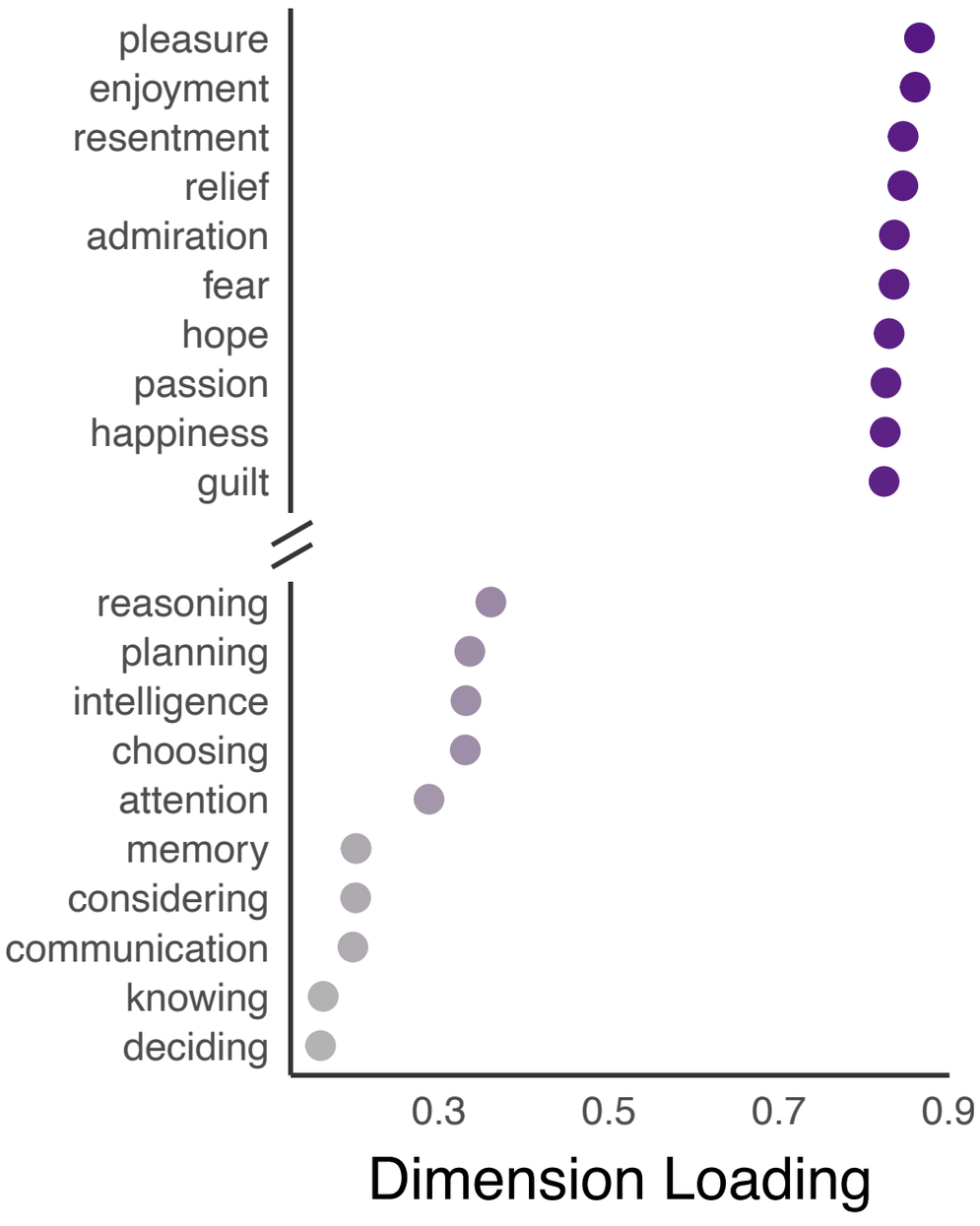
MENTAL STATE ATTRIBUTIONS



MENTAL STATE ATTRIBUTIONS

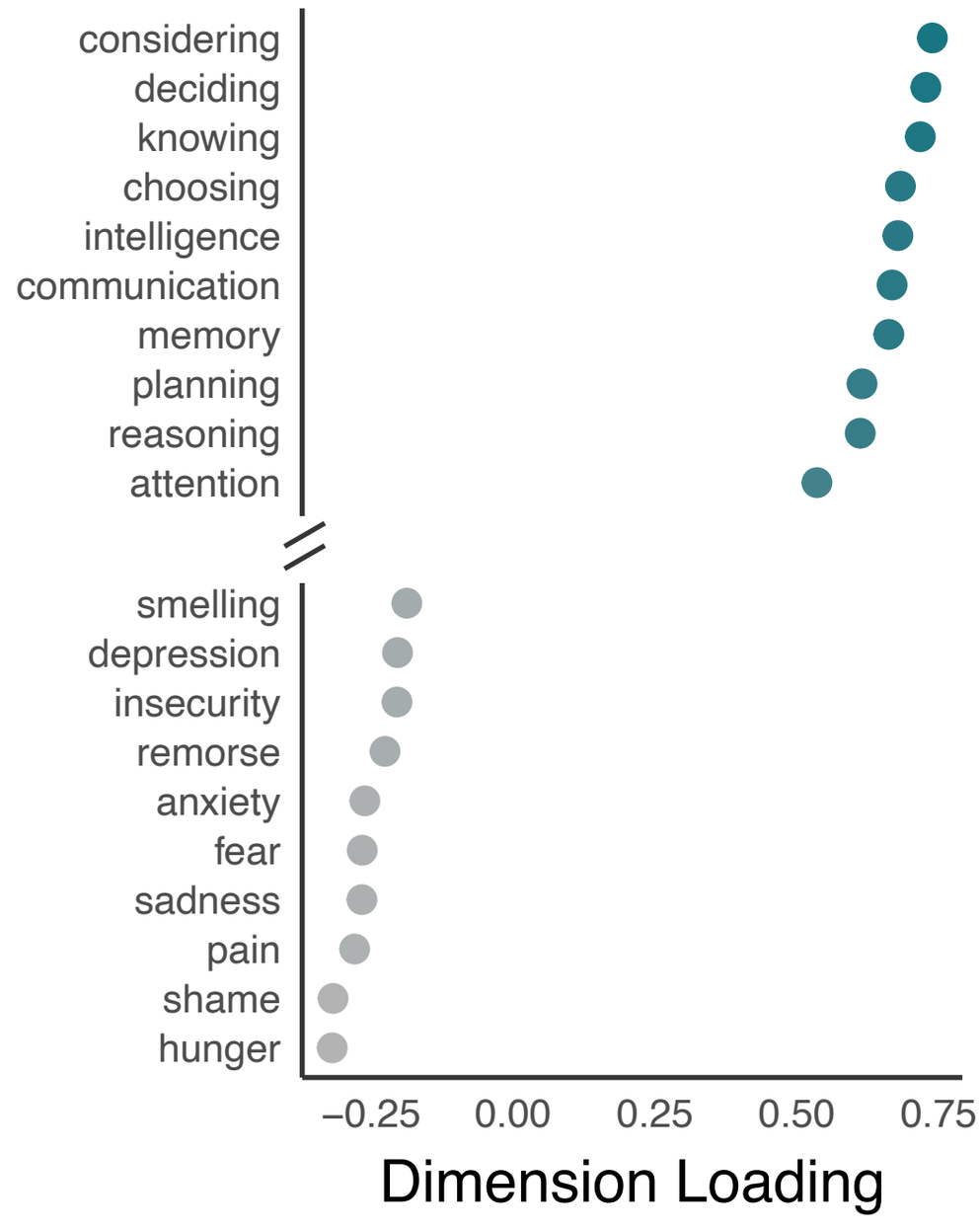
Dimension 1

"Experience"



Dimension 2

"Intelligence"



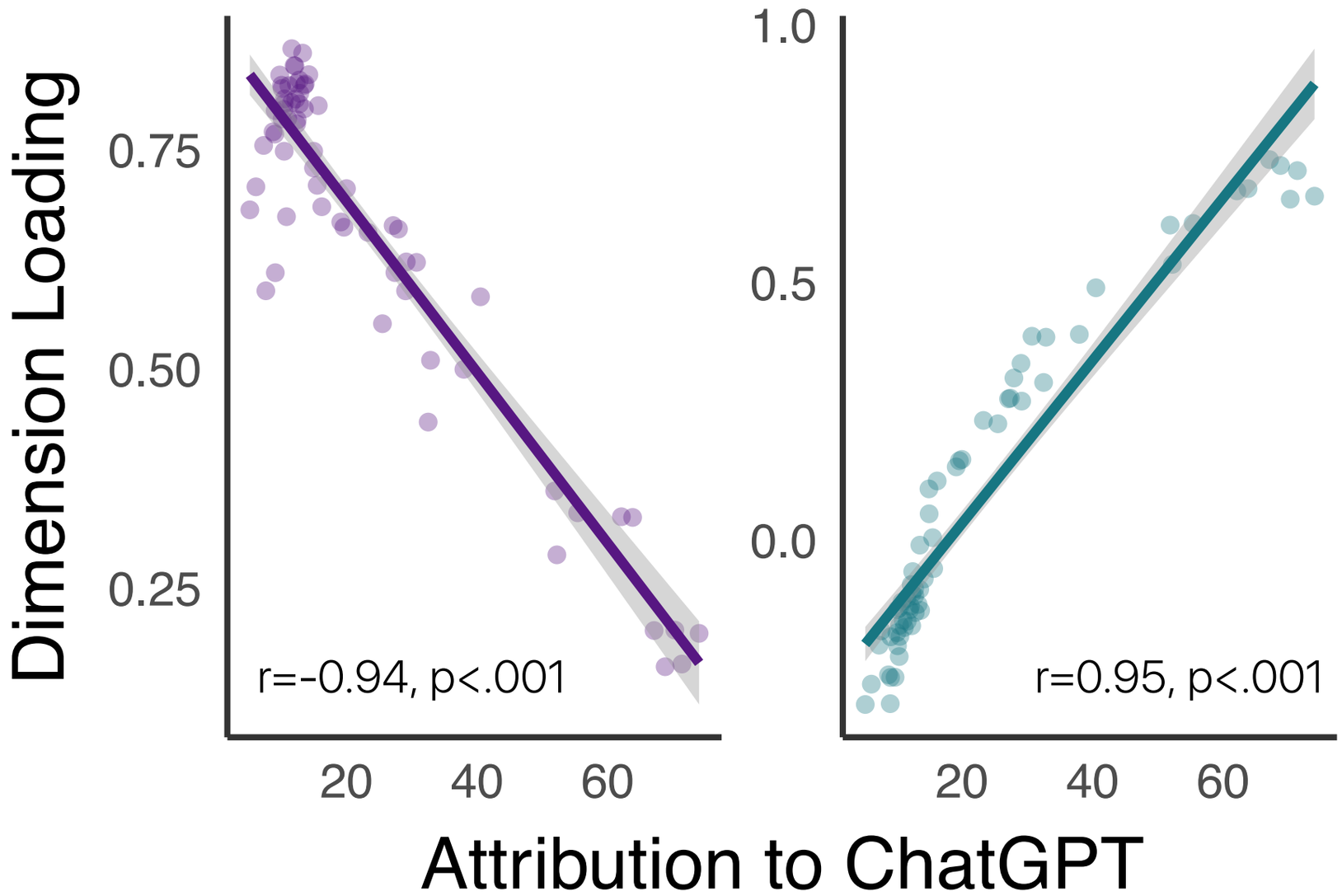
MENTAL STATE ATTRIBUTIONS

Dimension 1

"Experience"

Dimension 2

"Intelligence"



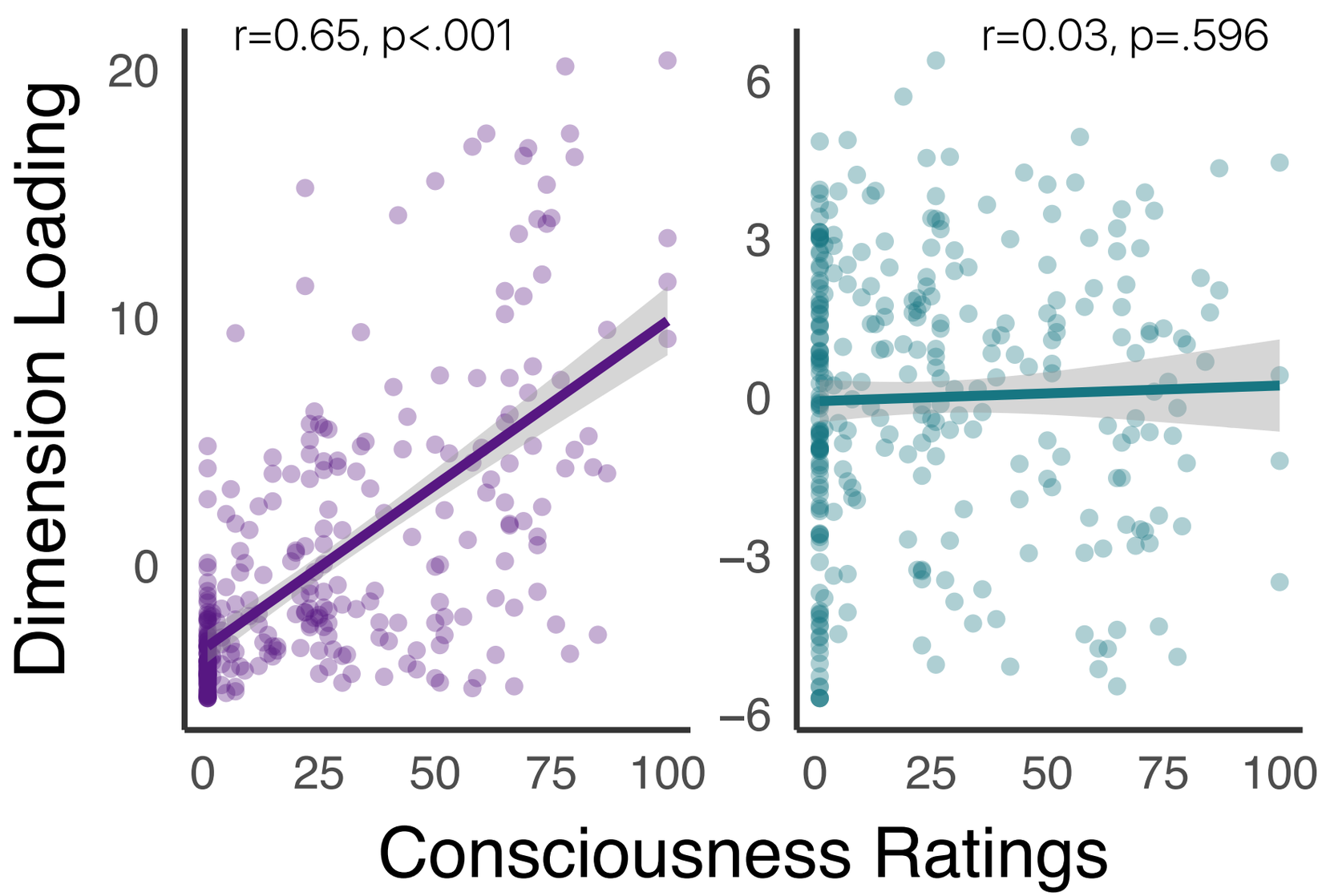
MENTAL STATE ATTRIBUTIONS

Dimension 1

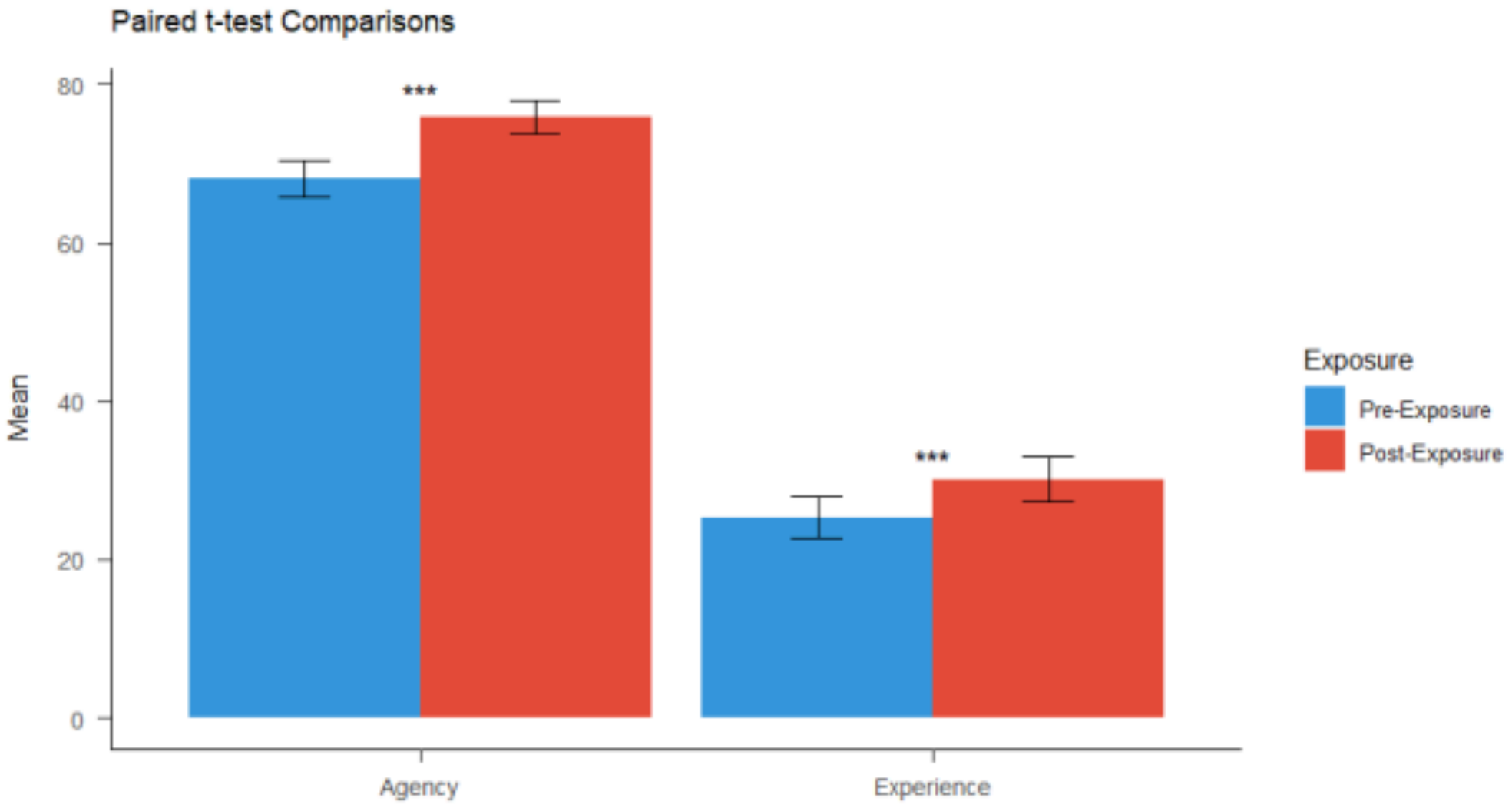
"Experience"

Dimension 2

"Intelligence"



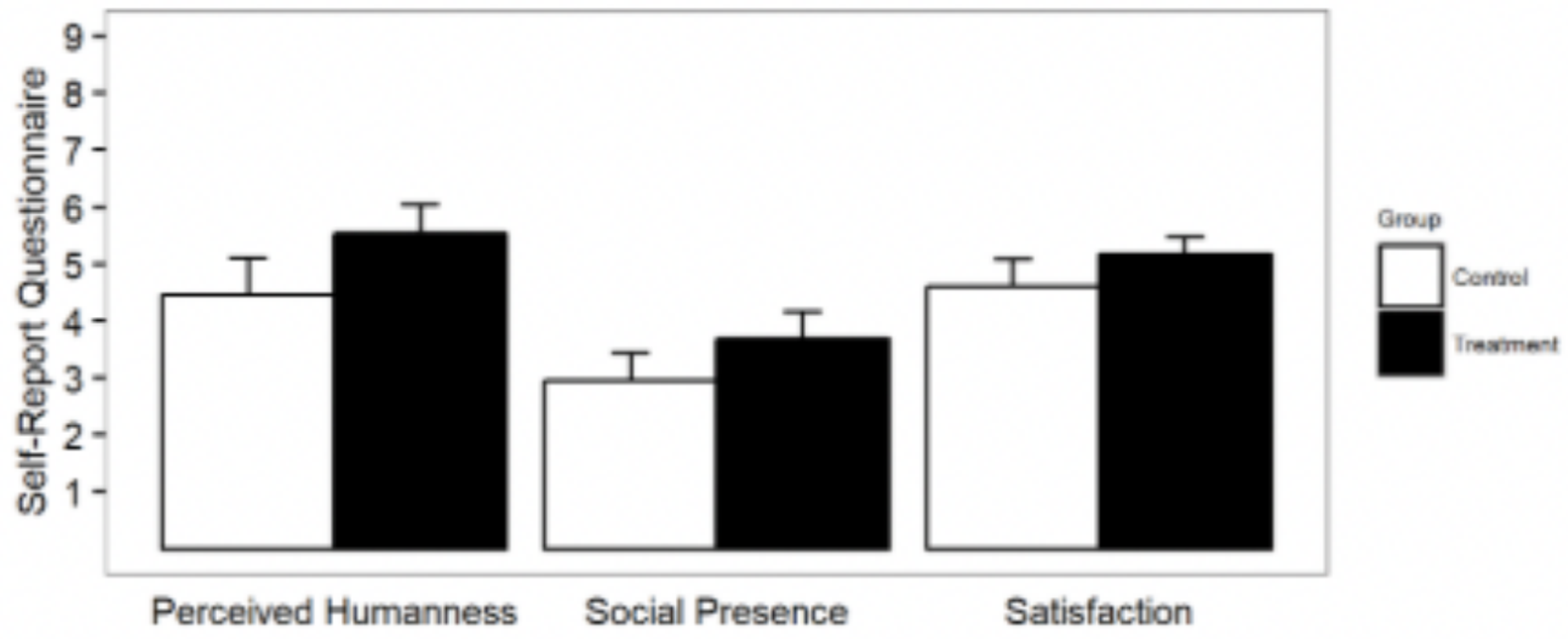
EXPERIENCE WITH CHATS



Jacobs, Pazhoohi, & Kingstone, 2024

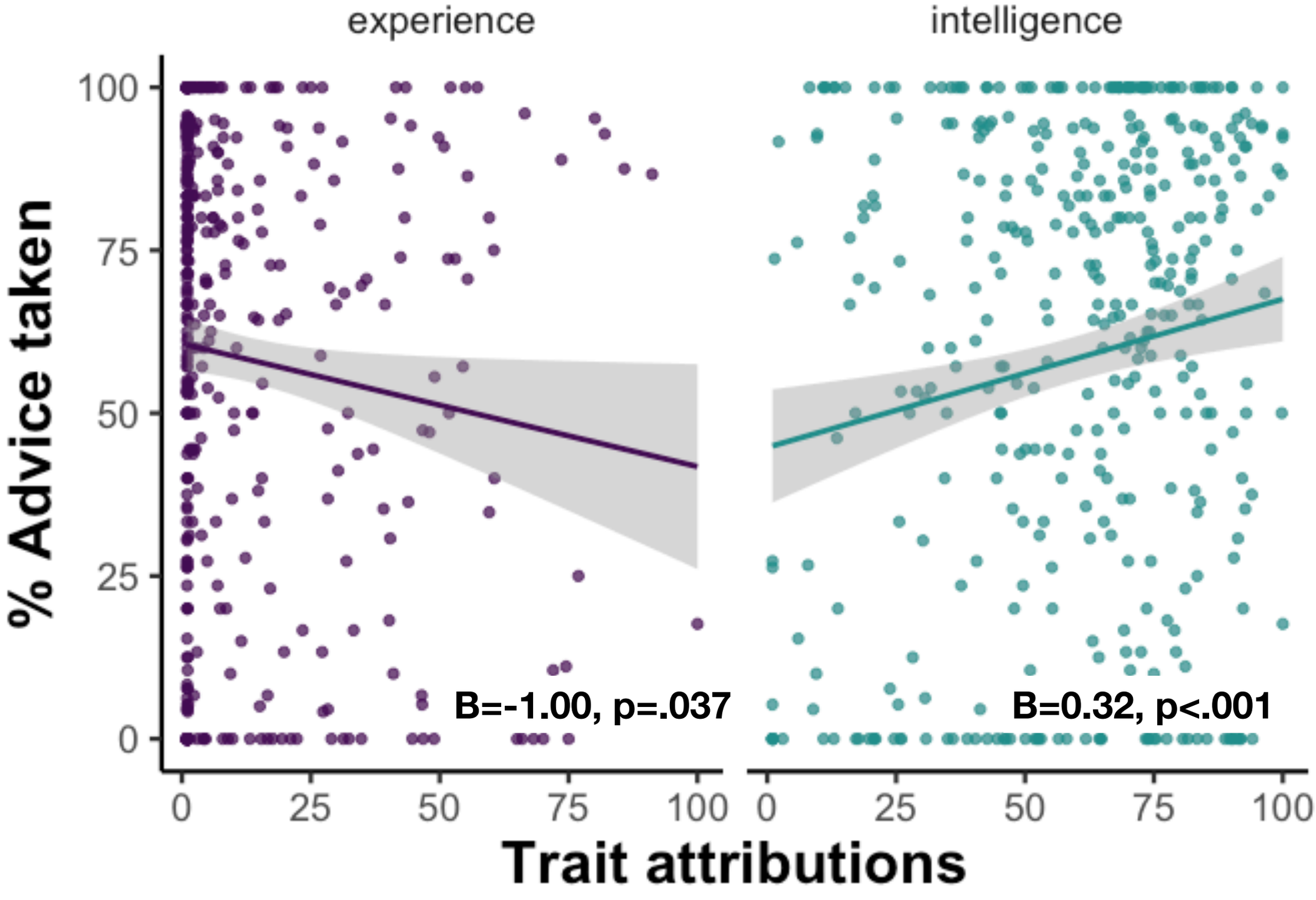
BEHAVIOURAL MARKERS

Messages exchanged between human and chatbot	Message complexity	Total response delay
Human: "*Hey*" Chatbot: "*Hey*"	0 0	0ms + 0ms = 0ms
Human: „*Help me!*" Chatbot: *"If you need a new mobile phone plan, try asking me things like: 'new mobile phone plan'"*	0 4.922	0ms + 2351ms = 2351ms
Human: „*Yes, I often travel on business to Asia and North America."* Chatbot: „*Okay, final question: How much are you willing to spend on a mobile phone plan per month?"*	2.504 2.995	2049ms + 2126ms = 4175ms



Gnewuch et al., 2023

MENTAL STATE ATTRIBUTIONS



TRUSTING MINDS

Different dimensions of mind perception have differential impacts on trust

An interplay of prior beliefs & behavioural cues

PERCEIVING OTHER MINDS

Visual Perception

Physical appearance

Dynamic motion

Static configuration

Cognitive Inferences

Prior beliefs

Communication

Consequences on interactions

THANK YOU!

https://colombattolab.com/

Vision and
Cognition Lab

EPSRC
Pioneering research and skills

Microsoft Research

NSERC
CRSNG