



1PM

6PM in London (GMT), 3AM in Tokyo (GMT+9)

Panel: Intelligence Types

Moderator: Katy Börner, *Indiana University*

Panelists:

- Marlot Meyer, **Hotspot**, *Royal Academy of Art, The Hague*
- Erica Amanda Cartmill, *Indiana University*
- Peter M. Todd, *Indiana University*



Marlot Meyer



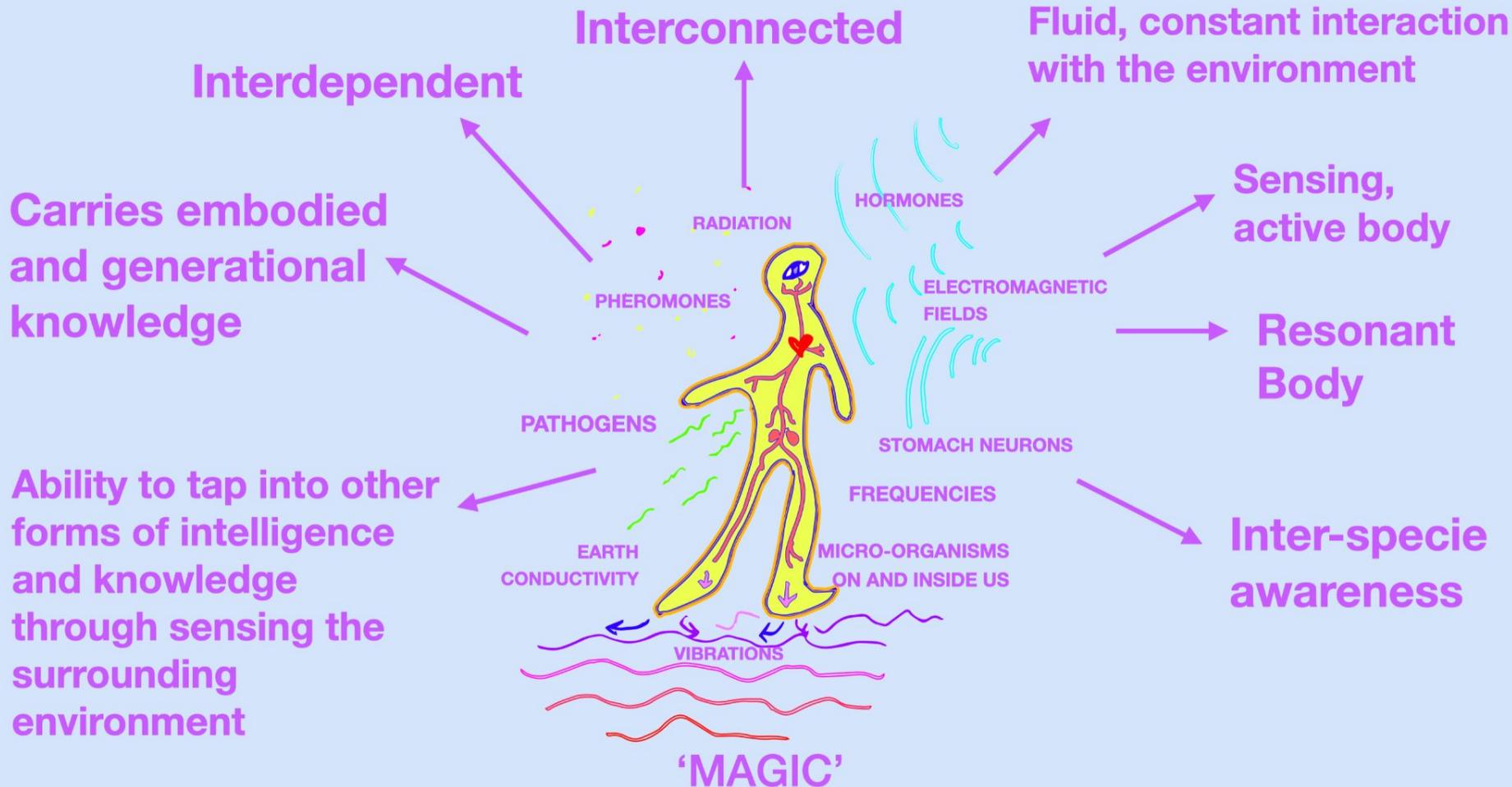
Marlot Meyer was born and raised in Cape Town, South Africa, and lives and works in The Hague. Since graduating from the Interactive Media Design (IMD) department in 2020, her practice has explored how to redefine the ‘body’ beyond the human body ending at the skin, to include the online, ecological, electric, and collective, shared body.

Embracing the DIY mindset, her practice is driven by an intuitive curiosity for how systems work. She uses technology as a tool to infiltrate, examine, and reconstruct the often unseen energies inside and between bodies. As a maker and teacher, her intention is to provide an embodied form of learning for her audience. This intention extends to her role as a tutor at KABK, where she leads the ‘Interactive Media Design Studio’ course, guiding students through self-directed projects that involve personal, conceptual, theoretical, and material research.

Working with the body as a source of information and material, she explores what embedded knowledge lies within our physical bodies, and how we have created cultures, practices, and tools around it. She collaborates with researchers and scientists to understand the biological body, exploring alternative practices of harnessing and creating embodied knowledge.

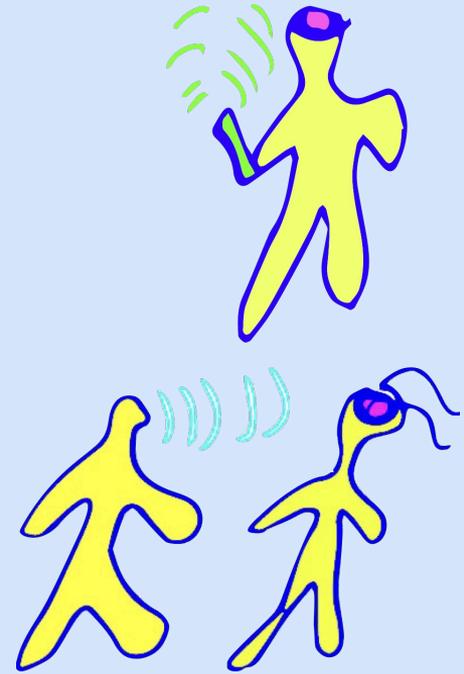


Embodied Intelligence

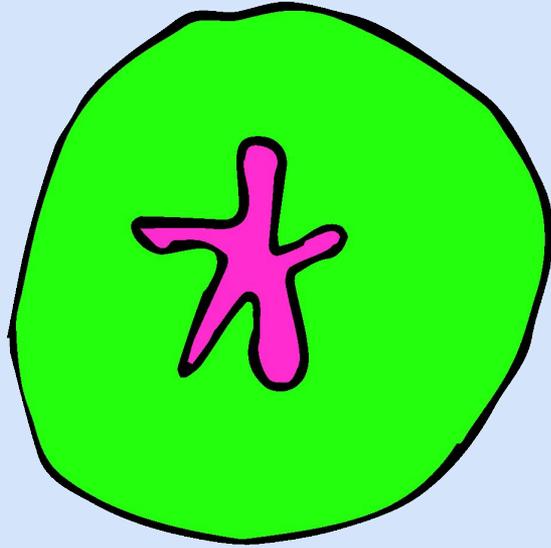




interconnected,
embodied, relational
human experience



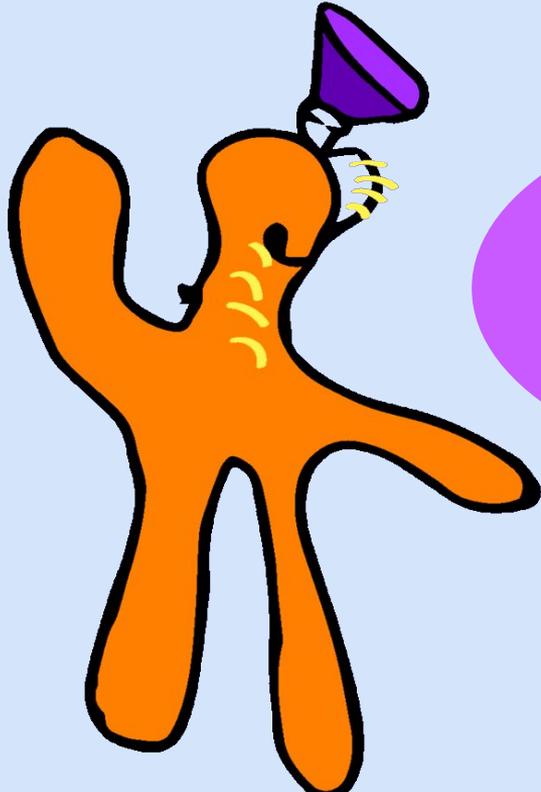
technology,
information,
language



Knowing the world by being *in* the world



Knowing the world by observing it from the 'outside'



Technology *does*
have the potential to
remind and reinforce
these relations to the
world



Hotspot





Create a form of non-verbal communication between bodies

Using existing processes in the body as the language



BIOSENSOR

collects

INPUT

sweat
brain activity
eye movement
heart rate

INFLUENCES & CREATES
FEEDBACK WITH BODIES

mapping

body data to electrical stimulation
+ spatial activation

OUTPUT

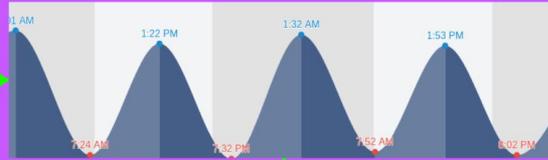
One body felt by other bodies
by electrical stimulation and
space responds to bodies

Project Tidal

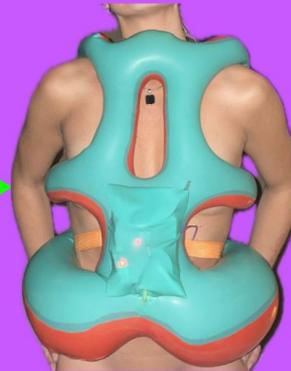
2016-10-25



Create a new/forgotten
connection between
the body and the tides



MAPPED TO INFLATING VEST



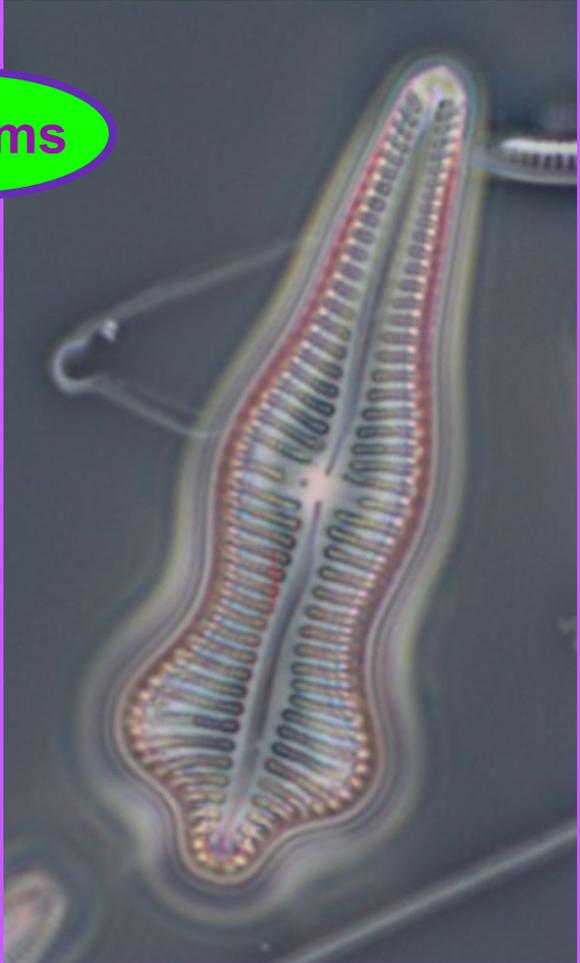
Formed a relationship of care with the tides and the sea

Pneuma





diatoms





Using their breath to
communicate to the
creatures – as a practice
of non-human dialogue

Erica Cartmill

Erica is an interdisciplinary scientist interested in the evolution of communication and social cognition. She is Professor of Cognitive Science, Anthropology, Animal Behavior, Psychology, and Informatics at IU Bloomington and an External Professor at the Santa Fe Institute. She works with many animal species, including humans, chimpanzees, orangutans, dogs, and birds. She runs the COMPARE lab at IU and collaborates with the Indianapolis Zoo and zoos in Europe and Japan.

Erica co-directs the Diverse Intelligences Summer Institute (DISI), and chairs the Evolution of Language (EVOLANG) conference series.



Visualizing Non-human Interaction



Erica Cartmill
Indiana University

Cognitive Science
Animal Behavior
Anthropology
Informatics
Psychology

December 13, 2025

Welcome to the COMPARE Lab!

Comparing Other Minds in Play, Adaptation, Representation, and Emotion



How do you visualize social interactions?

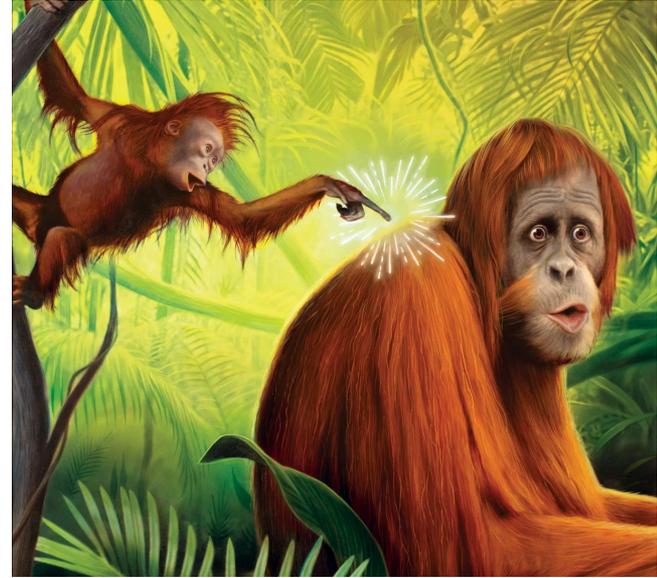
- An interaction involves
 - 2 or more individuals
 - Producing dynamic actions and reactions
 - Within a specific social relationship
 - Situated in space
 - Unfolding over time
- Scientific visualizations are typically
 - Static images
 - Averaged data
 - Graphs or tables

Different possible strategies

1. Describe an example interaction in text
 - Similar to ethnographic approach in anthropology
 - **Pros:** walks people through key moments in interaction and allows them to understand the complexity of one example
 - **Cons:**
 - doesn't highlight generalizable features
 - doesn't provide visualization
2. Present a video of an example interaction
 - **Pros:** shows people the real interaction with all its complexity
 - **Cons:**
 - doesn't highlight generalizable features
 - people might not notice features you want
 - video isn't always available as an option
3. Present video stills in a comic strip form
 - **Pros:** highlights key moments using real images
 - **Cons:** Static, doesn't show timing
4. Create drawings from video stills
 - **Pros:**
 - highlights key moments
 - can be stylized and de-identified
 - **Cons:** time-consuming and less realistic

1. Describe an example in text

One sunny afternoon in San Diego, three-year-old Aisha played outside while her father sat nearby. Her father wasn't paying much attention to her, so Aisha took a toy and waved it at him. When he didn't respond, she redoubled her efforts, gently bonking him on the head with the toy. She looked at her dad's face expectantly, but to no avail. Aisha then waved the toy in her dad's face and brushed it across the top of his head, making it harder and harder for him to ignore her. Finally, he gave in and watched while she swung on a swing.



2. Present a video of an example interaction

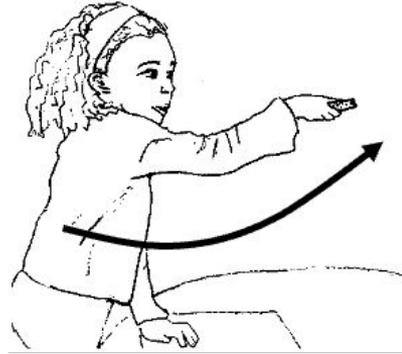
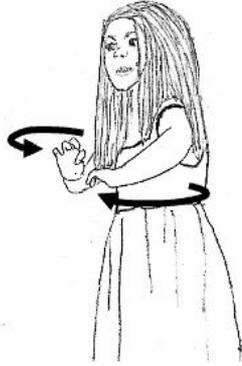


Laumer, I. B., Winkler, S. L., Rossano, F., & Cartmill, E. A. (2024). Spontaneous playful teasing in four great ape species. *Proceedings of the Royal Society B*, 291(2016), 20232345

3. Present video stills in a comic strip form

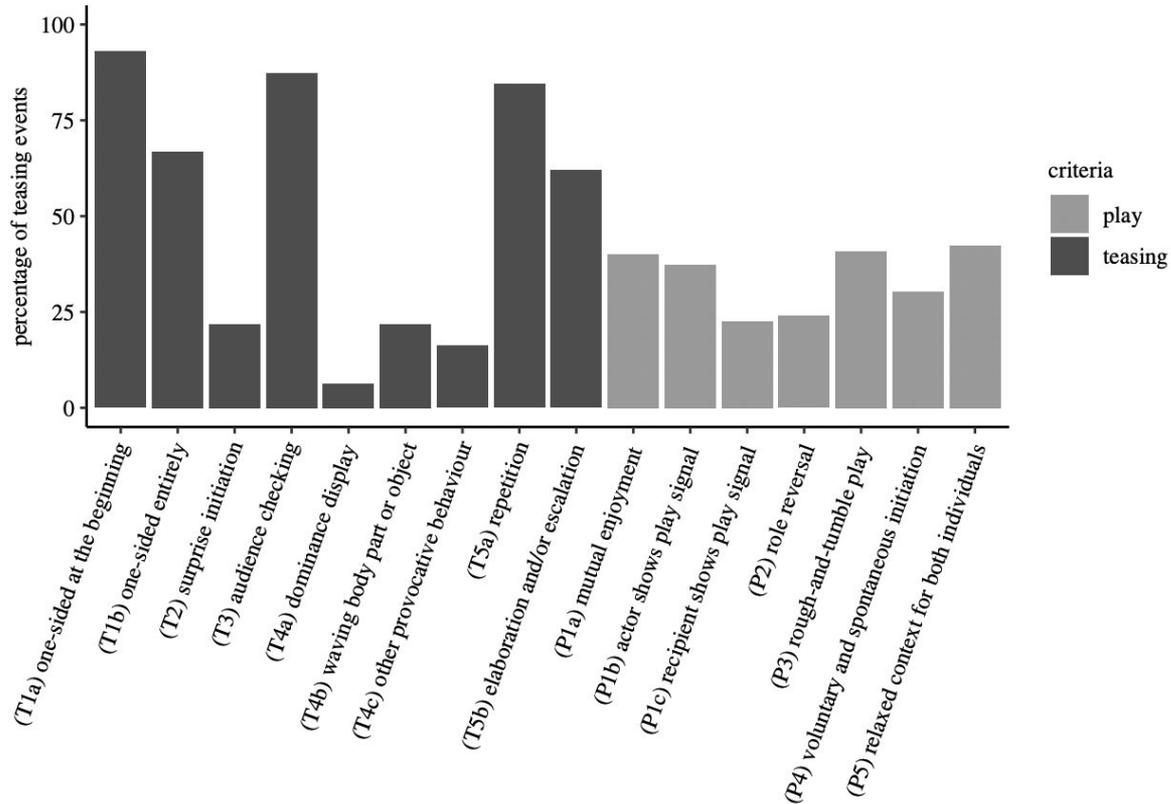


4. Create drawings from video stills



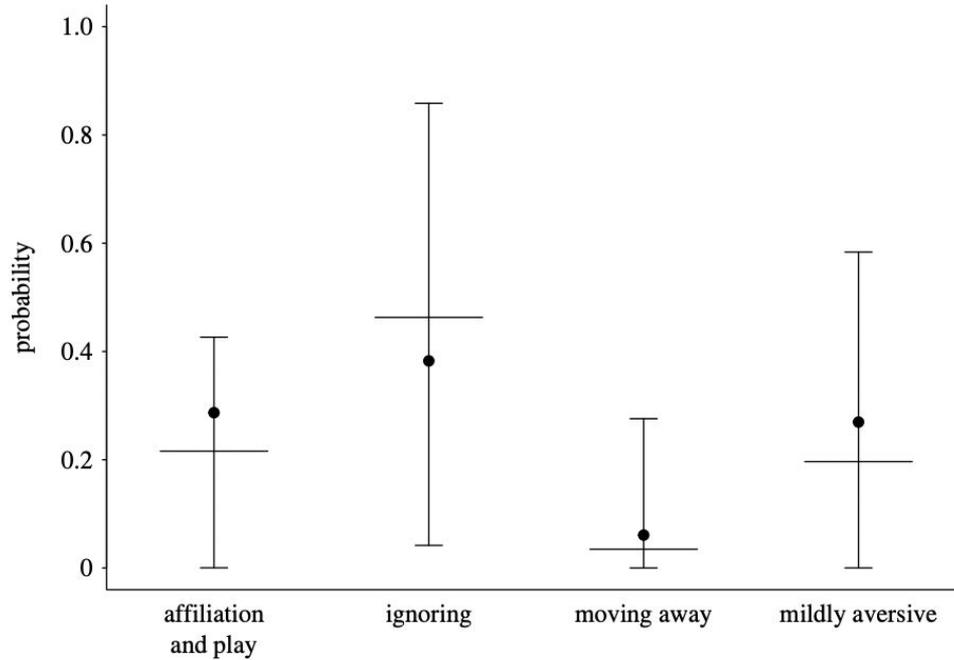
Cartmill E.A., Rissman, L., Novack, M.A., Goldin-Meadow, S. (2017) The development of iconicity in children's co-speech gesture and homesign. *Language, Interaction and Acquisition*, 8(1), 42-68

Visualizing summary data: ape teasing



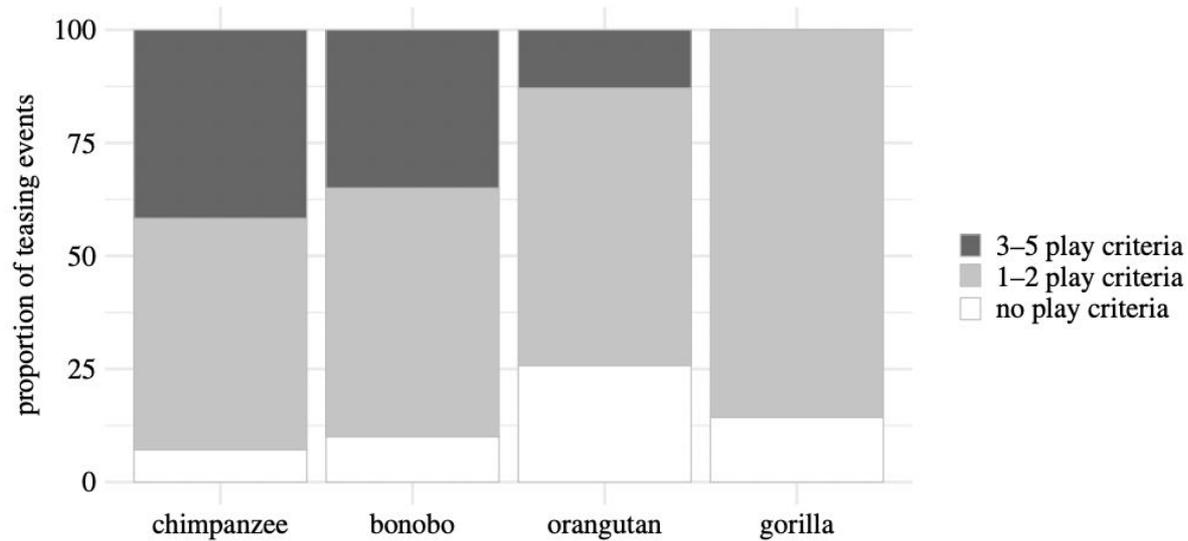
Q: How common are different feature of teasing?

Visualizing summary data: ape teasing



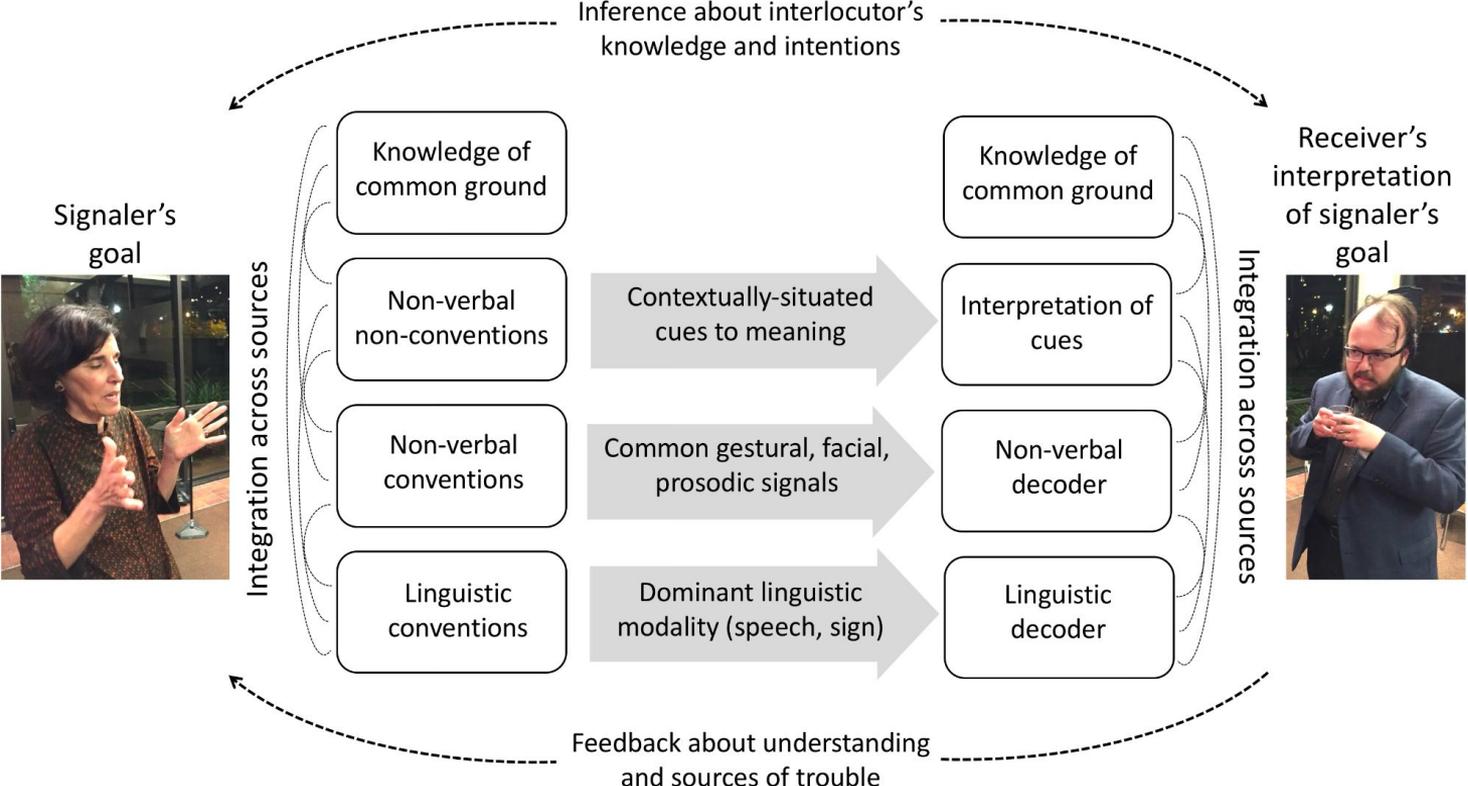
Q: How to targets respond to teasing?

Visualizing summary data: ape teasing



Q: Do species differ in the playfulness of their teasing?

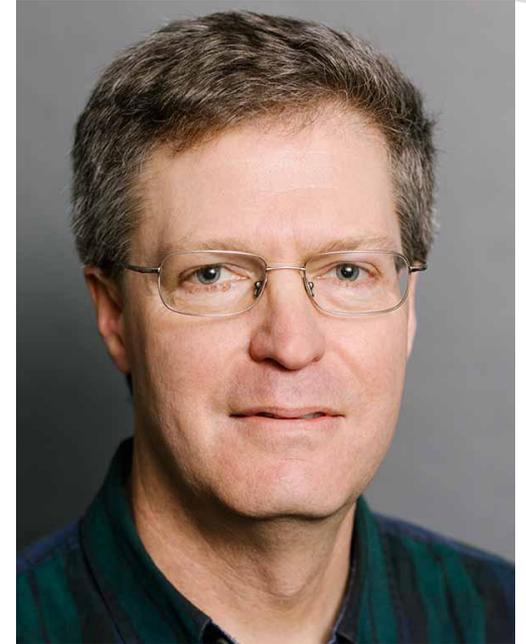
Using patterns to propose models



Peter M. Todd

Provost Professor
Cognitive Science, Psychological and Brain Sciences, and Informatics
Indiana University

Peter M. Todd grew up in Silicon Valley, received a PhD in psychology from Stanford University, and in 1995 moved to Germany to help found the Center for Adaptive Behavior and Cognition (ABC), based at the Max Planck Institute for Human Development in Berlin. The Center's work on decision making was captured in the books *Simple Heuristics That Make Us Smart* (OUP, 1999) and *Ecological Rationality: Intelligence in the World* (OUP, 2012). Todd moved to Indiana University in 2005 where his research focuses on the cognitive mechanisms that people and other intelligent agents use to make decisions about adaptively important resources—including mates, information, and food—in space and time, both present and future. His work on search led to the book *Cognitive Search: Evolution, Algorithms, and the Brain* (Todd, Hills, and Robbins, eds.; MIT Press, 2012). He has served as the Director of the IU Cognitive Science Program and the co-first Director of the IU Food Institute.



Intelligence Involves Exploration

Peter M. Todd

Indiana University, Cognitive Science,
Psychology, and Informatics



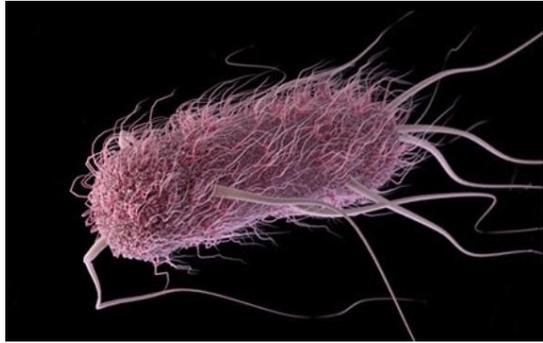
Adaptive Behavior and Cognition Lab

Search makes life smart

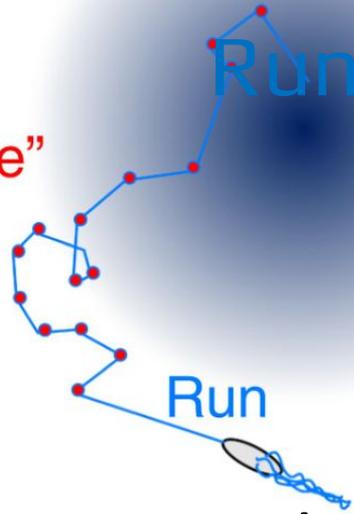


Life without search: Sea pens, relatives of coral

Searching bacteria: Run and Tumble



“Tumble”

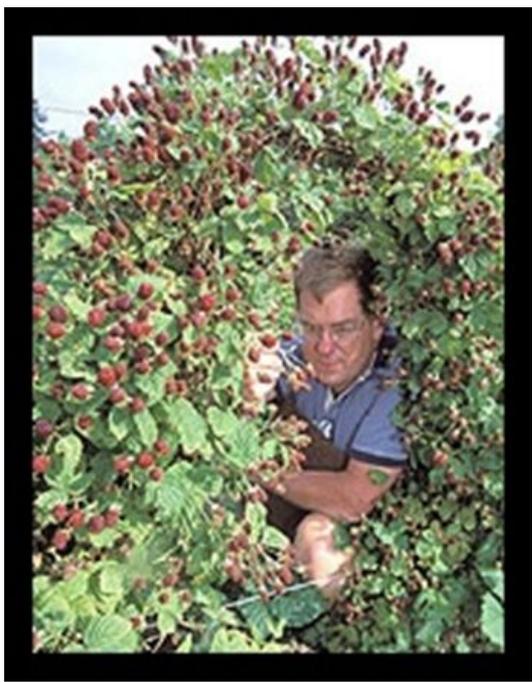


Win-Stay/Lose-Shift:

Keep doing what you're doing if things are good (run),
switch it up if things aren't good enough (tumble)

Exploration-Exploitation Tradeoff





When to leave a patch?

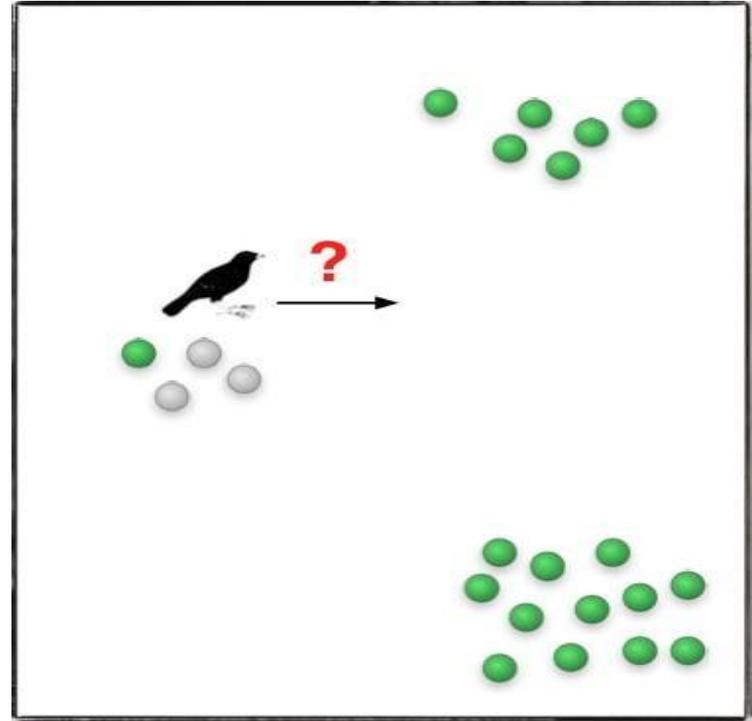
How much is left here?

How much is elsewhere?

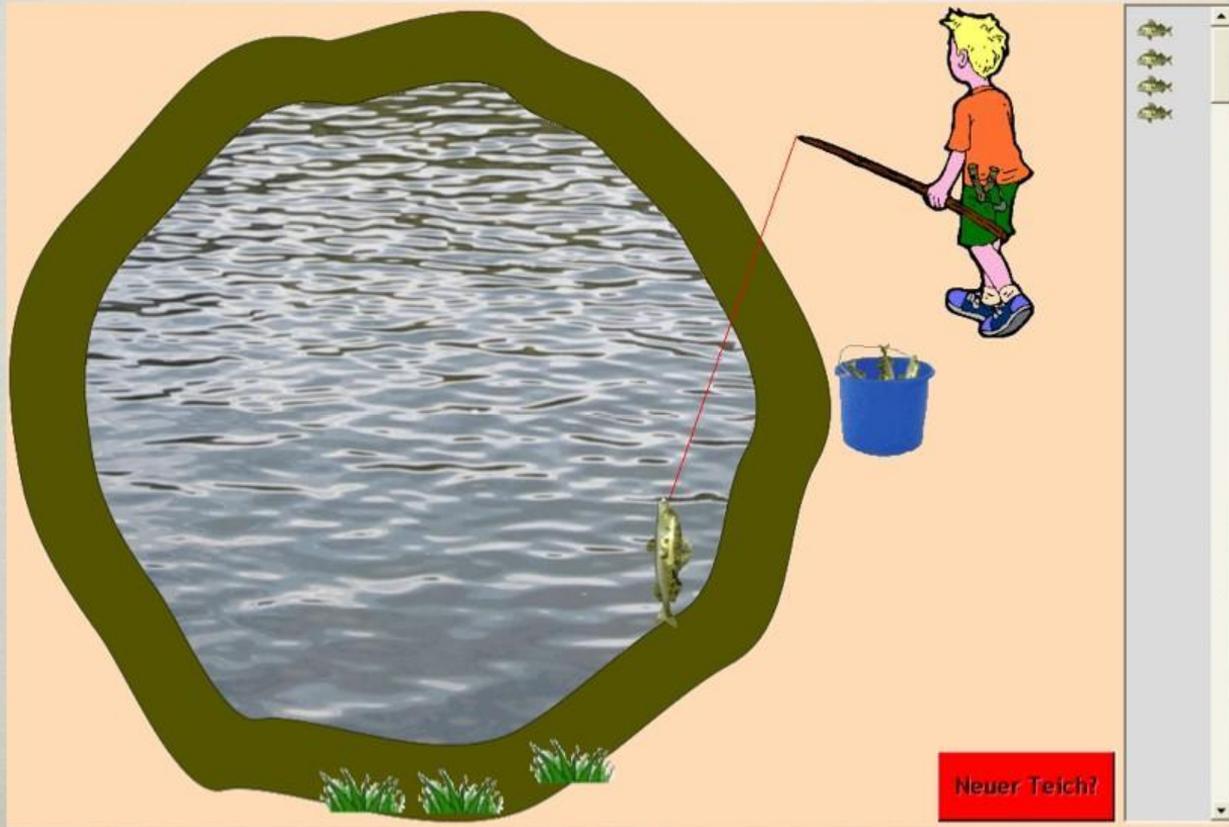
Should I stay or should I go?

Win-Stay/Lose-Shift:

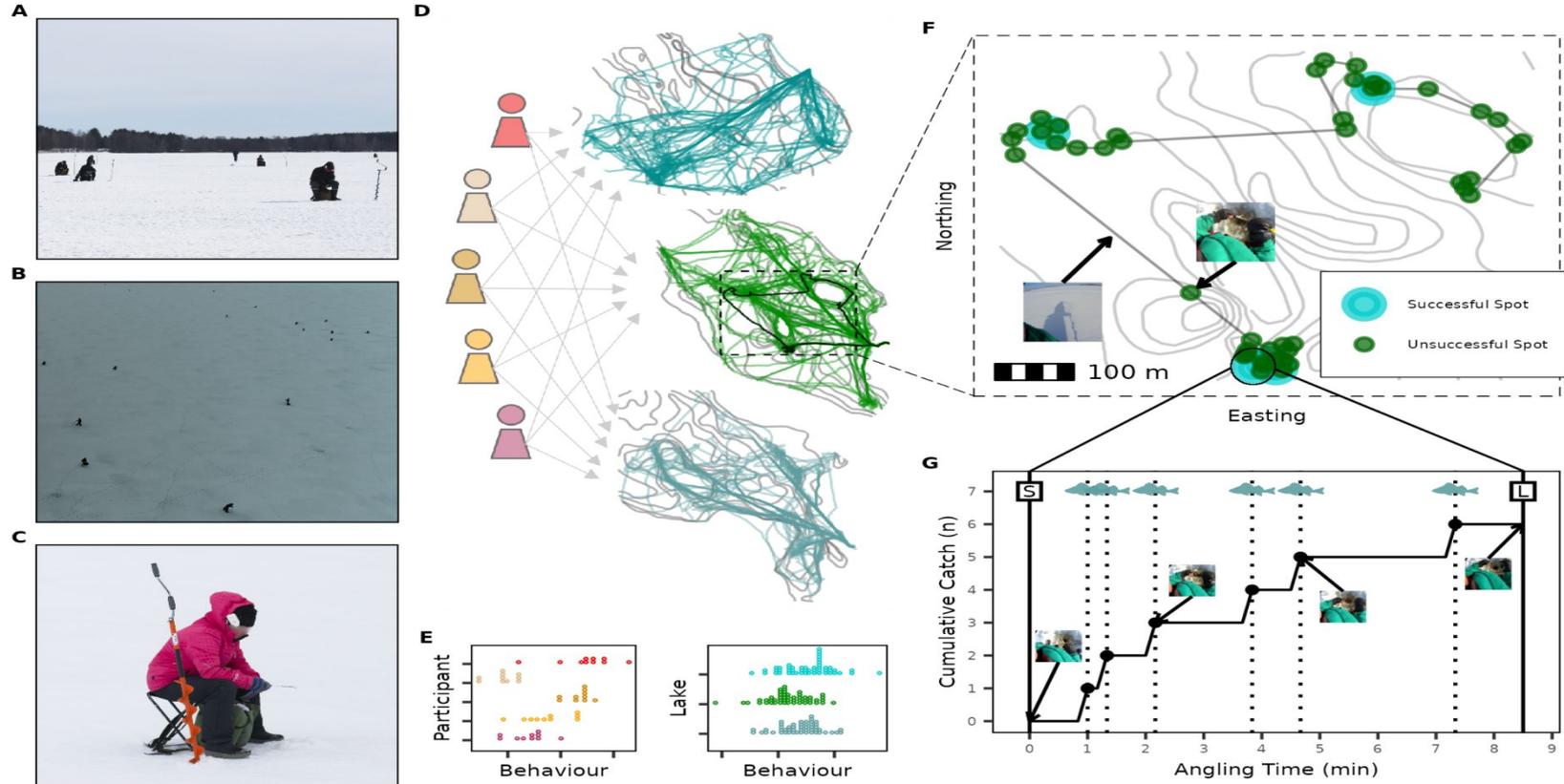
If I'm doing better here than elsewhere: stay, otherwise: go



EXTERNAL SEARCH: THE FISHING TASK



Also seen in real ice-fishing

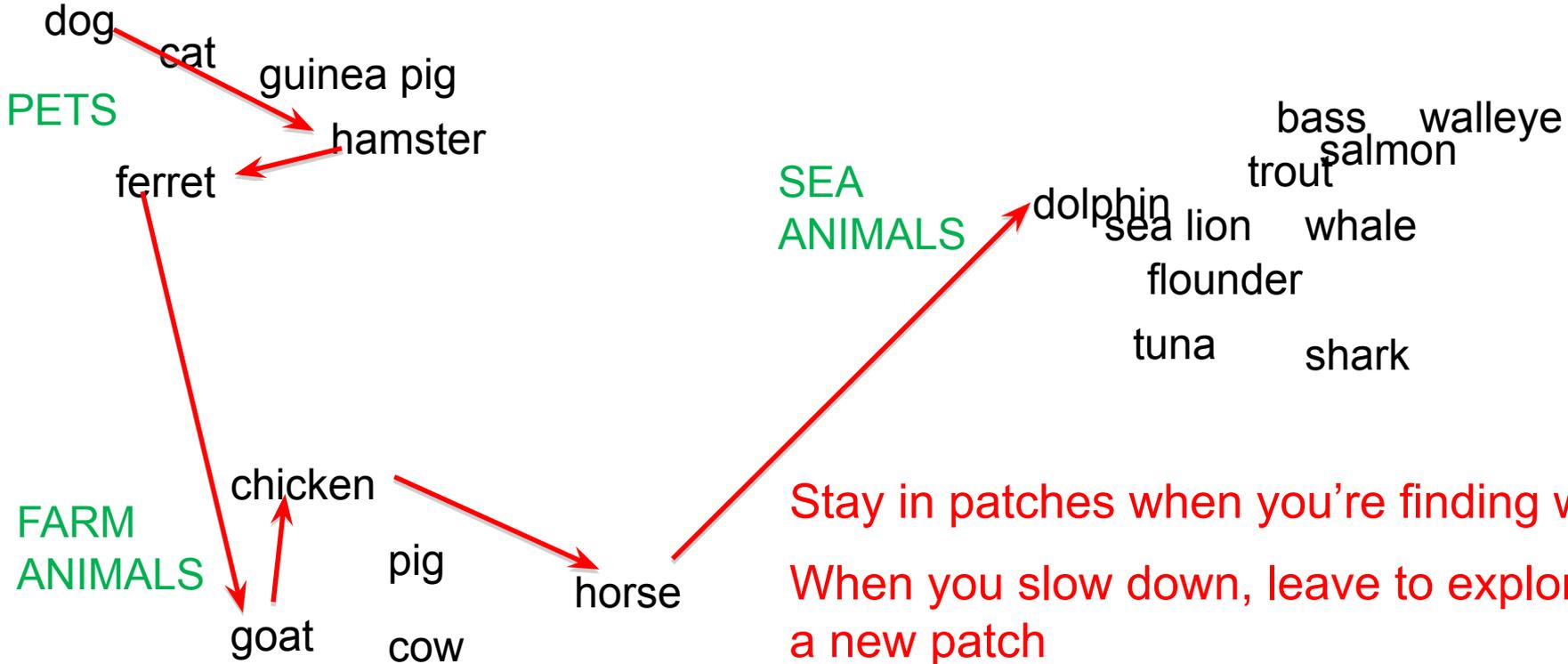


Socioecology drives adaptive social foraging dynamics in the wild.

Schakowski, ..., & Kurvers, 2025. <https://osf.io/preprints/psyarxiv/qbvp9> v1

Name all the animals you can think
of in a minute

Exploring in your mind



Stay in patches when you're finding words
When you slow down, leave to explore for a new patch

food...



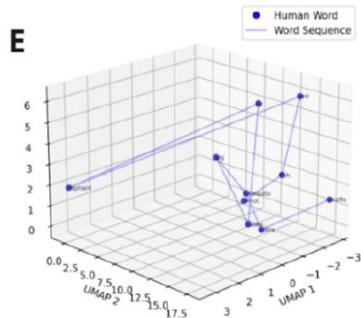
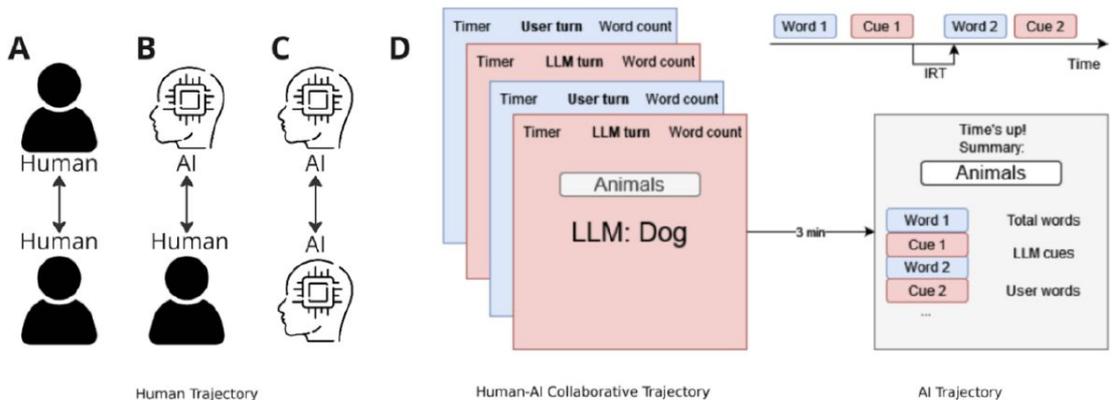
food/ideas...



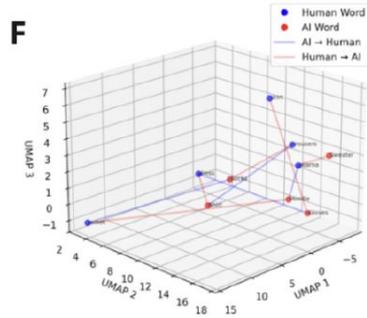
food/ideas...



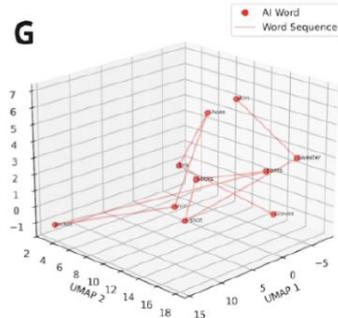
How can AI help humans explore?



 Human : Solo



 Human + AI : Collaborative



 AI : Solo

Exploring in conversations

Contextual word embeddings

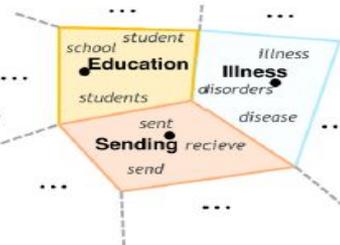
100 DATM topics

Topic assignment

A: Topic modeling

Transcripts

school student
illness ...
students disorders
sent disease
send recieve



Went to kindergarten and first grade through sixth grade.

66 cold winter.

From sixth grade I went to [...] high school.

Graduated in 1982.

I went straight to the service.

- "Education"
- "Two-digit numbers"
- "Education"
- "Education"
- "Sending "

Contextual utterance embeddings

I had an older sister, she was my fathers first child.

▼ cluster 1

She lives in Liberia, where she originated from also in Louisiana.

▼ cluster 1

Then he met my mother, she was a student at [...] university.

▼ cluster 1

She graduated from there.

▼ switch

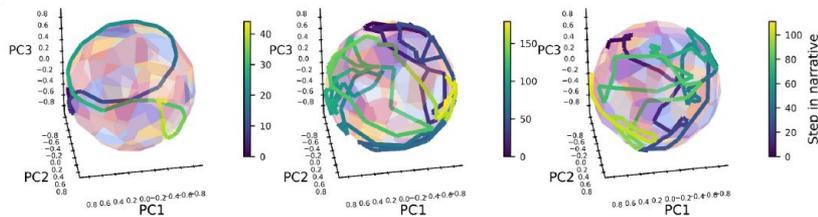
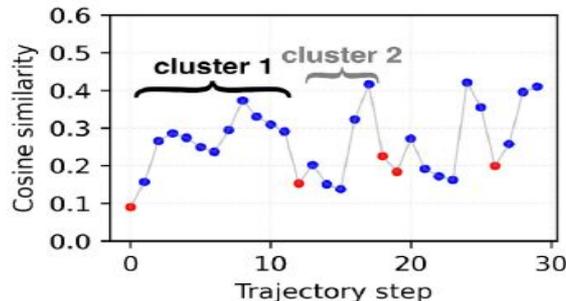
They moved up here when I was two years old.

▼ cluster 2

We lived on [...] and [...] in that neighborhood.

B: Segmentation of semantic trajectories

Segmented semantic trajectory



24h Envisioning Intelligences
event slides and video recordings:



Call for exhibit submissions:
<https://scimaps.org/call-for-submissions>

