

Qualitative data analysis with LLMs

Dirk Wulff

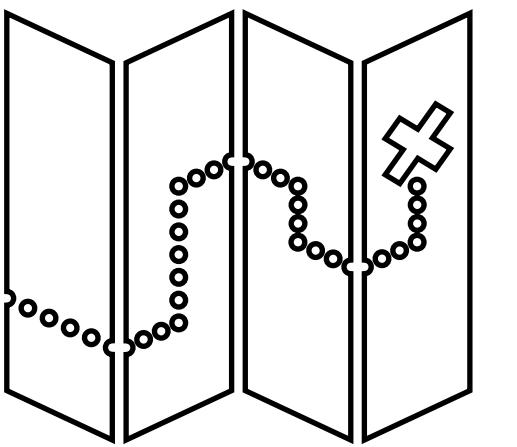


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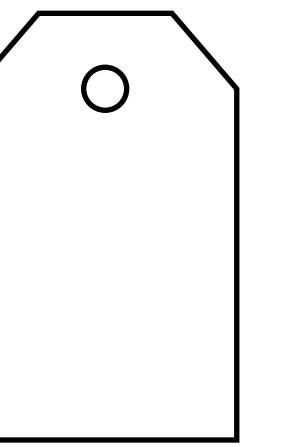


Applications

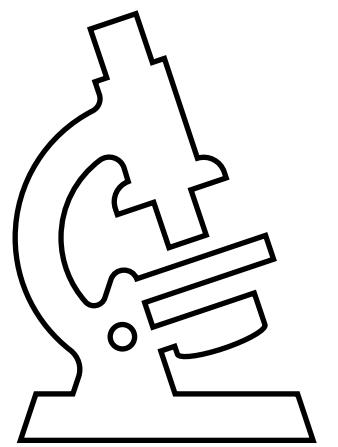
For qualitative data analysis



Map out and cluster



Label



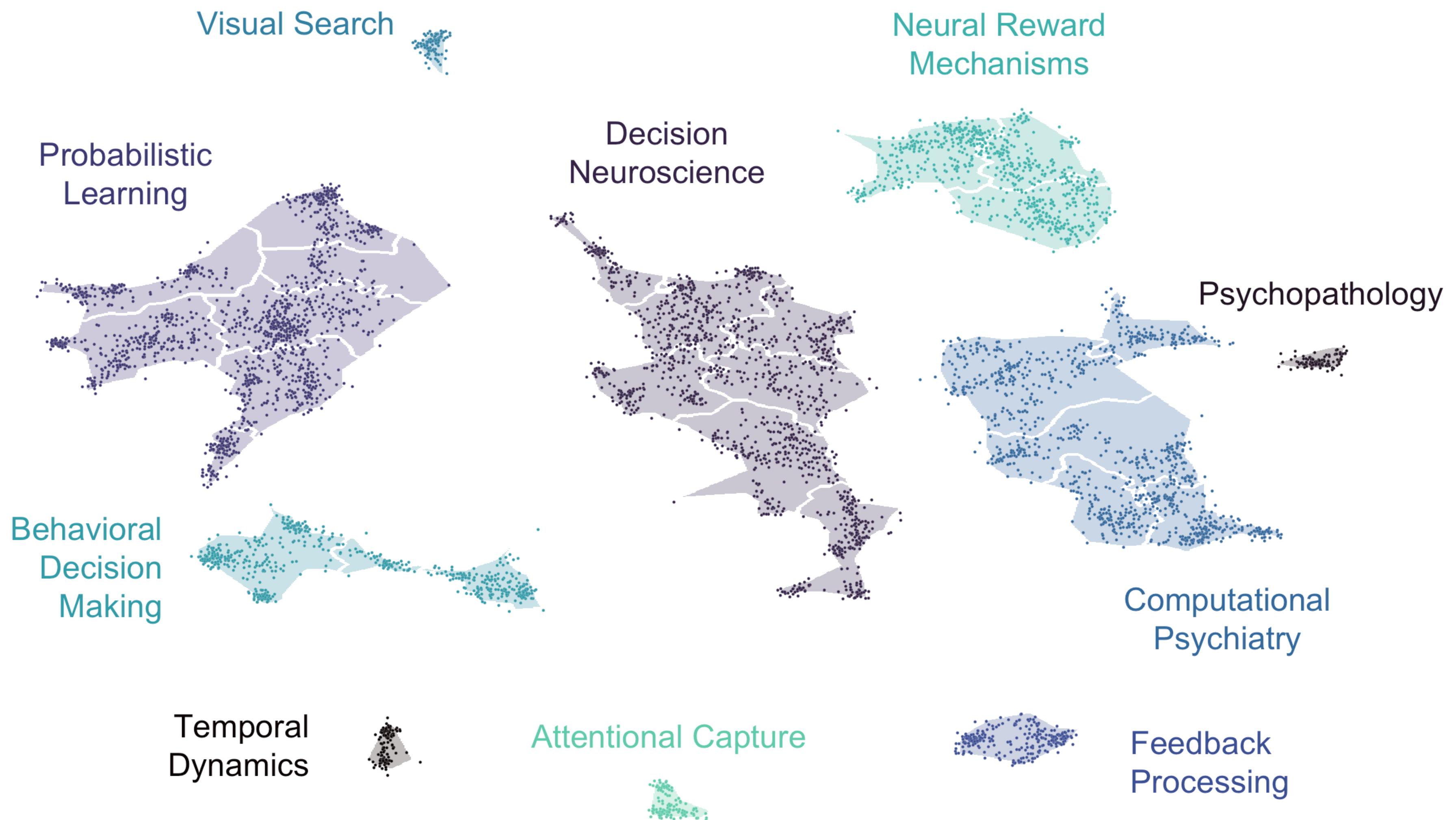
**Summarize
or paraphrase**



Search

Map and cluster

The landscape
of behavioral
reinforcement
learning
research



Map and cluster

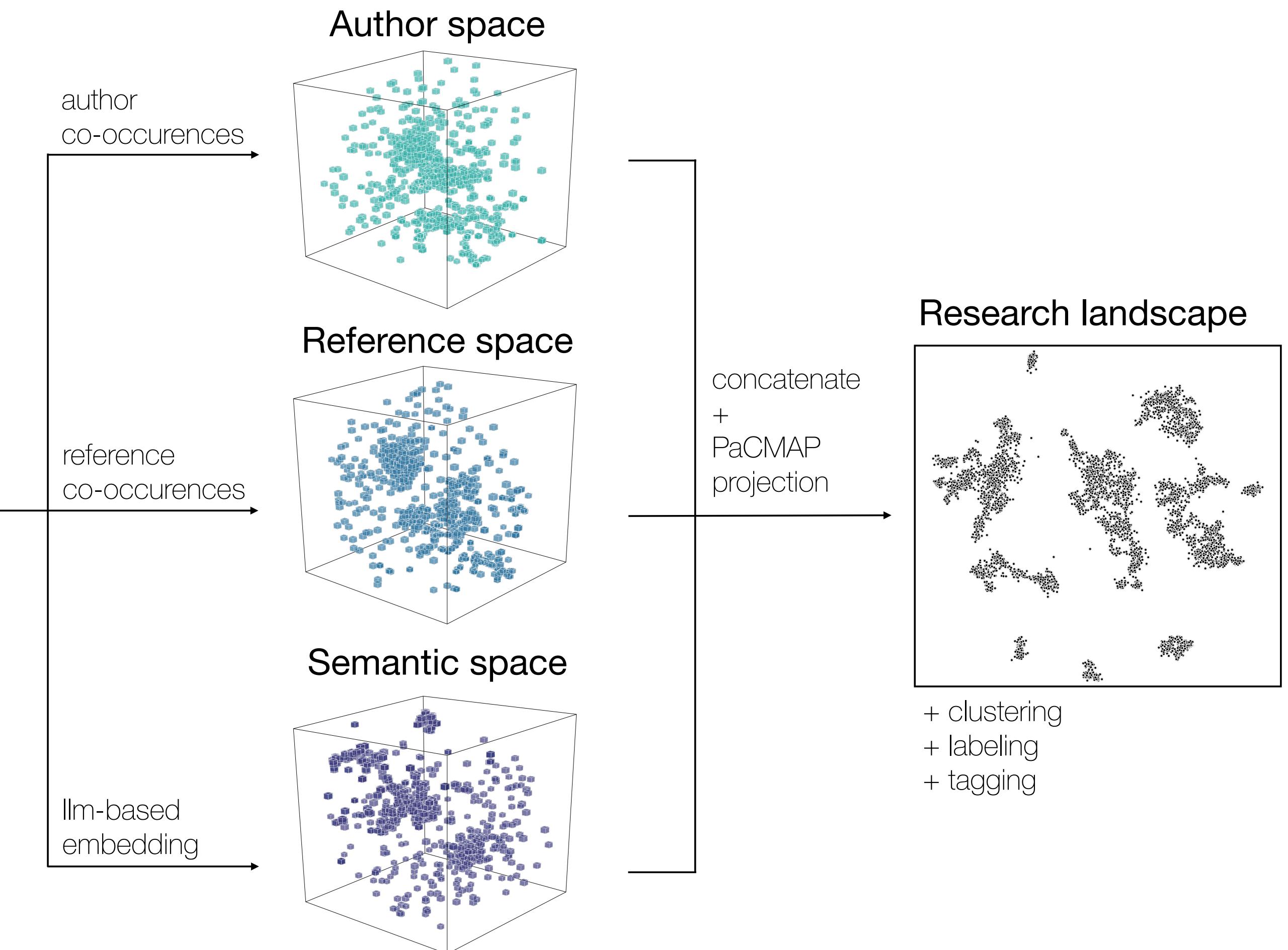
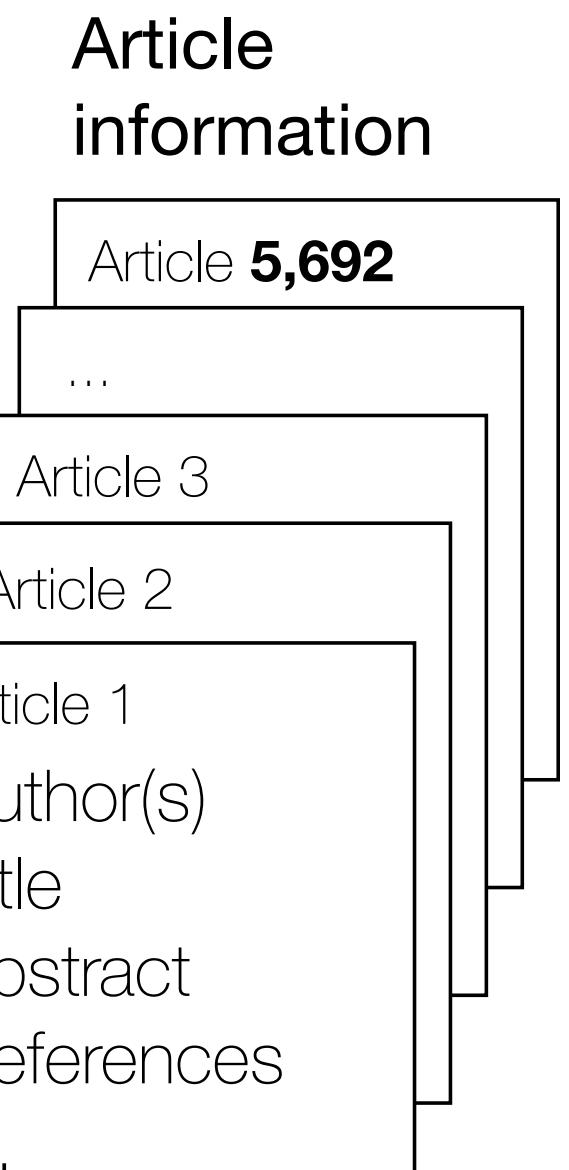
The landscape of behavioral reinforcement learning research

Search query

TITLE-ABS-KEY("reinforcement learning"
OR "decision* from experience" OR
"choice* from experience" OR "experience-
based choice*" OR "experience-based
decision*" OR "repeated choice*" OR
"repeated decision*" OR "sequential
choice*" OR "sequential decision*" OR
"dynamic decision making" OR "probability
learning" OR "reward learning" OR "reward-
based learning" OR "reward-based
choice*" OR "reward-based decision*" OR
"value learning" OR "value-based learning"
OR "value-based choice*" OR "value-
based decision*") AND
LANGUAGE("English") AND DOCTYPE("ar")
AND SUBJAREA("NEUR" OR
"PSYC" OR "ECON")

↓
8,144 hits

cleaning & filtering



Identifying core and peripheral topics in reinforcement learning



Map and cluster

free associations

avalanche

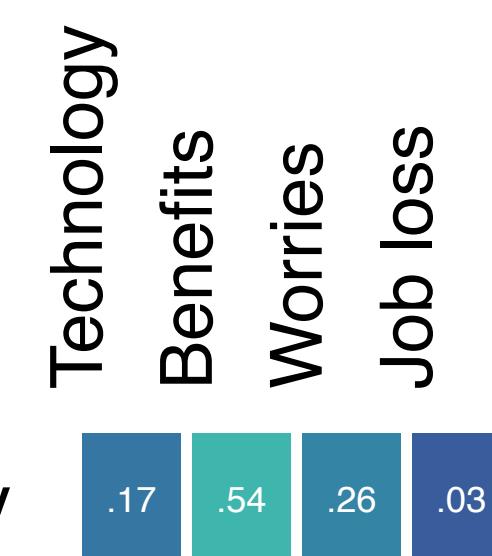
Enter a first association

Progress

+ Next response✗ Unknown word

Map and cluster

How people
think about
AI

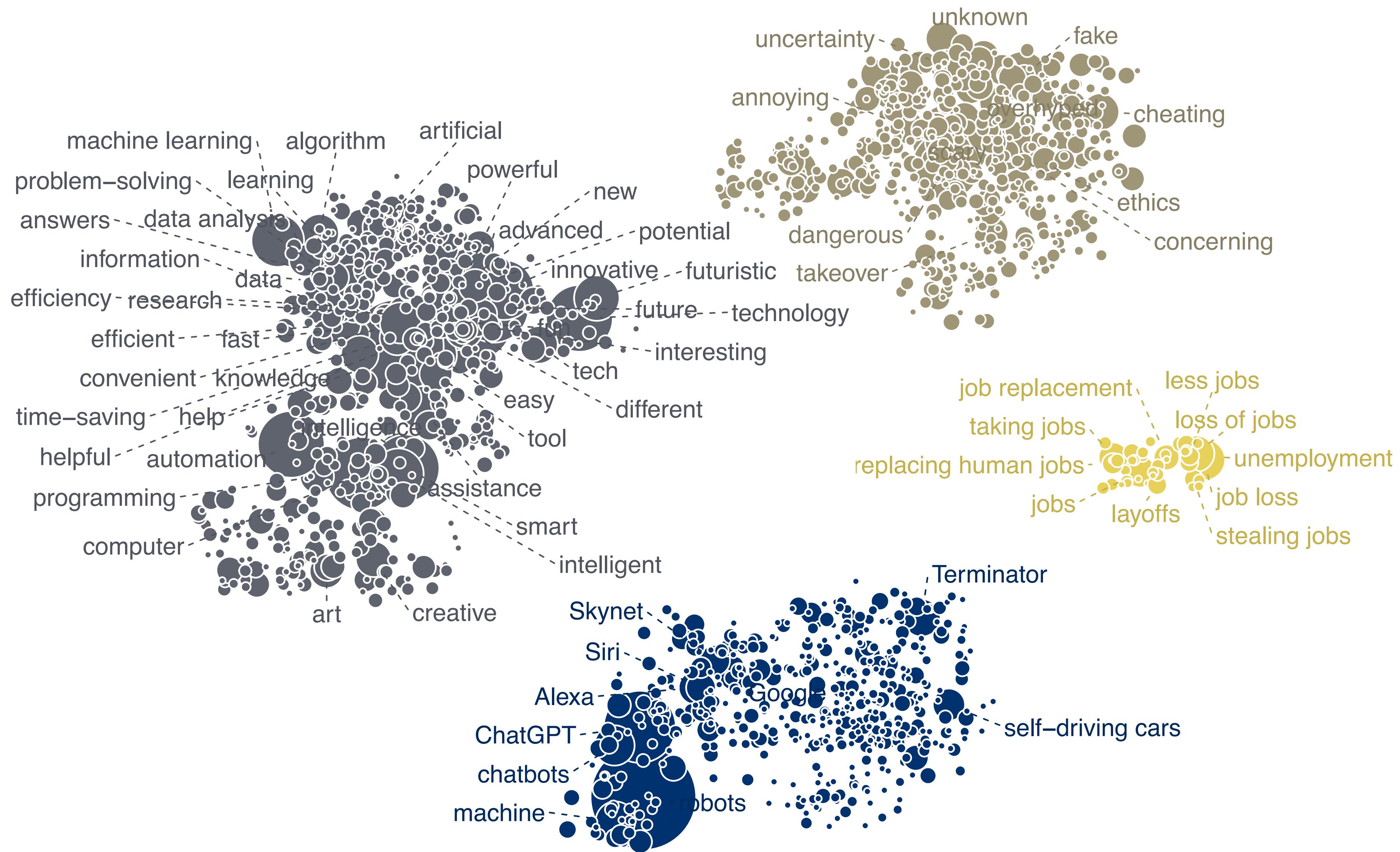


Wave (2 vs. 1)

-.1	.03	.01	-.1
-.01	.17	-.31	-.37
.04	.24	-.48	-.36

Expertise (high vs. low)

Trust (high vs. low)



Labeling

Predicting risk perception
with GPT-4-Turbo

The screenshot shows a ChatGPT interface with two messages. The first message is from 'You' asking for a numerical estimate on a risk scale for a 'robot'. The second message is from 'ChatGPT' responding with the number 30. The third message is from 'You' asking for a numerical estimate on a risk scale for a 'virus'. The fourth message is from 'ChatGPT' responding with the number 70. Below the messages are standard social media interaction icons: a speaker icon, a thumbs up icon, a refresh/circular arrow icon, and a thumbs down icon.

You
On a scale from -100 (safe) to 100 (risky), how risky or safe is 'robot'? Respond with a numerical estimate.

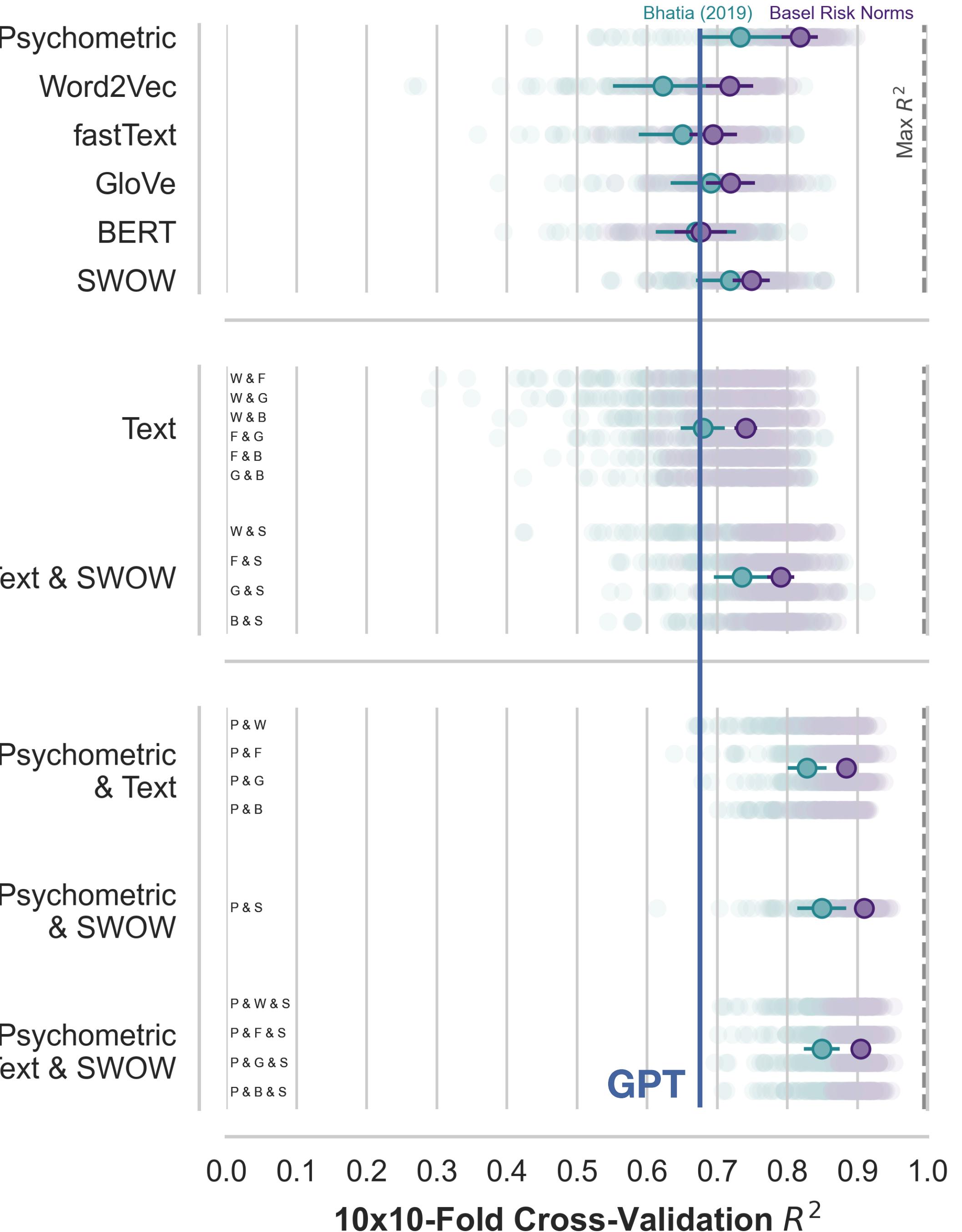
ChatGPT
30

You
User
On a scale from -100 (safe) to 100 (risky), how risky or safe is 'virus'? Respond with a numerical estimate.

ChatGPT
70

Labeling

Predicting risk perception
with GPT-4-Turbo



Labeling

Sustainable Development Goals



www.text2sdg.io

Bycatch -the retained catch of non-target but commercially viable species, plus all fisheries discards - is an element of almost every marine capture fishery. Fishing mortality through bycatch in purse seines and pelagic longlines, the two main gear types used to catch tunas, is a primary source of the drastic global population declines observed in several species of marine megafauna, including sharks, rays, cetaceans, seabirds and sea turtles. As seafood consumers around the world are progressively sensitized to the ecological implications of fisheries bycatch, customer preferences have translated into an increasing demand for seafood that is certified through eco-labelling or certification schemes...



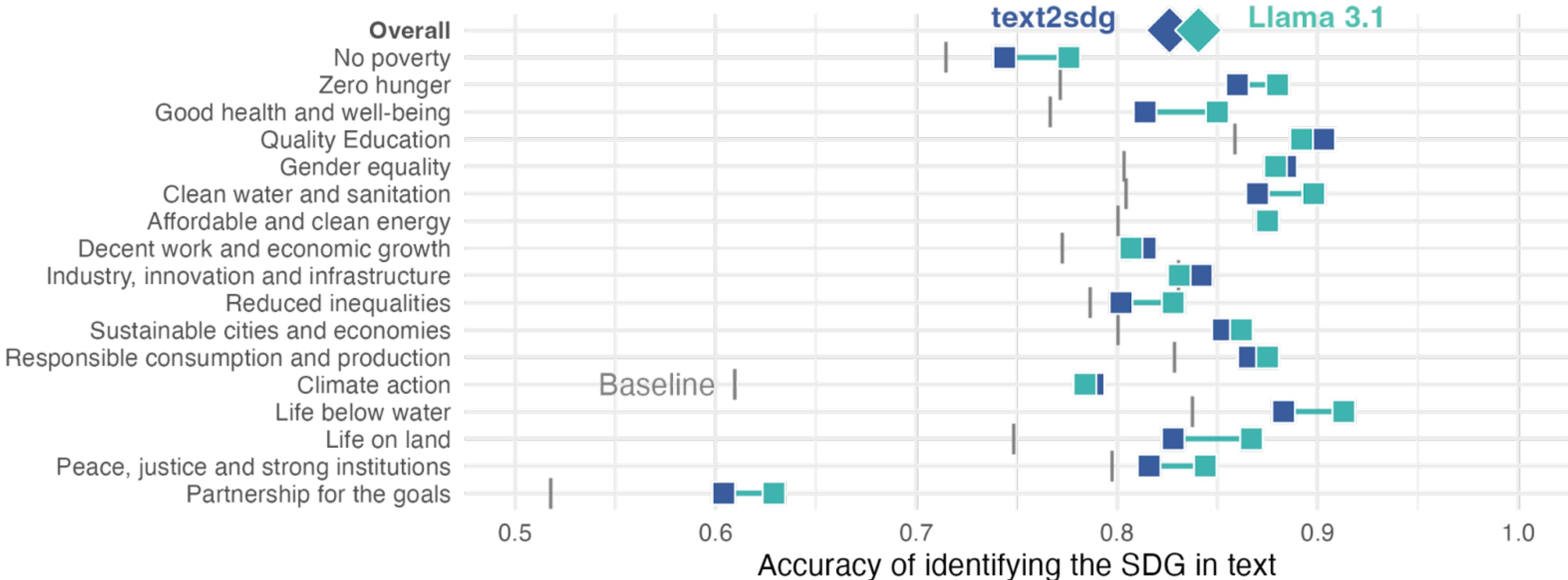
(ocean* OR
marine OR coast*
OR sea OR seas
OR seawater* OR
sea water* OR
coral reef*)
AND
(overfish* OR
fisheries OR
fishery OR fish
stock* OR fishing)

AURORA
UNIVERSITIES NETWORK



Labeling

Sustainable Development Goals



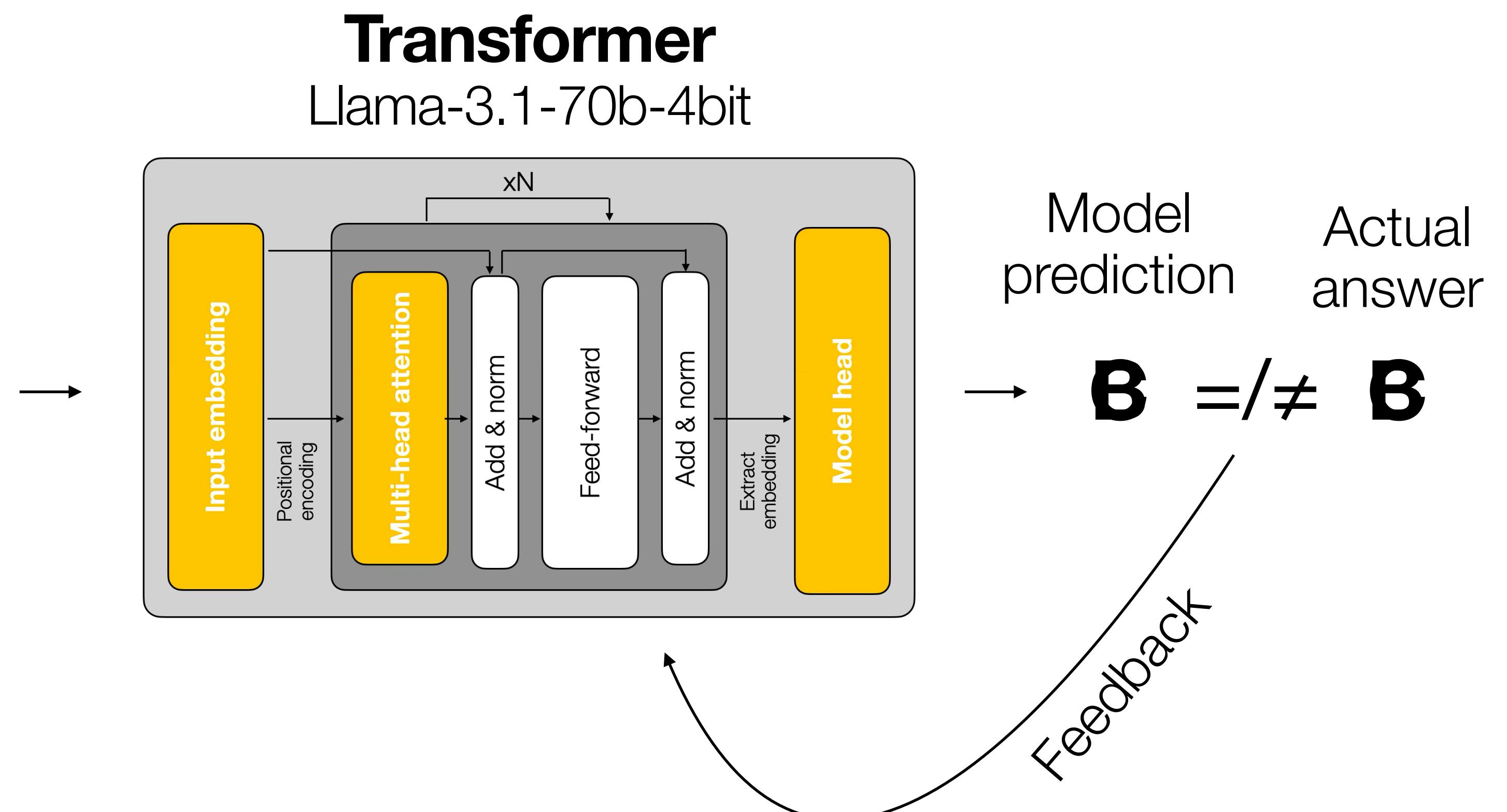
Labeling

Cognitive science

Bandit task

In this task, you have to repeatedly choose between two slot machines labeled **B** and **C**. When you select one of the machines, you will win or lose points. Your goal is to choose the slot machines that will give you the most points.

You press <<**C**>> and get -8 points.
You press <<**B**>> and get 0 points.
You press <<**B**>> and get 1 points.



Labeling

Cognitive science

160
studies

60,092
participants

10,681,650
choices



Memory

N-back, Digit span, Recall, Recognition, Episodic memory, etc.

Learning

Associative learning, Categorization, Multiple-cue judgment, Gardening task, etc.

Bandits

Decisions from experience, Iowa gambling task, Two-armed bandit, Structured bandit, etc.

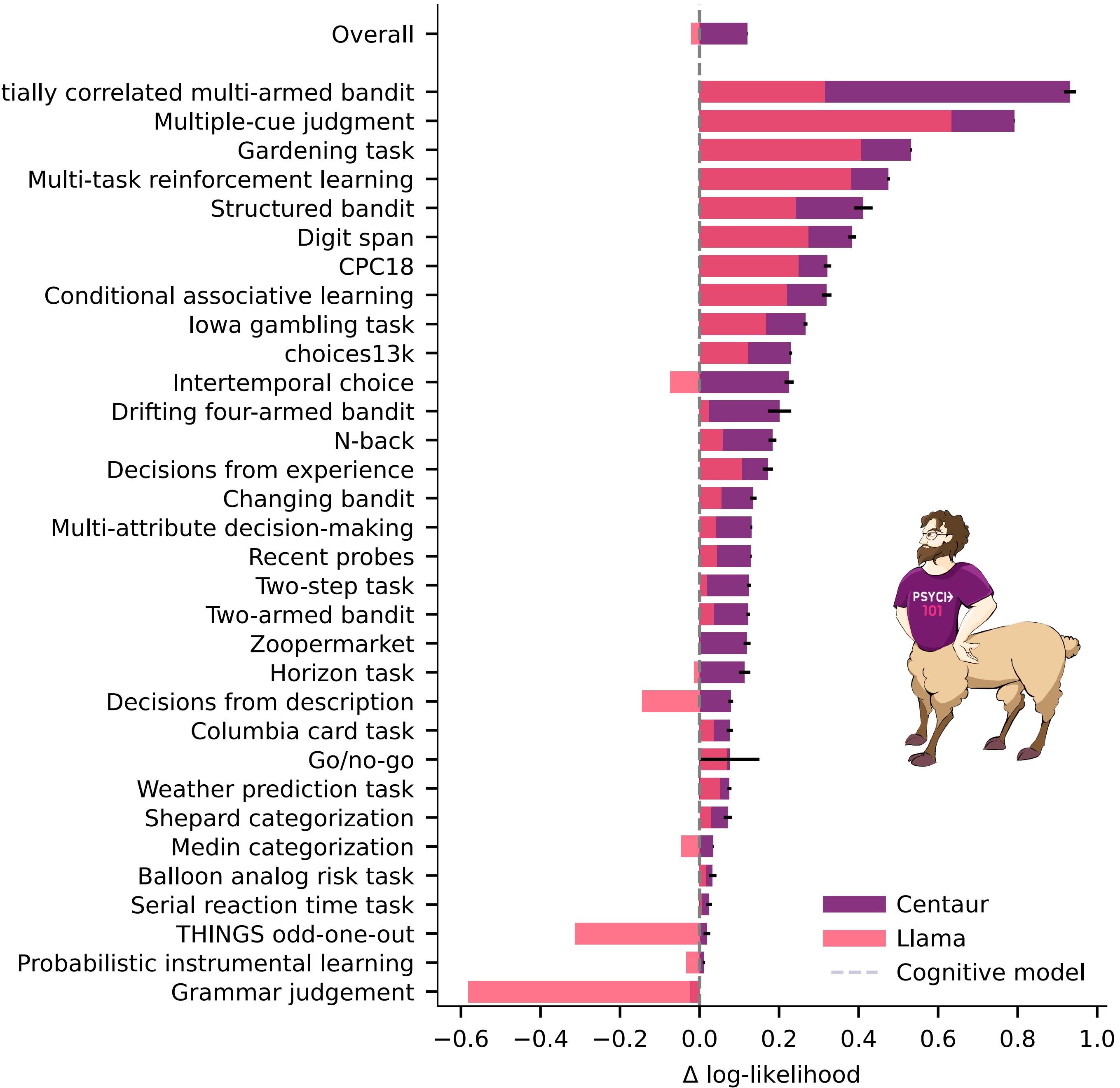
Decisions

Risky choice, Balloon analog risk task, Columbia card task, Intertemporal choice, etc.

Labeling

Cognitive science

Centaur outperforms established cognitive models



Paraphrasation

To characterize and organize decision-related proverbs

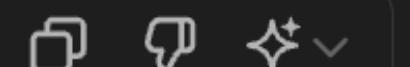


The proverb "curiosity kills the cat" warns that excessive inquisitiveness can lead to trouble or danger. It implies that exploring unknown or risky matters may result in harm, highlighting the potential perils of being overly curious or meddling in affairs best left alone.

Write a 50-word description of the proverb "fortune favors the brave"



The proverb "fortune favors the brave" suggests that bold actions often lead to success. It emphasizes that taking risks and showing courage can attract good luck and positive outcomes. This saying encourages proactive and fearless behavior, implying that opportunities are more likely to come to those who are daring.



Write a 50-word description of the proverb "the ship has sailed"



The proverb "the ship has sailed" signifies that an opportunity has been missed and cannot be reclaimed. It suggests that the moment to act has passed, often due to hesitation or delay, and now it's too late to seize the chance or achieve the desired outcome.

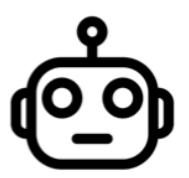
Proverb 1 of 49528

Fortune favors the bold



Summarize the gist of the proverb.

1

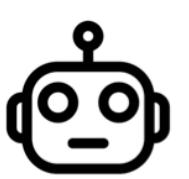


This proverb suggests that those who take risks and act decisively are more likely to succeed than those who are timid and hesitant.

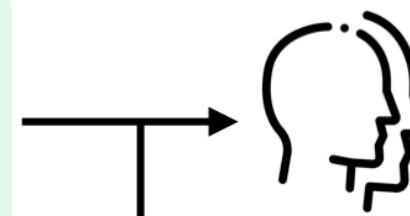


Provide taxonomic tags capturing the proverb's topic.

2



1. decision making
2. risk management
3. success



Does the proverb provide guidance on how to act or make decisions?

3



No Yes

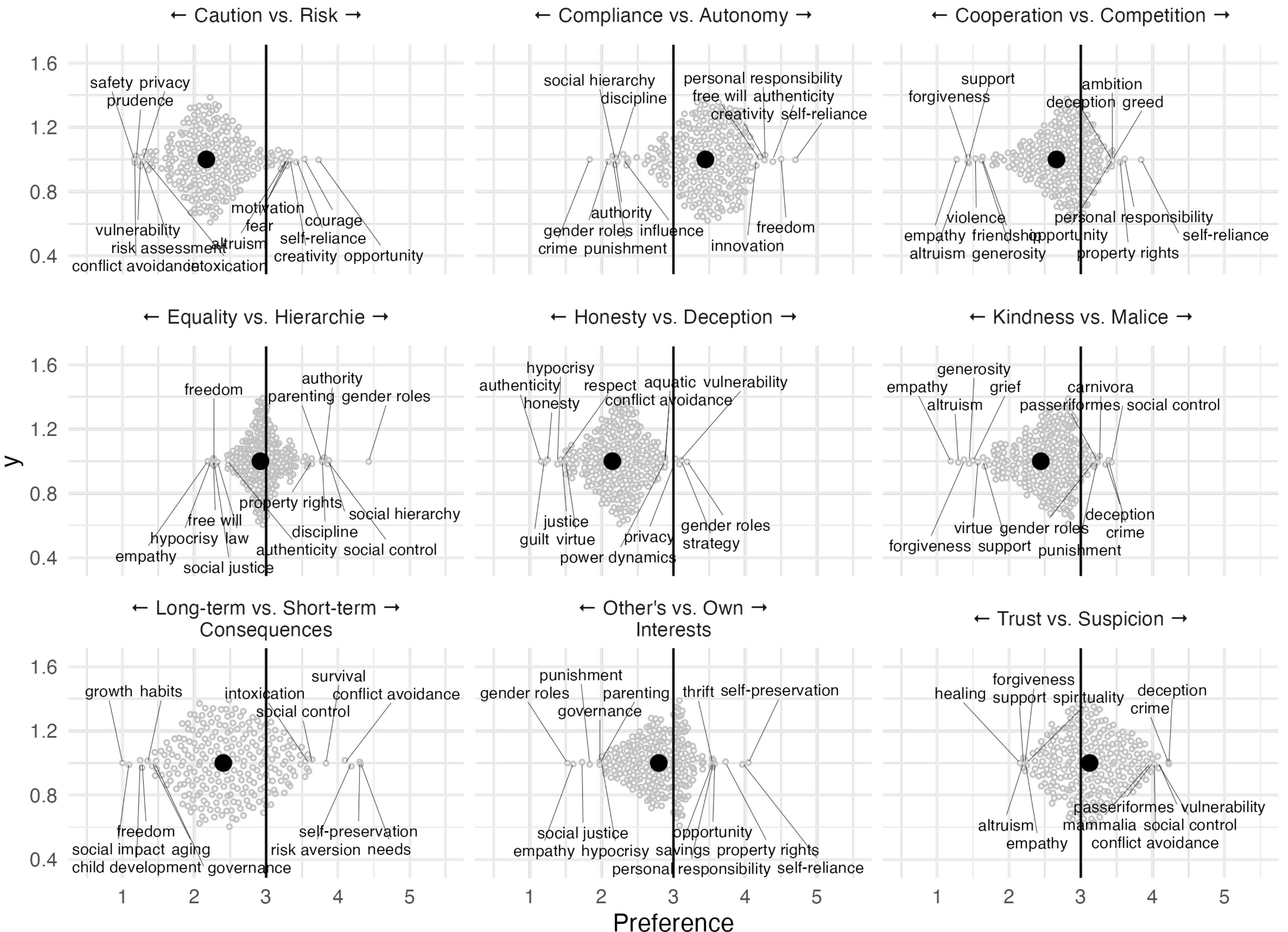


What does the proverb favor?

4

Risk		Caution
Short-term consequences		Long-term consequences
Own interests		Other's interests
Autonomy		Compliance
Trust		Suspicion
Honesty		Deception
Equality		Hierarchie
Kindness		Malice
Cooperation		Competition

Proverbs advocate safety, autonomy, cooperation, honesty, kindness, and a focus on long-term consequences and other's interests





Search in documents



American Psychological
Association
232'000 articles

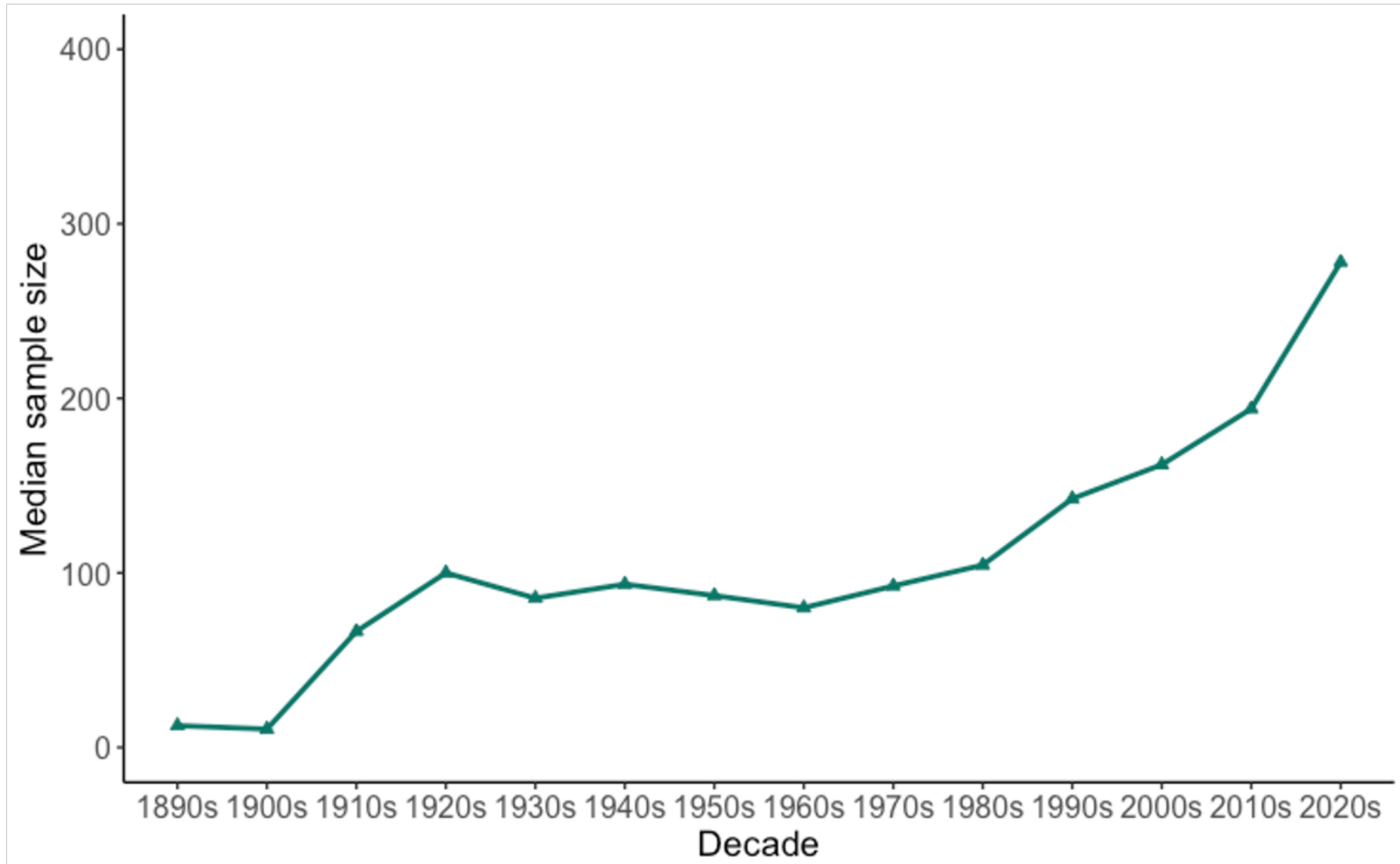
Participant Characteristics

	Characteristic	Value
1	Sample Size	1205
2	Gender (Female)	50%
3	Age (Mean)	47.7
4	Age (SD)	16.6
5	Age Range	18-87

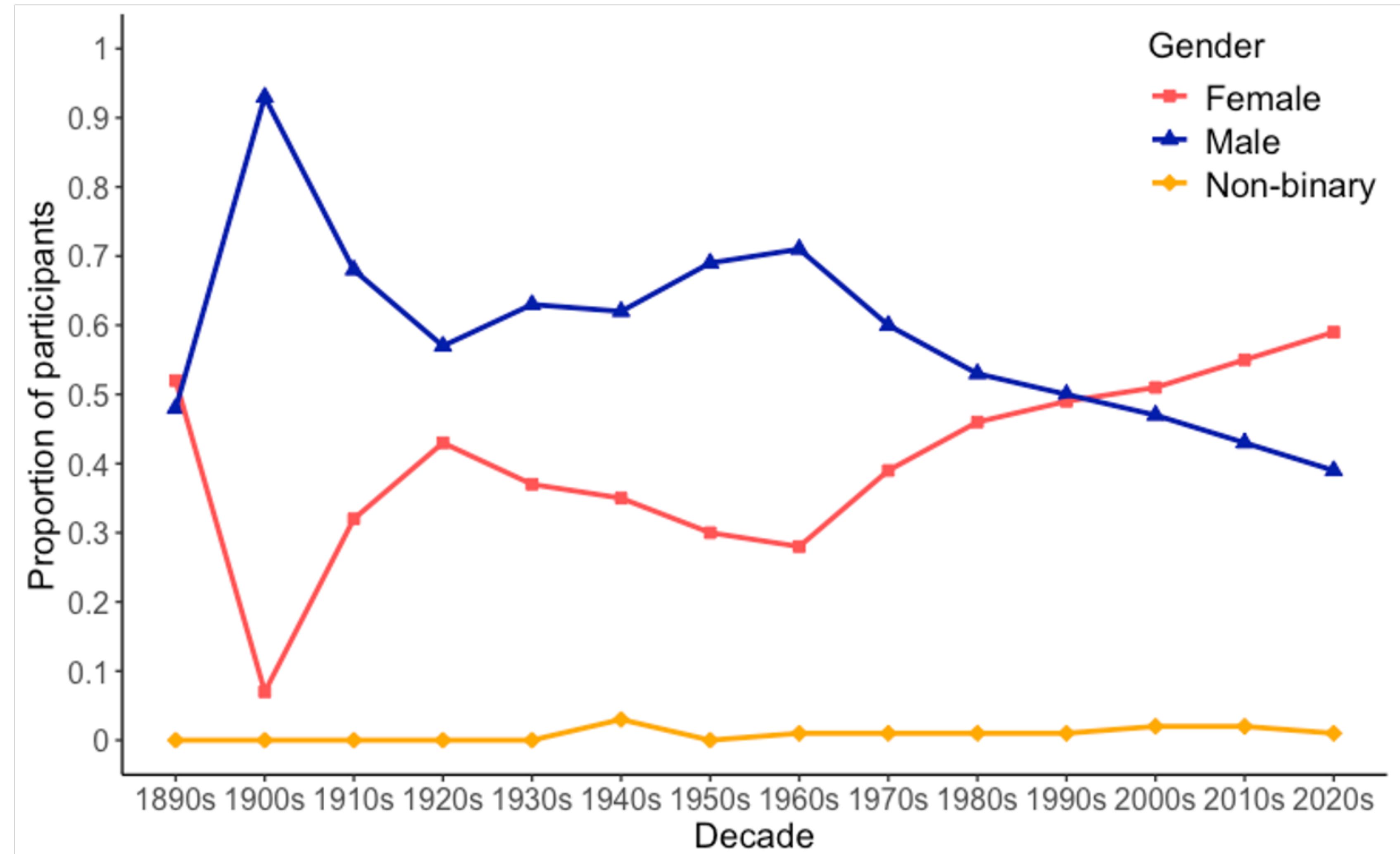
The table of participant characteristics, including demographic information for the studies included in the document, has been created and displayed for you. If you need any additional information or further analysis, please let me know! [\[x\]](#)



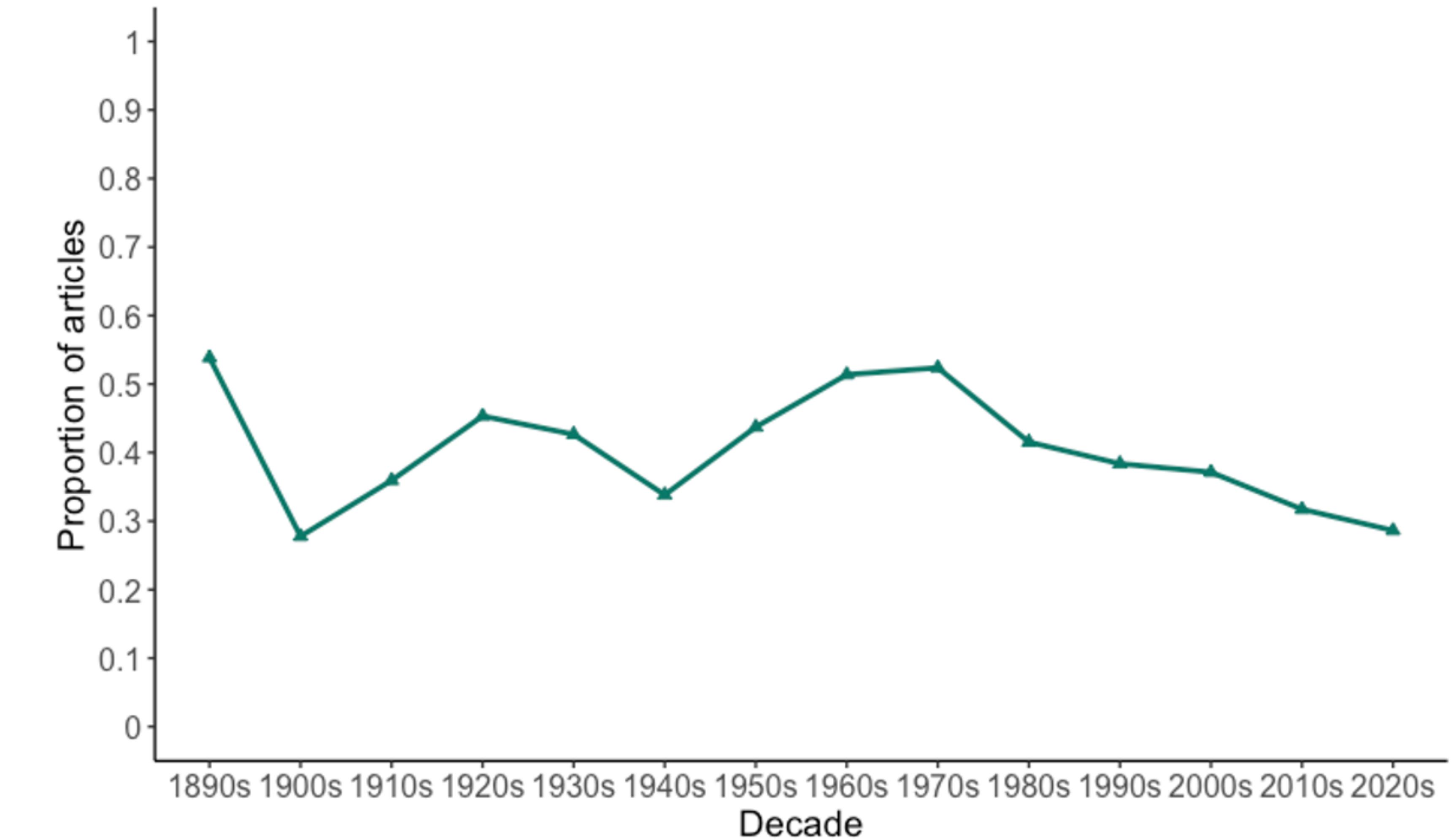
Sample sizes increase drastically



Samples are increasingly female

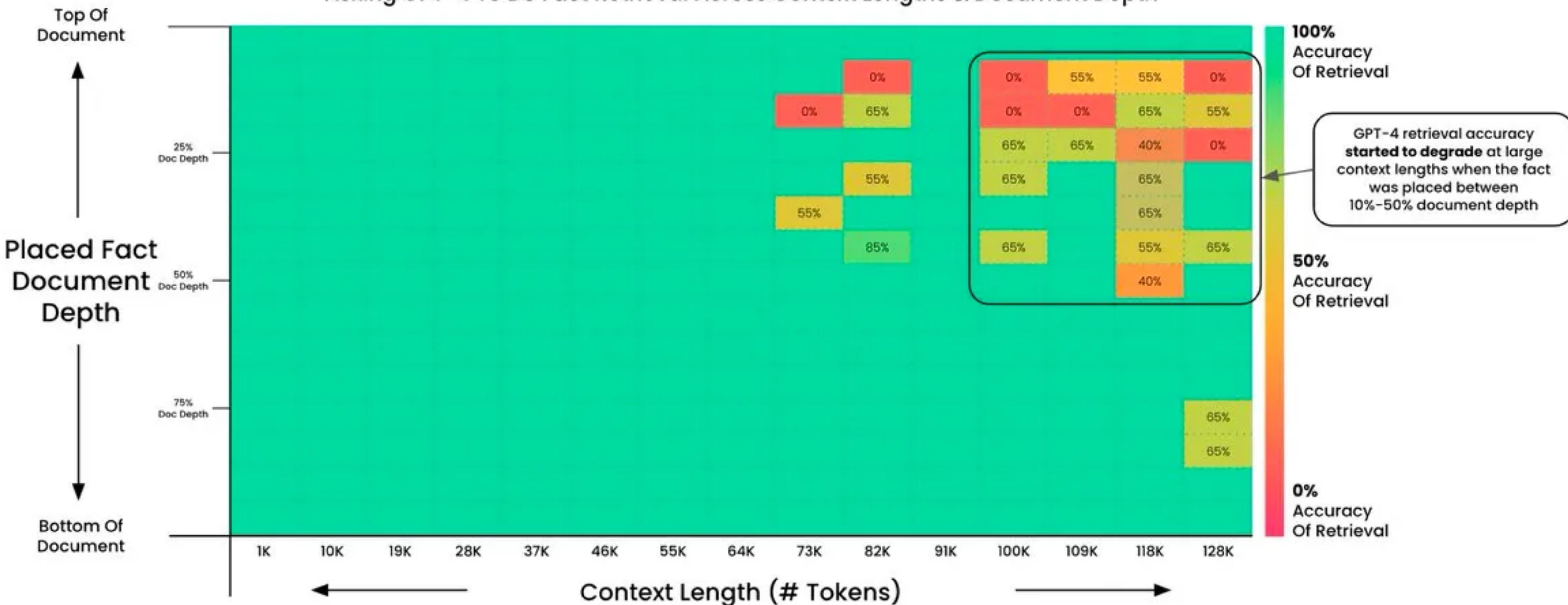


Still many samples are drawn from student populations



Pressure Testing GPT-4 128K via "Needle In A HayStack"

Asking GPT-4 To Do Fact Retrieval Across Context Lengths & Document Depth



Goal: Test GPT-4 Ability To Retrieve Information From Large Context Windows

A fact was placed within a document. GPT-4 (1106-preview) was then asked to retrieve it. The output was evaluated for accuracy.

This test was run at 15 different document depths (top > bottom) and 15 different context lengths (1K > 128K tokens).

2x tests were run for larger contexts for a larger sample size.

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