Cognition

PSYC 2040

W13: Culture

Part 1

logistics: project

- presentations will be 8-10 minutes with 3 minutes for questions
- 3 points for presentation + 2 points for team skills
- 11 groups
- Apr 29: 5 groups
- May 1: 6 groups

13	T: April 15, 2025	W13: Culture
13	Th: April 17, 2025	W13 continued…
13	Su: April 20, 2025	**Week 13 Quiz due**
14	T: April 22, 2025	W14: Intelligence
14	Th: April 24, 2025	W14 continued…
14	Su: April 27, 2025	**Week 14 Quiz due**
11	M: April 26, 2025	**Jennifer's Office Hours (12-2 pm, Kanbar 200)**
15	T: April 29, 2025	W15: Project Presentations
15	Th: May 1, 2025	Project presentations
16	T: May 6, 2025	W16: Last Class / Final Review
17	T: May 13, 2025	**Final Exam (1.30-3 pm, VAC North)**

April 29 groups

Ala Memoriae (Alex, Liam, Anna)	• eyewitness testimony reliability
Group 3 (Isaac, Ty, Jacob)	• memory & aging
Mind your Language (Fabiola, Estefania, Gigi)	• bilingualism
JZD (Joseph, Zahren, Daniel)	• gambling & substance use
KMB (Kassi, Moana, Bryan)	• special-ed classrooms & cognition
KPN (Kyra, Peter, Noah)	• emotion-related memory biases

May 1 groups

Linguistic Learners (Isabella, Ayhorng, Alison)	• bilingualism & sentence processing
OSPAN (Liam, Rima, Asher)	• false memory & mood disorders
Pavlov's dawgs (Kira, Kaylee, Addison)	• multitasking & creativity
Senior Smiles (Bella, Eshani, Maya)	• stress & decision making
The Neighborhood (Cole, Kelly, Ryan)	• exercise & cognitive decline

today's agenda: culture & cognition

defining culture

language-based effects

- space and time
- frames of reference
- color perception
- event perception and memory

non-language effects

- visual perception
- fairness and cooperation
- memory
- smell

what is culture?

- a group of people with shared experiences or perspectives
- two key features:
  - information transmission
  - shared context between groups of individuals
- various ways to define cultural groups
  - geography (typical)
  - demographics
  - shared affiliations (universities, sports teams, etc.)

the biased nature of science

- Henrich et al. (2010)
- large sampling bias
- 96% of participants in psychological research are Western, Educated, Industrial, Rich, or Democratic (WEIRD)

BEHAVIORAL AND BRAIN SCIENCES (2010) **33**, 61–135
doi:10.1017/S0140525X0999152X

The weirdest people in the world?

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language bias

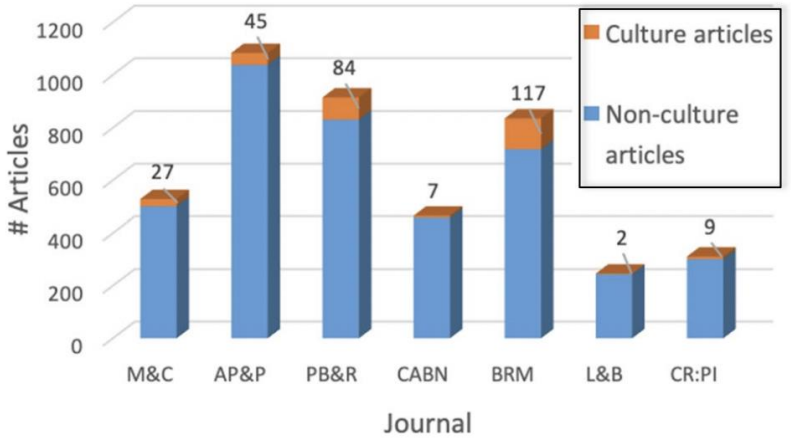


Fig. 1 Prevalence of articles related to culture in the journals of the Psychonomic Society from 2016 to 2020. The number of articles published in each journal during this timeframe is divided into those that consider culture (in orange) and those that do not (in blue). Abbreviations of journal names: M&C (*Memory & Cognition*), AP&P (*Attention, Perception, & Psychophysics*), PB&R (*Psychonomic Bulletin & Review*), CABN (*Cognitive, Affective, & Behavioral Neuroscience*), BRM (*Behavior Research Methods*), L&B (*Learning & Behavior*), and CR:PI (*Cognitive Research: Principles and Implications*)

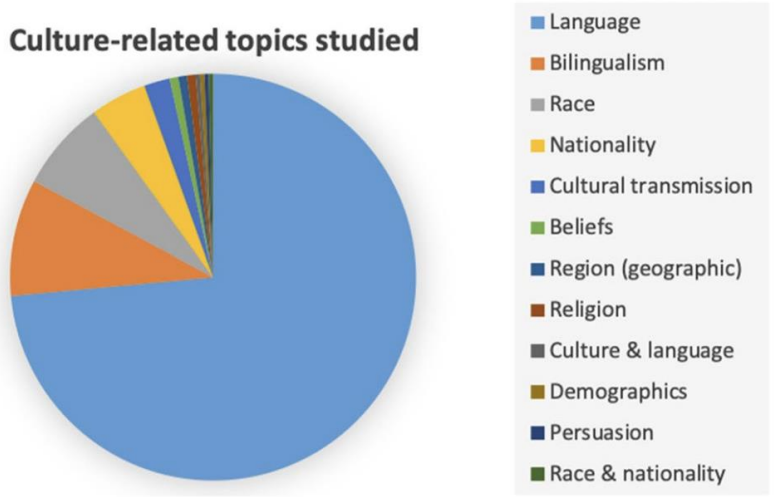
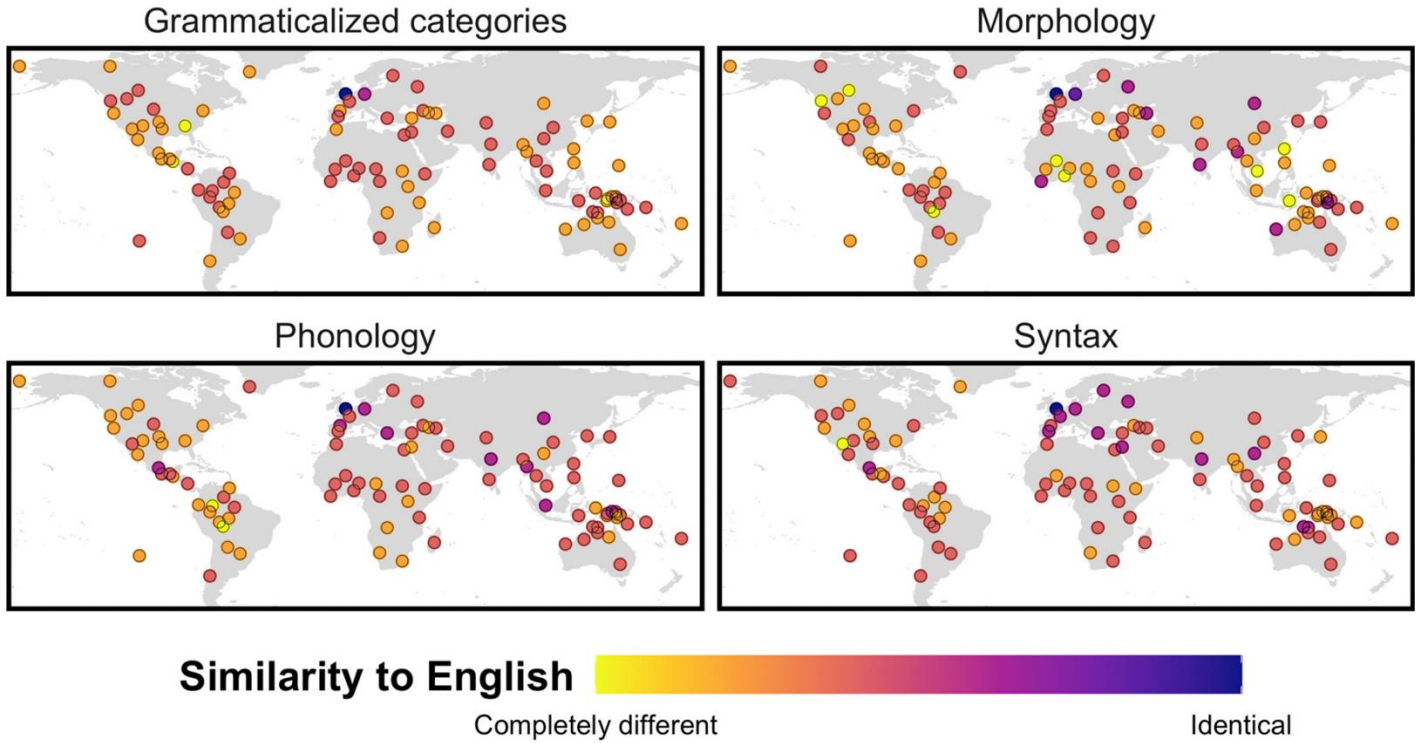


Fig. 2 Culture-related topics studied. For articles in journals of the Psychonomic Society from 2016–2020 coded as involving "culture," the topics were further coded to illustrate how culture was studied. Topics are ordered by largest to smallest proportion in the legend. Approximately 83% of the articles involved language or bilingualism, with a small number of articles addressing other aspects of culture. Examples of manuscripts included in the count for each topic are further characterized in the text

English bias

- English is similar to a handful of the world's languages (often related through history) but very different from most others



Sapir-Whorf hypothesis

- *misnomer
- strong version: linguistic determinism
  - language *determines* thought and how we perceive the world
- weak version: linguistic relativity
  - language *influences* cognition and your worldview

space and time

- English: horizontal metaphors about time
- Mandarin: horizontal AND vertical metaphors about time

(1) SPACE

zài zhuōzi qián-bian zhàn-zhe yī ge xuésheng
there is a student standing in front of the desk

TIME

hǔ nián de qián yī nián shì shénme nián?
what is the year before the year of the tiger?

(2) SPACE

zài zhuōzi hòu-bian zhàn-zhe yī ge lǎoshi
there is a teacher standing behind the desk

TIME

dàxué bìyè yǐ-hòu wǒ yòu jìn le yánjiūyuàn
after graduating from university, I entered graduate school

(1) SPACE

māo shàng shù
cats climb trees

TIME

shàng ge yuè
last (or previous) month

(2) SPACE

tā xià le shān méi yǒu
has she descended the mountain or not?

TIME

xià ge yuè
next (or following) month

paper

space and time

- English and Mandarin speakers first answer priming questions in horizontal/vertical directions
- after priming, they answered a true/false question
  - spatiotemporal: March comes ***before/after*** April
  - temporal: March comes **earlier/later** than April

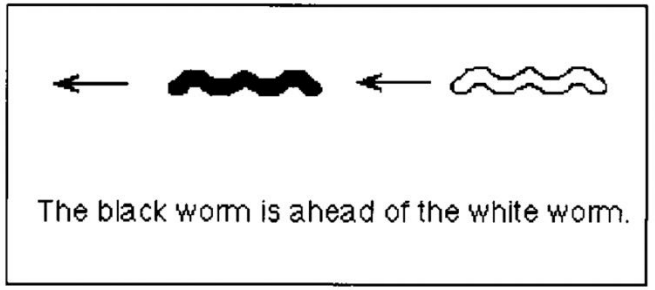


FIG. 3a. Example of a horizontal spatial prime used in Experiments 1 and 3.

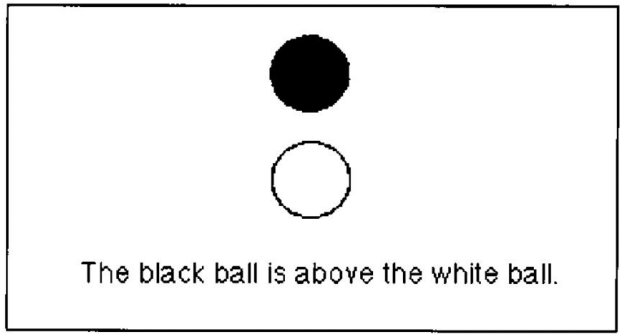
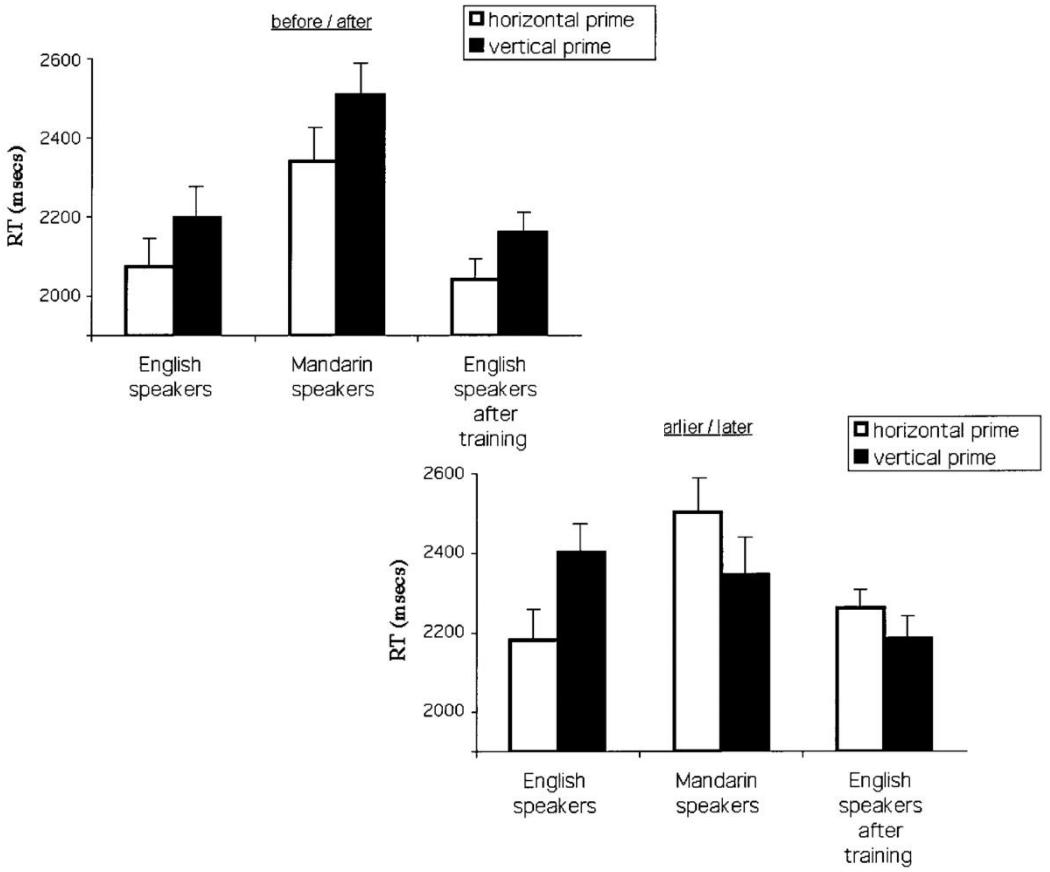


FIG. 3b. Example of a vertical spatial prime used in Experiments 1 and 3.

paper

space and time

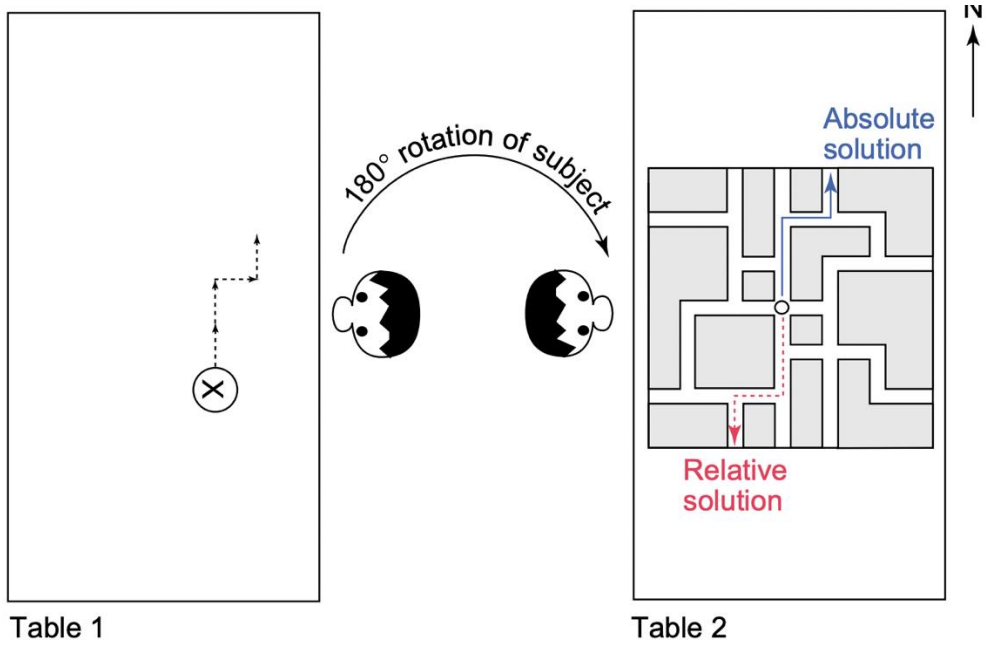
- for **before/after (spatiotemporal)** questions, both English and Mandarin speakers answered faster after horizontal primes than after vertical primes
- for **earlier/later (temporal)** questions
  - English speakers answered faster after horizontal primes than after vertical primes
  - Mandarin speakers were faster after vertical primes than after horizontal primes



paper

frames of reference

- Dutch and Tzeltal (Chiapas, Mexico) participants
- shown the path of a toy man on Table 1
- after a delay, the participant was rotated through 180 degrees and led to a maze on Table 2
- the maze had several possible paths, and the participant was asked to choose the path that the toy man had followed
- two corresponding paths
  - relative coordinates / egocentric
  - absolute coordinates / allocentric



paper

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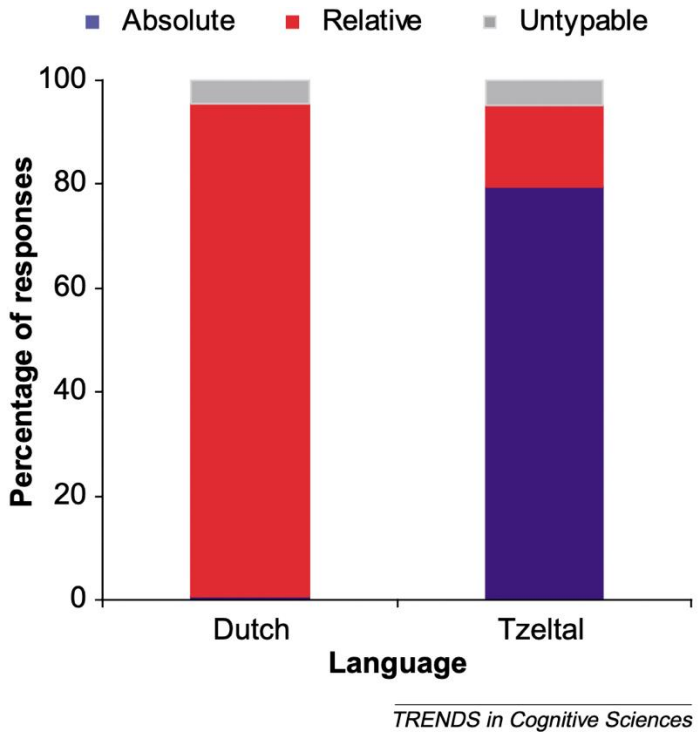


paper

frames of reference

- 4-year-old German-speaking children, gorillas, orangutans, chimpanzees, and bonobos were tested on a simplified version of the same task
- all showed a marked preference for allocentric/absolute reasoning
- inference: an innate preference for allocentric spatial reasoning, that can be overridden by cultural practices

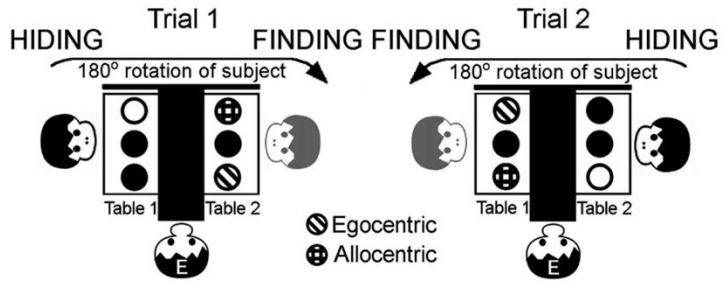
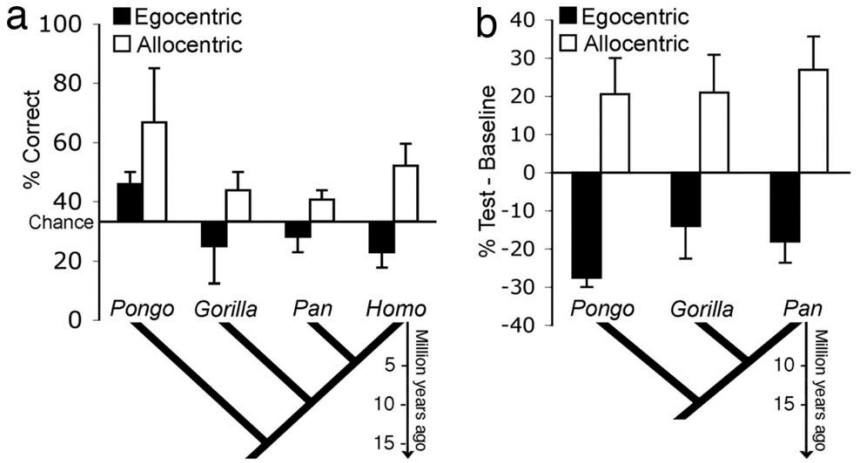


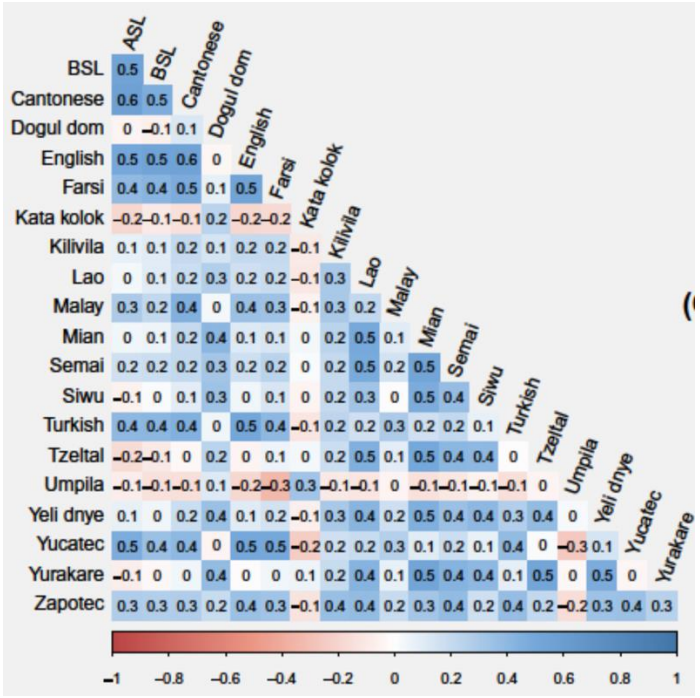
Fig. 3. Experiment 2: Experimental setup in two consecutive example trials. Six exactly identical cups are placed on two tables (three cups on each table). Participants are watching while a target is hidden under the cup depicted as white (HIDING). Then the participants move to the other table and indicate where they think a second target might be hidden (FINDING). The two differently striped cups show the different contingencies rewarded in one of two consecutive blocks of trials.

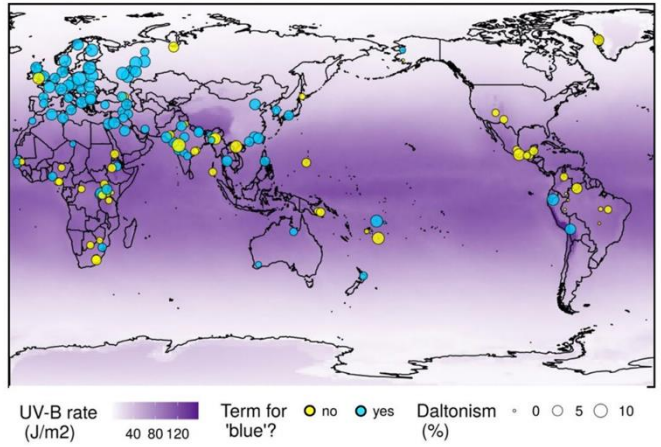


paper

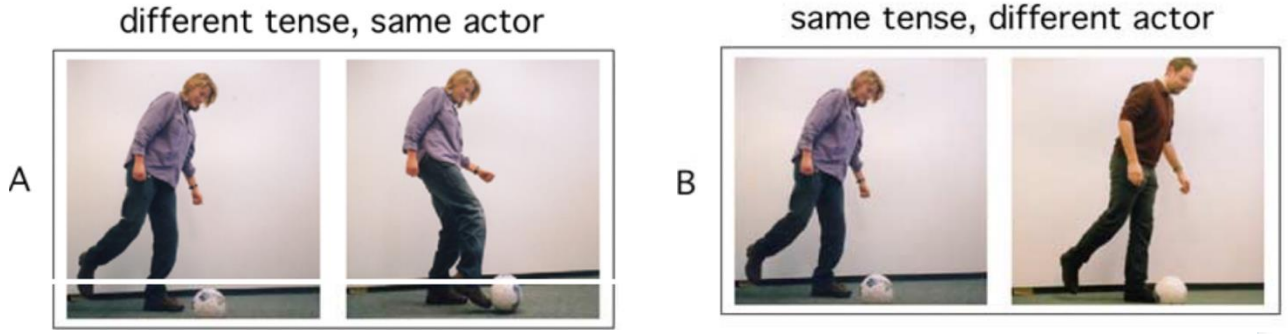
color perception

- vast differences in which colors have names and whether they map onto the same colors across languages

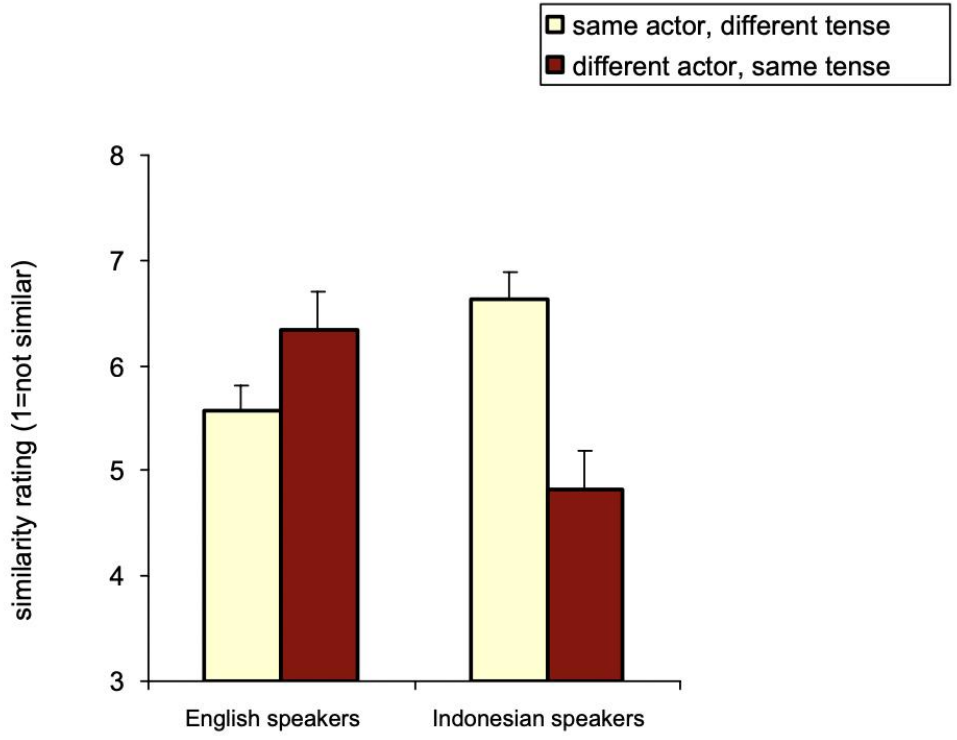




event perception

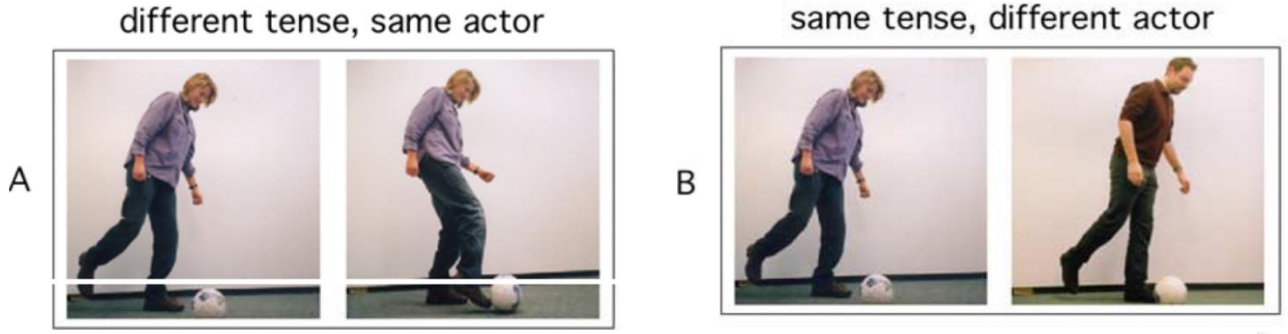


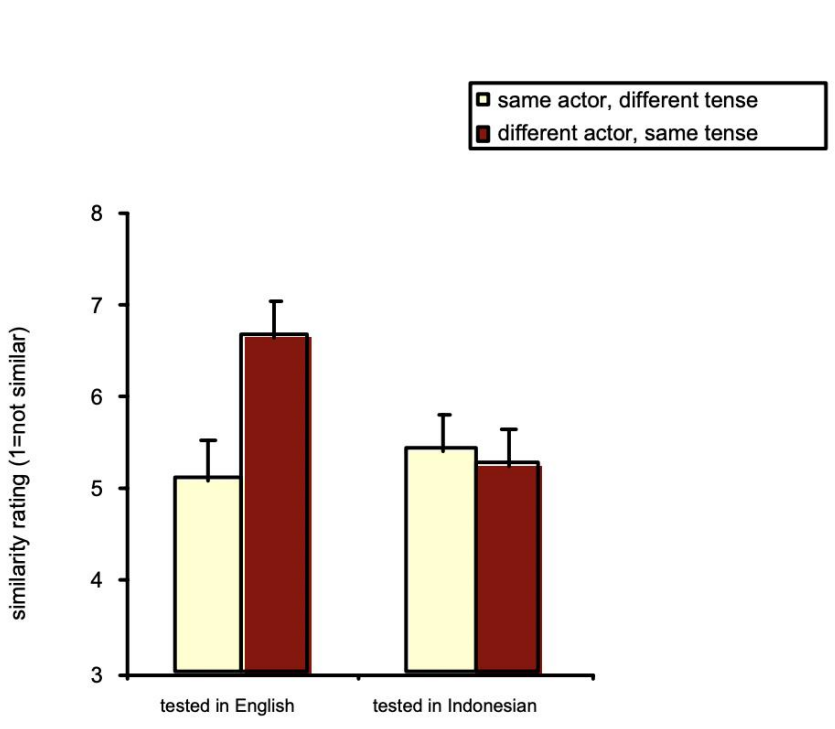
- participants shown images of actions
  - same actor performing the same action in different tenses
  - different actors performing the same action in the same tense
- native English vs. monolingual Indonesian speakers asked to rate how similar those two pictures are
- unlike English, Indonesian verbs do not include tense markers



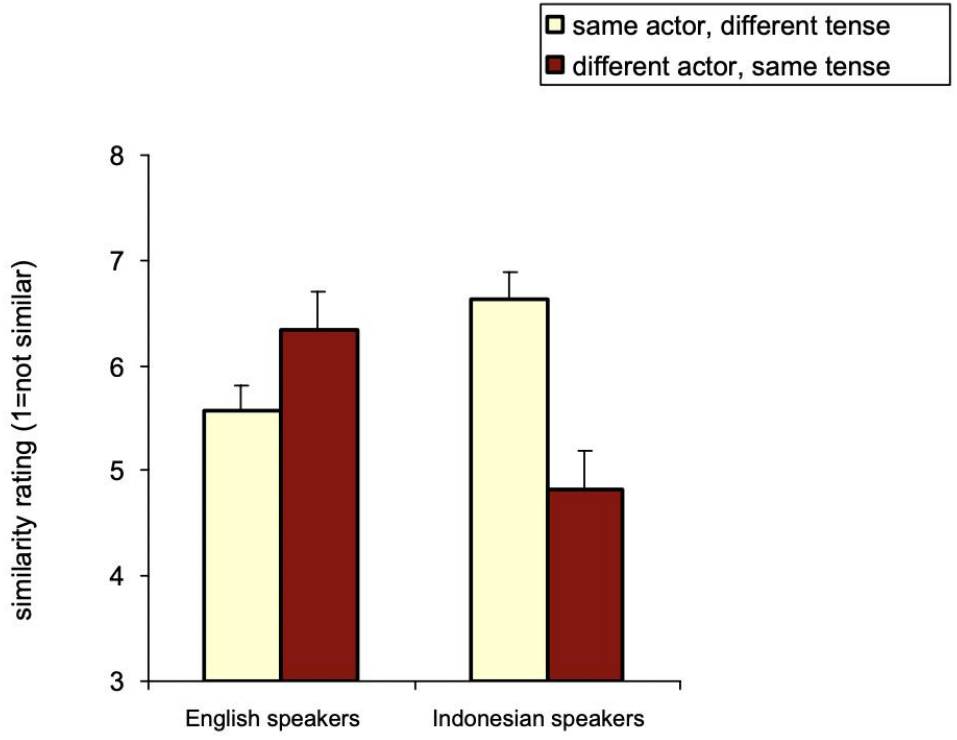
paper

event perception





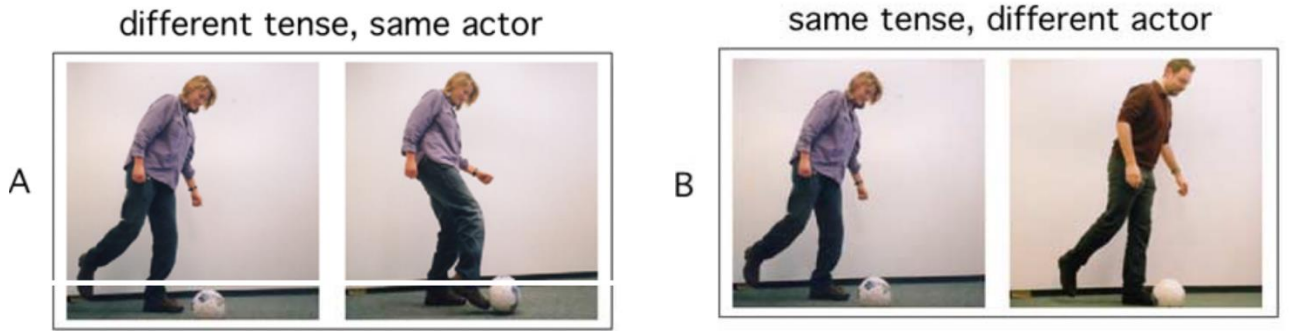
bilingual English-Indonesian speakers



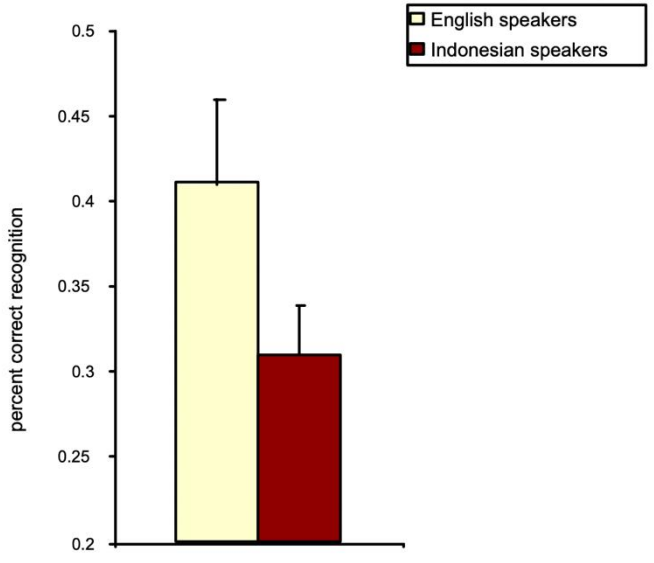
native English vs. monolingual Indonesian speakers

paper

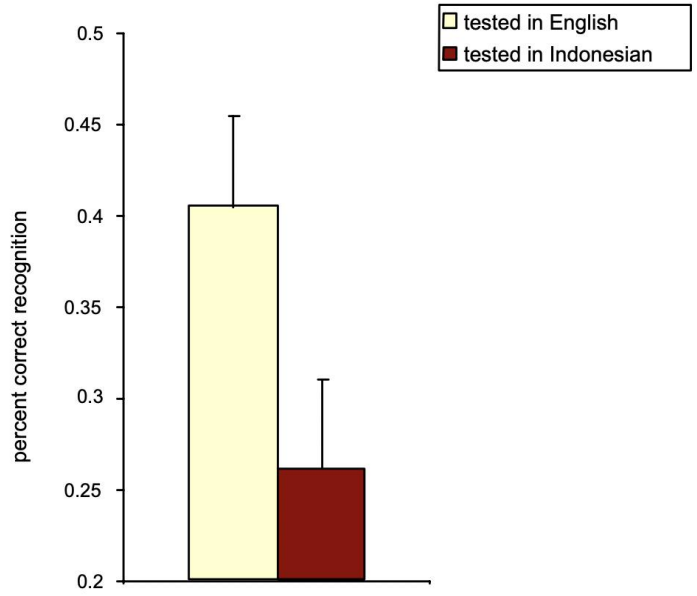
event memory



- memory for tense was better among English speakers or when tested in English



native English vs.
monolingual Indonesian speakers



bilingual English-Indonesian
speakers

paper

whodunit

- intentional and accidental versions of 16 unique events were videotaped
- English vs. Japanese speakers
- Japanese is less agent-focused

Table 1: Events.

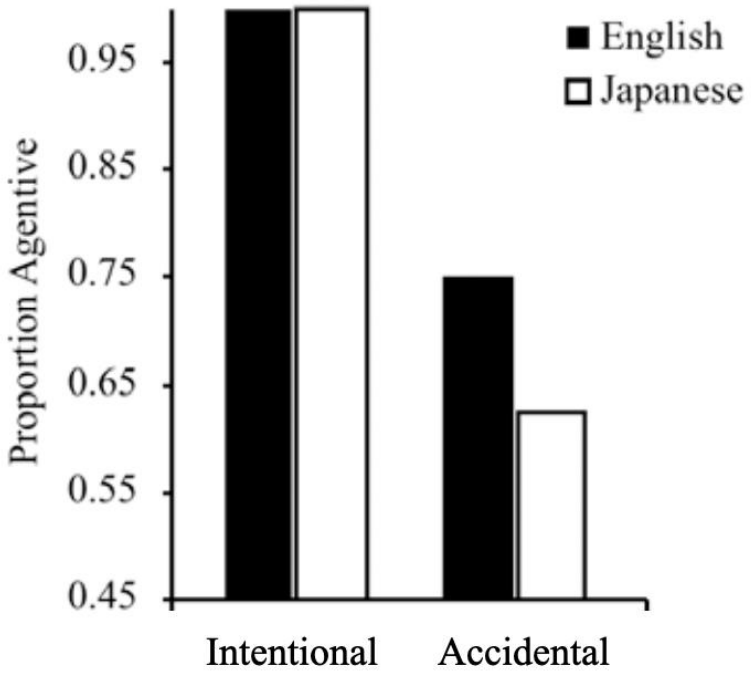
Crumple can Spill rice Drop keys Turn off light Knock box	Knock cups Crack egg Open umbrella Close drawer Rip paper Pop balloon	Release balloon Close book Break pencil Stick sticker Open door

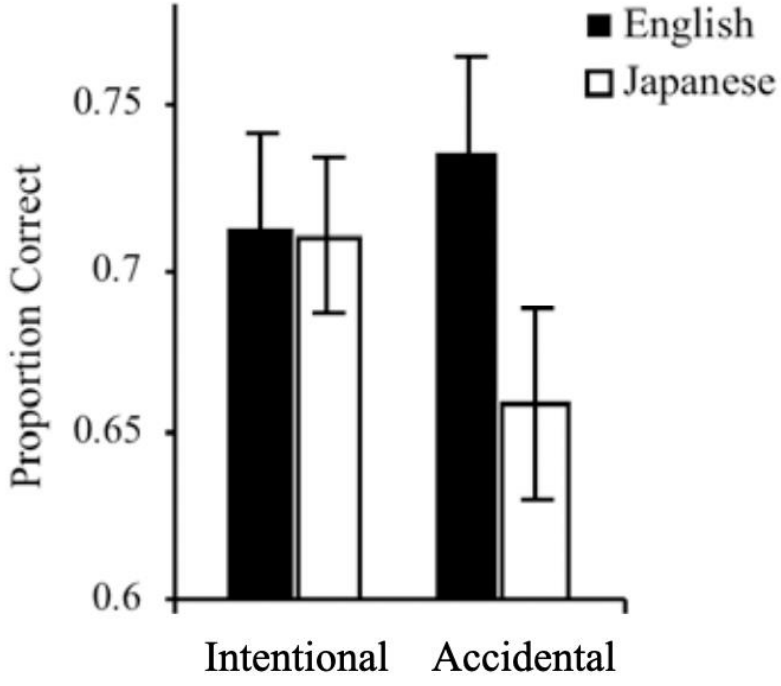
Table 2: Example accident descriptions.

	Agentive	**Non-agentive**
Japanese	黒い男性が鉛筆を折った。 (The black male broke the pencil.)	えんぴつが折れた。 (The pencil broke.)
	男の人が本をとじた。 (The man closed the book.)	本が急に閉じました。 (The book suddenly closed.)
English	He broke his pencil.	A guy was writing and his pencil broke.
	A sitting man is surprised when he closes his book.	The person's open book closed.

paper

whodunit

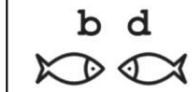
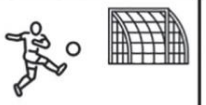




paper

summary: English bias

- differences in language structure has cognitive consequences

	English	Global diversity
	Mirrored graphs hinder mirror invariance detection	Written **Tamil** does not have mirrored graphs and its users are better at identifying mirror invariance
	Left-to-right cognitive biases evident in memory and attention are said to be innate	Readers of **Arabic** and **Hebrew** show right-to-left cognitive biases in accordance with their writing direction
	Auditory pitch and spatial height are inherently associated in non-linguistic tasks	**Farsi** and **Turkish** speakers do not display robust non-linguistic associations between pitch and height
	Large numerosities rely on a generative vocabulary for large numbers	Speakers of **Tsimané** resort to approximate number representations in simple numerical matching tasks according to their verbal count range
	Underdeveloped semantic distinctions in vocabulary render domains (like olfaction) less salient and memorable	Speakers of **Jahai** and **Semaq Beri** can reliably identify around a dozen "basic" smell categories, each of which receives its own linguistic label
	A relative frame of reference is used to represent and remember the location of objects	Speakers of **Guugu Yimithirr** remember objects and locations according to absolute coordinates
	Right-branching phrase structure is associated with better recall of the last (vs. initial) item in non-linguistic sequences	Speakers of **Japanese** and **Korean** (left-branching languages) have better recall for the initial (vs. last) element in non-linguistic sequences
	Absence of negatively biased mental verbs slows down the development of Theory of Mind (ToM)	Children acquiring **Spanish** (which has verbs indicating false belief) have better performance in false-belief tasks
	Describing caused motion events succinctly affects early allocation of visual attention in causal events	**Greek** speakers (who use different linguistic strategies for caused motion events) display a different pattern of visual attention
	Conversations are claimed to be optimized for quick and direct information exchange	In **Yoruba,** other West African, and East Asian languages, indirectness and vagueness are central parts of conversation
	The frequent and systematic expression of gratitude is required for maintaining social relations	**Cha'palaa** users do not express gratitude and do not evidence any negative social consequences

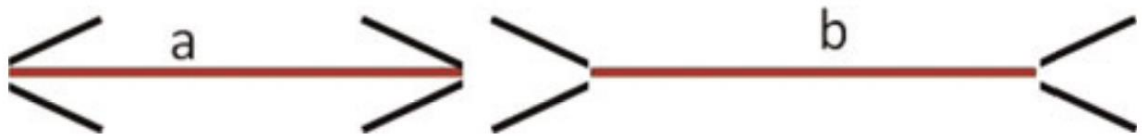
Trends in Cognitive Sciences

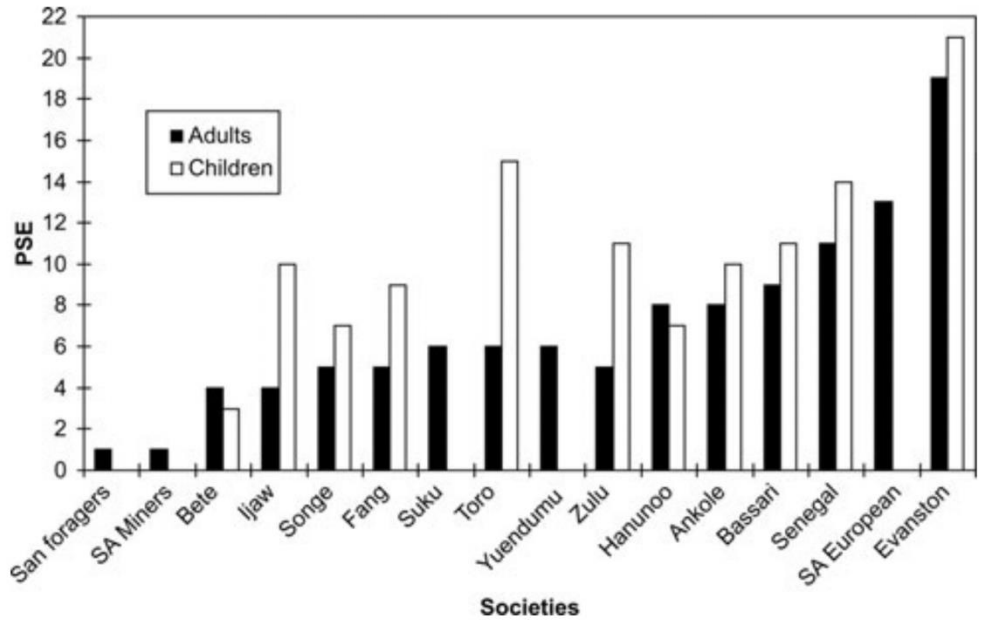
non-language domains

- visual perception
- fairness and cooperation
- memory
- smell/olfaction

visual perception differences

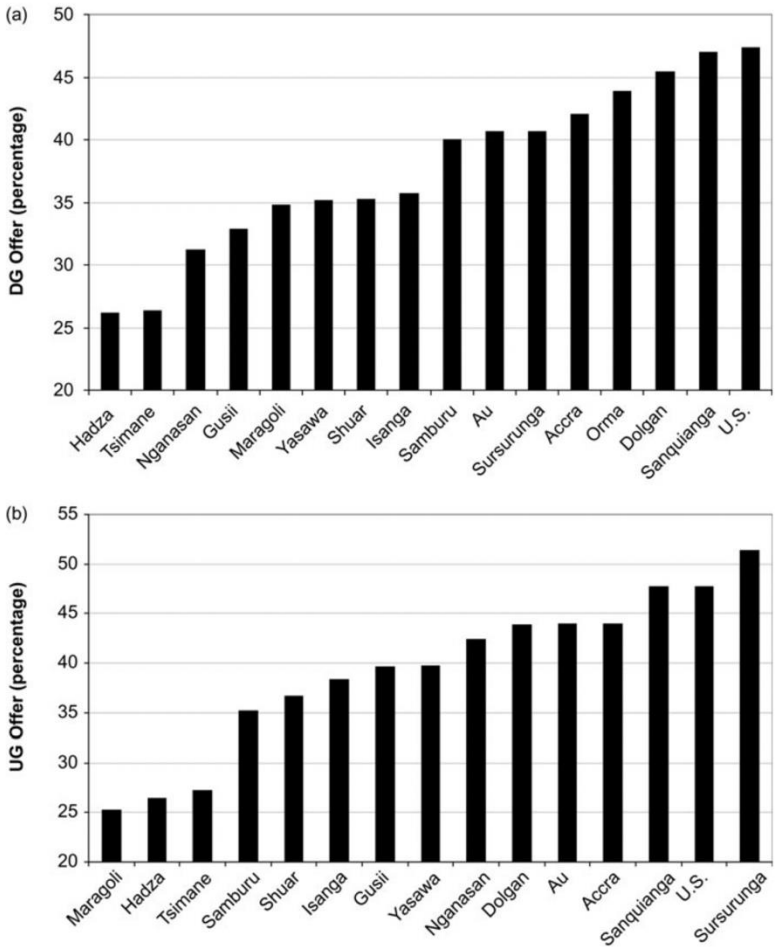
- Muller-Lyer illusion: two lines of the same length appear to be of different lengths
- point of subjective equality (PSE): the amount by which segment “a” must be longer than segment “b” for the two segments to be judged equal
- San foragers (Kalahari) and SA Miners do not show the illusion at all





fairness & cooperation

- cross-cultural variation in the offers made in dictator and ultimatum games



collective memory & cognition

- Abel et al. 2019
- collective memories of World War II of people from 11 countries (8 Allies, 3 Axis)
- assessed general knowledge of the war
- asked people to nominate the ten most important events

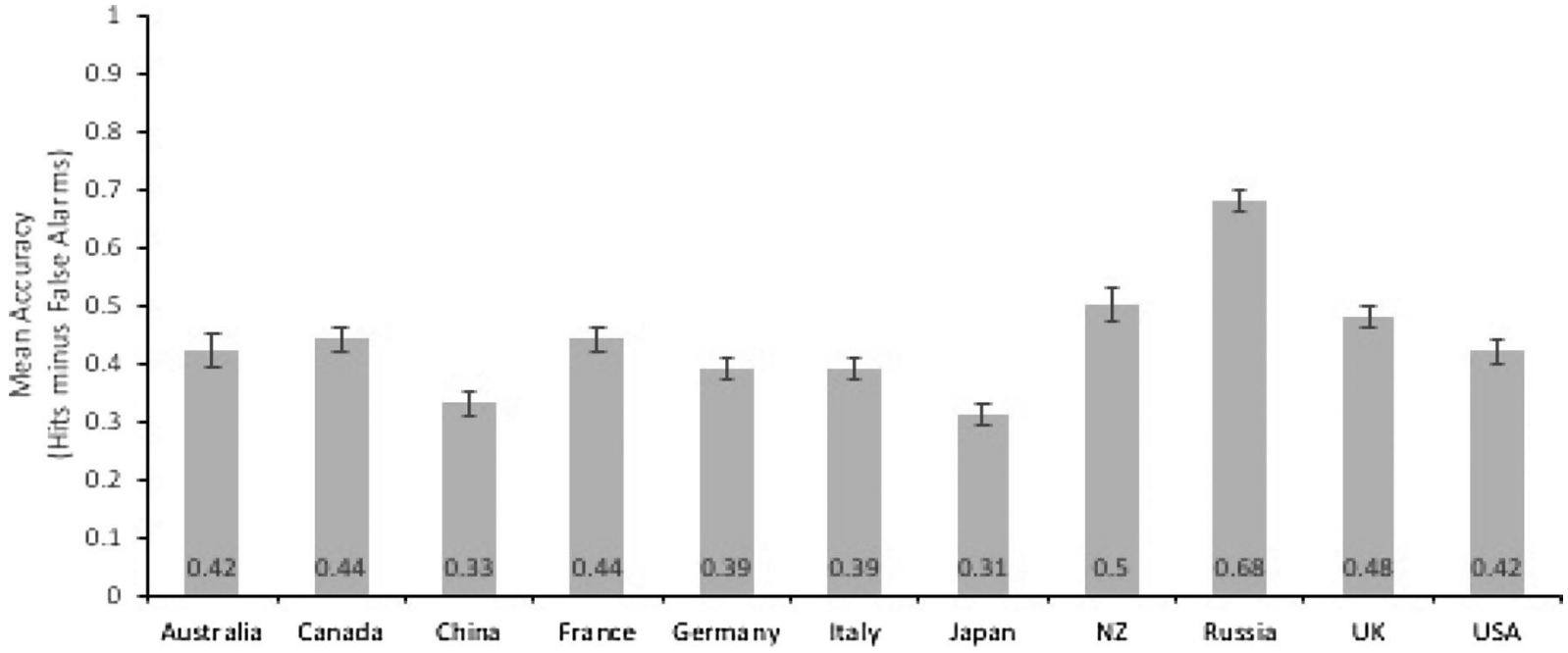
memories of WWII

- Russia remembered more detailed/local events

Australia	Canada	China	France	NZ	Russia	UK	USA	Germany	Italy	Japan
Attack on Pearl Harbor 77%	Attack on Pearl Harbor 78%	Attack on Pearl Harbor 75%	D-Day 90%	Attack on Pearl Harbor 81%	Battle of Stalingrad 93%	D-Day 75%	Attack on Pearl Harbor 91%	German Invasion of Poland 71%	Atomic Bombings 87%	Atomic Bombings 88%
Atomic Bombings 67%	D-Day 75%	Atomic Bombings 55%	Holocaust 72%	Atomic Bombings 73%	Battle of Kursk 73%	Attack on Pearl Harbor 67%	D-Day 81%	Holocaust 68%	D-Day 75%	Attack on Pearl Harbor 74%
Holocaust 58%	Holocaust 67%	D-Day 53%	Atomic Bombings 62%	Holocaust 61%	D-Day 66%	Holocaust 59%	Atomic Bombings 80%	D-Day 62%	Holocaust 68%	
D-Day 54%	Atomic Bombings 66%		Attack on Pearl Harbor 52%	D-Day 60%	Siege of Leningrad 65%	Battle of Britain 59%	Holocaust 66%	Atomic Bombings 59%	Attack on Pearl Harbor 66%	
German Invasion of Poland 50%			De Gaulle's Appeal 50%	German Invasion of Poland 50%	Battle of Moscow 64%	Atomic Bombings 58%		Attack on Pearl Harbor 50%		
					German Invasion of USSR 60%	German Invasion of Poland 54%				
					Battle of Berlin 57%					

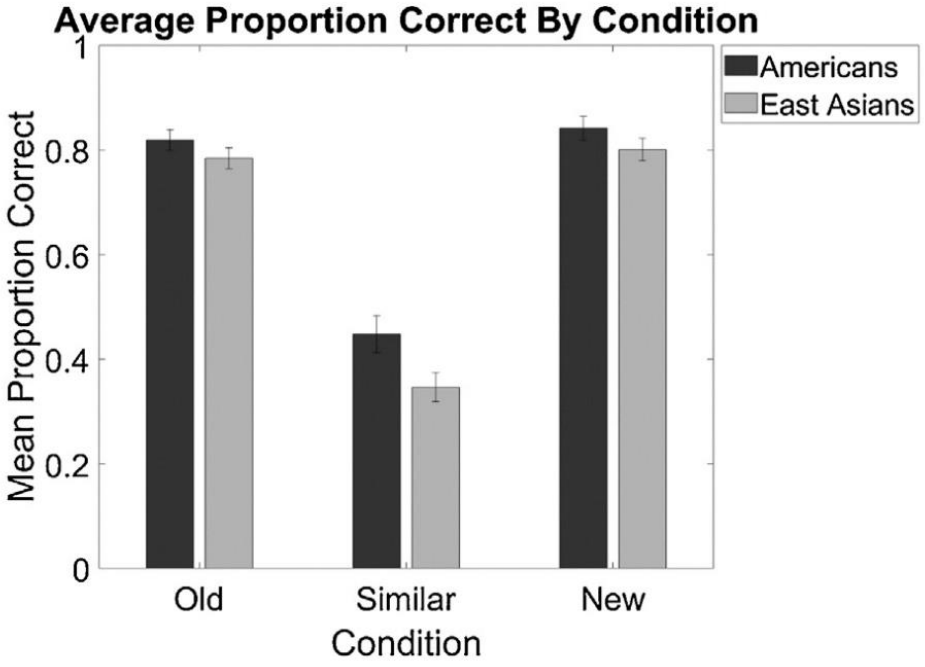
memories of WWII

- Russia had the highest recall



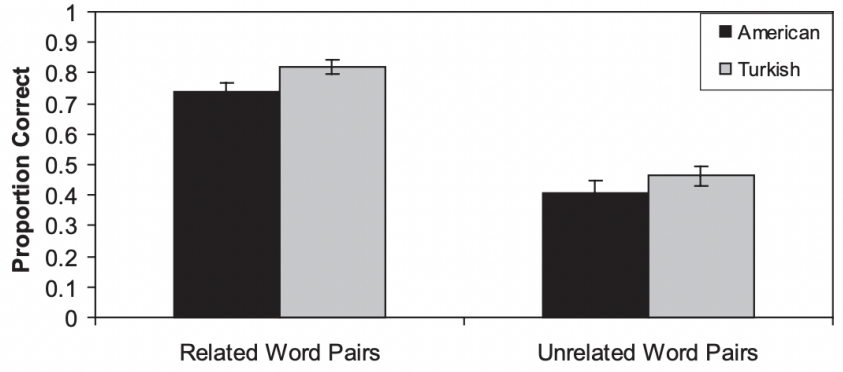
memory & culture

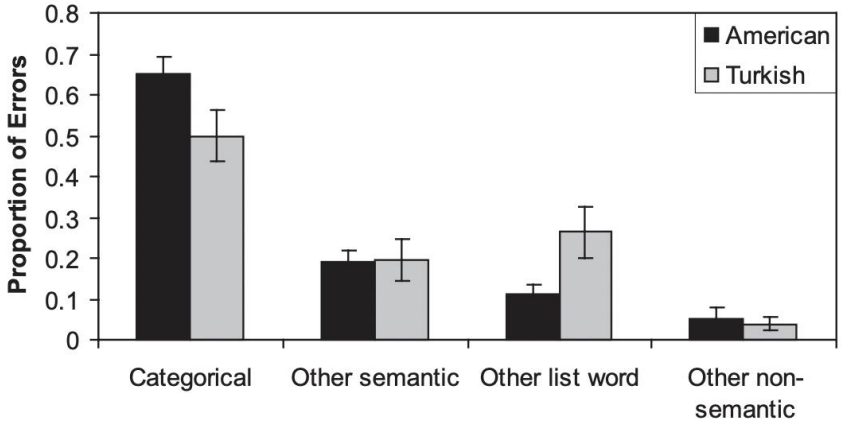
- Leger & Gutchess, 2021
- tested North American and East Asian participants with a recognition task with everyday objects
- North Americans had higher memory performance than East Asians when discriminating same from similar and new items



categorical word learning & culture

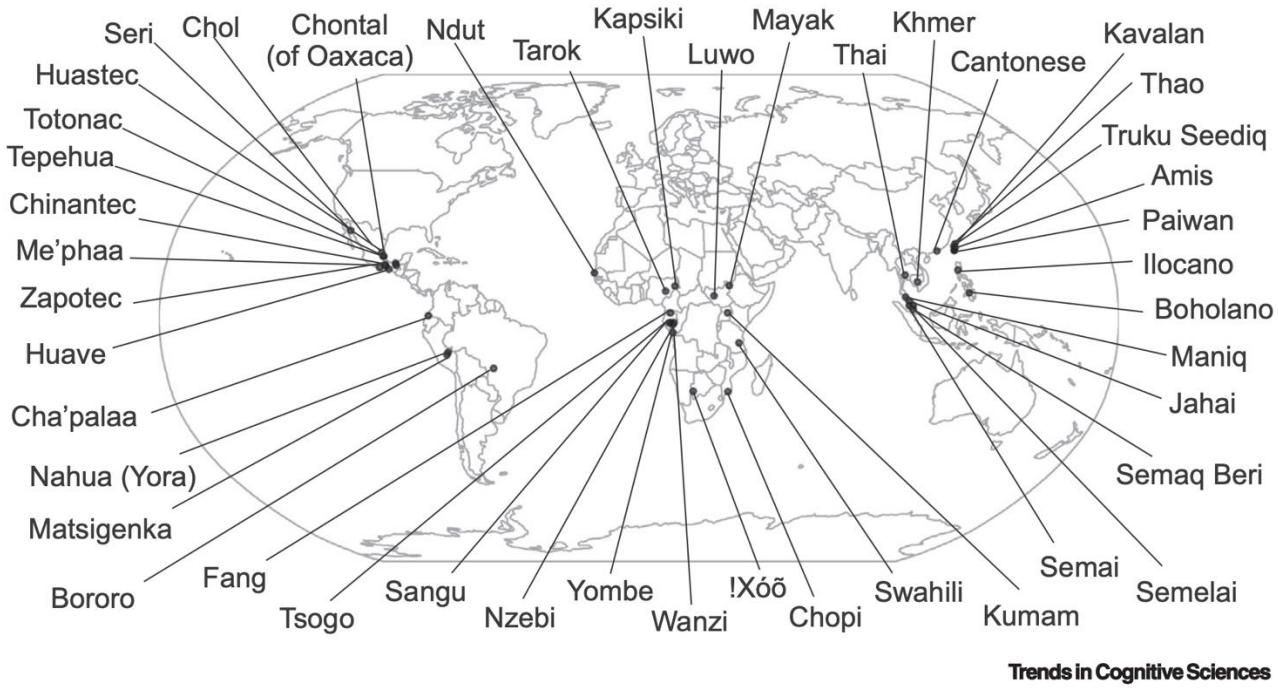
- Schwartz et al., 2014
- Americans and Turks viewed word pairs, half of which were categorically related and half unrelated. Participants then attempted to recall the second word from the pair in response to the first word cue
- Americans committed more categorical errors than did Turks
- Turks mistakenly recalled more non-categorically related list words than did Americans





culture & olfaction

- wide differences in how many smells we can recognize and label
- why?
  - ecology
  - culture
  - genes



paper

culture & olfaction

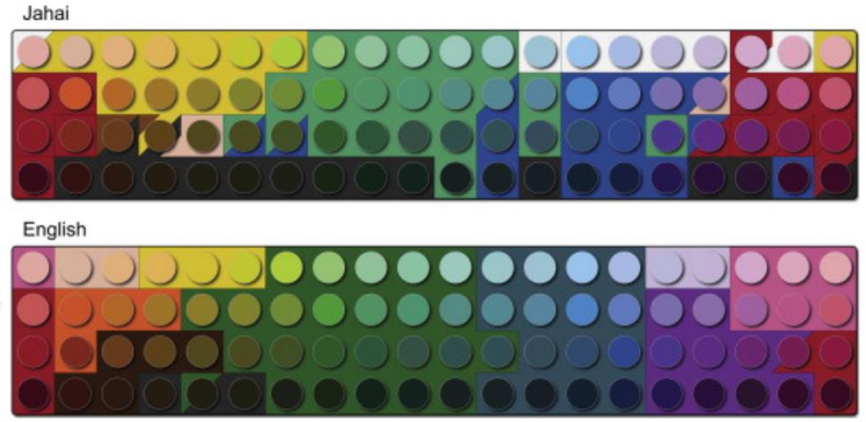
- wide differences in how many smells we can recognize and label
- why?
  - ecology
  - culture
  - genes

Table 1
Jahai odor and color terms. A list of the Jahai odor terms are given. Not all of these were attested in the experimental task. The color terms listed were dominant for at least one color chip in the color naming task, unless otherwise indicated. Glosses are based on a separate focal color elicitation task.

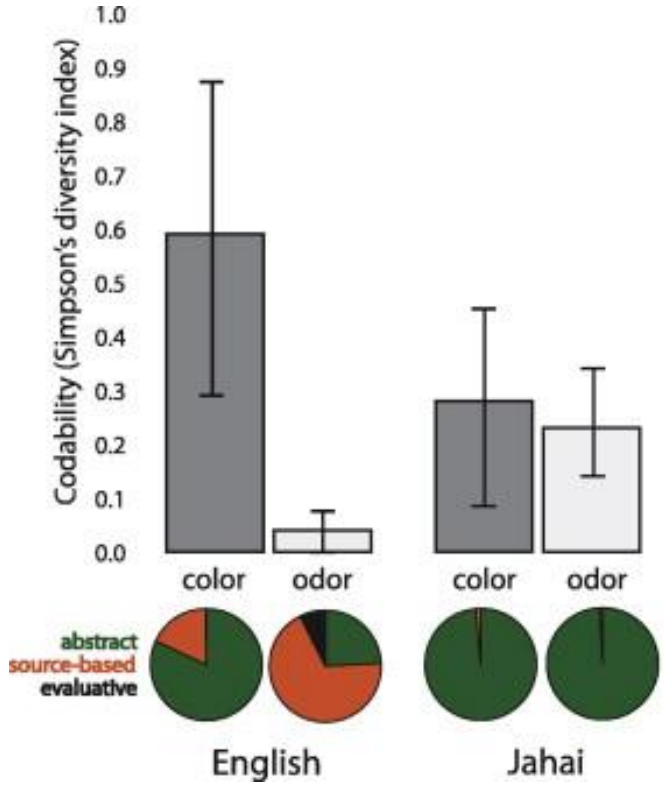
Odor terms	Approximate translation	Color terms	Approximate translation
cŋəs	'to smell edible, tasty' e.g., cooked food, sweets	*byɔk*	'to be white' (not a dominant response)
crŋir	'to smell roasted' e.g., roasted food	*gcĩh*	'to be black'
harɨm	'to be fragrant' e.g., various species of flowers, perfumes, soap (Malay loan; original Malay meaning 'fragrant')	*rhɨk*	'to be red'
ltpɨt	'to be fragrant' e.g., various flowers, perfumes, bearcat	*rgɔy*	'to be red'
haʔɛ̃t	'to stink' e.g., feces, rotten meat, prawn paste	*bkup*	'to be beige'
pʔus	'to be musty' e.g., old dwellings, mushrooms, stale food	*puteh*	'to be white' (Malay loan; original Malay meaning 'white')
cŋɛs	'to have a stinging smell' e.g., petrol, smoke, bat droppings	*merah*	'to be red' (Malay loan; original Malay meaning 'red')
sʔɪŋ	'to have a smell of human urine' e.g., human urine, village ground	*klabuʔ*	'to be grey' (Malay loan; original Malay meaning 'grey, ash-colored')
haɲcĩŋ	'to have a urine-like smell' e.g., urine (Malay loan; original Malay meaning 'foul odor, stench')	*hijɔw*	'to be grue' (Malay loan; original Malay meaning 'green')
pʔih	'to have a blood/fish/meat-like smell' e.g., blood, raw fish, raw meat	*biruh*	'to be blue' (Malay loan; original Malay meaning 'blue')
plʔeŋ	'to have a blood/fish/meat-like smell' e.g., blood, raw fish, raw meat	*meloh*	'to be brown' (Malay loan; source-based term; original Malay meaning 'milo-colored', 'brown')
plʔɛŋ	'to have a bloody smell which attracts tigers' e.g., crushed head lice, squirrel blood	*kuniŋ*	'to be yellow' (Malay loan; original Malay meaning 'yellow')

paper

culture & olfaction



- English and Jahai (nomadic hunter-gatherers in the Malaysian & Thai peninsula) people
- English speakers show poor codability for odors in comparison to color
- Jahai speakers show equal codability for odors and colors, using abstract terms for both



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some universals

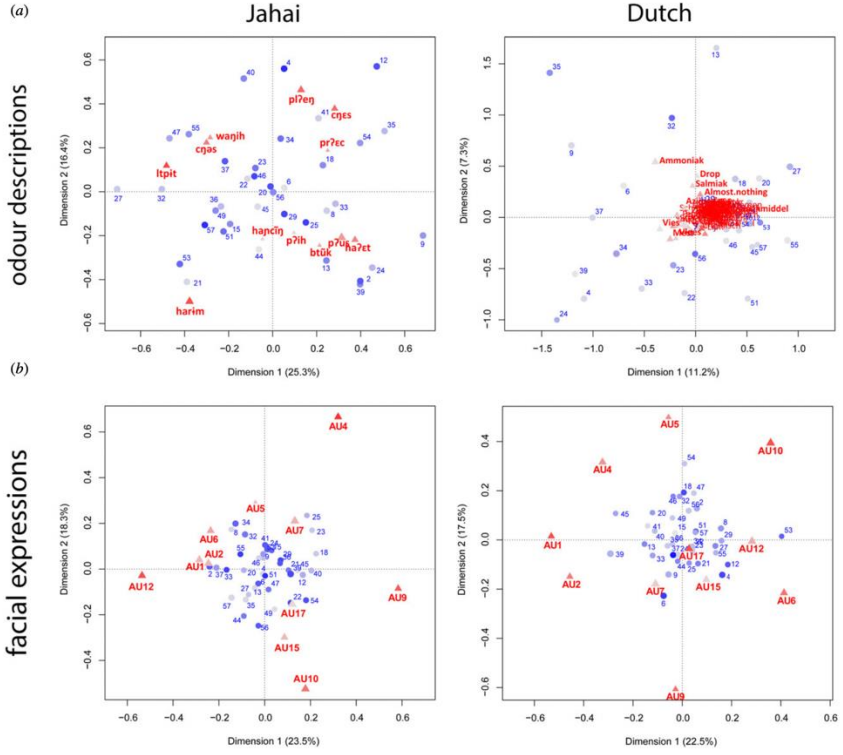
- pleasantness of odors
- groupings of stars in constellations
- language networks

culture & olfaction

- despite differences in naming and identification of odors, whether or not an odor is pleasant is a universal experience

Table 2. Action units (AUs) coded for facial expressions, their brief description, and correlation values (Pearson *r*) across odorants between Jahai and Dutch participants (with *p* one-tailed; $df = 35$).

action unit	description	r	p
AUs associated with pleasant emotions			
AU1	inner brow raise	0.033	0.423
AU2	outer brow raise	−0.087	0.305
AU6	cheek raise	0.295	0.038
AU12	lip corner pull	0.360	0.014
AU17	chin raise	0.234	0.082
AUs associated with unpleasant emotions			
AU4	brow lower	0.461	0.002
AU7	lid tight	0.520	0.000
AU9	nose wrinkle	0.292	0.040
AU10	upper lip raise	0.290	0.041
AU15	lip corner depress	0.105	0.268
AU5	upper lid raise	−0.045	0.396



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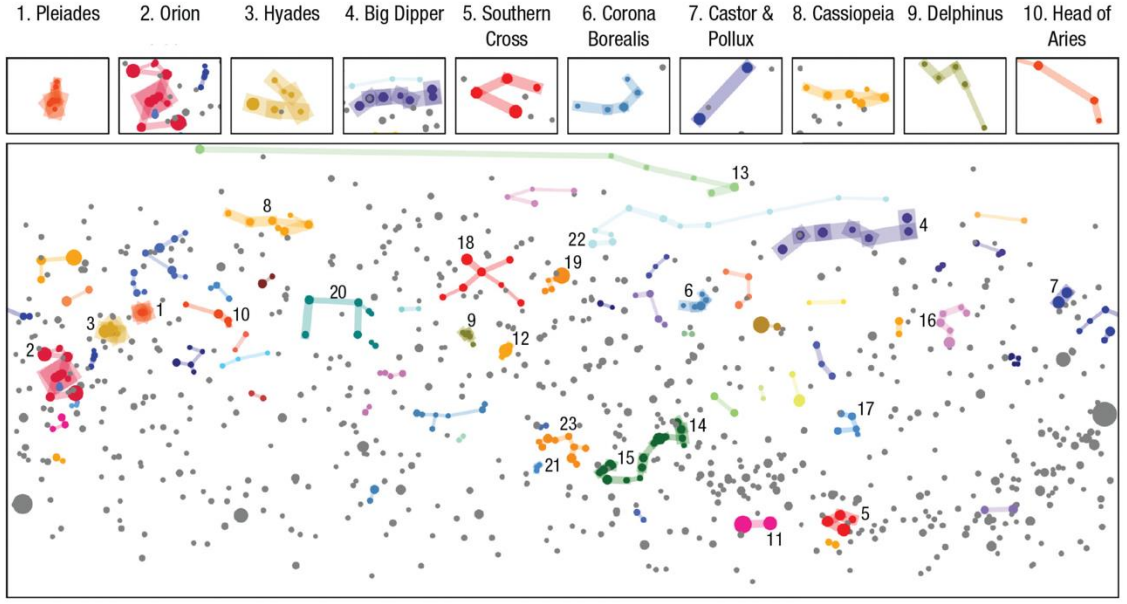
constellations and culture

- groupings of stars from 27 cultures
- perceptual properties such as brightness and proximity account for many of the groupings
- while constellations have different names and stories across cultures, basic perceptual processes seem to guide what is defined as a constellation



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culture & language networks

- topography of the language network in speakers of 45 languages is similar, and the variability observed is similar to the variability that has been reported for the speakers of the same language

paper

next week

- more on collective culture