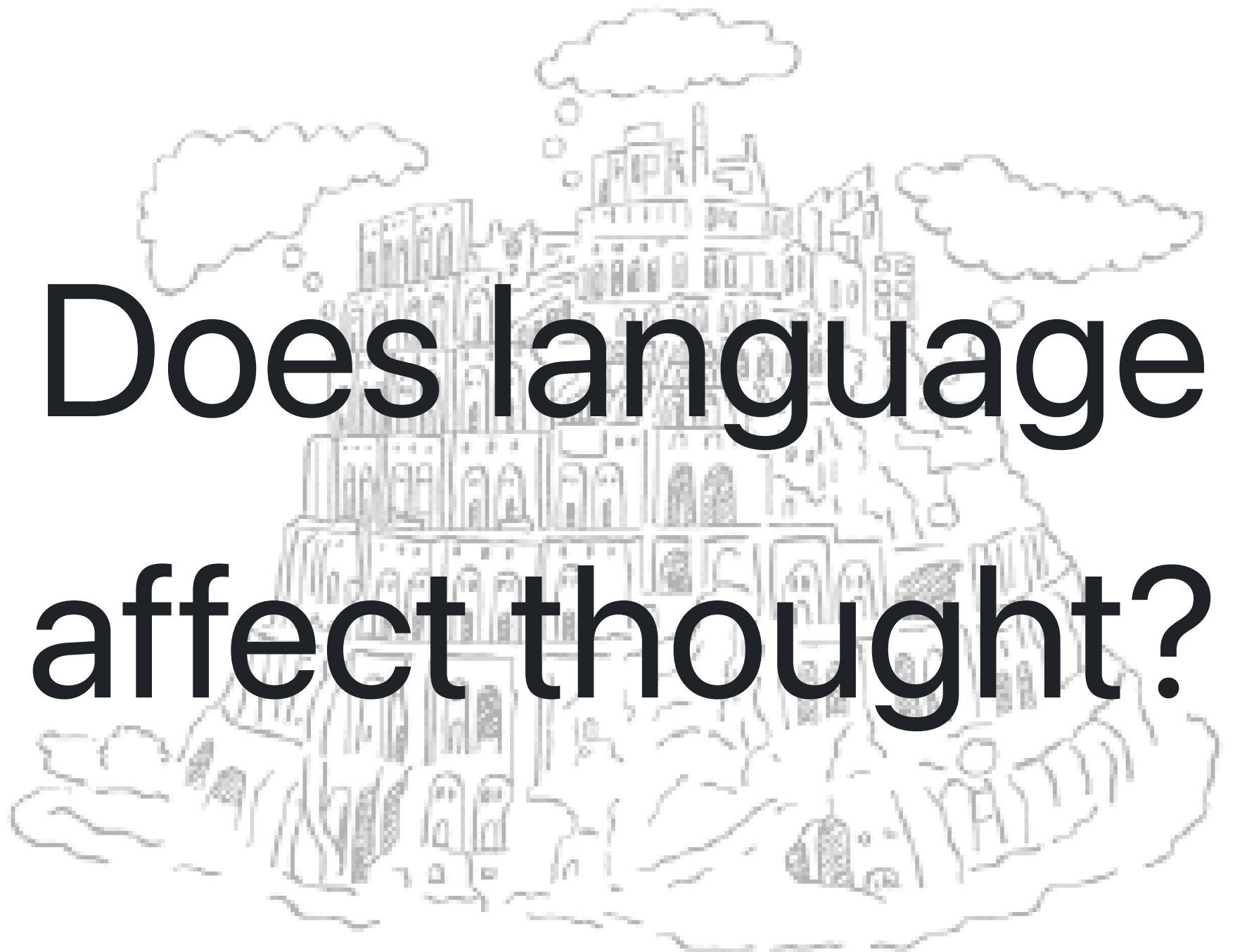


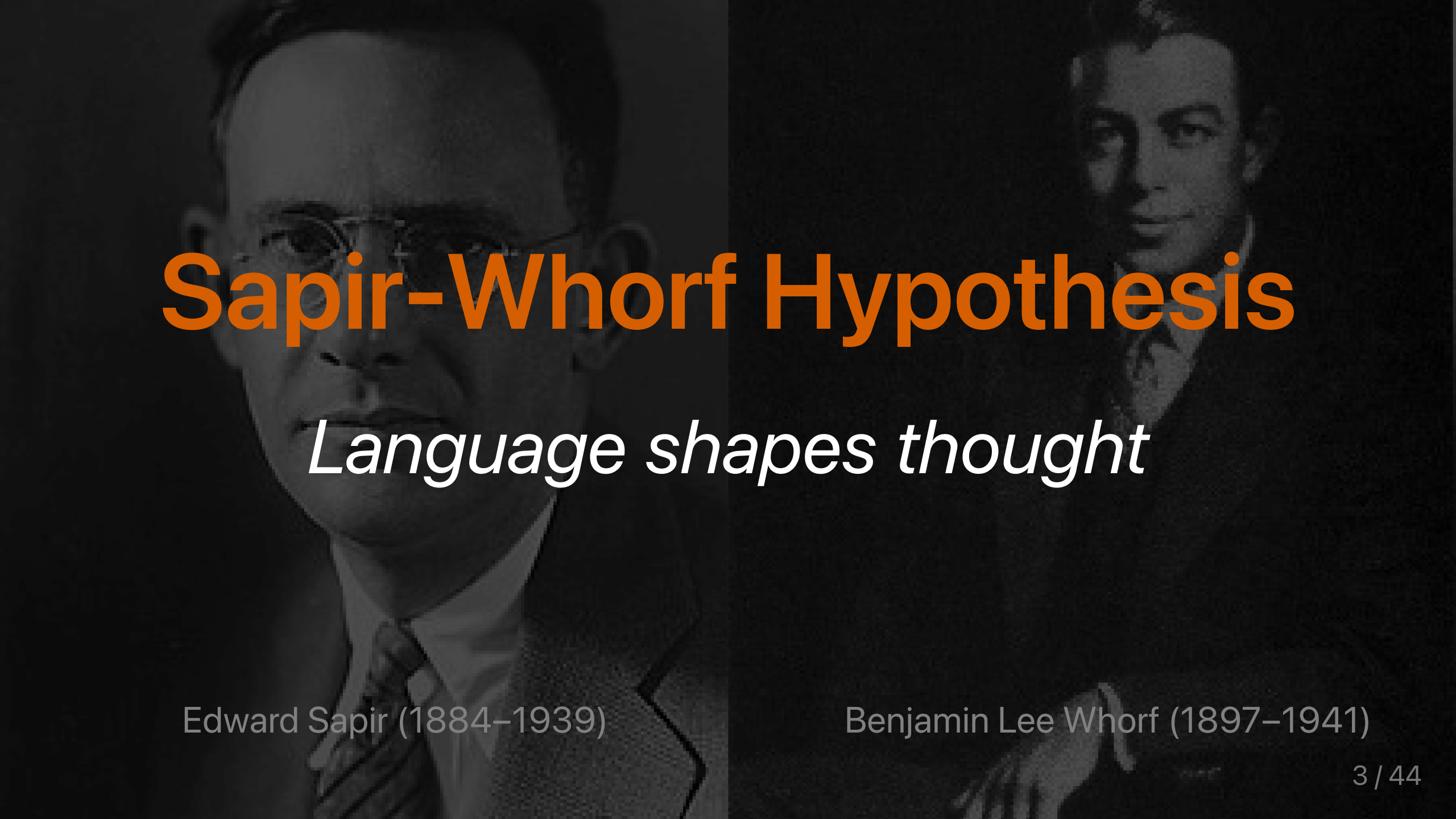
PLIN0068 Constructed Languages

2024–25

Lecture 5: Linguistic relativism



Does language
affect thought?

The background of the slide is a dark, grayscale image. On the left side, there is a portrait of Edward Sapir, an older man with glasses, wearing a suit and tie. On the right side, there is a portrait of Benjamin Lee Whorf, a younger man with dark hair, also wearing a suit and tie. The portraits are slightly faded and serve as a backdrop for the text.

Sapir-Whorf Hypothesis

Language shapes thought

Edward Sapir (1884–1939)

Benjamin Lee Whorf (1897–1941)

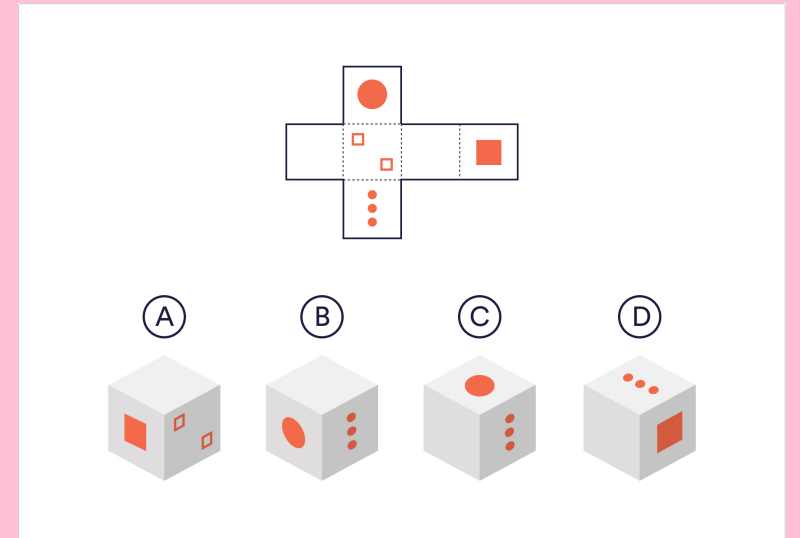
Linguistic Determinism

Language determines and limits thought

👉 Speakers of different languages must think in different ways

Linguistic determinism is considered to be untenable

1. Non-verbal thought (e.g. spacial reasoning)
2. Color terms and color perception
3. Whorf's evidence has been discredited
 - Temporal thought in Hopi (Malotki 1983)
 - *Snow* in Yupik and Inuit (Pullum 1989)



Linguistic Relativism

Language may affect thought

Linguistic relativism itself is almost a truism

- Knowing new words certainly affect how you think
BBC: The 'untranslatable' emotions you never knew you had
- Verbalizing thought processes can help think, memorize, etc.

Research question: What aspects of language affect what aspects of cognition, and to what extent?

Overview

1. Color
2. Time
3. Space-time
4. Number

Other linguistic features: **mass/count**, **gender**



Color

Basic color terms

Different numbers of **basic color terms** in different languages

- English: *black, white, red, green, yellow, blue, brown, purple*, etc.
- Dani: *mili* (cool, dark), *mola* (warm, light)
- Bambara: *dyema* (white-beige), *fima* (dark), *blema* (red-brown)

Berlin & Kay's (1969) hierarchy based on 98 languages

black
white $\rightarrow \left\{ \begin{array}{l} \text{green,} \\ \text{yellow} \end{array} \right\} \rightarrow \text{blue} \rightarrow \text{brown} \rightarrow \left\{ \begin{array}{l} \text{purple, pink} \\ \text{orange, gray} \end{array} \right\}$

Criticisms

- What are **basic color terms**?
 - monomophemic (so not *light blue* or *space gray*)
 - no broader basic color term (so not *scarlet* or *crimson*)
- What about: *teal, turquoise, beige, silver*, etc.

(For overviews, see Kay & Regier 2006, Regier & Kay 2008, Everett 2013, [Wikipedia](#))

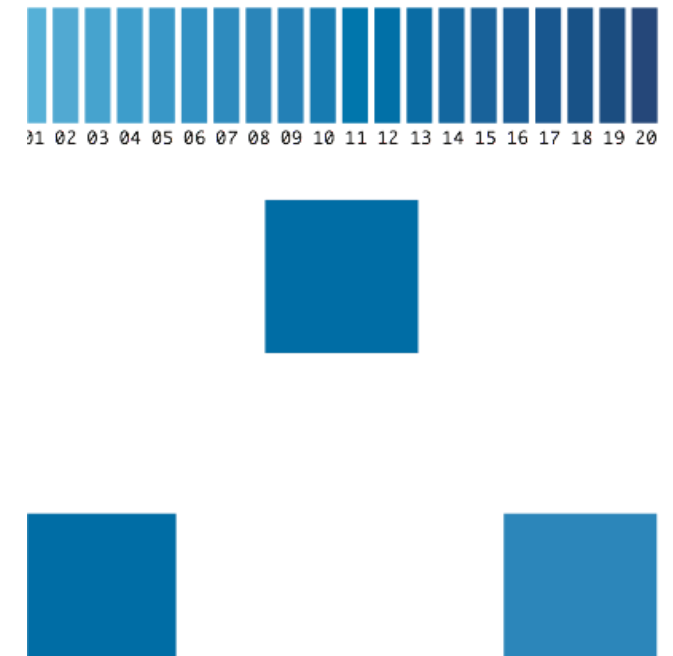
Memory effects of basic color terms

- Brown & Lenneberg 1954: English speakers remembers colors more easily if they are describable by simple words
- Davidoff et al. 1999: Similar memory effects in Berinmo, which has *nol* (blue-green) and *wor* (yellow-green)

Discrimination task

Winawer et al. 2007

- Russian speakers discriminate голубой-blue and синий-blue faster than two hues that'd be described by the same word (1,164 vs. 1,288 ms on ave.)
- No such effect for English speakers (900 vs. 914 ms on ave.)
- The effect disappears in Russian with a verbal dual task



A stylized clock face with a light blue background and dark blue concentric circles. The clock has several tick marks. In the center of the clock is a silhouette of a blue bird, possibly a penguin, standing on its feet. The word "Time" is written in a large, bold, black sans-serif font across the middle of the clock face.

Time

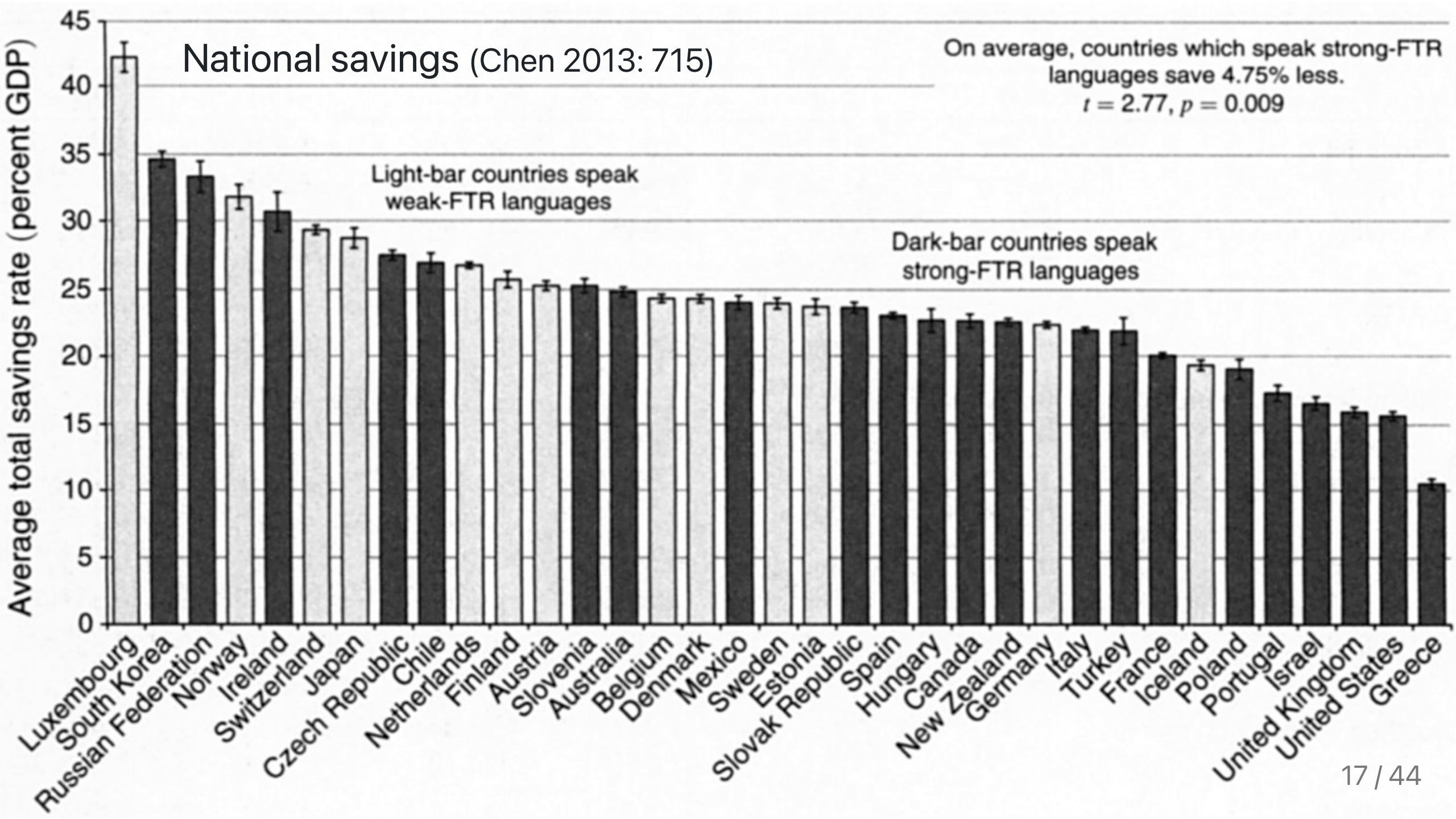
Linguistic variation

- Obligatory tense marking
 - Yes: English, French, Finnish, Korean, etc.
 - No: Mandarin Chinese, Hopi, Hawai'ian, etc.
- Obligatory future marking ("It rains tomorrow")
 - Yes: English, French, Russian, etc.
 - No: German, Finnish, Hungarian, Korean, Japanese, etc.

Observations

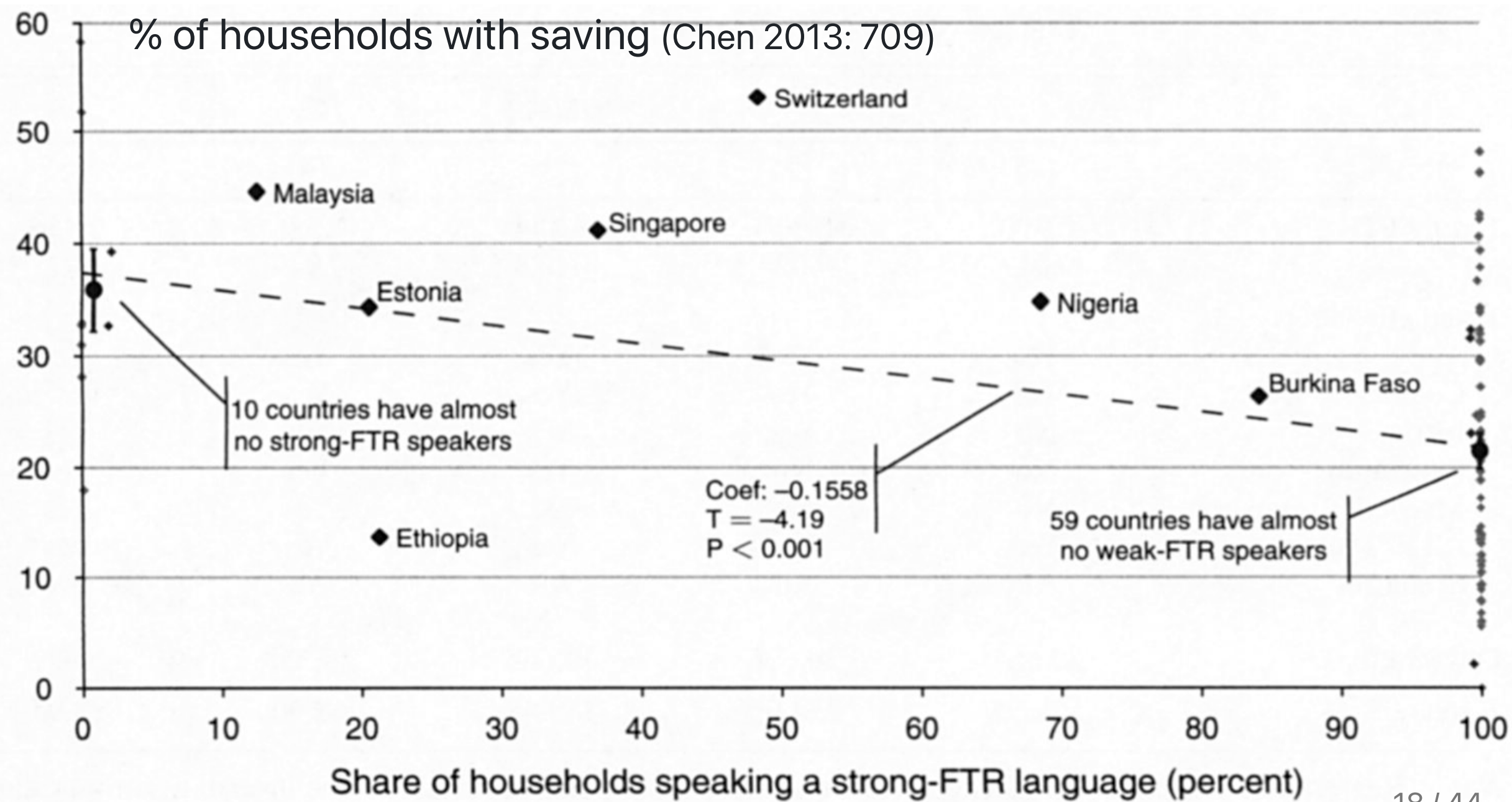
Chen 2013: Speakers of obligatory future marking languages (English, French, etc.) are less likely to take future-oriented behavior

- saving
- exercising
- non-smoking
- condom use etc.



% of households with saving (Chen 2013: 709)

Percent of households saving



Share of households speaking a strong-FTR language (percent)

After controlling for country, sex, age, income-level, education, religion, etc., following effects are found for obligatory future-marking languages

- 30% less likely to save
- retire with 25% less in savings
- 20-24% more likely to smoke
- 13-17% more likely to be obese
- 21% less likely to use condoms

Theoretical interpretation

Chen claims: These behavioral differences arise because:

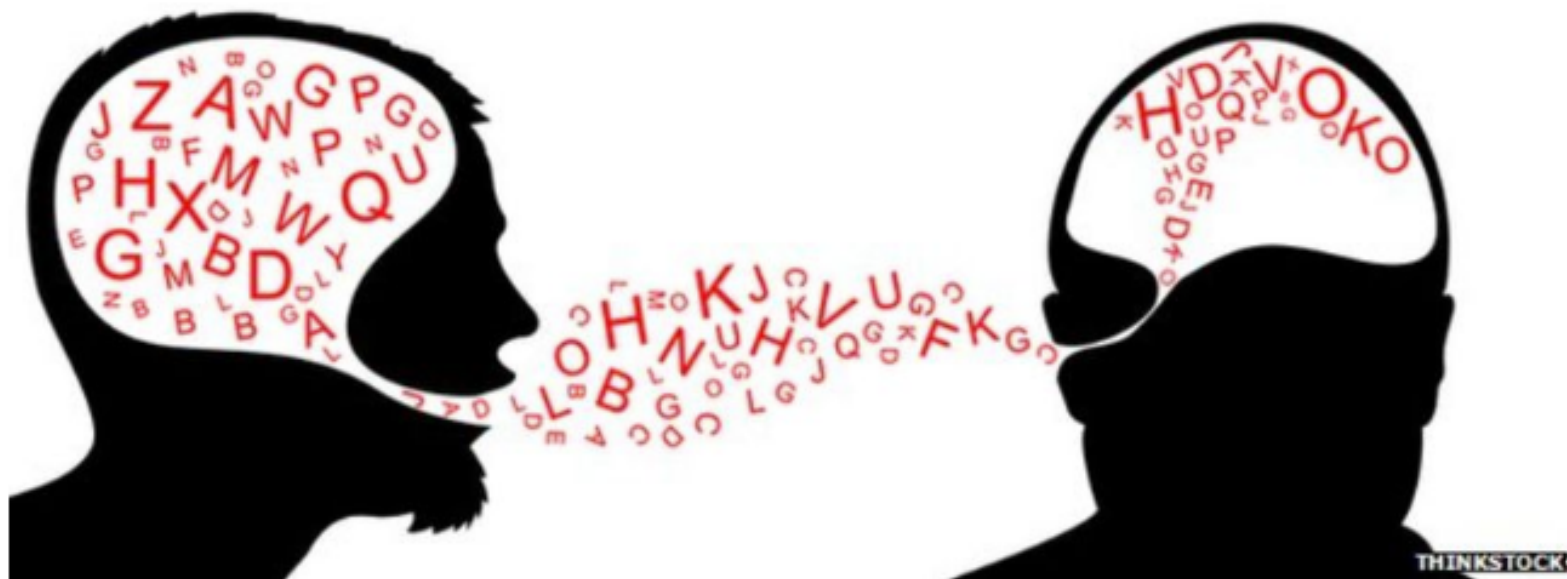
- for speakers of obligatory future-marking languages (e.g. English), future feels distant
- since future feels distant, they are less attuned to potential benefits of behavior that has positive returns later

Why speaking English can make you poor when you retire

By Tim Bowler
Business reporter, BBC News

🕒 23 February 2013

[f](#) [💬](#) [🐦](#) [✉](#) [Share](#)



Not all languages require the use of a future tense

Top Stories

Universal credit 'will make some worse off'

Cabinet minister Esther McVey says those who lose out can take on more work to boost their income.

🕒 5 minutes ago

Two dead in minibus and lorry crash

🕒 1 hour ago

Kanye: 'Trump made me feel like Superman'

🕒 1 minute ago

Features





Related studies

- Chen et al. 2017: Firms in areas with obligatory future marking languages have less cash holdings
- Mavisakalyan et al. 2018, Essi et al. 2023: Speakers of obligatory future marking languages are less likely to behave pro-environmentally
- He & Zhang 2018: Firms in areas with obligatory future marking languages pay higher dividends
- Lien & Zhang 2020: Countries where obligatory future marking languages are spoken have lower suicide rates

Related studies (cont.)

- Caskey & Dutta 2022: Less financial development (saving, investment, property rights, etc.) in countries with obligatory future marking languages
- Mavisakalyan et al. 2022: Speakers of obligatory future marking languages are less likely to be religious and less susceptible to incentives for religious behavior
- Campo et al. 2024: Immigrants in Switzerland speaking obligatory future marking languages are less likely to be self-employed
- Bernhofer et al. 2024: Mood marking correlates with risk aversion
- Yin et al. 2024: Less life insurance consumption in countries with obligatory future marking languages

etc. etc. etc.

Critical discussion: causation

- Data is correlational in nature, not directly showing causation
- To infer causation, we need more theoretical justification

E.g. effect of obligatory past marking would be expected

- Obligatory past marking: English, French, German, Russian
- Non-obligatory past marking: Mandarin Chinese

For speakers of obligatory past marking languages, past events feel distant, so they learn less from them?

Critical discussion: causation (cont.)

The explanation could well go in the opposite direction, contradicting data

- For speakers of obligatory future marking languages always have to pay attention to the distinction between future and present
- Therefore future is more cognitively prominent in their mind, and they are more likely to take future-oriented behavior

Critical discussion: language classification

Japanese is classified as a non-obligatory future marking language

- Does not have an obligatory future tense morpheme like *will*
- But obligatorily marks the present interpretation with progressive (like English; unlike German), similarly to *It is raining*

According to Chen's reasoning, what should matter is whether or not grammar distinguishes the present and future interpretations

Critical discussion: data analysis

Roberts, Winters & Chen 2015: When geographic and historical relatedness among languages is taken into consideration, the correlation disappears but the correlation remains in other statistical tests



Space-Time

Relative and absolute spacial terms

- **Relative (egocentric):** *left, right, front*, etc.
- **Absolute (geocentric):** *north, south, uphill*, etc.

Cross-linguistic variation

- English speakers normally use relative expressions
- Kuuk Thaayorre and Tzeltal speakers primarily use absolute expressions

Spacial metaphors for time

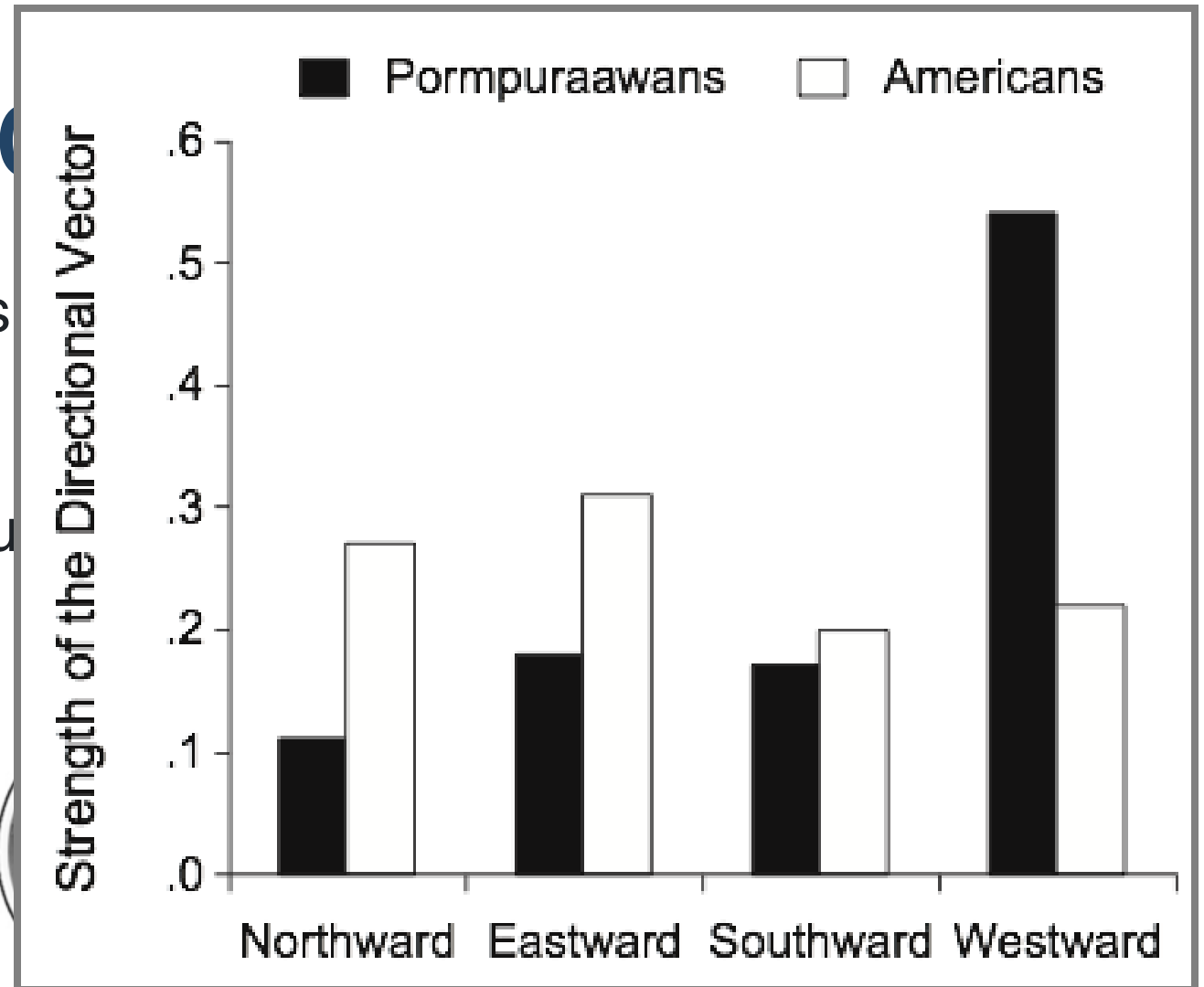
Common to use spacial metaphors for temporal concepts

- For English speakers, time often flows from left to right
- What about speakers of other languages?

Boroditsky & Gaby 20

Comparison b/w (American) English
Kuuk Thayorre

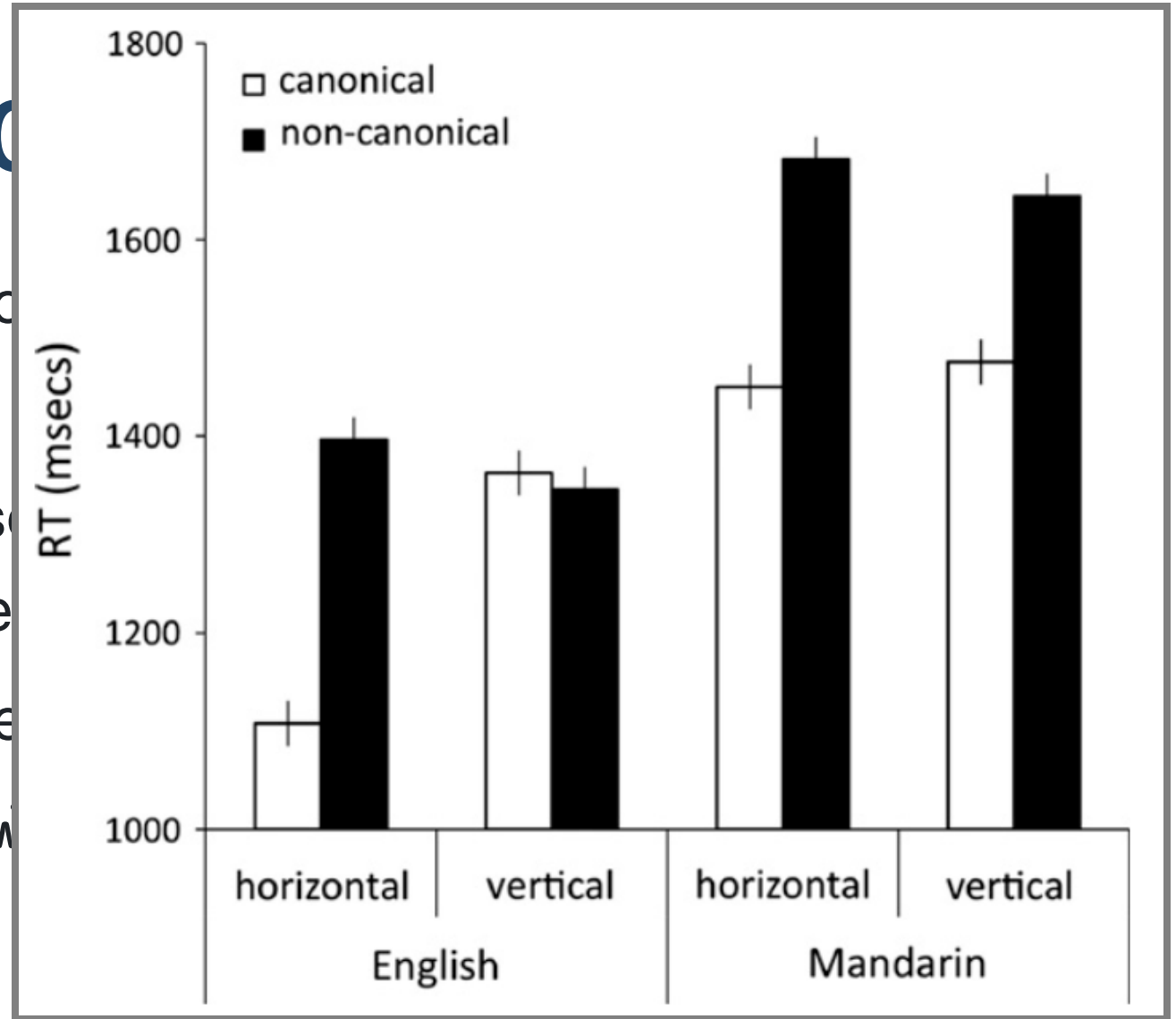
Task: Chronologically arrange pictures
same man taken at different times



Boroditsky et al. 2010

Mandarin Chinese uses more vertical
'last month' = last month)

- Two pictures of the same person, the second one was taken later
- Two keys: black = earlier, white = later
- Four key arrangements: B-W, W-B, B-B, W-W

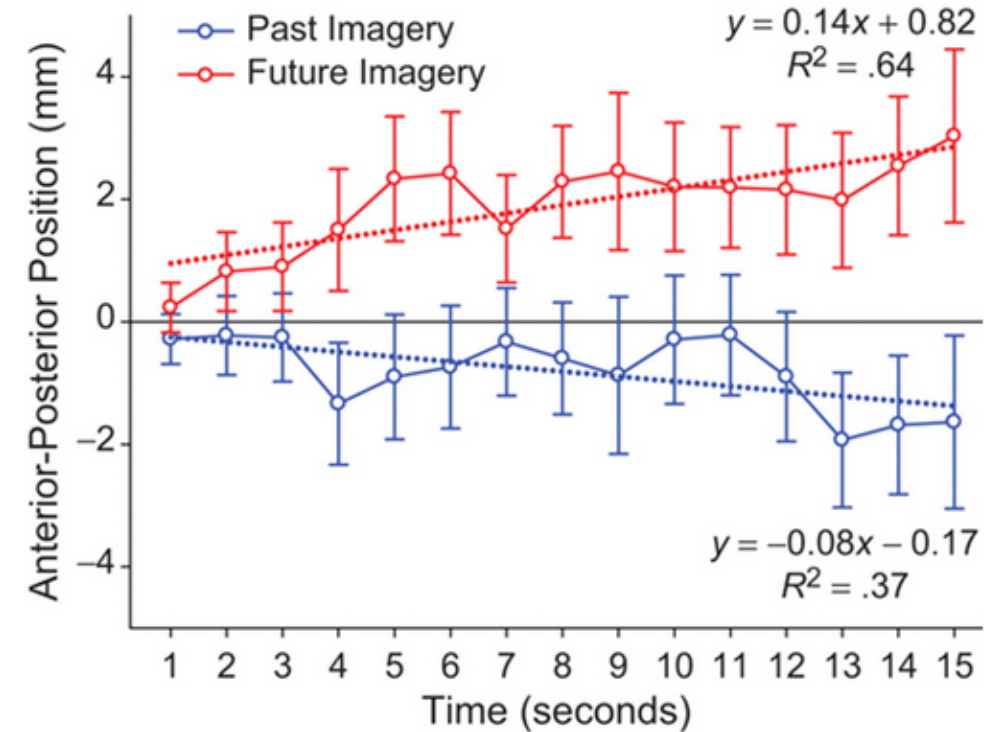




Front-back axis

Crosslinguistic variation

- English: future = front, past = back
- Aymara: future = behind, past = front
- Yupno: future = uphill, past = downhill



Miles et al. 2010: Blindfolded English speakers tend to sway backward, when imagining a past event (4 years ago), and forward, when imaging a future event (4 years later)

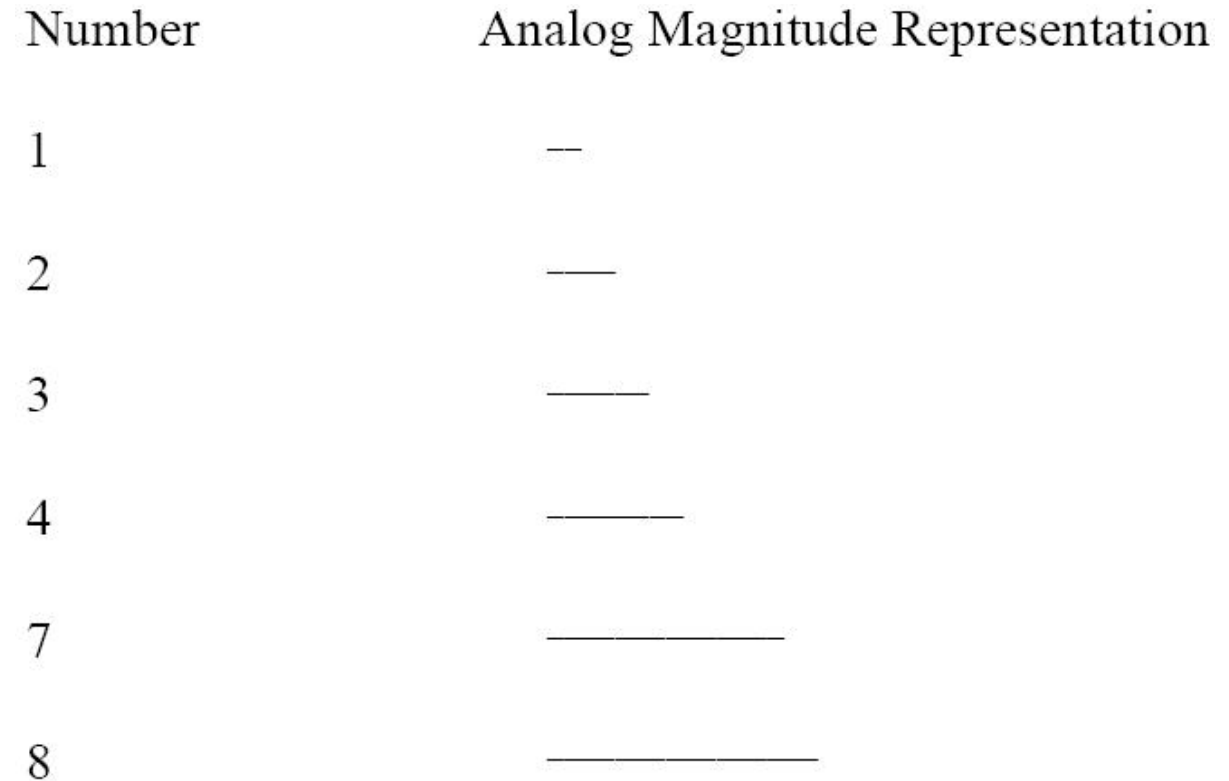
Number

Number cognition

Pre-linguistic infants and many animals (e.g., chimpanzees, dogs, horses, crows, toads, guppies, spiders, bees, etc.)

'count' using **analog magnitude estimation**, instead of discrete counting

(Dehaene 1997, Gallistel & Gelman 1999, Xu & Spelke 2000, Feigenson et al. 2004, Carey 2009, Agrillo et al. 2012)



Pirahã

Pirahã has no nominal number marking; very few number words, which all have non-exact meanings (Everett 2005, Gordon 2004, Frank et al. 2008)

- *hói* = roughly one
- *hoí* = roughly two
- *baagiso/aibaagi* = many

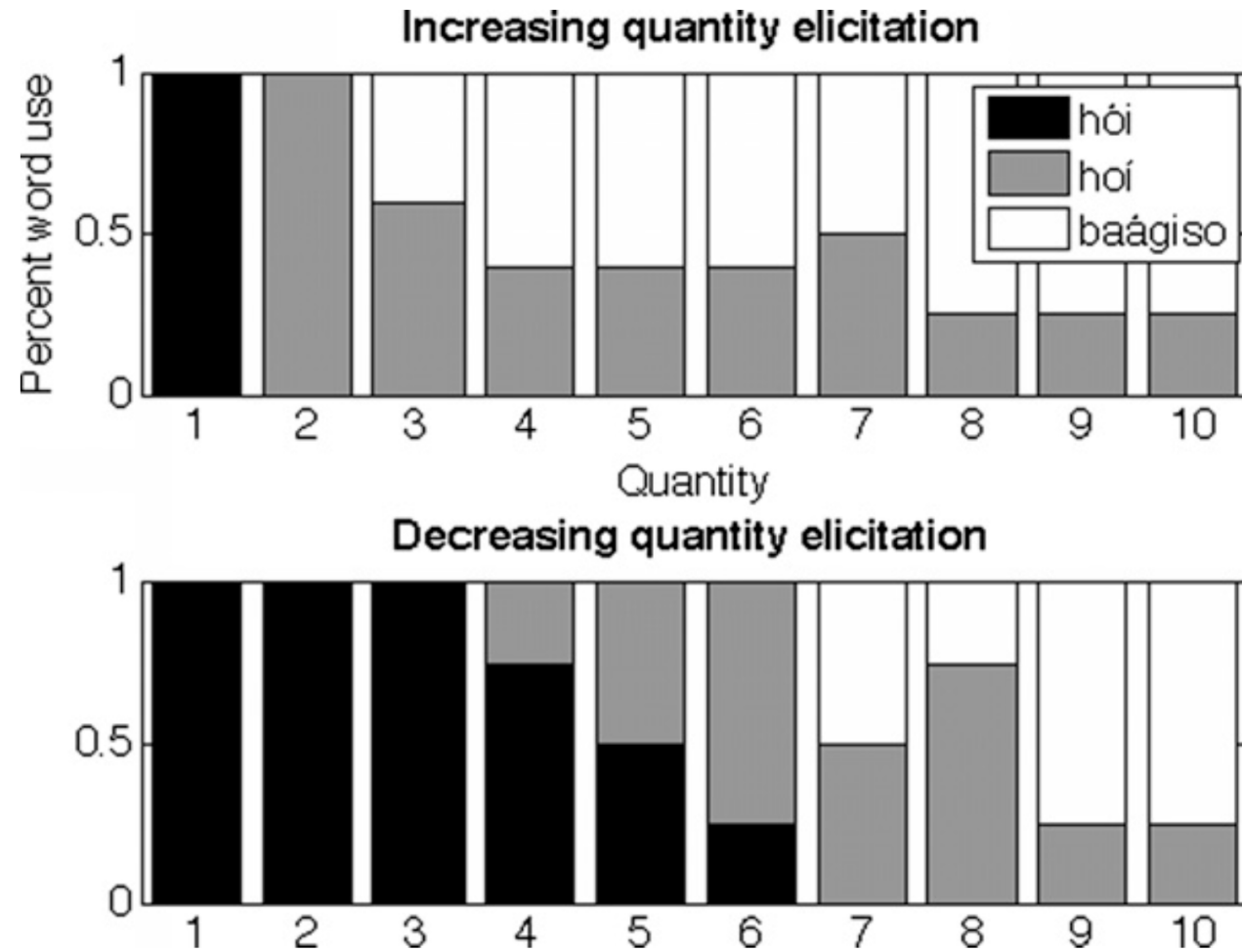
Gordon 2004 suggests that Pirahã speakers only mentally represent approximate numbers



Frank et al. 2008:

Experiment 1

Presented spools of threads and asked 'How much/many is this?' in Pirahã for each quantity from 1 (increasing) or from 10 (decreasing)



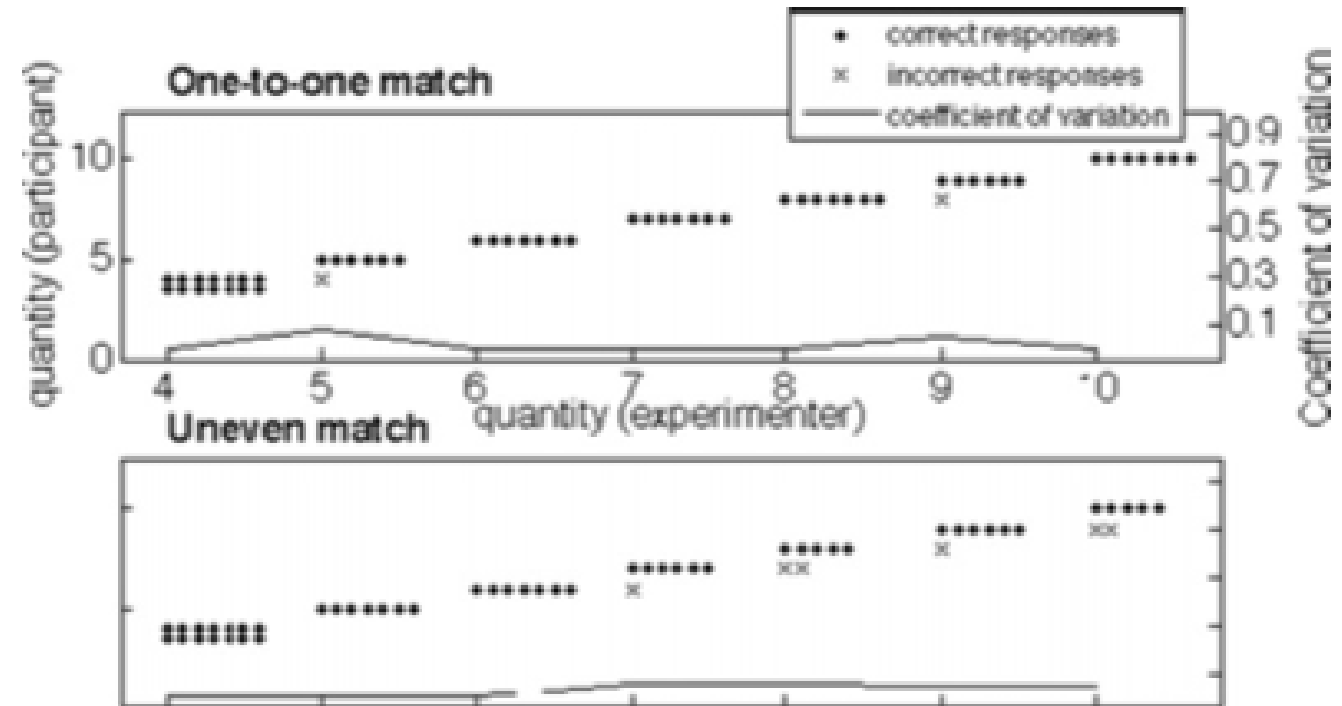
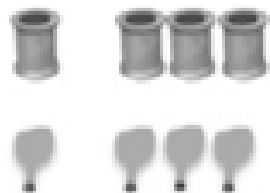
Frank et al. 2008: Experiment 2

Non-verbal matching task:
Presented spools of threads
and asked to give the same
number of balloons

1-1 match

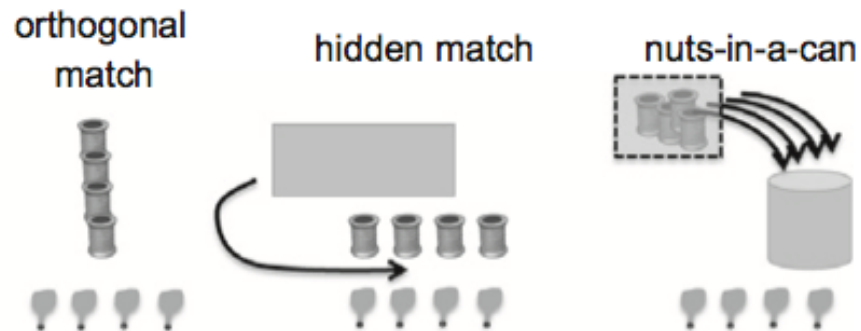


uneven match

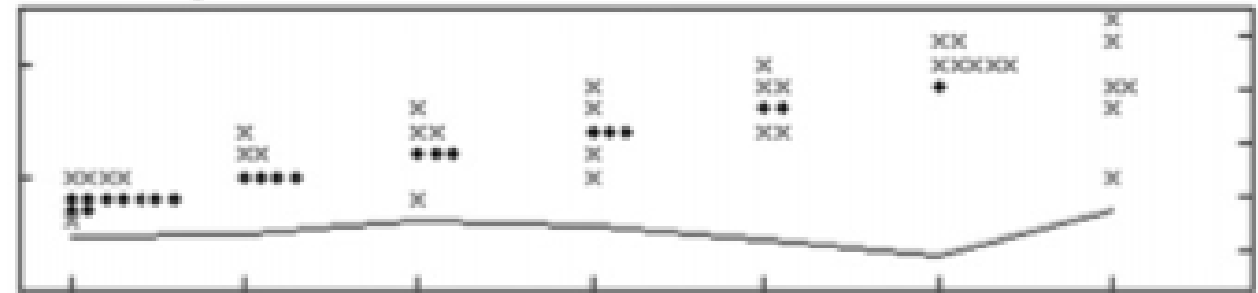


Frank et al. 2008: Experiment 2

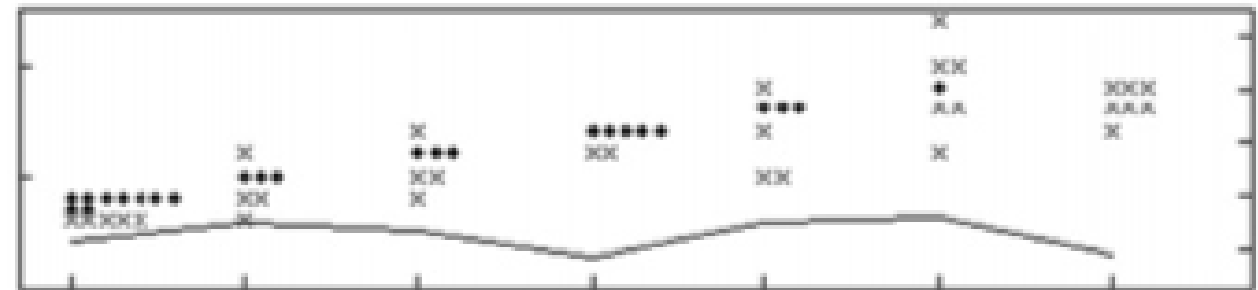
When memory is involved,
performance gets worse



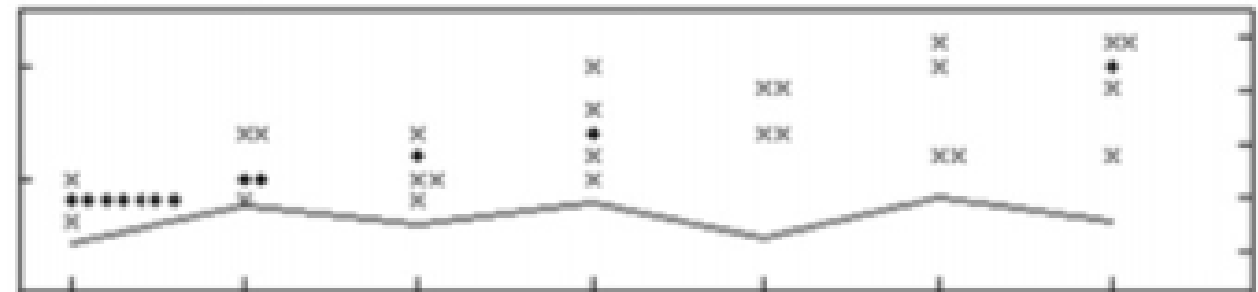
Orthogonal match



Hidden match



Nuts-in-a-can



Frank et al. 2012

Verbal shadowing (while listening to radio news, and repeat the words)

- Exp 1: Verbal shadowing while the experimenter places spoons. English speakers do the five tasks better than Pirahã speakers (e.g., 54% correct vs. 32% correct for nuts-in-a-can)
- Exp 2: Verbal shadowing while the experimenter places spoons (Encoding), while the participant answers (Retrieval), or both. Worse performance when encoding is interfered (66% vs. 87% vs. 53%)



Concluding remarks

- Very small effects of crosslinguistic variation
- In particular, having access to (frequent) words seems to help memory (color, number) and perceptual categorization (color)
- Economic and other effects of tense marking are open to question
- Boroditsky's time-space effects could be cultural, rather than grammatical effects