

Language and Thought

Linguistics 101 (Bruening)

September 12, 2006

1 Some Properties of Language

All communication systems:

1. A mode of communication (vocal-auditory, visual, tactile, chemical)
2. Semanticity: Signals have meaning
3. Pragmatic function: Serves some purpose (staying alive, influencing others)

Some communication systems:

4. Interchangeability: Individuals can both send and receive messages (NOT: females going into heat)
5. Cultural transmission (not innate)
6. Arbitrariness of signs
7. Discreteness: complex messages built up of smaller parts that can be recombined

Only human languages:

8. Displacement: the ability to talk about things that are not immediately present
9. Productivity: the ability to produce and understand new messages

2 Language and Thought

The *Sapir-Whorf Hypothesis* (or *The Linguistic Relativity Hypothesis*):

“We are thus introduced to a new principle of relativity, which holds that all observers are not led by the same physical evidence to the same picture of the universe, unless their linguistic backgrounds are similar, or can in some way be calibrated.” (Whorf 1956, 214)

Proponents today:

“Instead of language merely reflecting the cognitive development which permits and constrains its acquisition, language is thought of as potentially catalytic and transformative of cognition.” (Bowerman and Levinson 2001, 13)

- Categorical perception from language acquisition (later in course): Children’s brains become attuned to just the distinctions made in the language they’re learning, lose the ability to make other distinctions.

- Not so crazy to think that distinctions of lexicon or grammar made in native language will sensitize person to just those distinctions and suppress others.
- Some initial evidence, examples of how language might affect cognition:

1. Egocentric vs. geocentric directions:

- Tenajapan Mayan uses absolute directional terms ('north', 'south'), lack egocentric directional terms (*left* and *right*).
- Spatial task, e.g. rotation: Tenajapan Mayans reproduce scenes according to absolute direction, Dutch according to relative direction (Brown and Levinson 1993, Pederson *et al.* 1998).

2. Chinese and English speakers' facility with counterfactual reasoning: Chinese speakers claimed to be poor at it because Chinese does not grammatically encode counterfactuals.

But, conceptual arguments against (most from Gleitman and Papafragou 2004):

1. (Humpty Dumpty)

2. Language is sketchy, thought is rich:

- Ambiguous words like *bat*, *bank*, *bug* are pervasive but the concepts are clearly distinct in thought;
- Understanding a sentence involves huge inferential reasoning (*It's raining* usually taken to mean here and not on Mars; if said indoors, taken to mean "just outside of here");
- Don't always have different words for things that are clearly distinct in thought: e.g., *uncle* does not distinguish between sibling of mother or father, or blood relative vs. relative by marriage, but someone who says "my uncle" possesses all that information;
- The fact that we perform different actions in opening an envelope vs. opening a can vs. opening an umbrella shows that we have much more knowledge than the word *open* expresses;
- Could never say anything if you had to say everything; instead have to choose just a subset based on knowing what others already know and are capable of inferring.

3. Where a language lacks words or grammatical devices to express something, speakers make up a new word, invent a metaphor, borrow words or expressions; that would be impossible if language determined thought.

4. Similarly, people who come up with new concepts just make up new words for them, like Freud with the *id*. If language determined thought, that would also be impossible.

5. Can explain a concept without having a word for it (e.g., pose of horse where one front leg is held up, common in statues and paintings—Arabic has a word for it).

And experimental findings against:

1. Verbs of manner vs. verbs of path:

- Most English verbs include a manner component, path specified by prepositional phrase:
He walked/crawled/floated/slid/ran through the tunnel.
- Spanish, Greek: most verbs include path, motion specified by adverb:
literally, 'He entered the house running.'
- Children and adult are sensitive to these patterns; English speakers describe motion scenes in terms of manner, Greek speakers in terms of path (Papafragou, Massey, and Gleitman 2002).
- But English and Greek speakers do not differ in conceptual tasks: Classification or memory (Papafragou, Massey, and Gleitman 2002).

2. Egocentric vs. geocentric directions again:

- Li and Gleitman (2002) note that geocentric directions used even in English in presence of stable landmarks (e.g., Manhattan uptown, downtown, crosstown).
- Replicated rotation experiments but added or withheld landmark information:
- English speakers reproduce scenes in absolute directions in presence of landmark.
- Recent experiments by Papafragou: Tenajapan Mayans have no problem thinking in relative (egocentric) terms.

3. Evidentials: Some languages, e.g., Korean, grammatically mark source of evidence for a proposition.

- Children learn these very early.
- But English and Korean children do not differ in their reasoning about chains of evidence and knowledge attribution; in fact Korean children were more advanced in their reasoning about evidence than in their knowledge of the meaning of the grammatical markers (Papafragou, Li, and Han 2003).

4. Color terms: huge differences in linguistic systems (below), very little difference in actual perception and categorization (Brown and Lenneberg 1954, Heider and Oliver 1972).

- Not only that, red-green colorblind individuals organize *names* the same way as color-seeing people, even though they can't organize actual colors that way.
- Perception is *independent* of linguistic naming.

2.1 Color Term Systems

Two-Term System: Jalé (New Guinea)

- *siN* = 'black (dark)', *hóló* = 'white (light)'

Three-Term System: Tiv (Nigeria)

- *ii* = 'black (dark)', *pupu* = 'white (light)', *nyian* = 'red (warm, red-brown-yellow)'

Four-Term System (A): Hanunóo (Philippines)

- (*ma*) *biru* = 'black (dark)', (*ma*) *lagti?* = 'white (light)', (*ma*) *rara?* = 'red (warm)', (*ma*) *latuy* = 'green'

Four-Term System (B): Ibo (Nigeria)

- *oji* = 'black (dark)', *nzu* = 'white (light)', *uhie* = 'red', *odo* = 'yellow'

Five-Term System: Tzeltal (Mayan)

- *?ihk'* = 'black', *sak* = 'white', *cah* = 'red', *yaš* = 'grue', *k'an* = 'yellow'

Six-Term System: Plains Tamil (India)

- *karuppu* = 'black', *vellai* = 'white', *sivappu* = 'red', *paccai* = 'green', *manjal* = 'yellow', *nilam* = 'blue'

Seven-Term System: Nez Perce (Washington state)

- *ḡayḡayḡ* = 'black', *cimú:xcimux* = 'white', *?ilp'ilp* = 'red', *ḡeḡus* = 'green', *magsmags* = 'yellow', *ku:skú:s* = 'blue', *suk'uysuk'uy* = 'brown'

Eight-to-Eleven-Term Systems: Add a term for purple, pink, orange, grey, or some combination of these.

2.2 One Experiment on Color: Kay and Kempton 1984

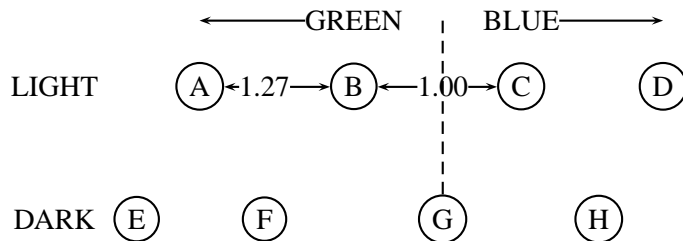
- English: Eleven-term system; in particular, distinguishes blue and green.
- Tarahumara (Uto-Aztecan, spoken in Chihuahua, Mexico): Five-term system, has just one word, *siyóname*, for green and blue)

Competing Hypotheses:

1. Relativity: Colors near the green-blue boundary will be pushed apart by English speakers because English contrasts them, but Tarahumara speakers will show no such distortion.
2. Universalist: No difference between English and Tarahumara.

Stimuli:

- Eight color chips varying along blue-green, two levels of brightness
- Perceptual distance based on just noticeable difference (jnd):



Task:

- Presented with a triad of color chips (A,B,C), have to say which is least like the other two.
- Presented all 56 possible triads; the proportion of times two stimuli are split up indicates their distance relative to other pairs of stimuli.

Findings:

- English speakers exaggerate the B-C difference, making it bigger than A-B;
- Tarahumara speakers say A-B difference is bigger than B-C difference.

Possible, non-Whorfian explanation:

- Subject sees A, B, and C; very similar.
- Forced to set one aside; thinks, “Aha! A and B are both CALLED *green* while C is CALLED *blue*.” So they pick C.
- That is, this becomes a linguistic task.

Experiment 2:

- Exactly the same, but put triad in box with cover that only reveals two at a time (A-B, then B-C).
- Instructions:
 1. (Reveal A-B:) “You can see that this chip (A) is greener than this chip (B).”

2. (Reveal B-C:) “You can see that this chip (C) is bluer than this chip (B).”

- Subject has already heard chip B being called both *green* and *blue*.

Findings:

- English speakers now act like Tarahumara speakers: say distance between A and B is bigger than between B and C.

See also Kay and Regier 2006.

References

- Bowerman, Melissa, and S. C. Levinson (2001), “Introduction.” In Melissa Bowerman and S. C. Levinson, eds., *Language Acquisition and Conceptual Development*, Cambridge: Cambridge University Press, pp. 1–16.
- Brown, P., and S. C. Levinson (1993), ““Uphill” and “Downhill” in Tzeltal.” *Journal of Linguistic Anthropology* 3: 46–74.
- Brown, R., and E. Lenneberg (1954), “A Study in Language and Cognition.” *Journal of Abnormal and Social Psychology* 49: 454–462.
- Gleitman, Lila, and Anna Papafragou (2004), “Language and Thought.” In K. Holyoak and B. Morrison, eds., *Cambridge Handbook of Thinking and Reasoning*, Cambridge: Cambridge University Press, p. to appear.
- Heider, E., and D. C. Oliver (1972), “The Structure of Color Space in Naming and Memory for Two Languages.” *Cognitive Psychology* 3: 337–354.
- Kay, Paul, and Willett Kempton (1984), “What is the Sapir-Whorf Hypothesis?” *American Anthropologist* 86: 65–79.
- Kay, Paul, and Terry Regier (2006), “Language, Thought, and Color: Recent Developments.” *Trends in Cognitive Sciences* 10: 51–54.
- Li, P., and L. Gleitman (2002), “Turning the Tables: Spatial Language and Spatial Cognition.” *Cognition* 83: 265–294.
- Papafragou, A., P. Li, and C. Han (2003), “Evidentiality and the Language/Cognition Interface.” Ms.
- Papafragou, A., C. Massey, and L. Gleitman (2002), “Shake, Rattle ‘n’ Role: The Representation of Motion in Language and Cognition.” *Cognition* 84: 189–219.
- Pederson, E., E. Danziger, D. Wilkins, S. Levinson, S. Kita, and G. Senft (1998), “Semantic Typology and Spatial Conceptualization.” *Language* 74: 557–589.
- Whorf, Benjamin Lee (1956), *Language, Thought, and Reality*. Cambridge, Mass.: MIT Press. Edited by John B. Carroll.