

Cognitive & Linguistic Determinism: Object Reference & Relational Reference

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Natural partitions hypothesis (1982):

(1) The linguistic distinction between nouns and predicate terms, such as verbs and prepositions, is based on a preexisting perceptual-conceptual distinction between concrete concepts such as *persons* or *things* and predicative concepts of activity, *change-of-state*, or *causal relations*:

(2) The category corresponding to nouns is at its core conceptually simpler or more basic than those corresponding to verbs and other predicates.

(3) When we lexicalize the perceptual world, the assignment of relational terms is more variable crosslinguistically than that of nominal terms.

That is, referential patterns are more variable cross-linguistically for relational terms than for object terms (restricting the domain to the perceptual world).

Goals today:

- a. Deal with some remaining gaps in previous evidence
- b. Stress point (3)
- c. Add a conjecture:

(4) The open-class -- closed-class distinction is more usefully seen as a continuum with common nouns at the open end, grammatical terms at the closed end, and verbs and spatial prepositions in the middle.

An important corollary is that verbs are more linguistically shaped than nouns.

I. The Natural Partitions Hypothesis (1982) Revisited

Evidence cited in 1982

Infants acquire nouns before verbs: the first true-word vocabularies are predominantly made up of nouns

- Generality:

-- Production vocabularies (English)

-- Comprehension studies (English)

-- Cross-linguistic findings (below)

- Non-semantic explanations tested:

-- Word frequency

Cannot explain noun advantage, even in English, since the nouns acquired by children are less frequent than many verbs that are not acquired.

-- Morphological complexity

Noun advantage in acquisition is not simply due to greater morphological complexity of verb in English.

HIGHLY SYNTHETIC	MODERATE	HIGHLY ANALYTIC
Kaluli	English	Mandarin Chinese
Turkish	German	
Japanese		
N/V .60/.23	.70/.17	.62/.27

-- Word order

Noun advantage in acquisition is not simply due to English SVO order.

VERB FINAL	NOUN FINAL
Japanese (SOV)	English (SVO)
Turkish (SOV)	Mandarin (SVO)
Kaluli (OSV, OSV)	
German (SOV)	
N/V .65/.20	.69/.20

However, some problems remained.

1. Adult word-classes might be invalid measures for child language.

Dromi (1982) correlated child's referential category with adult part of speech in one child's acquisition of Hebrew.

.86 correlation between object-reference and adult noun

.91 correlation between action/state reference and adult verb

(lower correlations for modifiers and social words)

2. Possible exceptions to noun advantage.

-- Tanouye (1980) reports predominance of relational words in early acquisition of Japanese.

However, the relational category was defined more broadly than is typical. Besides words normally classed as relational ['gone' ('nai'), 'more' ('motto'), 'open' ('akete'), and 'need' ('iru')], it also included deictics such as

'this' ('kore') modifiers such as 'red' ('akai') and 'small' ('chisai');

-- Pye (1986) suggests testing the noun-first hypothesis with studies of acquisition of polysynthetic languages such as Salish, Eskimo, Algonkian and Athabaskan.

3. There remained other possible non-semantic explanations for the noun advantage.

--Stress

--Phonology (consonant and syllable structure)

--Number of repetitions to child

A series of studies by Schwartz, Camerata, and Leonard address these issues.

A. Equating stress, phonology, position in sentence, and number of presentations, as well as presence of action on object, young children learn more object-words than action-words.

Schwartz (1983): 8 novel object-words and 8 novel action-words (each with 4 exemplars, a total of 64), matched as above.

Object words: familiar actions on unfamiliar objects
(e.g., hold up and drop a shuttlecock)

"Here's a boba."

Action words: unfamiliar actions on familiar objects
(e.g., spinning a stacking ring with thumb and index finger)

"Watch me fof."

Schwartz (1983) continued

12 children aged 1;0.21 to 1;3.15 (all with less than 5 'true' words at start)
10 sessions, about 10-14 days apart, over 3-4 months

Each session, all 64 objects and actions were named (two twice, two once) and production probes were given for each exemplar.

Results:

	OBJECT WORDS	ACTION WORDS
Percent of time action performed (object-related actions or referent actions)	64%	43%
Mean number of words acquired (out of 32 referent-word pairs)		
Prior action	11.5	3.33
No prior action	5.5	2.83
Number of presentations prior to child's production		
Prior action	9.52	11.16
No prior action	9.06	10.04

B. Equating stress, phonology, position in the sentence, and number of presentations, young children pronounce object names more accurately than action names.

(Camerata & Schwartz, 1985); Camerata & Leonard, 1986)

e.g. Camerata & Leonard (1986): object and action names constructed for each individual, based on spontaneous speech.

Matched for:

- phonetic structure (e.g., /dok/, /dek/)
- morphological complexity (both uninflected)
- word order (both sentence-final)
- stress (final word (object- or action-word) always stressed)
- number of presentations

10 children 1;8 - 2;1 (MLU 1.16-1.40)

10 novel objects (e.g., a lemon-press) and 10 novel actions (e.g., rotating a doll at the waist)

8 sessions (about one hour) each word 6 times/session

- 1-3. Training: "Here's the ____" or "Watch the baby ____"
4. Production probe, followed by correct word if child missed. "What's this?"; or "What's the baby doing?"
- 5,6. Comprehension probes: "Give me the ____"; or "Make the baby ____"

Camarata & Leonard (1981) continued

Results: Percentage of consonants produced correctly

	OBJECT-WORDS	ACTION-WORDS
unsolicited imitations	53.7	36.4
spontaneous productions	58.4	24.1
spont. prod., min. pairs	53.0	18.4
responses to prod. probes	50.8	15.7
post-test prod. probe	61.7	20.5

Conclusions:

1. Increasing semantic complexity - decreasing phonetic accuracy
2. Action words possess greater semantic complexity than object words.

CONCLUSIONS:

1. The noun advantage in early acquisition results from semantic factors.
2. Object reference provides an early hook between language and world, helps child bootstrap the more opaque parts of speech.

Natural partitions hypothesis (1982):

(1) The linguistic distinction between nouns and predicate terms, such as verbs and prepositions, is based on a preexisting perceptual-conceptual distinction between concrete concepts such as *persons* or *things* and predicative concepts of activity, *change-of-state*, or *causal relations*:

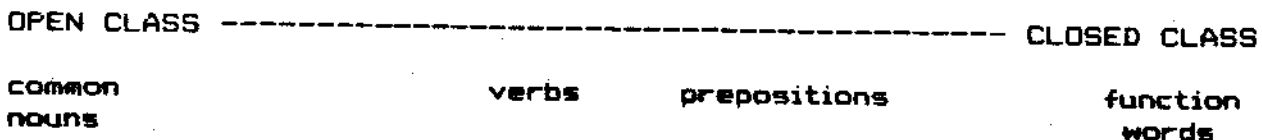
(2) The category corresponding to nouns is at its core conceptually simpler or more basic than those corresponding to verbs and other predicates.

→ (3) When we lexicalize the perceptual world, the assignment of relational terms is more variable crosslinguistically than that of nominal terms.

That is, referential patterns are more variable cross-linguistically for relational terms than for object terms (restricting the domain to the perceptual world).

ADD (4) The open-class -- closed-class distinction is more usefully seen as a continuum with common nouns at the open end, grammatical terms at the closed end, and verbs and spatial prepositions in the middle.

An important corollary is that verbs are more linguistically shaped than nouns.



II Evidence: Verbs behave more like closed-class words than nouns do.

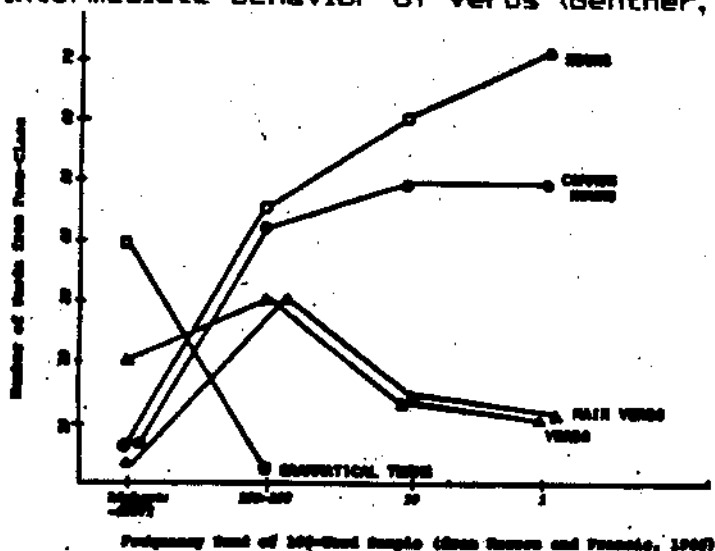
CLOSED-CLASS PHENOMENA

1. concentrated at high frequency
2. not easily translated
3. not borrowed in language contact
- 4 late in acquisition
5. late in second-language learning
6. context-sensitive, polysemous (syncategorematic)
7. poor in memory

APPLY C.C. PHENOMENA TO VERBS

1. C.C. are concentrated in high frequency; O.C. can occur at low frequencies.

● But note intermediate behavior of verbs (Gentner, 1981)



2. C.C. are low in translatability relative to O.C.
 ● Double translation task --> verbs less translatable than nouns
 e.g. motion verbs in English and French (with Francoise Zurif & Richard Jahiel)
 Talmy (1975, 1978): verb conflation patterns
 English: manner + change of location
 French: direction + change of location

Incompatible conflation: e.g. English manner verb "curtsey"
 --> French "faire une reverence"

Compatible: e.g. English "climb" --> French "escalader"

	NOUNS		VERBS	
	HI FREQ	LO FREQ	COMP.	INCOMP.
Double translation:	89.0	52.5	40.7	26.3
Single translations:	92.6	80.3	47.8	27.4

3. C.C. are not borrowed in language contact; O.C. are (e.g. Weinreich, 1968;)

- However, some studies show nouns are the most heavily borrowed class and that verbs are much less borrowed than nouns.

A study of English borrowing into Japanese (with Kazuko Otake): surveying 50 articles from Japanese newspapers for all English-derived Kana words (647 types, 1067 tokens). 95% of these were nouns:

Number of English-derived Kana Words in each Form Class
 Across 50 Articles Taken from Japanese Newspapers

Dedre Gentner
Kazuko Otake

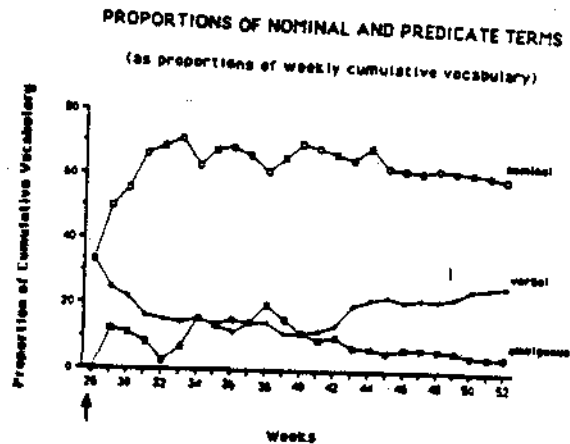
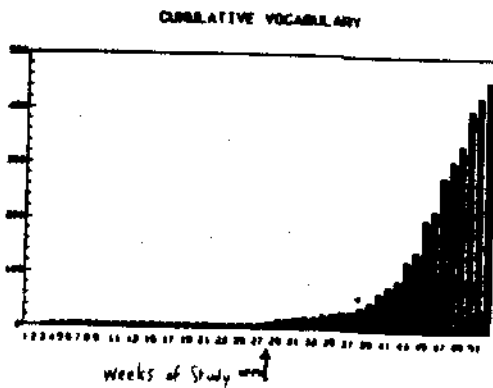
Type of Article	FN		CN		VT		V=CN(v)+I		Adj=Adj+I		Totals	
	types	tokens	types	tokens	types	tokens	types	tokens	types	tokens	types	tokens
Editorials	28	40	29	37							57	77
Head	42	64	53	101			4	5	2	2	99	170
Economic	19	42	111	227			5	5			136	275
Sports	29	45	189	315	2	2	5	5	4	4	229	371
Family	11	15	105	151			4	4	6	6	126	176
Totals	129	206	487	831	2	2	18	19	12	12	647	1067
Means	0.199	0.192	0.752	0.777	0.003	0.002	0.028	0.018	0.018	0.011		
Means without proper nouns			0.940	0.962	0.004	0.002	0.035	0.022	0.023	0.013		
Totals without proper nouns											518	863

Types:
 proper noun: .20 } .95
 common noun: .75
 verb: .031
 adjective: .18

4. C.C. are later in acquisition than O.C.

Content words < Function words (e.g., Brown, 1973; Gleitman & Wanner, 1982)

- Common nouns < Verbs (e.g., Gentner, 1982; Nelson, 1973)



Steven Gillis Case study of child learning Dutch

5. C.C. are later in second language learning than O.C.

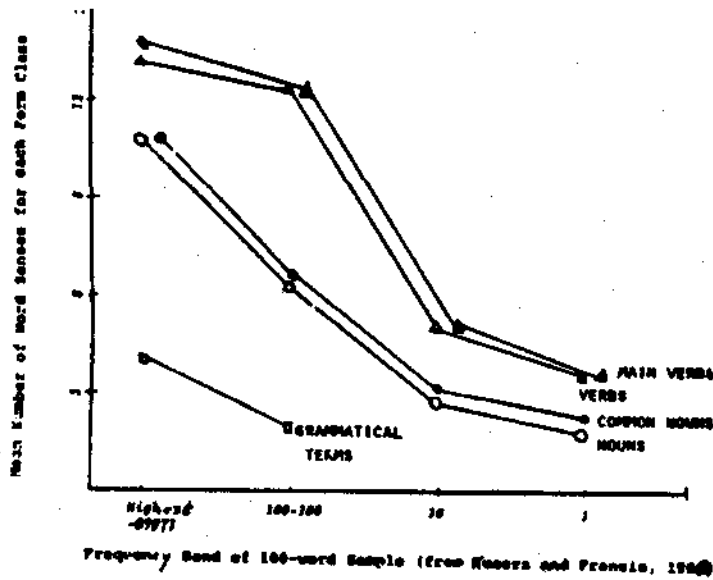
- But verbs are also later than nouns according to some reports (e.g., Deitrich, 1984; Yim, 1984).

Note that this cannot be accounted for purely conceptually.

If this second-language noun advantage is general, it will make a stronger case for linguistic difficulties in verb acquisition than the first-language pattern. For L1, at least part of the explanation could be that the concepts necessary for object-naming are simply acquired earlier than the concepts necessary for relational naming (e.g., Gopnik, Meltzoff, McCune-Nicolich, Tomasello, Farrar).

However, by L2, adults presumably have a rich set of relational concepts, so any noun advantage must be explained differently.

- 6. C.C. are more polysemous and context-sensitive than O.C.
- Verbs are more polysemous than nouns (Gentner, 1981)



- Verbs are more context-sensitive than nouns (Gentner & France, 1988)
Paraphrase task with semantically strained noun-verb pairs:
The lizard worshiped --> The small gray reptile stared unblinkingly at the sun.

- 7. C.C. are poor in memory relative to content words.
- But verbs are also more poorly recognized and recalled than nouns (Filenbaum's paradox).

III. Just as grammatical terms are more linguistically defined than content words, so verbs are more linguistically defined than nouns.

1. Linguistic Evidence.

e.g., Taimv's (1975, 1978) analyses of differences in semantic conflation patterns between motion verbs in English, Spanish (and other Latin languages, including French), and Atsugewi (and Navaho). (See also Lancker, 1987).

VERB INCLUDES (BESIDES MOTION)

English
most I.E.
Chinese manner/cause

Romance
Semitic
Polynesian path

most northern
Hokan figure

English: The bottle floated into the cave.
Spanish: La botella entro a la cueva, flotando.

English: The bottle floated past the rock.
Spanish: La botella paso por la piedra, flotando.

Atsugewi:
cwaqputicta = it-windily-dirted-aliquid =
"Some dirt blew into the creek."

2. Verb Deficits in Agrammatic Aphasia

Agrammatic language is characterized by syntactic deficits such as omission of grammatical markers, reduced phrase length, and restriction in range of syntactic constructions used (Goodglass, 1976; Caramazza & Berndt, 1985).

Agrammatics often have difficulty with verbs.

-- inappropriate verb morphology (predictable from general deficit);
but also

-- difficulty producing main verb of sentence (e.g., Marin, Saffran & Schwartz, 1976; Miceli, Silveri, Villa & Caramazza, 1984)

-- omission of main verb (e.g., Gleason, Goodglass, Obler, Green, Hyde & Weintraub, 1980; Miceli, Mazzuchi, Menn & Goodglass, 1983)

e.g., Miceli, Silveri, Villa & Caramazza (1984) gave an object and action naming test (70 pictured items each) to agrammatic aphasics, anomie aphasics and normals.

Result: The agrammatics were impaired at naming actions.

	OBJECT NAMING	ACTION NAMING
Agrammatic (n=5)	64.6	57
Anomic (n=5)	42.5	72.3
Normal (n=10)	91.5	95.8

Note: The patients were Italian so that noun/verb form class could be assigned with less ambiguity than in English.

Miceli et al note that "Current theories of agrammaticism do not provide a clear explanation for the co-occurrence of omission of grammatical markers and main verbs..."

They conclude:

- (1) Verbs are a distinct lexical category from nouns
- (2) Agrammatism implicates damage to two different mechanisms -- lexical (which accounts for omission of the main verb) and syntactic.

A conjecture: Perhaps lexical entries for verbs are more linguistic -- more closely allied with syntactic mechanisms -- than those for nouns.

IV. Conclusions

1. The open-class/closed class distinction is better thought of as a continuum

OPEN CLASS	-----			CLOSED CLASS
common nouns	verbs	prepositions	function words	

2. Verbs are more linguistically defined and embedded than nouns.

3. For acquisition

For nouns, the child can just attach object concepts to words.

But for verbs, children have to figure out how verbs work in their language: e.g., which semantic connotations obtain.

Thus again, object-names form the initial point of entry.

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