A Constructionist Approach to Language

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Basics of the Constructionist Approach

Constructions: learned form-function pairings at varying levels of complexity and abstraction.

Knowledge of language: an interrelated network of *constructions*.

Creativity stems from:

Generalizing instances to form more abstract constructions (with open slots)

Combining constructions

Constructions at varying levels of complexity and abstraction	
Word	e.g., *Germany, snow, banana*
Word (partially filled)	e.g., *pre-N*, V-*ing*
Idiom (filled)	e.g., *Going great guns, give the Devil his due*
Idiom (partially filled)	e.g., *Jog* <someone's> *memory, send* < someone> *to the cleaners* <someone's> *for the asking*
Idiom (partially filled) The Xer the Yer	(e.g., *The more you think about it, the less you understand*)
(unfilled) Ditransitive construction: Subj V Obj1 Obj2	(e.g., *He gave her a fish taco;* *He baked her a muffin.*)
Passive: Subj aux VPpp (PPby)	(e.g., *The armadillo was hit by a car*)

Assumptions of both generative and constructionist approaches:

- Language is a cognitive phenomenon
- A non-trivial learning theory is needed

Desiderata

--Psychological reality

Consistent with language acquisition

Consistent with language production and comprehension

--Descriptive adequacy: subtle facts about semantics and use of particular constructions need to be accounted for.

No distinction between "core" and "residue"

--Typological validity and explanation

Constructionist Approach is intended inclusively:

- Various flavors of CxG (sign-based, fluid, emergent, radical, cognitive)
- Various functional and cognitive grammars
- More recent HPSG

N**ull hypotheses** of constructionist approaches:

- There are no empty, null, silent syntactic elements of any kind
- There is no movement
- There are no innate domain-specific stipulations

The Lumper-Splitter dilemma

"Splitters see very small, highly differentiated units--their critics say that if they can tell two animals apart…they place them in different genera, and if they **cannot** tell them apart… they place them in different species.

Lumpers, on the other hand, see only large units--their critics say that if a carnivore is neither a dog nor a bear… they call it a cat."

(Simpson 1945)

Psychological reality

Usage-based model: we retain an impressive amount of item-specific knowledge including relative frequencies of usage, and we ***also*** categorize (generalize) the input we hear into patterns based on form and function (e.g., Langacker 1988; Barlow and Kemmer 2000; Tomasello 2003; Goldberg 2006).

Knowledge of items

Tens of thousands of words, idioms and compositional "prefabs" are learned (Pawley and Syder 1983; Jackendoff 2002; Dabrowska 2004)

Recall and recognition memory for verbatim language is above chance (Gurevich, Johnson and Goldberg, to appear)

idioms and "prefabs"

You've got to be kidding!	Double whammy
wear out <one's> welcome	Eat, drink and be merry
What's up?	Excuse <poss> French
What for?	Face the music
shoot the breeze	sooner or later
Are you all right?	What did you say?
Tell me what happened.	Can I come in?
I'm sorry to hear that.	Need any help?
It just goes to show	I see what you mean.
	Blithering idiot

Knowledge of input statistics

In language acquisition (e.g., Akhtar and Tomasello 1997; Baker 1979; Bannard & Matthews 2008; Bates and MacWhinney 1987; Bowerman 1982; Braine 1976; Gropen et al. 1989; Ingram and Thompson 1996; Lieven et al. 1997; Tomasello 2000, 2003; Wannacott, Newport and Tanenhaus 2007)

In adult language processing (Ford, Bresnan and Kaplan 1982; Jurafsky forthcoming; MacDonald, Pearlmutter and Seidenberg 1993; Garnsey et al. 1997; Trueswell et al. 1993; Pierrehumbert 2000; Losiewicz 1992; Baayan et al. 1997; Bod 1998; Bybee 2000; Gahl and Garnsey 2004; Booij 2002)

Speakers are faster and more accurate at repeating utterances that they hear with high frequency (when lexical frequency and length are controlled for).

(2 & 3 year olds: Bannard and Matthews, 2008, *Psych. Science;* adults: Bod 1998).

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Memory for details

Tens of thousands of words, idioms and compositional "prefabs" are learned (Pawley and Syder 1983; Jackendoff 2002; Dabrowska 2004)

Recall and recognition memory for verbatim language is above chance (Gurevich, Johnson and Goldberg, to appear)

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"Any linguistic pattern is recognized as a construction as long as some aspect of its form or function is not strictly predictable from its component parts or from other constructions recognized to exist.

…In addition, *patterns are stored even if they are fully predictable as long as they occur with sufficient frequency"* (Goldberg 2006: 5)

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How could we know that any item had "sufficient frequency" if some memory trace of it were not retained at least for some period of time upon a single exposure?

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Common wisdom holds that people *don't* remember the forms of utterances, they only the semantic "gist."

- "the original form of the sentence is stored only for the short time necessary for comprehension to occur" (Sachs 1967)
- "One of the most robust findings in psycholinguistics is that people cannot reliably recall sentence structures" (Loebell and Bock 2003)
- "Research on memory for verbal materials has demonstrated that sentences are quickly transformed into an underlying abstract meaning and that the original surface structure is lost" (Holtgraves, 2008:361).

Verbatim recognition of sentences *is* known to exist under certain conditions…

- If people *are told* they will be asked to recognize the formal properties of sentences (Johnson-Laird and Stevenson 1970; Reyna and Kiernan 1994)
- In "highly interactive" contexts (Keenan, MacWhinney, Mayhew 1977; Murphy & Shapiro 1994)
- If few sentences are given and recognition is tested immediately (Reyna and Kiernan 1994)

Constructionist approach: **items** generalization learning case-study typology

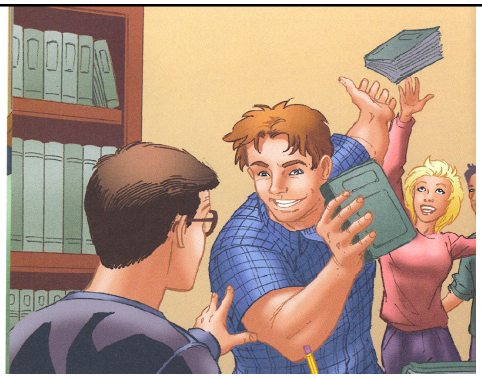
But do people retain implicit, or even explicit, verbatim memory in more naturalist contexts?

Constructionist approach: **items** generalization learning case-study typology

Verbatim Memory studies

- Undergrads hear one of two versions of a 300 word story. (between subjects).
- They are not warned that their memory will be tested.

(Gurevich, Johnson and Goldberg, to appear



#1: "I really liked school. But it wasn't always easy for me. I didn't always fit in."

#2: "School was interesting. But I had a hard time. Fitting in was the problem."

#1: "Some of the kids didn't like me."

#2: "At school, I wasn't liked by some of the kids."

Constructionist approach: **items** generalization learning case-study typology

RECOGNITION MEMORY

<picture>

It wasn't always easy for me.

Old or new?

<picture>

Fitting in was the problem.

Old or new?

(Gurevich, Johnson and Goldberg, to appear, study #1

Constructionist approach: **items** generalization learning case-study typology

RECOGNITION MEMORY

Results

72% correct ("yes" to matching and "no" to non-matching)

Chance rate: 50%

	Matching		Non-Matching
Probability of "yes"	.86 (hits)	⟷	.41 (false alarms)
Probability of "no"	.14 (misses)	⟷	.59 (correct rejections)

d'= 1.42 : t(23)=14.08, p< .01

(Gurevich, Johnson and Goldberg, to appear, study #1

Other studies demonstrate:

People spontaneously able to *recall* significant amount verbatim, even in fairly naturalistic context in which:

- Meaning and lexical effects are controlled for.
- Participants are not warned they will need to remember sentences
- They hear a relatively long story (300 words)
- The context is non- "interactive"
- Even after a week long delay.

(Gurevich, Johnson and Goldberg, to appear, studies #2-5)

- What of the older research?
- It turns out that whenever #'s were given, they hinted at the existence of verbatim memory (Sachs 1967; Jarvella 1973)
- Researchers' aim was to compare verbatim with gist memory.

Usage-based model:

We retain impressive amount of item-specific knowledge.

We ***also*** categorize (generalize) the input we hear into patterns based on form and function….

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Generalizations are necessarily made

Otherwise languages could be a collection of item-specific factoids:

Pat saw Chris.
Pat Chris kissed.
Hate Pat Chris.

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Argument structure CONSTRUCTIONS

Meaning	Form *Example*
X causes Y to receive Z	Subj, V, Obj, Obj2 *She faxed him something.* *She gave him something.*
X moves (to) Y	Subj, V, PP *She whooshed down the street.* *She went down the street.*
X causes Y to move Z	Subj V, Obj, PP *She sneezed the foam off the cappuccino.* *She put the ball in the box.*
X causes Y to become Z	Subj, V, Obj, RP *She kissed him unconscious.* *He made her crazy.*

Evidence of generalizations

Constructional ("structural") Priming (e.g., Bock 1986; Bock and Loebell 1990; Bock et al. 1992; Branigan e tal. 1995; Potter and Lombardi 1998; Hare and Goldberg 1999; Bock and Griffin 2000; Chang et al. 2000; Savage et al. 2003; Bencini and Valian to appear)

Fast mapping of a novel construction

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Structural priming facts:

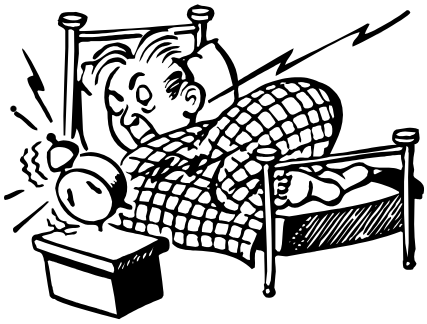
- Passives prime passives
- Ditransitives prime ditransitives
- Datives prime datives

(e.g., Bock 1986; 1991;1992)

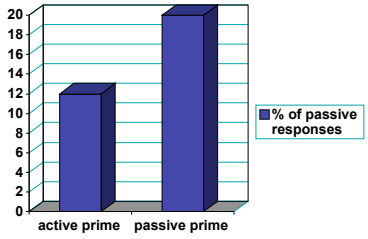
example

"The chess master was outsmarted by the computer"

Please repeat.



(Bock 1986)



Structural priming

Structural priming provides additional evidence that generalizations are formed.

It may also be an important factor underlying the fact that there *are* generalizations in languages:

It is easier to produce the same or similar patterns (in linguistic and non-linguistic domains)

Evidence of generalizations

Constructional ("structural") Priming

Fast Mapping of a novel construction

Is it possible to *generalize* new constructions without explicit training or feedback?

Learning a novel construction:

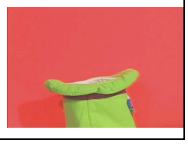
- Experiments designed to test whether a novel construction can be generalized without explicit instruction.

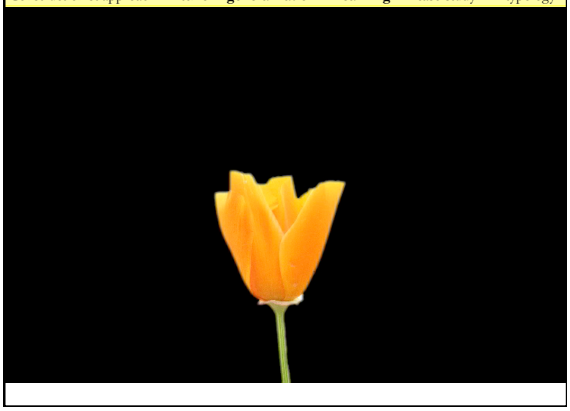
(Goldberg, Casenhiser and Sethuraman 2004; Casenhiser and Goldberg 2005; Goldberg, Casenhiser and White 2007, Boyd and Goldberg, to appear)

- Form: Subj Obj V-o
- Meaning: theme APPEARS in location

Example:

- "The frog the hat moopo-ed."
- Video: the frog appears in the hat.





EXPOSURE CONDITION**:** witnessed 16 instances of novel construction with 5 novel verbs (4-4-4-2-2)

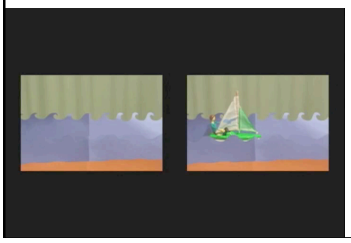
CONTROL CONDITION**:** watched same 16 video clips without sound

Test: forced choice

- Determine which scene a sentence corresponds to:

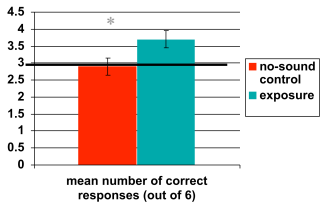
Scene #1: scene of appearance

Scene #2: matched foil scene



– Novel instances of the new construction
  - (involve NEW novel verbs; NEW scenes)

Comparison of two conditions (mean age 6;4, n=34)
(Casenhiser & Goldberg 2005, *Dev. Sci.*)



Children were able to generalize novel construction after 3 minutes of exposure

SKEWED FREQUENCY EXPOSURE **condition**: 8-2-2-2-2
(BALANCED) EXPOSURE **condition**: 4-4-4-2-2
CONTROL: watched video without sound

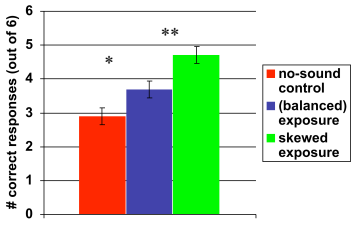
Controlled for overall token/type frequency:
Total # of scenes: 16
Type frequency (number of novel verbs): 5

All three conditions watched exactly the same video

One verb often does account for the lion's share of tokens

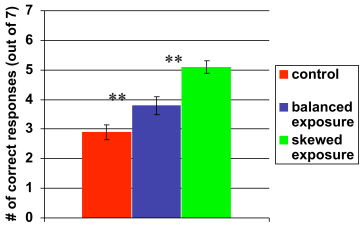
Construction	Corpus data	Total # of verb types
Subj V Oblique	39% *go* (136/353) (Bates et al. 1988 corpus)	39 verbs
Subj V Obj Obj2	44% *give* (226/517) (Bresnan and Nikitina 2007)	> 13 verbs
Subj V Scomp	40% *think* (Kidd et al. to appear)	8 verbs
Subj V [poss way] PP	40% *make* (Goldberg 1996)	>50 verbs

Results for all three conditions
(mean age 6;4, n=51)



The existence of a single high frequency exemplar facilitates the learning of the novel construction

Similar results for adults (n = 81)
(Goldberg, Casenhiser and Sethuraman 2004, *Cog. Ling.)*



- Comparison with kids

Additional learning studies

- Parallel learning in non-linguistic domains
- Additional controls (with objects named)
- Inclusion of other constructions at test
- Production tasks
- Varying type and token frequencies
- Younger subjects

(Goldberg, Casenhiser & White 2007; Boyd, Gottschalk & Goldberg to appear; Boyd and Goldberg to appear)

Evidence of generalizations

Constructional ("structural") Priming

Fast mapping of a novel construction

Usage-based model:

We retain impressive amount of item-specific knowledge.

We ***also*** categorize (generalize) the input we hear into patterns based on form and function:

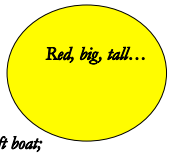
--We can do so quickly

--Priming is evidence of generalizations, and also provides motivation for generalizations.

A case study

Adjectives

In English: pre-nominal



?the adrift boat;

?the awake man

Evidence for judgments….

??the/an **asleep** child
??the/an **afloat** ship
??the/an **alive** monster
??the/an **abashed** child
??the/an **ablaze** building
??the/an **afraid** child

Google hits

	attributive	predicative	
	e.g."the/an asleep child"	e.g. "child was asleep"	Total
asleep-- child	1%	99%	11,041
afloat-- ship	.01%	99.99%	1580
alive -- monster	.01%	99.99%	3400
aghast-- audience	16%	84%	1043
abashed --child	3%	97%	306
ablaze-- building	.01%	99.99%	4179
afraid-- child	.01%	99.99%	79.6K
Average:	**3%**	**97%**	

Constructionist approach: items generalization learning **case-study** typology

Is the generalization a general semantic dispreference?

Stable properties: prenominal (*the shy child*)

Temporary properties: predicative (*the child was shy*)

(cf. Bolinger 1967; Givon 1984; Thompson 1988; Saylor 2000)

a-adjectives tend to be temporary: *asleep, afloat, abashed, ablaze, afraid… alive*

Constructionist approach: items generalization learning **case-study** typology

Is the generalization a general semantic dispreference?

Compare a-adjectives to near synonyms

Constructionist approach: items generalization learning **case-study** typology

the/a **sleepy** child
the/a **floating** ship
the/a **living** monster
the/a **shocked** audience
the/an **embarrassed** child
the/ a **flaming** building
the/a **scared** child

Constructionist approach: items generalization learning **case-study** typology

Google hits	attributive	predicative	
	"the/a sleepy child"	"child was sleepy"	Total
sleepy-- child	58%	42%	3960
floating-- ship	25%	75%	10,330
living-- monster	60%	40%	5400
shocked –audience	80%	20%	4120
embarrassed --child	10%	90%	5824
flaming-- building	99.9%	.01%	3533
scared --child	36%	64%	45,527
average:	53%	47%	

The distribution between **a-adjectives** and **semantically similar** non-a -adjectives is significantly different: $\chi 2(1\ N= 179,843) =48801$, $p < .00001$

Constructionist approach: items generalization learning **case-study** typology

Is the distribution simply a phonological dispreference ?

[unstressed unstressed-stressed stressed]
the/an a-FRAID man

the/a ma-LIGNED man

Constructionist approach: items generalization learning **case-study** typology

	"the/an extinct animal"	"animal was extinct"	Total
extinct-- animal	93.7%	6.3%	17450
maligned --man	96.2%	3.8%	184
inane-- comment	95%	5%	6162
impaled– person	96.7%	3.3%	209
upset --child	13.5%	86.5%	36869
immense-- building	57.7%	42.3%	1270
petite-- person	89.5%	10.5%	83200
average:	**77%**	**23%**	

The distribution between **a-adjectives** and **phonologically similar** non-a-adjectives is significantly different. $\chi 2\ 2(1\ N=153,524) = 121,015$, $p < .00001$.

The pattern is not due to some general rule-like generalization.

Explanation for the distribution:

Historical "persistence":

	Old English
asleep	< *in sleep*
abloom	< *in bloom*
adrift	< *on drift*
afloat	< *on float*
ablaze	< *on blaze*

As PPs, **the on sleep child*

Synchronically: Requires usage-based model:
speakers are aware of which adjectives they've heard in which constructions.

Assume a-adjectives are synchronically "underlyingly" prepositional phrases?

Lack of separation by modification and lack of conjunction would not be explained:

*The man was a extreme fraid.

*The man was a 'fraid and 'sleep.

Assume a-adjectives are synchronically "underlyingly" prepositional phrases?

The man under the bed had escaped the police. (postnominal PP)

*The man asleep had escaped the police. (postnominal a-adjective)
The man, asleep on the floor, had escaped the police.

*The man short had escaped the police. (postnominal (non a-) adjective)
The man, short even with his boots on, had escaped the police.

Assume a-adjectives are synchronically "underlyingly" prepositional phrases?

Also, how would learners *know* that these adjectives and only these adjectives are underlyingly prepositional phrases?

--> Learners would have to notice that these adjectives and only these adjectives appear predicatively. (**this is exactly what we want to explain**)

Constructionist (usage-based) view

- Learners record statistics about particular items' distribution.
- Constructional generalizations emerge from learners categorizing over the input.

afraid <> "on fraid"

Instead *afraid* < p. ppl of *affray (v.): "to startle"*

Speakers have assimilated *afraid* to category of a-adjectives.

Circumscribing the pattern even more narrowly:

Not all a-adjectives resist prenominal use:

the absurd comment

Exceptions to the exceptions

	attributive	predicative	
	e.g."the/an absurd comment"	e.g. "comment was absurd"	Total
absurd--comment	93.5%	6.5%	4863
astute--man	94%	6%	6248
adult--tree	93.4%	6.6%	17,540
acute—situation	91.7%	9.3%	38030
aloof—man	82.9%	17.1%	887

Segmentability: a + root: Resist prenominal use

Afloat: a + float; cf. *float*
Alive: a+ live; cf. *live*
Ablaze: a + blaze; cf. *blaze*
Afraid: a+ fraid; cf. *frighten, fraidy-cat*

Non-segmentable as a + root: unrestricted

Absurd ≠ a + bsurd
Astute≠ a + stute
Acute ≠ a + cute
Adult ≠ a + dult

Exceptions to the exceptions

Segmentability: a + root: Resist prenominal use

Non-segmentable as a + root: unrestricted

Historical facts motivate the generalization that a-adjectives should be segmentable as a + root.

A-adjectives

Input statistics from the days when a-adjectives were PPs have been perpetuated.

Synchronically, speakers form a category of a-adjectives on the basis of phonology and morpho-syntax and assimilate new members to this category.

usage-based model: we record a great deal of item-specific information and we generalize (intelligently) over it.

A-adjectives

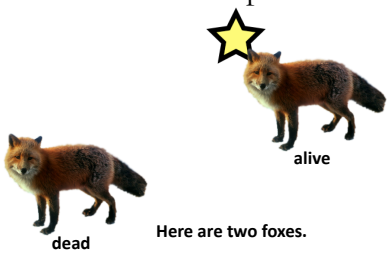
Can we see the process of generalization at work?

A-adjective experiment
(Goldberg and Boyd, forthcoming)

- Undergraduate native speakers of English (n = 32)
- Production task

An example trial

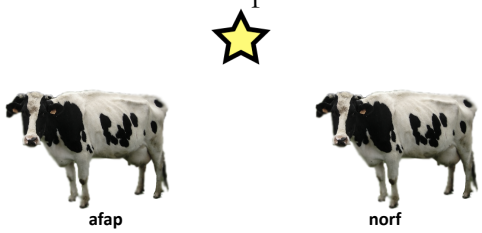
An example trial



Which fox moved to the star?

Participants were asked to be clear about which one of two animals moved, and to produce sentences that sounded natural.

An example trial



Here are two cows.

Which cow moved to the star?

24 target items

REAL:

a-adjs: *ablaze, afloat, afraid, aghast, alive, asleep*

non-a-adjs: *flaming, floating, frightened, shocked, living, sleepy*

NONSENSE:

a-adjs: *ablim, adax, afap, agreep, alaz, aspril*

non-a-adjs: *breem, chammy, flitzy, gecky, slooky, veeby*

24 counterbalanced fillers:

Prototypical adjectives: likely to elicit prenominal use: *the bad dog*

bad, good, smart, dumb, fast, slow, old, young, rich, poor, strong, weak

Present tense verbs: likely to elicit predicative use: the dog that bites

bites, camps, cooks, cries, gambles, reads, runs, smokes, snowboards, travels, votes, writes

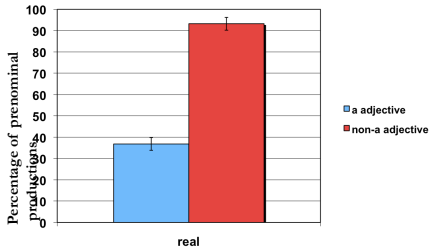
Fillers elicited the intended structure 99% of the time.

Manipulations

- **Phonology**: whether the adjective used was an A-adjective or not.
- **Adjective status**: whether the adjective used was real or nonce (e.g., *asleep* v. *afap*).

- **Dependent variable: P(prenominal)**

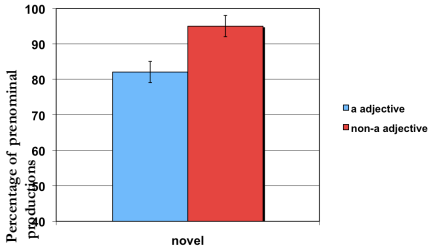
Results (Goldberg and Boyd, forthoming)



F(1, 31) = 98.82, p < .0001 (36.85% .v 93.23%)

Speakers do in fact avoid using real a-adjs (*afraid, asleep*) prenominally

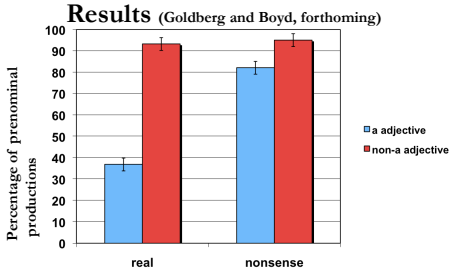
Results (Goldberg and Boyd, forthoming)



F(1, 31) = 10.57, p = .0028, (82.10% v. 95.05%).

Speakers also avoid using nonsense a-adjs (*ablim, afek*) prenominally

Results (Goldberg and Boyd, forthoming)



Restriction on real adjectives is stronger than restriction on nonse adjectives.

Main effect: A-adjectives are less preferred in attributive position than non-A adjectives (59.47% v. 94.14%). *F*(1, 31) = 69.42, *p* < .0001. Interaction of phonology and real vs nonsense, F(1, 31) = 70.25, p < .0001.

Learning the restriction

- *??the afraid man*
- How do kids learn to avoid using a-adjectives prenominally?

No negative evidence

?? "Don't say *the afraid man*, please say *the man is afraid*."

Me loves you, Mommy.

I have just completed a colorful mural on my bedroom wall with indelible markers.

Statistical Preemption

If a child expects,
the afraid man

But hears
the man who was afraid

(Goldberg 1993, 1995, 2006, Brooks and Tomasello 1999)

Statistical Preemption

**goed (went)*
**childs (children)*

Why was the effect attenuated with novel adjectives?

Hypothesis:

Unclear whether novel adjectives should be viewed as segmentable or not, since they were not assigned meaning.

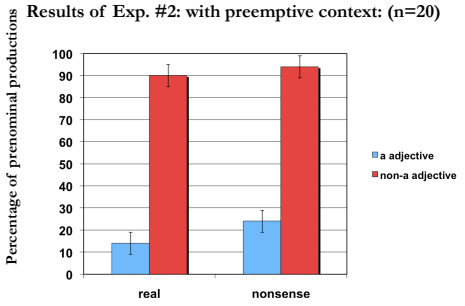
Novel adjs. weren't preempted by predicative use

New study:
introduce preemptive context for novel a-adjectives

Design

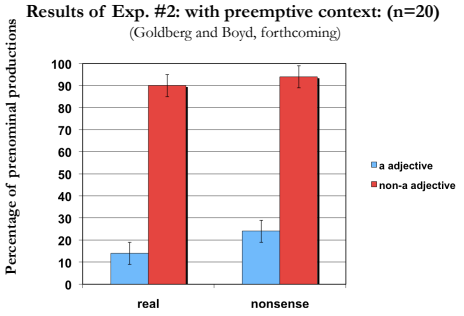
- Exposure Block
  - 6 "practice trials": participants witness 2 novel *a*-adjectives in preemptive context (relative clause)
- Test Block (as before):
  - 16 critical trials interleaved with 16 filler trials.
    - 2 novel a-adjectives were seen during exposure, 2 new novel adjectives.
  - To encourage response variability, fillers were strongly biased towards either an attributive or RC response.

Results of Exp. #2: with preemptive context: (n=20)



No difference between real a-adjectives (14%) and novel (24%), t(19) = 1.25, p = .23.

Results of Exp. #2: with preemptive context: (n=20)
(Goldberg and Boyd, forthcoming)



No difference between novel a-adjectives seen during exposure (20%) and those that weren't (27.5%), t(19) = -1, p = .33.

Experiment 3: pseudo-preemptive context

Are people smart enough to know when a context is truly preemptive?

Exposure to pseudo-preemptive context:

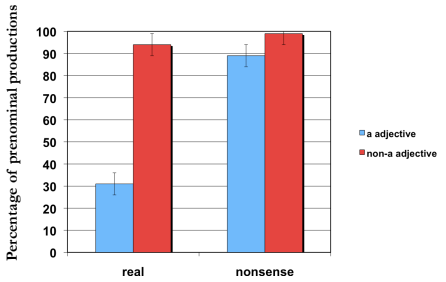
The fox that's adax and proud of itself…

Notice that prenominal attributive construction is unavailable:

**The proud of itself fox…*

**The afek and proud of itself fox….*

Results of Exp. #3: with pseudo-preemptive context: (n=20)



Subjects rationally ignore pseudo-preemptive context

(e.g., *The fox that was ablim and proud of itself..*)

Summary

We retain a surprising amount of item-based information

Some generalizations about language are due to historical persistence (and lack synchronic motivation).

We also (intelligently) generalize over item-specific facts
afraid & novel a-adjs

We can learn what *not* to say via statistical preemption (rationally ignoring pseudo-preemptive contexts)

Typological validity and explanation

Cross-linguistic universals are only revealed by typological research, using systematic language samples (cf. Greenberg, Comrie, Croft, Haspelmath, Dryer, Van der Auwera, etc.).

Pitfalls of considering few languages
(cf. Comrie 1981; 1984; Mithun 1999; Pierrehumbert 2000; Newmeyer 2005; Croft 2001, 2005; Dryer 1992; Everett 2004; Evans and Levinson 2009)

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The nature of Nature:
Accounting for typological generalizations

- Universal Grammar Hypothesis: we bring to the task of language learning, *domain-specific* knowledge
- Constructionist Hypothesis: we learn language on the basis of independently needed cognitive and social abilities. Generalizations therefore result from:

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The nature of Nature:
Accounting for typological generalizations

- Universal Grammar Hypothesis: we bring to the task of language learning, *domain-specific* knowledge
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  - The functions of the constructions involved
  - Attentional constraints and biases
  - General pragmatic or social principles

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Proposed universals related to
ARGUMENT STRUCTURE

--"linking generalizations"
--# of arguments = # of complements (cf. theta criterion)

Proposed Cross-Linguistic Universals

E.g., Dowty (1991):

- **if** there's a subject and an object, and
- **if** there's an ACTOR and an UNDERGOER then
  - ACTOR -> subject;
  - UNDERGOER -> object,

except when they're linked the **opposite way,** in certain (syntactically ergative) languages.

- Dowty: relatively weak claim
- Oversimplified account of ergativity
  - Yidiny is syntactically ergative with nominals; syntactically accusative with pronouns (Dixon 1979)
- Also, what counts as "subject" "object" differs cross-linguistically (Keenan 1976; Fried 1993; Morris 1997; Croft 2001; Barðdal 2005)

Reformulation of Dowty's generalization:

Actors and undergoers tend to be expressed in prominent slots

Reformulation of Dowty's generalization:

Actors and undergoers tend to be expressed in prominent slots

Prominent slots may be:
obligatory
lack case marking
indicated by verb agreement

Actors are salient

--Visual attention tends to be centered on the actor in an event (Robertson and Suci, 1980; Leslie 1982; 1984).

--Agent bias (*chase* vs *flee*) (Fisher *et al.* 1994)

--9 month olds: attribute intentional behavior to even inanimate objects (Csibra *et al.* 1999)

--16 month olds: distinguish intentional vs accidental actions (Carpenter *et al.*1998).

Undergoers are salient

--Easier to discriminate between events that have distinct endpoints than distinct onsets (Regier and Zheng 2003)

-- 6 month olds attend more to changes of state than to changes of motion without corresponding state-change (Woodward 1998; 1999)

--subjects use a wider range of more specific verbs to describe endpoint-focused actions than onset-focused actions (Landau, 2003).

--Eng and Fr speakers are more likely to mention goal-directed paths of motion than atelic paths when describing video clips (Pourcel, 2004).

Reformulation of Dowty's generalization:

Actors and undergoers tend to be expressed in prominent slots

****

Tendency is explained by the fact that we **attend** to actors and undergoers.

Particular constructions allow for exceptions (e.g., passive)

Another generalization:

# of arguments expressed
=
# of semantic arguments

The isomorphic mapping principle

(Lidz et al. 2003)

Examples of general tendency in English

# of arguments expressed = # of semantic arguments

Meaning	Form
X moves (to) Y	Subj V PP X Y
X causes Y to move Z	Subj V Obj PP X Y Z
X causes Y to become Z	Subj V Obj RP X Y Z
X causes Y to receive Z	Subj V Obj Obj2 X Y Z

ENGLISH (intrans)	**ÉWÉ** (transitive)
– run	fu_V "$course_{NP}$"
– swim	fu_V "$water_{NP}$"
– blow	$blow_V$ "air_{NP}"

Essegbey 1999, to appear

Lao (Ameka to appear): At most two arguments per verb.

Do we need a generalization that is *specific to language*?

- Grice (1975): Maxim of Quantity: Say as much, and only as much, as is needed for the communicative goal.

: Pragmatic assumption in all kinds of linguistic and non-linguistic communicative acts.

(cf. also Paul 1889; Zipf 1935; Horn 1984; Levinson 2001)

Pragmatic Mapping Generalizations

(Goldberg, 2004, *Cognition*)

A) The arguments that are expressed are interpreted to be ***relevant*** to the message being conveyed.

C) Any semantic arguments in the event being conveyed that are ***relevant*** and ***non-recoverable*** from context ***must be overtly indicated.***

…Pragmatic generalization

- Expressed --> Relevant
- Relevant & Non-recoverable --> Identifiable

Pragmatic generalizations say nothing about arguments that are recoverable or irrelevant.

In fact, languages and constructions within languages treat these arguments variably…

Recoverable arguments are commonly omitted cross-linguistically

Chinese

A: gei3
give
" [I] give [you] [some peach]" (Mok and Bryant 2006)

Korean, Japanese, Thai, Hindi, Hungarian, Kannada, Laos…

Argument Omission is not just a simple parameter:
Languages often have special constructions that violate the language's overall tendency

Thai:
Recoverable arguments are generally omissable.

Yet speakers often use proper name NPs (nicknames) to refer to self when talking to intimates

Speaker Mai (Ratitumkul 2007):
Mai waa Mai tham _ ʔa ʔa-rɔy kwaa raan ʔiik na
Mai think Mai make _ Part. delicious more restaurant more Part.
Mai[speaker] thinks Mai[speaker] made (it) better than the restaurant.

English: arguments are not generally omissible, and yet we do have special constructions:

	# arguments expressed	**# semantic arguments**
Short Passives (e.g., *Pat was killed*)	**1**	**2**: (Pat, Pat's killer)
The deprofiled object construction (e.g., *The tiger killed again)* (Goldberg 2001)	**1**	**2**: (the tiger, the tiger's prey)

So Isomorphic Mapping principle does not hold, but Pragmatic Mapping generalizations do.

The Constructionist Approach

Usage-based model: we retain a great deal of item-specific knowledge while generalizing over it.

Generalizations are learnable: e.g., categorization, statistical preemption

A-adjectives: case study

Typologically valid generalizations addressed by
- The functions of the constructions involved
- Attentional constraints and biases
- General pragmatic and social principles

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