1. Introduction

"Hey man, bust me some fries."
"Can we vulture your table?"
"I IM'ed him to go ahead."
"what a bodacious thing to say"

Table 1.1: Novel linguistic exemplars that demonstrate the productivity of various constructions (examples from Google).

<table>
<thead>
<tr>
<th>Expression</th>
<th>Construction Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>??She explained him the story</td>
<td>Double-object construction</td>
</tr>
<tr>
<td>(cf. She told/guaranteed him the story.)</td>
<td></td>
</tr>
<tr>
<td>??He vanished the rabbit.</td>
<td>Transitive causative construction</td>
</tr>
<tr>
<td>(cf. He hid the rabbit.)</td>
<td></td>
</tr>
<tr>
<td>??She considered to go</td>
<td>To-infinitival complement construction</td>
</tr>
<tr>
<td>(cf. She hoped/planned to go.)</td>
<td></td>
</tr>
<tr>
<td>??The asleep boy</td>
<td>Attributive modification construction</td>
</tr>
<tr>
<td>(cf. The astute/sleepy boy)</td>
<td></td>
</tr>
</tbody>
</table>

Table 1.2: Novel formulations that are judged odd by native speakers.

A) Speakers balance the need to be Expressive and Efficient while obeying the Normative conventions of their speech community.
B) Our Memory is vast; new information is related to old information. Representations are partially abstract (lossy).
C) Lossy memories are aligned when they share relevant aspects of form and function, resulting in emergent clusters of representations: Constructions
D) Multiple constructions are activated to the degree that they are suitable to express the intended message, and Compete with one another for expression.
E) Mismatches between what is expected and what is witnessed fine-tune our network of learned constructions via Error-driven learning.

Table 1.3 The CENCE ME Principles

2. Word Meanings

2.1. Words evoke semantically rich, structured, partially abstracted senses

<table>
<thead>
<tr>
<th>Word</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banish</td>
<td>Dismiss</td>
</tr>
<tr>
<td>Blackball</td>
<td>Fire</td>
</tr>
<tr>
<td>Blacklist</td>
<td>Expel</td>
</tr>
<tr>
<td>Cast out</td>
<td>Exile</td>
</tr>
<tr>
<td>Deport</td>
<td>Extradite</td>
</tr>
</tbody>
</table>

2.2. Implicit memory for how words are used is vast
(e.g., faster to identify a word repetition by same speaker: Palmeri, Goldinger & Pisoni 1993)

2.3. We regularly employ old words for new uses: common words evoke a cluster of conventional, related senses (bandwidth, lit, friend, optics, spam, literally).
2.4. Creativity: New representations are added

![Figure 2.1](image1.png)

**Figure 2.1:** A: Structured, distributed representation of a single memory trace of a word occurrence; B: Strengthened representation of a word sense as aspects are repeated over time (represented by darker nodes); C: Representation of sense as it continues to be strengthened over experience.

![Figure 2.2](image2.png)

**Figure 2.2:** Symbolic (A) and abstract, structured, distributed (B) representation the senses

2.5. Competition: Word meanings are constrained by competition from other words

2.6. Speakers learn to avoid overgeneralizations by learning and gaining fluency with more appropriate labels for the intended meanings

2.7. Summary

3: Constructions as invitations to form categories

3.1. The semantics of English argument structure constructions

3.1.1 Experimental evidence:
3.1.2 Relationships among argument structure constructions

Figure 3.1: Argument structure constructions are part of a network of constructions.

3.1.3 Semantic compatibility between verb and construction is gradient

3.2. Syntax: abstraction through structural alignment

3.3. Phonology

Figure 3.1: Proportional use of the double-object and prepositional paraphrase for a subset of Latinate and Germanic (sounding) verbs in the COCA corpus.

3.4. Information Structure

3.5. Variation across dialects of English

3.6. Variation across languages

3.7. Summary

4: Creativity: coverage is key

4.1. We retain memory traces of which verbs are used with which constructions

4.2. Why noun phrases are typically less finicky than predicates

(If he can do it, you and I can do it, too.)

4.3. Entrenchment: more familiar formulations are more preferred

4.4. Creativity: productive uses of argument structure constructions

4.5. Coverage: clustering of partially abstract exemplars in high dimensional conceptual space

4.6. Constructions can be combined (recursively), but most be compatible

4.7. Modeling COVERAGE

4.8. Summary
5. Competition in context: statistical preemption
5.1 Statistical Preemption as Probability of witnessing competing constructions

5.2. Recasts
5.3. Confidence
5.4. What coverage adds
5.5 Summary

6. Age effects
Children have been known to put diapers on their heads and marbles in their mouths, but in other ways they are less than fully creative. Imagine a young child brought to an elaborate carnival that boasts a dizzying array of games, newly rearranged each day. Dauntingly, the rules for each game vary from booth to booth, and no one is able to instruct the child as to how to play. Instead, adults and older children are busy playing the games themselves, skipping from booth to booth; their reactions convey a deep involvement, as they often stare fixedly, weep openly, or laugh heartily.

Young children would no doubt be intrigued and would want to play these games themselves. Some understanding of the carnival would come quickly; an impression of the sights and sounds, tacit knowledge of the physical layout of the most colorful booths or knowledge of which ones had the longest lines. But only slowly would most children be able to venture out and toss their first ring. Most likely, young children would initially stand close to others, trying to comprehend their intents and imitate their strategies. Learning to anticipate the rules of each game would require watching and listening, and children may initially misunderstand certain games, especially when the rules are complex or subtle. Children may not recognize that they need to stand behind the yellow line, they may misunderstand how the prizes are awarded, and they may toss the rings without great coordination. But over time, children would learn to play the games effectively and efficiently the way others do.

Language is not a carnival, but it does involve a dizzying array of conventional language games or constructions, each with its own quirks of form and function (Austin, 1962; Wittgenstein, 1953). To have adult-like competence in a language is to know how to use each word and each grammatical construction, producing and comprehending new combinations in contextually appropriate ways without conscious effort. By the age of three, children are typically able to converse about tickling, hugs, and cotton candy.

To push the carnival analogy a bit further, when we as adults visit a carnival in a new place, some things are familiar and others are quite new. Someone from New Jersey who pops
balloons with darts like an expert may struggle if the darts are a different size and weight at a carnival in New Orleans. An American would recognize a Ferris wheel at a carnival in France, but might not appreciate that there is mayonnaise atop the fries. A French person visiting the US may fail to notice the age restrictions on drinking or the weight restrictions on some rides. That is, prior knowledge affects our observations and our ability to adapt to new ways of doing things.

A child’s ultimate goal is to learn how formal patterns are paired with functions, as linking forms to functions is required for understanding others and linking meanings or functions to forms is required for speaking. Thus, a child must learn the constructions of their language. In this chapter, we focus on aspects of how learners’ age and differences in prior experience impacts language learning, offering an account of certain apparent contradictions in the literature, by situating the findings within the CENCE ME approach to language developed here.

6.1. Children are conservative when they fail to align similar exemplars.

Novel constructions: amount of input is controlled, and still, children show more conservative behavior than adults (e.g., Boyd & Goldberg 2009; Potter 2017; Schwab et al. to appear).

6.2. Children generalize when they fail to predict distinctions. They simplify:
Singleton & Newport, 2004; Hudson Kam & Newport, 2005; Hudson Kam & Newport, 2009

6.3. Early “structure mapping”; scaffolding
(Goldberg 2006: 60): Aliza:
- Up and down the neigh. (20 months) (“raise and lower the horse”).
- Come Abbi (20 months) (“make Abbi come”)
- You jump me to the sky. (25 months) (“help me jump to the sky”)

6.4. Why adult (L2) learners struggle to overcome overgeneralizations

6.4.1 Proficiency in L1 subtly warps the conceptual space that includes linguistic representations, making certain distinctions or similarities less usable in an automatic way (e.g., Korean, plural marking is only required in definite contexts, and Korean learners of English are faster to read and more accurate at judging English plural marking on definite nouns than indefinite nouns: Choi & Ionin 2017).

6.4.2. L2 learners make less use of statistical preemption due to a reduced ability to predict grammatical forms.

6.5. Summary:
1) When learners fail to identify or make use of relevant SIMILARITIES among exemplars, they fail to generalize (so they behave conservatively)
2) When learners fail to identify or make use of relevant DISTINCTIONS among exemplars, they (over)simplify (leading them to overgeneralize).
3) Statistical preemption facilitates the identification of relevant dimensions.
4) Adult (L2) learners have more difficulty recovering from explain-me-this errors than children because:
   a. L2 learners receive input that is less well suited to learning
b. L2 learners situate their L2 linguistic representations in the same hyper-dimensional conceptual space which has been somewhat warped by L1 linguistic representations.

c. L2 learners are less sensitive to statistical preemption, due to a reduced ability to generate predictions.

7. **The roads not taken**
    7.1. Is compatibility between verb and construction enough?
    7.2. Is positing invisible features or underlying structure explanatory?
    7.3. Do we only use formulations we have witnessed (conservatism via (negative) ENTRENCHMENT)?
    7.3. Is positing a “TOLERANCE PRINCIPLE” explanatory (Yang 2016)?
    7.4. *Hapax legomenon* is a symptom not an explanation
    7.5. A critique of preemption (“blocking”) by Embick & Marantz (2008)
    7.6. Do children witness enough data?
    7.7. Summary

8. **Where we are and what lies ahead**
Humans make use of language in creative, but constrained ways to an extent that goes far beyond anything found in the rest of the animal kingdom. As language allows an explicit record, it offers us a rare window into our even more general, creative but constrained system of general purpose knowledge, which allows us to teach and learn, dream and imagine, and reflect and reason in ways that are uniquely human.

**Acknowledgements** + lots o’ references.