Child language acquisition: some basics

- All normally developing children learn the language(s) that they are exposed to at home.
- Language is acquired quickly and seemingly effortlessly by young children.
- Young children do not have to be “taught” phonetics and grammar rules in order to learn to speak or sign.
- In contrast, teens and adults learning a foreign language usually need explicit teaching and studying, and benefit from corrective feedback.
Child language acquisition: some basics

There are several factors that make language acquisition possible:

1. Language input
2. Explicit feedback / correction by adults
3. General cognitive and social development
4. Innate linguistic abilities (the nature of these is debated, as we shall see!)

Of these (2) is probably the least important.

- Correcting young children’s pronunciation and grammar makes little to no difference in their development.
- Feedback can be more useful for word learning and pragmatics.
Methods of studying child language

Parental diaries – notes taken by parents observing their own children’s language development

Observational studies – audio or video tapes of children’s natural interactions taken in multiple sessions
  ◦ usually a few children are studied over a long period of time
  ◦ language is transcribed and coded for various linguistic features
  ◦ Multiple observational studies are compiled into a large database called CHILDES for quantitative analysis
Methods of studying child language

Experimental studies – a larger number of children perform a specific task in which production or comprehension of language is tested

- High-amplitude sucking paradigm; looking-time paradigm
- Elicited production tasks (e.g. novel word-learning)
- Yes-no judgment tasks
- Act-out tasks

Video: some experimental paradigms used in recent research at Macquarie University

https://www.youtube.com/watch?v=yIBQgkHnFA  (4:19)
Stages of language development: words

There is a mismatch between production and perception in nearly all aspects of language development: a child’s language production abilities tend to lag behind their abilities to understand linguistic distinctions.

### Word production

<table>
<thead>
<tr>
<th>Age</th>
<th>Avg. number of words</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 months</td>
<td>3</td>
</tr>
<tr>
<td>15 months</td>
<td>14</td>
</tr>
<tr>
<td>18 months</td>
<td>68</td>
</tr>
<tr>
<td>23 months</td>
<td>200</td>
</tr>
</tbody>
</table>

### Word comprehension

<table>
<thead>
<tr>
<th>Age</th>
<th>Avg. number of words</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 months</td>
<td>50</td>
</tr>
<tr>
<td>15 months</td>
<td>120</td>
</tr>
<tr>
<td>18 months</td>
<td>200</td>
</tr>
</tbody>
</table>

Between 16 and 24 months, there is typically a spurt of vocabulary growth. By age 6, kids know about 14,000 words.
Stages of language development: words

Development of different types of words

8-13 months

The very earliest words tend to refer to social routines (hi, bye, uh oh), names for favorite people (mommy, daddy), and sound effects (moo, meow).

13-24 months

Most words learned during this time denote people and things (dog, cat, potty, car, bottle, book, apple). Children generally assume that words refer to the whole object.

Words for actions (go, eat, run) and properties (all-gone, hot, dirty) also begin to be learned, but words for things (nouns) are much more common.

24-36 months

Children continue to learn more words for things, actions, and properties. The proportion of action and property words increases.

Grammatical function words start to be acquired (a, the, some, not, so, but, will, be).
Errors in word meaning

**Overextension** – using a word to refer to a more general idea or a wider range of referents than in the adult usage of the word (examples from Barrett 1995)

<table>
<thead>
<tr>
<th>Word</th>
<th>Referents</th>
</tr>
</thead>
<tbody>
<tr>
<td>dog</td>
<td>dogs, lambs, cats, wolves, cows</td>
</tr>
<tr>
<td>tick-tock</td>
<td>clocks, watches, wallpaper circles, a circular roadsign, a barometer with a circular dial,</td>
</tr>
<tr>
<td>kick</td>
<td>kicking a ball, fluttering of a moth, bumping a ball with a kiddicar, pushing own stomach against a mirror, pushing own chest against a sink</td>
</tr>
<tr>
<td>ball</td>
<td>balls, oranges, pumpkins, peas, round beads, pompoms, polka dots, spherical earrings</td>
</tr>
<tr>
<td>fly</td>
<td>fly, specks of dirt, all small insects, child’s own toes, crumbs of bread</td>
</tr>
</tbody>
</table>
Errors in word meaning

**Underextension** – using a word to refer to a more specific idea or a narrower range of referents than in the adult usage

<table>
<thead>
<tr>
<th>Word</th>
<th>Referents</th>
</tr>
</thead>
<tbody>
<tr>
<td>bottle</td>
<td>plastic baby bottles only</td>
</tr>
<tr>
<td>cut</td>
<td>cutting with a knife (not scissors)</td>
</tr>
<tr>
<td>doggie</td>
<td>the family dog only</td>
</tr>
<tr>
<td>juice</td>
<td>apple juice only</td>
</tr>
</tbody>
</table>

These “errors” are systematic, not random. They show that the child has semantic categories corresponding to words, but that these categories are somewhat different from the adult meanings.
Derivational morphology

By the age of three, children begin to productively apply derivational affixes:

Experimenter: “Here is a picture of a person digging. What do you call a person who digs? A person who digs is called a...

Child: “Digger”

At around the same age, children may begin to form novel compounds:

- water bird “duck”
- ant house “anthill”
Inflectional morphology

**Phase 1:** Case-by-case learning – child imitates the words he or she hears, but may not use them in the correct contexts

- dogs, children, geese
- talked, ran, went

**Phase 2:** Overuse of a general rule – child applies a regular rule in the correct contexts, but extends the rule even to irregular forms. (Even school aged children may remain in phase 2 for certain morphological processes.)

- Rule – *form plural by adding –s*
  - dogs, childs, gooses

- Rule – *form past tense by adding –ed*
  - talked, runned, goed

**The “wug” test.** Video: [https://www.youtube.com/watch?v=MgB2iMuEZAA](https://www.youtube.com/watch?v=MgB2iMuEZAA) (1:06)

**Phase 3:** mastery of exceptional forms as produced by adults

- dogs, children, geese (plural)
- talked, ran, went (past)
Practice: overgeneralization

Considering children’s tendency to overgeneralize morphological rules, what might we expect a young child to use in the place of the following adult words?

1. deer (plural)
2. put (past tense)
3. oxen
4. drove
5. himself / themselves
6. left
7. knew
8. more fun / most fun
Stages of language development: syntax

12-18 months – one-word utterances

At about 12 months, children begin to utter recognizable words, often in a naming context:

- **duck** while the child hits a toy duck off the edge of the bath;
- **sweep** while the child sweeps with a broom
- **car** while the child looks out of the living room window at cars moving on the street below
- **papa** when the child hears the father's voice.

Although children produce no syntactic structure, they show evidence of *understanding* syntactic structure (word order) at 16 months.

Video: [https://www.youtube.com/watch?v=KDMjsDDtKt4](https://www.youtube.com/watch?v=KDMjsDDtKt4) (2:32)
**Stages of language development: syntax**

**18-24 months** – two word utterances used in appropriate context, but with no consistent word order

<table>
<thead>
<tr>
<th>Language</th>
<th>Utterance 1</th>
<th>Translation</th>
</tr>
</thead>
<tbody>
<tr>
<td>German</td>
<td>buch da</td>
<td>&quot;book there&quot;</td>
</tr>
<tr>
<td></td>
<td>bitte apfel</td>
<td>&quot;please apple&quot;</td>
</tr>
<tr>
<td></td>
<td>wo ball?</td>
<td>&quot;where ball?&quot;</td>
</tr>
<tr>
<td>Russian</td>
<td>baba kréslo</td>
<td>&quot;grandma armchair&quot;</td>
</tr>
<tr>
<td></td>
<td>daj chasy</td>
<td>&quot;give watch&quot;</td>
</tr>
<tr>
<td></td>
<td>vôdy net</td>
<td>&quot;water no&quot;</td>
</tr>
<tr>
<td>Finnish</td>
<td>ei susi</td>
<td>&quot;not wolf&quot;</td>
</tr>
<tr>
<td></td>
<td>torni iso</td>
<td>&quot;tower big&quot;</td>
</tr>
<tr>
<td></td>
<td>missä pallo?</td>
<td>&quot;where ball?&quot;</td>
</tr>
<tr>
<td>Samoan</td>
<td>fia moe</td>
<td>&quot;want eat&quot;</td>
</tr>
<tr>
<td></td>
<td>mai pepe</td>
<td>&quot;give doll&quot;</td>
</tr>
<tr>
<td></td>
<td>tapale 'oe</td>
<td>&quot;hit you&quot;</td>
</tr>
</tbody>
</table>
Stages of language development: syntax

24-30 months – telegraphic speech, slightly longer utterances with some syntactic structure, but simpler than adult syntax, “function words” (such as the, is) are often missing.

<table>
<thead>
<tr>
<th>Pig say oink</th>
<th>Claire, 25 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kathryn no like celery</td>
<td>Kathryn, 22 months</td>
</tr>
<tr>
<td>Baby doll ride truck</td>
<td>Allison, 22 months</td>
</tr>
<tr>
<td>Want lady get chocolate</td>
<td>Daniel, 23 months</td>
</tr>
</tbody>
</table>

In the early multi-word stage, children who are asked to repeat sentences may simply leave out the determiners, modals and verbal auxiliaries, verbal inflections, etc., and often pronouns as well.
Stages of language development: syntax

30 months and older – more complex, adult-like syntax begins to emerge; more function words; still some errors in agreement, question formation, etc.

- When you goes to school, Robert and me play with him.
- Mommy haven’t finished yet, has she?
- I'm having this little one.
- What I did yesterday?
- Where I should put it?
Sign language acquisition

• Research on children of deaf parents acquiring American Sign Language as their first language shows:
  • Children acquiring ASL go through the same developmental stages (one-word, two-word, multi-word) as children acquiring spoken languages
  • Children acquiring ASL alter handshapes of words based on articulatory ease just as children acquiring English alter pronunciation
  • ASL has inflectional morphology (subject and object agreement marking) which differs for different classes of verbs. Children acquiring ASL overgeneralize inflectional morphology of one verb class and use it with a different verb class.
  • Evidence from ASL and other sign languages suggests that acquisition of language is not specific to speech but relies on universal cognitive and linguistic abilities. Also, language function is typically localized in the left hemisphere of the brain for both sign and spoken languages.


Video: one-year-old child using ASL [https://www.youtube.com/watch?v=TwqzZHXdmt8](https://www.youtube.com/watch?v=TwqzZHXdmt8)

Video: toddlers chatting in ASL [https://www.youtube.com/watch?v=5-fwQpCylW4](https://www.youtube.com/watch?v=5-fwQpCylW4)
How do children learn language?

Almost everyone agrees:

Humans have a unique ability to learn and use languages; the same linguistic abilities are not found in other species

Controversy concerns the nature of these abilities

- **Nativist view**: Language learning depends in part on an innate Universal Grammar

- **Usage-based view**: Languages are learned entirely on the basis of interactive linguistic input and general cognitive and social abilities
Nativist view of child language

- Language learning depends in part on an innate Universal Grammar
  - “Triggers” in the input link up to innately-given linguistic rules (e.g. Subjacency) and categories (e.g. noun, verb)
  - Assumes narrow view of learning strategies and autonomous generative syntax
  - Relies on “poverty of the stimulus” argument: generalizations are too complex to be learned from relatively impoverished input
Nativist view of child language

- **Example**: there is an innately given Subjacency rule which accounts for acquisition of subtle constraints on long-distance dependencies

  Who did she claim that she saw?  *Who did she make the claim that she saw?
  What did you think that you saw?  *What did you cry because you saw?

- **Example**: there is an innate capacity to understand structure dependence, which allows children to apply the inversion rule correctly.

  The man who is smoking is tall.
  *Is the man who __ smoking is tall?
  Is the man who is smoking __ tall?
Usage-based view of child language

- Languages are learned entirely on the basis of interactive linguistic input and general cognitive and social abilities
  - Rich information is available in the input in the form of statistical tendencies
  - Children are sensitive to statistical properties of the input, from which they are able to generalize
  - Assumes constructionist view of language structure
    - Syntactic structure is symbolic; Constructions are organized in inheritance network
  - Assumes more sophisticated view of learning strategies: cultural learning, schematization, analogy, entrenchment, preemption, functionally-based distributional analysis

- “Modern usage-based theorists are not behaviourists who believe the child works with unstructured linear strings, but rather they are cognitivists who believe in structure – just not of the purely formal kind.” (Tomasello 2009: 85)
Usage-based view of child language

• **Example:** once children understand pragmatic properties of questions, they understand constraints on long-distance dependencies (wh-phrase is focused, so can’t refer to presupposed information)

  Who did she reveal that she saw?  *Who did she reveal the fact that she saw?
  What did you think that you saw?  *What did you cry because you saw?

• **Example:** once children understand the function of relative clauses within referring expressions, they will treat the entire subject as a unit

  The man who is sitting there is tall.
  *Is the man who __ sitting there is tall?
  Is the man who is sitting there __ tall?
Evidence for usage-based view

Pivot schemas

Children’s early multi-word expressions include templates with specific lexical items and open slots (like a simple kind of construction). Table from Diessel (2013: 352)

Table 1. Examples of pivot schemas (adopted from Braine 1976)

<table>
<thead>
<tr>
<th>More __</th>
<th>All __</th>
<th>No __</th>
</tr>
</thead>
<tbody>
<tr>
<td>More car</td>
<td>All broke</td>
<td>No bed</td>
</tr>
<tr>
<td>More cereal</td>
<td>All clean</td>
<td>No down</td>
</tr>
<tr>
<td>More cookie</td>
<td>All done</td>
<td>No fix</td>
</tr>
<tr>
<td>More fish</td>
<td>All dressed</td>
<td>No home</td>
</tr>
<tr>
<td>More hot</td>
<td>All dry</td>
<td>No mama</td>
</tr>
<tr>
<td>More juice</td>
<td>All shut</td>
<td>No pee</td>
</tr>
<tr>
<td>More sing</td>
<td>All wet</td>
<td>No plug</td>
</tr>
</tbody>
</table>
Evidence for usage-based view

Pivot schemas

Children’s early multi-word expressions include templates with specific lexical items and open slots (like a simple kind of construction). Table from Diessel (2013: 353)

Table 2. Examples of verb-island constructions (adopted from Tomasello 1992)

<table>
<thead>
<tr>
<th>Find it __</th>
<th>__ get it</th>
<th>__ gone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Find-it funny</td>
<td>Block get-it</td>
<td>Peter Pan gone</td>
</tr>
<tr>
<td>Find-it bird</td>
<td>Bottle get-it</td>
<td>Raisins gone</td>
</tr>
<tr>
<td>Find-it chess</td>
<td>Phone get-it</td>
<td>Doo-doo gone</td>
</tr>
<tr>
<td>Find-it bricks</td>
<td>Towel get-it</td>
<td>Cherry gone</td>
</tr>
<tr>
<td>Find-it Weezer</td>
<td>Bedus get-it</td>
<td>Fox gone</td>
</tr>
<tr>
<td>Find-it ball</td>
<td>Coffee get-it</td>
<td>Hammer gone</td>
</tr>
<tr>
<td>Find it stick</td>
<td>Mama get-it</td>
<td>French fries gone</td>
</tr>
</tbody>
</table>
Evidence for usage-based view

Pivot schemas

Children’s early multi-word expressions include templates with specific lexical items and open slots (like a simple kind of construction). Examples from Diessel (2013: 354)

(4) What doing? (many times) 1;11.11
(5) What's Mommy doing? (many times) 1;11.21
(6) What's donkey doing? (4 times) 2;0.18
(7) What's Nomi doing? (2 times) 2;0.18
(8) What's toy doing? 2;0.18
(9) What's Mommy holding? 2;0.26
(10) What's Georgie saying? 2;1.19
(11) What is the boy making? 2;11.17
(12) What is Andy doing? 2;11.18
Evidence for usage-based view

Emergence of general syntactic operations

As children go beyond simple pivot schemas, they begin to exhibit errors that are often interpreted as evidence of general syntactic rules. Examples from Diessel (2013: 354)

Diessel (2013) argues that even these types of errors can be shown to depend on the child’s experience with lexically-specific pivot schemas.

(13) Why he can go? Non-inversion error
(14) What can he can do? Double marking error
(15) What does he likes? Agreement error
(16) Where does her go? Case error
(17) Does he going to the shops? Auxiliary-verb mismatch
Evidence for usage-based view

Usage-based analysis of error production in English interrogatives

Based on a large corpus of English question productions, Rowland (2007) showed that children are more prone to inversion errors and other errors in lexically innovative questions.

They produced significantly fewer errors when a pivot schema was available, such as:

- Does NP __
- Who can __
- Can I __

Figure 3. Error rate in children’s questions with and without a prior frame (based on data from Rowland 2007: 123, Table 6)

Evidence for usage-based view

Children’s pivot schemas gradually become more like constructions, as they begin to extend the open slots to a wider range of lexical items/phrases. Examples from Diessel (2013: 356).

(18) I wanna bag.                    Sarah 2;3
(19) I wanna ride (my horsie).      Sarah 2;3
(20) I want ice cream in the refrigerator.  Sarah 2;10
(21) Want me open it?               Adam 2;9
(22) Do want he walk?               Adam 2;10
Evidence for usage-based view

Children’s early verb use is typically limited to the most frequently-used construction for that verb. Example: Tomasello’s 2-year-old daughter only used *break* in the Transitive Construction, and not in any of the other constructions where *break* occurs in adult usage.

(23) He *broke* his arm. Transitive construction
(24) The window *broke*. Intransitive construction
(25) She *broke* the vase into pieces. Caused motion construction
(26) The mirror is *broken*. Passive construction
Evidence for usage-based view

Goldberg (2006: 79) hypothesizes that the early use of specific verbs in the most frequent construction is crucial for learning to use that construction more productively.

Table 4.3. Main verbs and the constructional meanings they correspond to

<table>
<thead>
<tr>
<th>Verb</th>
<th>Constructional Meaning</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>go</td>
<td>X moves Y</td>
<td>Intransitive Motion</td>
</tr>
<tr>
<td>put</td>
<td>X causes Y to move Z</td>
<td>Caused Motion</td>
</tr>
<tr>
<td>give</td>
<td>X causes Y to receive Z</td>
<td>Ditransitive</td>
</tr>
<tr>
<td>make</td>
<td>X causes Y to become Z</td>
<td>Resultative</td>
</tr>
</tbody>
</table>

The present hypothesis is that the high frequency of particular verbs in particular constructions facilitates children’s unconsciously establishing a correlation between the meaning of a particular verb in a constructional pattern and the pattern itself, giving rise to an association between meaning and form.
Evidence for usage-based view

How do children learn to extend a verb for use in different constructions?

From about age 2;6 onward, we find evidence in children’s overextension errors.

In these examples, intransitive verbs were extended to transitive constructions.

(27) Kendall *fall* that toy. 2;3
(28) Who *deaded* my kitty cat? 2;6
(29) They just *cough* me. 2;8
(29) Don’t *giggle* me. 3;0
(30) I am gonna put the washrag in and *disappear* something under the washrag. 3;7
Evidence for usage-based view

How do children learn to extend a verb for use in different constructions?

From about age 2;6 onward, we find evidence in children’s overextension errors.

In these examples, which are less frequent, transitive verbs are used intransitively.

(32) The flower cuts. [= The flower can be cut] 2;8
(33) Bert knocked down. [= Bert got knocked down] 3;0
(34) They don’t seem to see. [= They cannot be seen] 3;8
Evidence for usage-based view

How do children learn to extend a verb for use in different constructions?

From about age 2;6 onward, we find evidence in children’s overextension errors.

In these examples, transitive verbs are being used in Resultative and Ditransitive constructions.

(38) I pulled it unstapled. 3;8
(39) I am patting her wet. 4;0
(40) Are you washing me blind? 5;6
(41) I’ll brush him his hair. 2;3
(42) I said her no. 3;1
(43) Button me the rest. 3;4
Evidence for usage-based view

What constrains overextensions, and how do children eventually learn the adult form?

Tomasello (2009) identifies three main factors:

1. **Entrenchment** – overall frequency of verb as experienced in a particular construction; children are less likely to extend verbs that are frequently used in one construction

2. **Preemption** – “blocking” effect in which verb is heard only in one of two possible constructions that are functionally equivalent; child learns that the verb is not felicitous in the expected but unused construction

3. **Knowledge of semantic subclasses** – only certain semantic subclasses of verbs are felicitous in a particular construction
Evidence for usage-based view

Evidence for relevance of *entrenchment*

In a study by Pinker, Lebeaux, and Frost (1987), 4-year-old children were taught novel verbs used in Active and Passive constructions.

Participants were divided into two groups:

• Group 1 learned the novel verbs in transitive frames: *The dog is pelling the elephant.*

• Group 2 learned the novel verbs in passive frames: *The elephant is being pelled by the dog.*

• After training, children were tested using two types of questions:
  • Elicit active: What is the dog doing?
  • Elicit passive: What is happening to the elephant?

Evidence for usage-based view

Overall **entrenchment** of novel verb in a construction limits extension to another construction.

Results showed that the two groups differed due to entrenchment of the novel verbs in a particular construction.

Active Construction is overall stronger attractor than Passive Construction, reflecting its overall more frequent occurrence in the input received outside experimental setting.

![Graph showing proportions of successful elicitation](image)

**Figure 4.** Proportion of successfully elicited active and passive constructions (based on data from Pinker, Lebeaux, and Frost: 125, Table 4)

Evidence for usage-based view

Preemption – more specific knowledge preempts more general knowledge in production, as long as either would satisfy the functional demands of the context equally well

Example: morphological blocking

\[
\begin{align*}
\textit{went} & \text{ preempts } \textit{goed} & \textit{referee} & \text{ preempts } \textit{reffer} \\
\textit{children} & \text{ preempts } \textit{childs} & \textit{higher} & \text{ preempts } \textit{more high}
\end{align*}
\]

DiSciullio & Williams (1987) found that adjectives that were less frequently used in comparative form were more prone to variation:

\[
\begin{align*}
\textit{fresher} & \text{ – more fresh} & \textit{moister} & \text{ – more moist} & \textit{duller} & \text{ – more dull}
\end{align*}
\]
Evidence for usage-based view

Preemption – more specific knowledge preempts more general knowledge in production, as long as either would satisfy the functional demands of the context equally well

Example: constructional blocking

As we have seen, constructions are not semantically identical in the way that *fresher* and *more fresh* are. But we still get preemption by functionally-similar constructions. (Note that these preemptions are not semantically motivated and must be learned.)

For certain verbs, dative preempts ditransitive:

She explained the story to me. / *She explained me the story.

For certain verbs, periphrastic causative preempts transitive construction:

She made the rabbit disappear. / *She disappeared the rabbit.
Evidence for usage-based view

Brooks & Tomasello (1999) showed constructional blocking experimentally using novel verb learning paradigm.

Children age 6-7 were much less likely to extend a novel verb to a transitive frame when it had been presented in two other frames than in only one other frame.

Training input: The ball is tamming. / He’s making the ball tam.
Test question to elicit transitive: What’s the boy doing?
Expected response: He’s tamming the ball.

The expected response occurred much less often when verb was heard in periphrastic causative construction than when verb was only heard in intransitive construction.

Evidence for usage-based view

Goldberg (2006: 100) notes that constructional blocking is not expected to occur when the two constructions are not functionally equivalent. This can help explain why some constructions such as caused motion accept such a wide range of verbs.

(10) She sneezed the foam off the cappuccino.

The reason sneeze can readily appear in the caused-motion construction as in (10) is because sneeze can be construed to have a meaning relevantly like other verbs that readily appear in that construction, as a verb that effects a causal force. Other verbs that appear in the construction indicate that the causal force may involve air (blow), and need not be volitional (knock). Since sneeze has not been pre-empted in this use—given that this meaning has only rarely if ever been expressed—(10) is fully acceptable. Example (11) of the way
Evidence for usage-based view

Summary:

- The earliest multi-word expressions include simple ‘pivot constructions’ – templates with fixed lexical content and open slots.
- Open slots gradually get extended to larger classes of lexical items.
- Verbs tend to start out as the fixed lexical content of pivot constructions and gradually get extended to new constructions.
- Extensions of verbs to new constructions are subject to overgeneralization errors, but such errors are constrained by the factors of entrenchment, preemption, and lexical semantic class.
Suggestions for further reading


