

Bootstrapping universal quantifiers: the role of genericity

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Why care about *each* and *every*?

Both can be used to label the same situations in the world

+

But both differ semantically in subtle ways

+

Learners are sensitive to these differences early

=

Acquisition Q: what evidence do learners use to infer their meanings?

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3 differences between *each* and *every*

Do they show up in parents' speech?

What are the targets of learning?

3

each/every are similar

Both are universal quantifiers

{ *each*
every } student is sleepy



Both are bad with collective predicates (Vendler 1962; Dowty 1987; Gil 1995; Beghelli & Stowell 1997; Tunstall 1998; Winter 2002; Champollion 2017; ao.)

**each* student {gathered/surrounded the teacher/is similar}

?*every* student {gathered/surrounded the teacher/is similar}

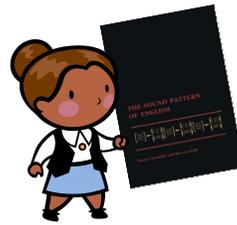
all students {gathered/surrounded the teacher/are similar}

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each/every are similar, but differ in important ways

Ability to offer pair-list responses (Williams 1986; Beghelli 1997; Szabolcsi 2010; 2015)

Which book did you give to $\left\{ \begin{array}{l} \text{each} \\ \text{every} \end{array} \right\}$ student?



P-L: ✓

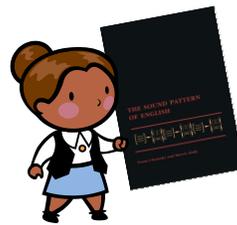
P-L: ✗

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each/every are similar, but differ in important ways

Ability to offer pair-list responses (Williams 1986; Beghelli 1997; Szabolcsi 2010; 2015)

Determine whether $\left\{ \begin{array}{l} \text{each} \\ \text{every} \end{array} \right\}$ student has a copy of Aspects



“no, only one of them does”

“student₁ does; student₂ doesn't; student₃ doesn't”

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each/every are similar, but differ in important ways

Ability to offer pair-list responses (Williams 1986; Beghelli 1997; Szabolcsi 2010; 2015)

Compatibility with “generic” generalizations (Beghelli & Stowell 1997)

↳ projects beyond the local domain

After a lifetime of investigation, Suzie came to a striking discovery:

{#Each } language has over 20 color words
 {Every }

Suzie just discovered 4 new languages and interestingly,

{Each } language has over 20 color words
 {#Every }

Claim about
local domain

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each/every are similar, but differ in important ways

Ability to offer pair-list responses (Williams 1986; Beghelli 1997; Szabolcsi 2010; 2015)

Compatibility with “generic” generalizations (Beghelli & Stowell 1997)

↳ projects beyond the local domain

↳ law-like / non-accidental

Gravity acts on **every** object

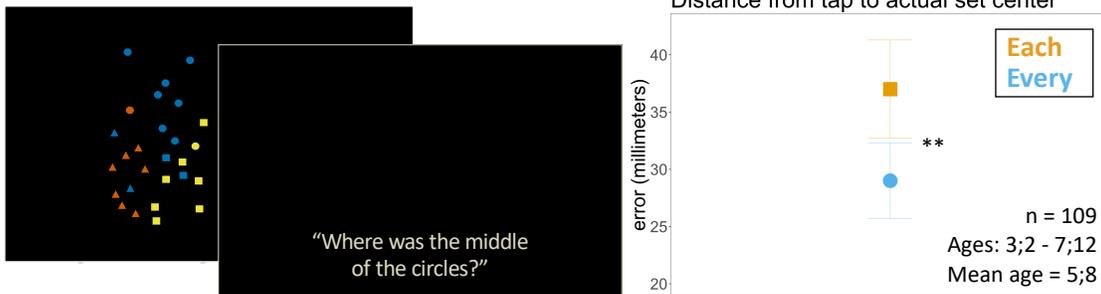
Every species of spider has eight legs

#Gravity acts on **each** object

#**Each** species of spider has eight legs

Sounds like contingent fact!

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Propensity for triggering group-representations (e.g., Knowlton et al. BUCLD 2018)

Is $\left\{ \begin{array}{l} \text{each} \\ \text{every} \end{array} \right\}$ circle blue?

- ➔ Adults & (3+ year old) children show better memory for group properties (#, center of mass) following *every*
- ➔ Different ways of representing domain (*individuals* / *group*)

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3 differences between *each* and *every*

Pair-list responses	✓	✗	} Semantic difference to be learned
"Generic" interpretations	✗	✓	
Group-representation	✗	✓	

Do they show up in parents' speech?

What are the targets of learning?

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What data might be available?

Pair-list responses

✓ *each* ✗ *every*

Generic interpretations

✗ *each* ✓ *every*

Group-representation

✗ *each* ✓ *every*

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What data might be available?

Pair-list responses

✓ *each* ✗ *every*

Generic interpretations

✗ *each* ✓ *every*

Group-representation

✗ *each* ✓ *every*

In CHILDES NA English

(over 1.7 million utterances):

WH-question & *each*: 11

With possible PL-responses: 1

Dad: What do you think each animal is about to do?

Child (3;04): Clean up that mess

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What data might be available?

Pair-list responses

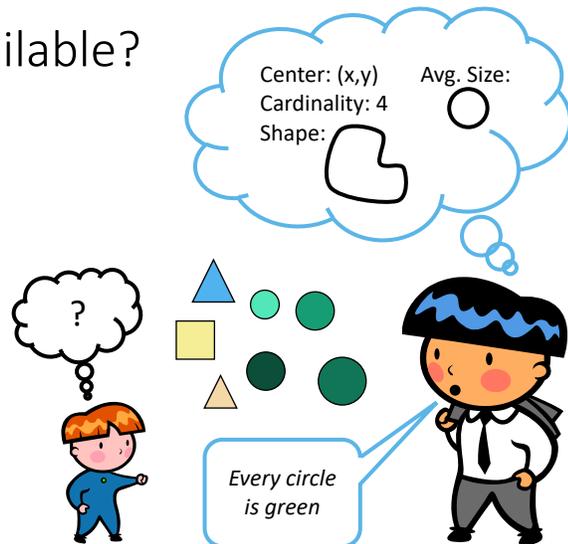
✓ *each* ✗ *every*

Generic interpretations

✗ *each* ✓ *every*

Group-representation

✗ *each* ✓ *every*



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What data might be available?

Pair-list responses

✓ *each* ✗ *every*

Generic interpretations

✗ *each* ✓ *every*

Group-representation

✗ *each* ✓ *every*

We gave *each* of your teddy bears some tea

Good for expressing
accidental facts about a local domain
vs. *non-accidental generalizations*

Every time we have a tea party, you spill!

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Distributional footprints the generic asymmetry

Predicted low-level differences

Quantifying over
individuals or *times*

Being in *past* or *present* tense

Being an *argument* or
topic-setting expression

We gave *each* of your
teddy bears some tea

Good for expressing
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 vs. *non-accidental generalizations*

Every time we have a
tea party, you spill!

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each and *every* in child-directed speech

Sample: All corpora in the North American English portion of CHILDES
 (that had typically-developing children under 8 years old)

➔ 1,706,381 child-directed utterances

<i>Each</i>	<i>Every</i>	<i>All</i>
538 (0.0315%)	728 (0.0427%)	20,558 (1.2048%)

Prorated, assuming 0.9 – 2.5 million utterances/year (Hart & Risley 1995; 2003)

<i>Each</i>	<i>Every</i>	<i>All</i>
284 – 788	384 – 1,067	10,843 – 30,119

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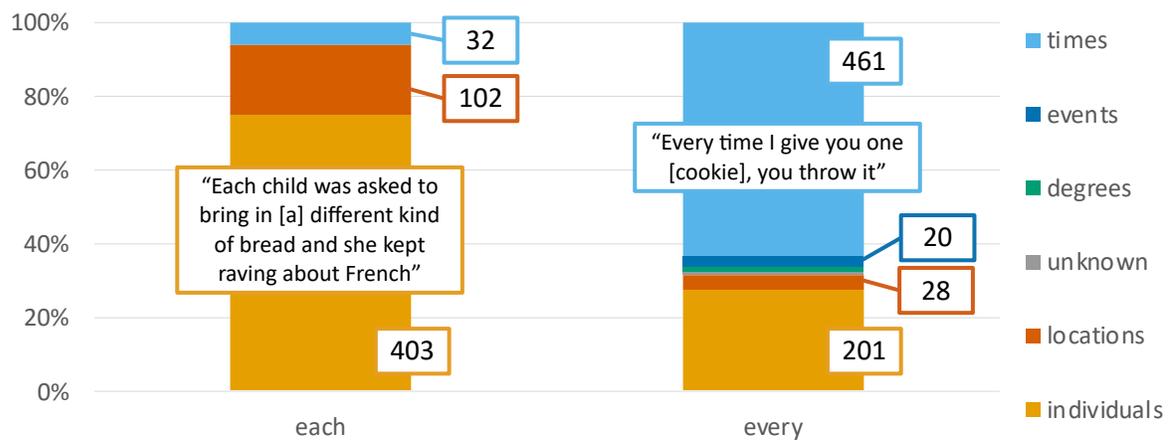
What's being quantified over?

Parents use *each* to talk about individuals in a local domain and *every* to express non-accidental generalizations (about situations)

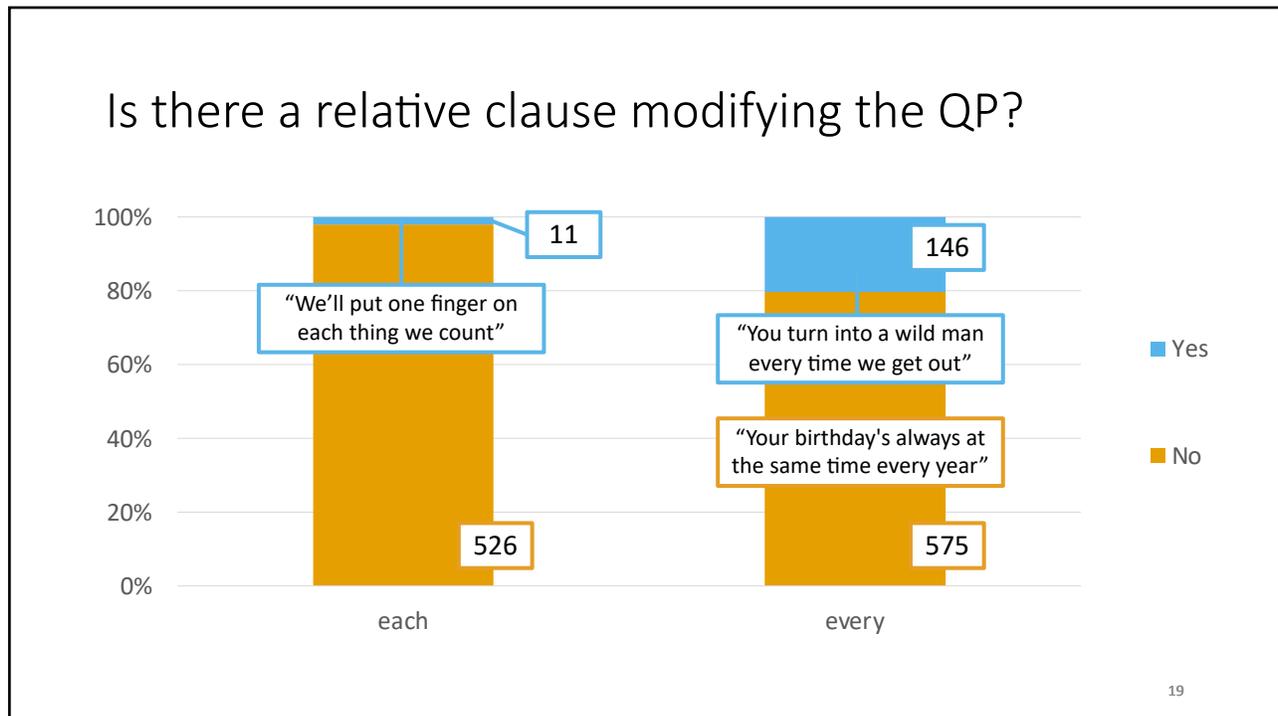
➔ Prediction: *individuals* for *each*; *times* for *every*

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What's being quantified over?



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What's being quantified over?

Parents use *each* to talk about individuals in a local domain and *every* to express non-accidental generalizations

➔ Quantify over *individuals* vs. *times*

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What's the tense of the QP's clause?

Parents use *each* to talk about individuals in a local domain and *every* to express non-accidental generalizations

➔ Quantify over *individuals* vs. *times*

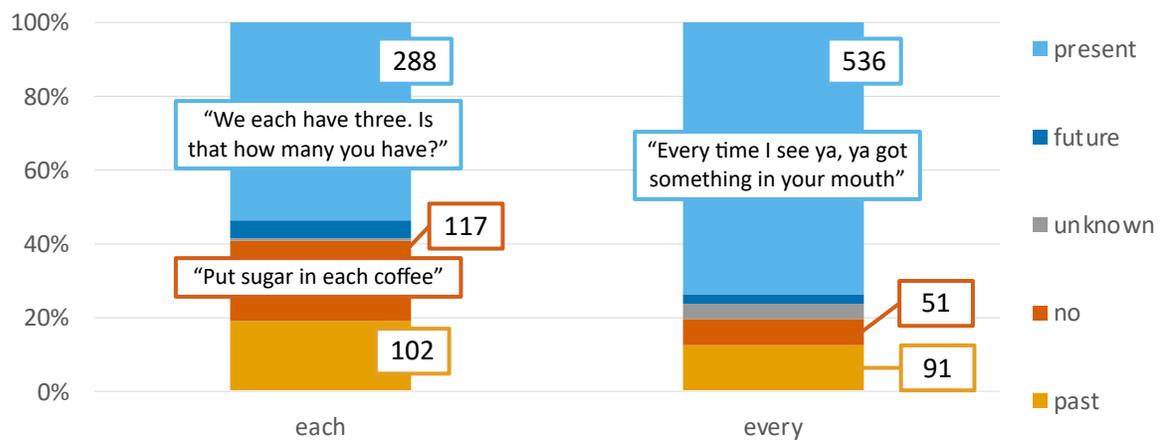
➔ Prediction: *present* tense preference for *every*

Every dog barked ⇔ no “generic” interpretation

Every dog barks ⇔ easy to get “generic” reading

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What's the tense of the QP's clause?



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What's the tense of the QP's clause?

Parents use *each* to talk about individuals in a local domain and *every* to express non-accidental generalizations

- ➔ Quantify over *individuals* vs. *times*
- ➔ Being an *imperative* or in *past* tense vs. in *present* tense

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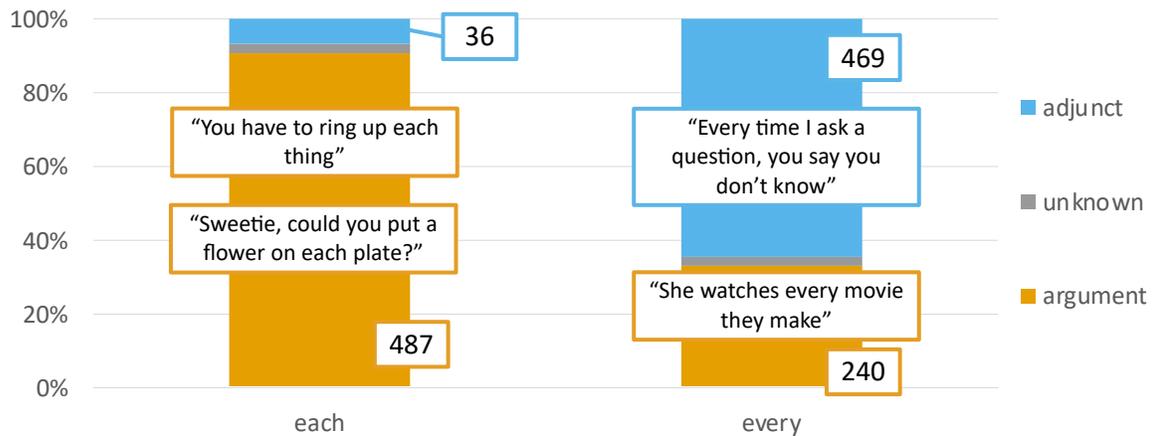
Is the QP and argument or an adjunct?

Parents use *each* to talk about individuals in a local domain and *every* to express non-accidental generalizations

- ➔ Quantify over *individuals* vs. *times*
- ➔ Being an *imperative* or in *past* tense vs. in *present* tense
- ➔ Prediction: *each* QP appears as an *argument*
every QP appears as topic-setting *adjunct*

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Is the QP and argument or an adjunct?



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Is the QP and argument or an adjunct?

Parents use *each* to talk about individuals in a local domain and *every* to express non-accidental generalizations

- ➔ Quantify over *individuals* vs. *times*
- ➔ Being an *imperative* or in *past* tense vs. in *present* tense
- ➔ Use a QP as an *argument* vs. *topic-setting expression*

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Genericity signals the difference (in principle)

Parents use *each* to talk about individuals in a local domain and *every* to express non-accidental generalizations

- ➔ Quantify over *individuals* vs. *times*
- ➔ Being an *imperative* or in *past* tense vs. in *present* tense
- ➔ Use a QP as an *argument* vs. *topic-setting expression*

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3 differences between *each* and *every*

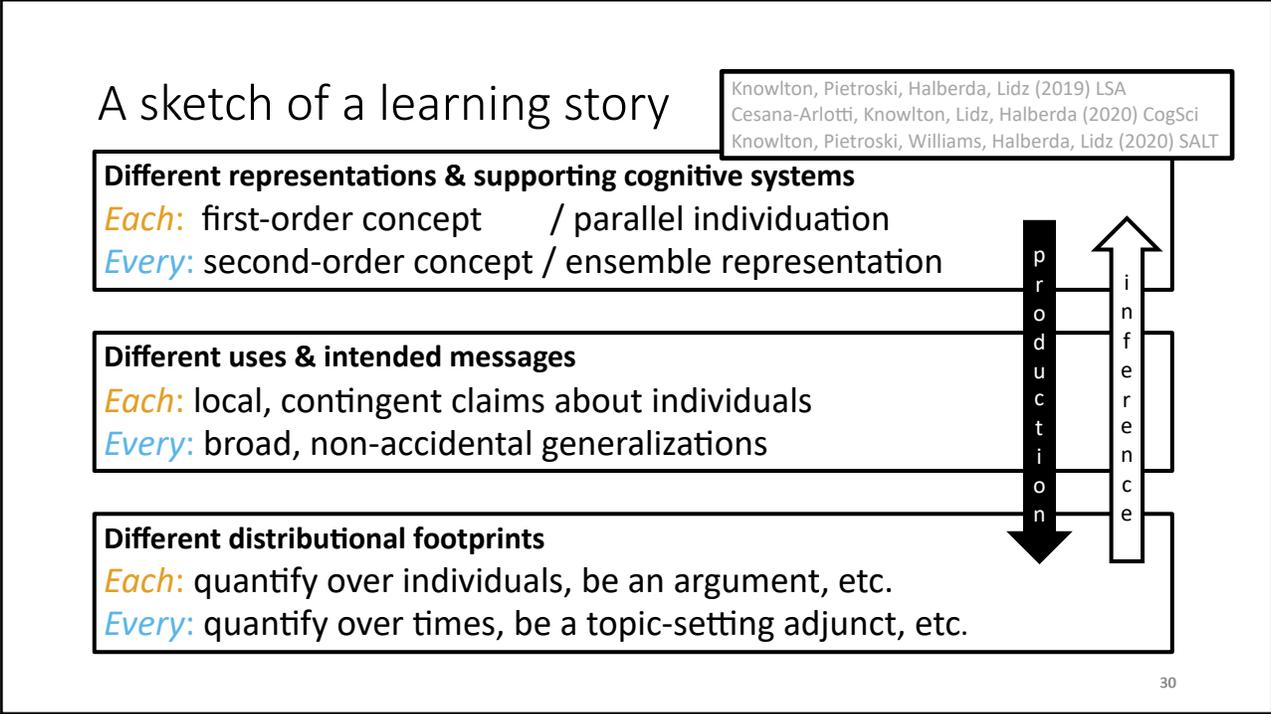
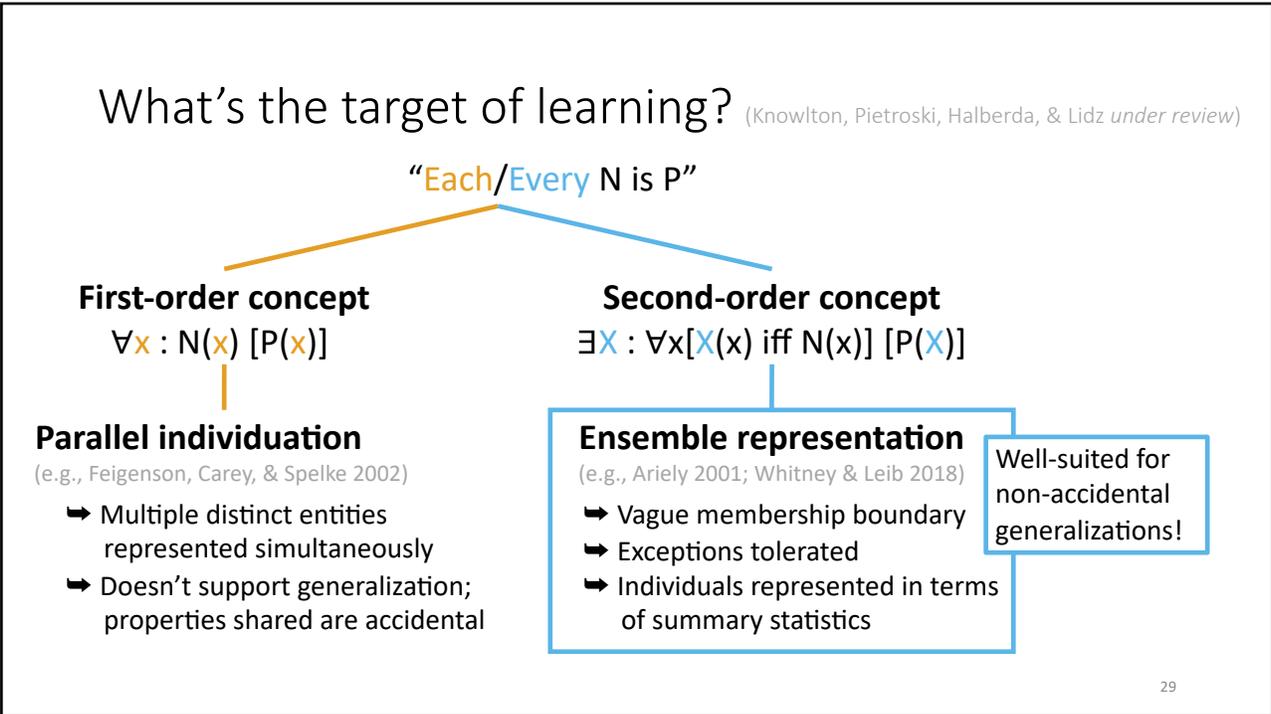
Pair-list responses	✓	✗	} Semantic difference to be learned
"Generic" interpretations	✗	✓	
Group-representation	✗	✓	

Do they show up in parents' speech?

individuals vs. *times*
past tense vs. *present tense*
argument vs. *topic-setting expression*

What are the targets of learning?

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