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Events and agents in the acquisition of universal quantification

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Although not intended as such, Lucas Champollion's paper, "Stratified reference: The common core of distributivity, aspect, and measurement," could be read as a proposal about what children have to learn, at least in part, about measurement, pluralities, and quantification in natural language, and what the path of acquisition might look like for phenomena associated with these topics in both the verbal and nominal domain. It is delightful indeed to see that he has considered that there may be implications for research in language acquisition and development, and how differences in the semantic representation might facilitate learners encoding a distinction among linguistic constructions (pp. 143–144). Here, I extend his proposal to the acquisition of universal quantification, and specifically differences among *all* and *each*.

A perennially vexing acquisition problem, which has recently received renewed interest, is young children's misinterpretation of sentences with universal quantifiers. For example, when shown three white circles and one white square and asked the question in (1), preschoolers typically answer, "No," drawing attention to the white square (Inhelder and Piaget 1958, 1964).

(1) Are all of the circles white?

Similarly, when shown four toy garages, three of which have a car parked in them, and asked the question in (2), children will answer, "No," pointing to the empty garage. And when shown four toy cars, three of which are in a garage, and asked the question in (3), children will also say, "No," pointing to the lone car (Donaldson and Lloyd 1974).

(2) Are all of the cars in the garages?

(3) Do all of the garages have cars in them?

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These examples have been referred to as errors in "quantifier spreading" since it seems as though the quantifier is not restricted to the subject, but applies to the object as well. Perhaps the most-cited example of such "quantifier spreading" errors comes from Philip and his colleagues (Philip 1995; Philip and Aurelio 1991; Philip and Takahashi 1991), in which there are boys riding elephants, and non-ridden elephants remain.

We know, however, that children's errors apply to an even wider set of circumstances. For example, in the four car-three garage scenario described above, a child who conducts an "underexhaustive search" might respond, "Yes," when asked the question in (2), presumably failing to take into account the extra car (Donaldson and Lloyd 1974; see also Drozd 2001). In addition, when shown a picture of three dogs, each eating a bone, and a rabbit eating a carrot, and asked the question in (4), children sometimes respond, "No," pointing to the bunny (Roeper et al. 2007; see also Philip and Verrips 1994).

(4) Is every dog eating a bone?

All of these errors seem to indicate that children are simply not successfully identifying the domain of quantification, or assigning the proper lexical semantic representation to these universal quantifiers.

However, these persistent misinterpretations are quite striking in light of a host of evidence that children age four to six are otherwise fairly advanced in their understanding of universal quantification. For example, children are aware of the difference in entailment patterns associated with a relative clause in the subject position and the direct object for sentences with *every* in subject position (Crain et al. 2004; Gualmini et al. 2003). And although children appear to more readily access the surface scope of scopally ambiguous sentences (Lidz and Musolino 2002; Musolino et al. 2000), they can also access the inverse scope when other factors have been controlled for (Musolino and Lidz 2006). Evidence that the inverse scope is most likely made available via a covert grammatical mechanism like that of adults comes from independent lines of research showing that children can perform Quantifier Raising. For example, they can access interpretations that require a universal quantifier in object position to raise higher in order to bind a pronoun in adjunct position (Lidz et al. 2004), and can successfully resolve antecedent-contained deletion – even in the service of accessing multiple interpretations of ambiguous ACD sentences (Syrett to appear; Syrett and Lidz 2011). Thus, by age six, children appear to possess sophisticated knowledge of quantification. Why, then, do they display such robust errors in "quantifier spreading?"

A number of theories have been proposed over the years to account for these systematic errors. For example, Drozd (2001) and Geurts (2003) have offered different versions of an account in which children's misinterpretations stem from a misconstrual of the strong, universal quantifier as a weak quantifier. Philip (1995) and Drozd and Philip (1993) have proposed that children mistakenly quantify over events, rather than entities. Still others have attributed the errors to a syntactic misanalysis of the quantifier and its position (Bucci 1978; Roeper et al. 2011, 2006).

Another line of explanation involves attributing these response patterns to performance errors, rather than competence. For example, Crain et al. (1996) argue that children's performance is impaired when pragmatic felicity conditions and plausible dissent are not met. Freeman et al. (1982) argue that the way in which the materials are presented, the way the story is told, and the relevance of the question to this story influence children's responses – an explanation that resembles Gualmini et al. (2008) in its appeal to something like the Question Under Discussion. Brooks and her colleagues (Brooks and Braine 1996; Brooks et al. 2001; Brooks and Sekerina 2005/2006) have argued that children carry an expectation that there should be a one-to-one correspondence between the entities involved, given the visual materials, and in the face of this, participants – even adults (Brooks and Sekerina 2005/2006) – may default to a "quick and dirty" low-level processing strategy, such as one of the competence-based explanations mentioned above.

At the same time, though, it appears that in addition to the types of errors described above that apply to all universal quantifiers, children have particular difficulty with *each* relative to *every* and *all*. Evidence for a delayed familiarity with the lexical semantics of *each* relative to other universal quantifiers comes from a variety of tasks, all of which suggest that the strong distributivity feature of *each* may not be in place until later in development, although it seems that cannot be the entire story.

The first line of evidence that children's treatment of *each* is delayed comes from preference tasks designed to differentiate *each* from *all*. Brooks and colleagues were interested following up on proposals from Vendler (1967) and Ioup (1975) that there are distinctions among quantifiers such as *each* and *all* with respect to whether they license collective and distributive interpretations, and that such distinctions might be universal among languages. They sought to determine whether these differences are in place early in language development.

Brooks et al. (2001), Brooks and Braine (1996), and Brooks and Sekerina (2005/2006) presented participants with a forced choice between two still images, and asked them to select the context that matched the target sentence. Participants heard sentences with *all* and *each* (and with B&S, *every*) within a

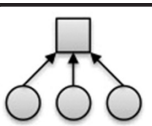
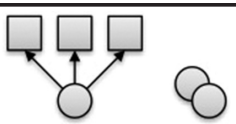
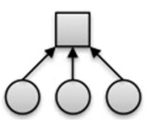
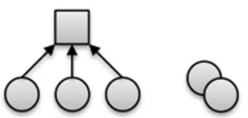
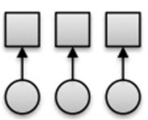
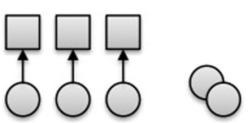
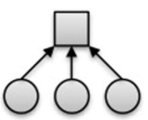
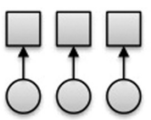
session. In B&B, participants heard both an active version and an existential construction, as in (5). (e.g., [*All of the men are/Each man is*] *carrying a box; There is a man carrying [all/each] of the boxes*).

(5) a. [All of the ○s are/Each ○ is] Ving a □.
b. There is an ○ Ving [all/each] of the □.

The *all* sentences were accompanied by a choice similar to the one in row 1 of Table 1, while the *each* sentences were accompanied by a choice similar to row 3.[1] (The other rows will be mentioned in due course in the context of other conditions and experiments.)

Because in the scenarios in rows 1–3, there were extra objects, and in those in row 4, there were no extra objects, the possibility of children attending to an outlier (or ignoring it) was neutralized between the two selections.

Table 1: Collective and distributive contexts presented across language acquisition tasks.

		A	B
1	Collective v. Collective		
2	Collective v. Collective		
3	Distributive v. Distributive		
4	Collective v. Distributive		

1 Brooks and colleagues always used sentences in the present progressive form, and their visual stimuli were still images. As a results, neither eventive interpretations nor telicity were highlighted – a point which might indeed prove important.

Given these selections in rows 1 and 3, adults consistently selected (A) for both the *all* and *each* versions of (5a), and (B) for both versions of the existential construction in (5b). Children also consistently selected the anticipated correct responses for the *all* sentences. However, for the *each* sentences, they remained at chance choosing between the two contexts in row 3 until 9 years of age, although their performance was noticeably better for (5a) relative to (5b) starting at age 7. In B&S, participants who were presented with the contrast in row 1 with an *all* sentence or the contrast in row 2 with an *each* sentence (as in (5a)) did not consistently accept A until age 6, presumably displaying a focus on the events in which participants were paired to the exclusion of the individual outliers – a so-called "underexhaustive" search.

Such a forced-choice task only demonstrates *preference*, however, and Brooks and Braine (1996) knew this. They followed up that task with an acceptance task, asking participants if each context could be considered a match for the given sentence. Here, the difference between *all* and *each* was striking. Beginning at 5, children paralleled the adults with *all*, allowing A and not B in row 1 for (5a), but they diverged remarkably from adults with *each*. When asked if the *each* version of (5a) could correspond to A in row 3, almost all agreed, but the majority of 4- and 5-year-olds and nearly half of the 6-year-olds also agreed that B was acceptable.

In a separate task, participants were presented with the contrast between the collective and distributive contexts in row 4 of Table 1. When they were given the *all* version of (5a), adults and children (starting at age 6) preferred context A, and accepted both scenes as a good match. Thus, children patterned much like the adults. When they were given the *each* version of (5a), children selected B the majority of the time, even as young as age 4, although they still selected A over a fourth of the time until age 8. Thus, they seemed to be aware of the distributivity component of *each*, although not at an adult-like level. In fact, when asked to judge the acceptability of the sentence-context correspondence as before, over 70% of the 6-year-olds and 40–50% of the 7- to 9-year-olds accepted context A for the *each* version of (5a). Adults only allowed A 25% of the time.

Finally, B&B and Brooks *et al*. teased apart distributivity and exhaustivity by comparing preference of context A in row 3 (a "distributive" context) to one where the additional □s were also being Ved by the same ○s (an "exhaustive" context). Four-year-olds were split between the two choices, but children five and older selected the distributive context. However, Brooks et al. (2001) also obtained evidence that there might be a difference among predicates, with distributive contexts preferred for 'actional' contexts (e.g., women carrying cakes) and exhaustive contexts preferred for 'locative' contexts (e.g., flowers occupying vases). This pattern for locative contexts was also confirmed by

Roeper et al. (2011). Even so, children did not display the strong distributive pull that adults did with *each* until at least 9–10 years of age.

These results demonstrating the difference between *all* and *each* in child language and a non-adult-like pattern with *each* are complemented by an act-out task conducted by Ferenz and Prasada (2001). In this task, children were given a number of directions, in the style of (6). Children as young as two years of age responded correctly for requests with both *each* and *all* by putting the entire set of objects on the tray. However, they did not produce 'distributive' responses, in which the objects would have been placed on the tray one by one, for *each*. By contrast, a control set of adults consistently produced 'collective' responses for *all*, and 'distributive' responses for *each*.

(6) Big Bird wants you to put ...
  a. [each (object)/each of the (objects)] on the tray.
  b. [all (objects)/all of the (objects)] on the tray.

The second line of evidence indicating that children diverge from adults in their recognition of the distributivity encoded in *each* comes from a question-answer task conducted by Achimova et al. (2013). In this task, Achimova et al. (2013) noticed a difference between *every* and *each* in the type of answers children 4 to 5 years of age produced in response to questions in which a *wh*-phrase interacted with a universal quantifier in either subject or object position (as in (7)).

(7) a. Subject quantifier question
  Which game did [every/each] friend play *t* ?
  b. Object quantifier question
  Which friend played [every/each] game?

Based on previous theoretical claims and experimental evidence from sentence processing (cf. Achimova *et al.* for references), the authors expected that both single answers and pair-list answers might be possible for both *every* and *each*.

Previous acquisition studies had reported that children over-produce pair-list answers to similar questions with *every* and *who*, but had not controlled for the type of universal quantifier or *wh*- phrase. As a result, the extent to which children diverge from adults was unclear. Surprisingly, while children in this study did *over*produce pair-list answers relative to adults for questions with *every*, they *under*produced pair-list answers for questions with *each*. Thus, adults refrained from producing pair-list answers for questions with *every*, but displayed a preference for pair-list answers for *each*, while children produced pair-list answers at the same rate, regardless of the quantifier. This pattern

seems to indicate that it is not until after age five that children treat the two quantifiers differently with respect to distributivity.

All of these tasks indicate that children may not share the same *preferences* as adults and/or may not display a sensitivity to the strong distributivity associated with *each* in the targeted methodologies. However, evidence that children are sensitive to distributivity on some level, but also access interpretations that are *not* licensed by the semantics comes from a judgment task conducted by Syrett and Musolino (2013). Syrett and Musolino (2013) presented children age 4 to 5 with sentences such as those in (8) in both collective and distributive contexts, as in row 4 of Table 1. Such sentences (without *each*) license both collective and distributive interpretations (cf. Link 1983, a.o.).

(8) a. Two girls (each) lifted a block.
b. Two girls (each) completed a puzzle.

Unlike in the earlier studies by Brooks *et al*, visual stimuli were videos recorded and edited in iMovie with live actors, and experimental participants viewed the events from start to finish. In the collective contexts, two individuals worked together to complete the activity (allowing the property to be predicated of the group, or plurality), while in the distributive contexts, they each completed the activity side by side (thus allowing for the property to be predicated of the individuals in the group). Within the trials presented to participants were events in which the predicate was telic (*build a tower*, *stack a set of rings*, *complete a puzzle*, *draw a circle*, etc.) and those in which it was atelic (*push a car, lift a block*, etc.)

Both adults and children consistently accepted the 'bare' (non-*each*) versions of the sentences in both contexts. However, when *each* was inserted, adults no longer accepted the sentences in the collective contexts, while children still did. That children were not just blindly accepting the sentences was evident from their responses to control items, as well as some of their justifications for their acceptances, some of which appear in (9) and (10).

(9) Acceptances in collective contexts
a. Cause they both did the same amount.
b. Cause they each drew a circle. [only one circle drawn]
c. They both did it. BOTH boys pushed a car!

(10) Acceptances in distributive contexts
a. They EACH lifted one [block] up!
b. Cause they both did the same thing.
c. They're building 'em by theirselves!

Thus, children seemed aware to some extent that *each* signaled properties of individuals, but did not recognize that the sentences with *each* could not be true in the collective context (especially with a telic predicat) because each individual did not have the property of completing a puzzle, drawing a circle, and so forth. It was not enough for each individual to have participated in a 'puzzle completion' or 'circle drawing' event (even if their participation was on par).

These various lines of research in language acquisition and development converge to demonstrate that although there are aspects of universal quantification that *are* in place prior to age 5–6, such as the covert mechanisms necessary to satisfy compositionality or generate distinct interpretations, children continue to struggle with other aspects of quantification, which are related to properly identifying the domain of quantification and the proper predication of atomic individuals in a plurality. I would like to suggest here that by drawing a parallel between the nominal and verbal domains and by capturing the difference between collectivity and distributivity in stratified reference, Champollion has provided us with a new perspective on the source of children's persistent errors with universal quantification – and specifically with *each*.

The studies cited above seem to indicate that children appeal to one-to-one correspondence or exhaustivity in their justifications of their incorrect rejections of quantifier spreading scenarios, but also often ignore an individual outlier not involved in a pairing with incorrect acceptances. They therefore seem to expect that the relevant individuals will share a particular relation in the events associated with the target predicate (riding (an elephant), being parked (in a garage), etc.). At the same time, they recognize relatively early on that there is a difference between *all* and *each* with respect to whether they should be associated with collectivity or distributivity. However, while they seem to recognize that *each* corresponds to individuals in some way, this awareness does not emerge in the strongly-distributive way that it does in adults – in preference, act-out, question-answer, or judgment tasks.

The formalism provided by Champollion in his (58) and (60) for *each* and his (59) and (61) for *all* (repeated and condensed here as (11)–(12)) may provide us with some insight into children's errors, and what must change in the course of development to make them more like adults.

(11) *all*

$[\![$ [all (of the) NP] $]\!] =$

$\lambda P \lambda e$: $\mathrm{SR}_{\mathrm{agent},\varepsilon(\lambda n.n = |\oplus \mathrm{NP}|)}(P).[P(e) \wedge {}^{*}\mathrm{agent}(e) = \oplus \mathrm{NP}]$

presupposition of *all*

$\forall e\,[\mathrm{VP}(e) \rightarrow e \in {}^{*}\lambda e'(\mathrm{VP}(e') \wedge \varepsilon(\lambda n.n = |\oplus \mathrm{NP}|)(\mathrm{agent}(e')))]$

(12) *each*
$[\![$ [each (of the) NP] $]\!]$ =
$\lambda P \lambda e$: $SR_{agent,Atom}(P).[P(e) \wedge$ *agent$(e) = \oplus$NP]

presupposition of *each*
$\forall e$ [VP$(e) \rightarrow e \in$ *$\lambda e'$(VP$(e') \wedge$ Atom(agent $(e'))$)]

I believe there are a number of benefits to considering Champollion's account of these quantifiers and how their differences with respect to collectivity and distributivity are encoded.

First, the representations of the universal quantifiers above appeal to events. Thus, Philip (1995) and others may not have been far off in attributing children's response patterns to event quantification, but this would also mean that there is no *qualitative* conceptual or representational change in the representations that would have to take place during the course of language development. Second, both *all* and *each* require children to take the 'main event' into consideration, to divide it into subevents, and to further determine whether the property can be predicated of the agents of those subevents – however small they are. This may mean that the *event* takes priority over the *individuals* when children are rendering the judgment of the sentence. A child who responds, "No," and points to a lone elephant when asked if *every boy is riding an elephant* may be attending to whether every possible '(elephant) riding' event has both a boy and an elephant. Likewise, a child who ignores the lone boy and responds, "Yes," may not consider that there is an additional '(elephant) riding' event to consider in which the boy would be an agent.

Third, in the stratified reference account, both *all* and *each* have two parameters: the dimension parameter (which is set to the thematic role for both), and the granularity parameter (which is set differently for each – atoms for *each* and small groups for *all*). It appears that children have some knowledge that the dimension parameter should be set to the thematic role. However, they may not successfully set the dimension parameter to the right thematic role. For example, they may not set it to *agent* and may allow it to apply to both *agent* and *patient*, or *theme*. Or, they may set it to agent, but not properly identify who or what the agent of the relevant event should be. Furthermore, under the stratified reference account, there seems to be an issue with how the granularity parameter is set for children, as they do not demonstrate the strong atomic performance with *each* that adults do, or recognize that it is not sufficient for the relevant atoms or subgroups to merely participate in the event – a fact that is highlighted by the telicity of the predicate. Finally, because the difference between *all* and *each* is encoded in the *presupposition* associated with the

quantifiers, the path of language development would then involve settling on the correct presupposition to properly distinguish the two and also correctly interpret *each*. Thus, children are faced with a presupposition problem, rather than a syntactic or semantic misanalysis.

Language acquisition research should not only be informed by theory, but – we also hope – be informative to theoretical research as well. Champollion's paper not only outlines a theoretical approach to unifying measurement and quantification in the nominal and verbal domains via stratified reference, but also outlines elements of the linguistic representation that could pose a challenge for children (as in the case of universal quantification), or could help children successfully identify differences among linguistic constructions (as in the case of measurement expressions). Future work should not only take these proposals as a starting point for future semantics research in language acquisition, but also use language acquisition research to test the claims presented therein concerning parallels between domains and distinctions in the way in which stratified reference is realized across linguistic expressions.

References

Achimova, Asya, Christa Crosby, Kristen Syrett, Viviane Déprez & Julien Musolino. 2013. Which account of *wh*-/quantifier interaction should everyone adopt? A new take on a classic developmental puzzle. In S. Baiz, N. Goldman & R. Hawkes (eds.), *Proceedings of the 37th Annual Boston University Conference on Language Development (BUCLD)*, 1–12. Somerville, MA: Cascadilla Press.

Brooks, Patricia J. & Martin D. S. Braine. 1996. What do children know about the universal quantifiers *all* and *each*? *Cognition* 60. 235–268.

Brooks, Patricia J., Martin D. S. Braine, Gisela Jia & Marcia da Graca Dias. 2001. Early representations for *all, each*, and their counterparts in Mandarin Chinese and Portuguese. In M. Bowerman & S. C. Levinson (eds.), *Language acquisition and conceptual development*, 316–339. Cambridge: Cambridge University Press.

Brooks, Patricia J. & Irina Sekerina. 2005/2006. Shortcuts to quantifier interpretation in children and adults. *Language Acquisition* 13. 177–206.

Bucci, Wilma. 1978. The interpretation of universal affirmative propositions: A developmental study. *Cognition* 6. 55–77.

Crain, Stephen, Luisa Meroni & Utako Minai. 2004. If everybody knows, then every child knows. In J. van Kampen & S. Baauw (eds.), *Proceedings of the Conference on Generative Approaches to Language Acquisition 3*, 127–138. Utrecht: LOT.

Crain, Stephen, Rosalind Thornton, Carrol Boster, Laura Conway, Diane Lillo-Martin & Ellen Woodams. 1996. Quantification without qualification. *Language Acquisition* 5. 83–153.

Donaldson, Margaret & Peter Lloyd. 1974. Sentences and situations: Children's judgments of match and mismatch. In F. Bresson (ed.), *Problèmes actuels en psycholinguistique*,

Colloques internationaux du Centre National de Recherche Scientifique, 74–86. Paris, France: Centre National de Recherche Scientifique.

Drozd, Kenneth F. 2001. Children's weak interpretations of universally quantified questions. In M. Bowerman & S. C. Levinson (eds.), *Language acquisition and conceptual development*, 340–376. Cambridge: Cambridge University Press.

Drozd, Kenneth F. & William Philip. 1993. Event quantification in preschoolers' comprehension of negation. In E. V. Clark (ed.), *Proceedings of the 24th Annual Child Language Research Forum*, 72–86. Palo Alto, CA: Stanford University, Center for the Study of Language and Information.

Ferenz, Krag & Sandeep Prasada. 2001. Singular or plural? Children's knowledge of the factors that determine the appropriate form of count nouns. *Journal of Child Language* 29. 49–70.

Freeman, Norman H., Christopher G. Sinha & Jacqueline A. Stedmon. 1982. All the cars–which cars? From word meaning to discourse meaning to discourse analysis. In M. Beveridge (ed.), *Children thinking through language*, 52–74. London: Edward Arnold.

Geurts, Bart. 2003. Quantifying kids. *Language Acquisition* 11. 197–218.

Gualmini, Andrea, Sarah Hulsey, Valentine Hacquard & Danny Fox. 2008. The Question-Answer Requirement for scope assignment. *Natural Language Semantics* 16. 205–237.

Gualmini, Andrea, Luisa Meroni & Stephen Crain. 2003. Children's asymmetrical responses. In *Proceedings of the 4th Tokyo Conference on Psycholinguistics*, 135–158. Tokyo: Hituzi Shobo.

Inhelder, Bärbel & Jean Piaget. 1958. *The growth of logical thinking from childhood to adolescence*. New York: Basic Books.

Inhelder, Bärbel & Jean Piaget. 1964. *The early growth of logic in the child: Classification and seriation*. London: Routledge and Kegen Paul.

Ioup, Georgette. 1975. Some universals for quantifier scope. *Syntax and Semantics* 4. 37–58.

Lidz, Jeffrey, Erin McMahon, Kristen Syrett, Joshua Viau, Florencia Anggoro, J. Peterson-Hicks, Elisa Sneed, Ann Bunger, Taki Flevaris, Anne Graham, Kristy Grohne, Yongeun Lee, & John Evar Strid. 2004. Quantifier raising in 4-year-olds. In A. Brugos, L. Micciulla & C. E. Smith (eds.), *Proceedings of the 28th Annual Boston University Conference on Language Development*, 340–349. Somerville, MA: Cascadilla Press.

Lidz, Jeffrey & Julien Musolino. 2002. Children's command of quantification. *Cognition* 84. 113–154.

Link, Godehard. 1983. The logical analysis of plural and mass terms: A lattice theoretic approach. In R. Bäuerle, C. Schwarze & A. von Stechow (eds.), *Meaning, use and interpretation of language*, 302–323. Berlin: de Gruyter.

Musolino, Julien, Stephen Crain & Rosalind Thornton 2000. Navigating negative quantificational space. *Linguistics* 38. 1–32.

Musolino, Julien & Jeffrey Lidz. 2006. Why children aren't universally successful with quantification. *Linguistics* 44. 817–852.

Philip, William. 1995. *Event quantification in the acquisition of universal quantification*. Doctoral dissertation, University of Massachusetts–Amherst.

Philip, William & Sabina Aurelio. 1991. Quantifier spreading: Pilot study of preschooler's "every." In T. Maxfield & B. Plunkett (eds.), *Papers in the acquisition of WH: Proceedings of the UMass Roundtable, May 1990*, 267–282. Amherst, MA: GLSA Publications.

Philip, William & Mari Takahashi. 1991. Quantifier spreading in the acquisition of "every." In T. Maxfield & B. Plunkett (eds.), *Papers in the acquisition of WH: Proceedings of the UMass Roundtable, May 1990*, 283–302. Amherst, MA: GLSA Publications.

Philip, William & Maaike Verrips 1994. Dutch preschoolers' *elke*. Paper presented at the 19th Annual Boston University Conference on Language Development (BUCLD).

Roeper, Thomas, Barbara Zurer Pearson & Margaret Grace. 2011. Quantifier spreading is not distributive. In N. Danis, K. Mesh & H. Sung (eds.), *Proceedings of the 35th Annual Boston University Conference on Language Development (BUCLD)*, 526–539. Somerville, MA: Cascadilla Press.

Roeper, Thomas, Petra Schulz, Barbara Zurer Pearson, & Ina Reckling. 2007. From singleton to exhaustive: The acquisition of *wh-*. In M. Becker & A. McKenzie (eds.), *Proceedings of Semantics of Under-represented Languages in the Americas (SULA) 3*, 87–102. Amherst, MA: GLSA Publications.

Roeper, Thomas, Uri Strauss & Barbara Zurer Pearson. 2006. The acquisition path of the determiner quantifier *every*: Two kinds of spreading. In T. Heizmann (ed.), *Current issues in first language acquisition, UMOP 34*, 97–128. Amherst, MA: GLSA Publications.

Syrett, Kristen. to appear. QR out of a tensed clause: Evidence from Antecedent-Contained Deletion. *Ratio 28*.

Syrett, Kristen & Jeffrey Lidz. 2011. Competence, performance and the locality of Quantifier Raising: Evidence from 4-year-old children. *Linguistic Inquiry* 42. 305–337.

Syrett, Kristen & Julien Musolino. 2013. Collectivity, distributivity, and the interpretation of plural numerical expressions in child and adult language. *Language Acquisition* 20. 259–291.

Vendler, Zeno. 1967. *Linguistics in philosophy*. Ithaca, NY: Cornell University Press.