J. Child Lang. **25** (1998), 443–484. Printed in the United Kingdom
© 1998 Cambridge University Press

DISCUSSION

How far does a construction grammar approach to argument structure take us in understanding children's language development?

NANCY BUDWIG
Clark University

Tomasello's stimulating review of Goldberg's (1995) book, *Constructions : a construction grammar approach to argument structure*, raises several themes worthy of discussion. Tomasello suggests numerous reasons why functional and cognitive linguistic approaches in general, and Goldberg's approach in particular, are central to current work in child language. In my commentary I will summarize Tomasello's central claims about what he sees as significant about Goldberg's book, and I will raise the question of whether construction grammar – rather than any other cognitive or functional approach – is worth pursuing. While generally sympathetic to Goldberg's approach, I will discuss two issues that I think are worthy of further consideration in future research.

Tomasello highlights three very important reasons why he believes Goldberg's approach makes a significant contribution to child language research. First, he states that construction grammar provides a way of understanding language development as a whole, and not just particular aspects of language development, such as core grammar. Second, Tomasello characterizes Goldberg's approach as noteworthy because it provides a way of relating language development to other domains of human cognition. A third advantage, Tomasello claims, is that construction grammar allows for the view of language development as protracted (e.g. not instantaneous), something Tomasello suggests fits well with his own research findings (see Tomasello, 1992).

As someone who lays claim to be a 'developmental-functionalist' (see Budwig, 1995), it should come as no surprise that I am in agreement with Tomasello that the above three points are central to any approach to child language. This seems to follow from my overarching support of a general functionalist position. The question remains, however, whether there are particular aspects of Goldberg's approach (e.g. construction grammar) that make it more worthy of consideration than, say, any alternative functional or cognitive approach to language. In other words, at this general level,

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

one could claim that a whole variety of cognitive and functional grammatical approaches to language would satisfy the above three mentioned points (see Budwig, 1995 for a review of a variety of these theories). My own stance on this issue is that more systematic work needs to be done in order to answer this question. Tomasello's target article provides a first step in this direction.

The heart of Goldberg's work centres around argument structure constructions. These constructions are said to 'encode as their central senses event types that are basic to human experience' (Goldberg, 1995: 39). These constructions not only encode meanings, but simultaneously carry meaning in such a way that is distinct from the particular lexical items making up the sentential units. I will turn now to critically consider what it means to say scenes are 'basic' and what is implied by suggesting constructions 'carry' meaning.

How basic are the scenes encoded by constructions?

Goldberg (1995), in a section entitled 'Some speculations on the semantics of the transitive construction' discusses the fruitfulness of prototype theory to a theory of transitivity. Like others (Lakoff, 1977; Hopper & Thompson, 1980), Goldberg notes that there is something like a prototypical 'transitive scene' that involves a 'volitional actor affecting an inanimate patient – a causative event' (p. 118). In sum, basic sentence types encode humanly relevant scenes. Goldberg (1995: 43) simultaneously suggests:

> ... it is not being claimed that ALL clause-level constructions encode scenes basic to human experience. Nonbasic clause-level constructions ... are primarily designed to provide an alternative information structure of the clause by allowing various arguments to be topicalized or focused. Thus children must also be sensitive to the *pragmatic information structure* of the clause (Halliday, 1967) and must learn additional constructions which can encode the pragmatic information structure in accord with the message to be conveyed.

According to Goldberg's Scene Encoding Hypothesis (1995: 39) children should first use transitive constructions to mark humanly relevant scenes and she is correct in noting Slobin's (1985) crosslinguistic research on basic child grammar as lending support to her general conclusion. At the same time, it is central to consider the precise nature of children's early use of transitive markers and constructions for here it becomes clear that the clean division that Goldberg draws between semantics and pragmatics may not be so clear to the two-year-old child at the initial forays into grammar. For instance, some English speaking children have been noted to mark self as volitional agent bringing about perceptible change similarly to their attempts to use language as a tool for bringing about change (see Budwig, 1989, 1995).

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

The point is, what is prototypical for the very young child, namely the integration of pragmatic change into the basic causative scene, is actually not part of the prototypical basic transitive scene described by Goldberg and others. Given what appears to be the often creative stamp children place on what constitutes 'prototypical transitivity' it is no longer clear that the step from child prototype to adult nonprototypical use is quite the same as Goldberg suspects. To date, the material we have is limited and the rich variation reported in individual developmental case studies suggests that further research is warranted. Nevertheless, it does seem that the very event types said to underlie the use of construction types themselves have a rich developmental history, suggesting that we cannot start from the assumption of basic (innate or sensori-motor-like) event schemata which neatly map onto constructions which later become more elaborate through processes of metaphorical extension and the like.

Just how much meaning do constructions carry?

Tomasello claims a second central feature of Goldberg's work is the view that constructions carry meaning apart from the particular words in the sentences. If children could be said to establish meaning from construction types, this, indeed, would provide a powerful developmental mechanism for learning and a rich source of creative potential for metaphoric extension. For a developmentalist, Goldberg's claim provides what, at first glance, could be construed as a key to one of the central problems of how children might so efficiently and effortlessly build up grammatical systems. Nevertheless, my own research on children's very early use of active, middle and passive constructions suggests (unfortunately) that the answer may not be so straight forward. The central issue is, once again, that children, early on, do not seem to always imbue constructions with the same meaning that adult speakers do, thereby making it seem unlikely that children are simply interiorizing a set of typological options presented in the constructions offered by their languages. While I will comment below that I do believe we can work towards a solution, I don't think the point is trivial. Let me illustrate with an example:

Goldberg (1995: 184), in her insightful analysis of middle formation, outlines semantic factors associated with the construction including an indefinite, volitional agent. She suggests that the example *The metal hammers flat easily* can be paraphrased as 'People can hammer the metal flat easily because of an inherent quality of the metal'. In longitudinal work I have conducted examining the use of voice alternations of English-speaking-children between the ages of 1;6 and 3;0, I found that from their earliest word combination, young children, indeed, contrastively employed active transitive, active intransitive, and middle constructions to talk about different event types (Budwig, Stein & O'Brien, 1997). And yet the children, as noted

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

above, went through an extended phase of actively imbuing middle forms with child-like meanings. Middles were systematically employed to refer to a scene describing 'resistance to the environment'. That is, the children used middle constructions when talking about ways in which objects failed to work according to their own intended plans. For instance, in attempting to build a garage out of wooden blocks, a young boy was attempting to open the doors stating *My gonna open it*, followed by *The doors won't open*. Note that the semantics of the children's use of middles in part link up with Goldberg's claims, yet at the same time, they have re-interpreted the middle construction in terms of a more narrowly defined action schema related to ongoing ways to interact with their surroundings.

My central point is that the meanings cannot really be said to be 'carried' by the constructions alone; rather, the constructions seem to be actively appropriated by children in actual contexts as they attempt to use language to co-construct reality with their interlocutor. Goldberg's view highlights the representational function of language and accordingly meaning is inherent in form. Alternatively I am suggesting a more dynamic view of meaning in which speakers actively negotiate meaning as part of ongoing social practices (see Gumperz & Levinson, 1996; Hanks, 1996).

Cognitive and functional linguistic approaches to grammatical constructions and child language theorizing: where to go from here?

What are we to conclude from this discussion? As Tomasello has correctly pointed out, over the last years child language researchers have watched linguistic theories come and go. Is it best then to proceed forward without them? However as Atkinson (1982) argued in his state of the art review, without such theories, our accounts of child language are nothing more than a series of static descriptions of things children say at various points en route to adult-like functioning. My view is that it is unlikely that any linguistic theory is going to be able to provide us answers to the developmental problems of the sort I have outlined regarding Goldberg's approach. At the same time, Goldberg's theory is, in my opinion, more satisfactory that others she reviews with regard to argument structure exactly because of its strong reliance on prototype theory, frame semantics, and metaphoric extension. My sense is that if a generation of child language scholars would use Goldberg's approach as a rich framework from which to begin to address issues such as those raised in my discussion above, progress can be achieved. As a comprehensive account of the relationship between constructions and semantic meaning, current child language work can begin to focus on how to elaborate on such an approach by rethinking it – first, in terms of discursive functioning that seems so central to early child language, and second, in terms of developmental constructs that will help us better understand the

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

transforming nature of the relationship between linguistic forms and functions over ontogenetic time.

REFERENCES

Atkinson, M. (1982). *Explanations in the study of child language development*. Cambridge: C.U.P.

Budwig, N. (1989). The linguistic marking of agentivity and control in child language. *Journal of Child Language* **16**, 263–84.

—— (1995). *A developmental-functionalist approach to child language*. Mahwah, NJ: Erlbaum.

Budwig, N., Stein, S. & O'Brien, C. (1997). Non-agent subjects in early child language: a crosslinguistic comparison. In K. Nelson, A. Aksu-Kol and C. Johnson (eds) Children's language, vol. 10: Languages in use, narratives and interactions.

Gumperz, J. J. & Levinson, S. C. (eds) (1996). *Rethinking linguistic relativity*. Cambridge: C.U.P.

Halliday, M. (1967). Notes on transitivity and theme in English. *Journal of Linguistics* **3**, 199–244.

Hanks, W. F. (1996). *Language and communicative practices*. Boulder, CO: Westview Press.

Hopper, P. J. & Thompson, S. A. (1980). Transitivity in grammar and discourse. *Language* **56**, 251–299.

Lakoff, G. (1977). Linguistic gestalts. *Chicago Linguistics Society* **13**, 225–235.

Slobin, D. I. (1985). Crosslinguistic evidence for the Language-Making Capacity. In D. I. Slobin (ed.), *The crosslinguistic study of language acquisition: Volume 2*. Hillsdale, NJ: Erlbaum.

Tomasello, M. (1992). *First verbs: a case study of early grammatical development*. Cambridge: C.U.P.

Language Under Constructions

DOUGLAS A. BEHREND

University of Arkansas

Although it is a difficult task to write a commentary on a commentary, Tomasello's essay on Goldberg's constructions is worthy of the effort. Tomasello embraces Goldberg's cognitive-functional construction grammar approach as a 'breakthrough that has revolutionary implications for the study of language development'. I am sympathetic to much of Goldberg's view, especially those aspects of her theory that derive from cognitive linguistics. On the other hand, I am also sympathetic to lexicalist approaches to grammatical development. Rather than become embroiled in the ensuing debate between supporters of each side of this issue, I will examine in this commentary some of the assumptions of construction grammar as they relate to our current knowledge of linguistic and cognitive development.

Do sentence-level constructions carry meaning?

The answer to this question is clearly, 'Yes'. From Berko's (1958) classic studies to the more recent work on syntactic bootstrapping, it has been clear

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

that children can hear a novel lexical form in a familiar syntactic context one time and make appropriate word-class and semantic interpretations on the basis of this single exposure. Early syntactic bootstrapping research has shown that when 2-year-old children hear a familiar verb in an ungrammatical frame (e.g. *The zebra came the cow.*), they are more likely to interpret that sentence in terms of the grammatical frame (i.e. construction) than in terms of the meaning of the lexical item itself (Naigles, Gleitman & Gleitman, 1993). This type of result can be taken as support for the position that children exploit information carried in sentence-level constructions and that these constructions are already more abstract than the level of the simple verb. Thus, while consistent with some of the claims made by construction grammar, this type of result speaks against Tomasello's stronger 'Verb Island' claim (which he views as fitting neatly into a construction grammar approach) that these syntactic contexts are learned on a specific verb by verb level. Clearly, by this age, children are sensitive to argument structure properties of sentences independent of the verbs used in those sentences. Whether the acquisition process is better characterized as the learning of formal syntactic structures or functional constructions is a question yet to be answered, but it appears that children use abstract properties of syntax during some of the earliest stages of acquisition.

Constructions and events

Exactly what, then, is the meaning that is carried by a construction (frame, argument structure, etc.)? For Goldberg, sentence-level constructions correspond to basic events that humans experience and observe. Most of these events involve movement, states, locations; changes in movements, states, and locations; and causes of these changes in movement, states and locations. I found this set of 'basic' events to be strongly reminiscent of sets of conceptual primitives for verb semantics such as those suggested by Miller & Johnson-Laird (1976) and Schank & Abelson (1978). It is fairly safe to say that neither of these ambitious works has stood the test of empirical time and thus it is reasonable to question the wisdom of the current approach in placing so much theoretical weight upon such a similar analysis. This is not to say that Goldberg's analysis of events is misguided: as a basic taxonomy of events it does quite well. However, whether this type of approach will lead to a better understanding of language and its acquisition is a less certain proposition. The underlying commonality in these approaches is that language and its acquisition can be best understood by analyzing the types of events experienced by humans. The implicit (or explicit) assumption is, of course, that human language (and syntax in particular) has evolved and developed to reflect events and, more specifically, human event cognition. This assumption is not an unreasonable one. Yet it is the opinion of this

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

author that what we currently know about the sentence-level event cognition of children in the early stages of syntax acquisition makes this assumption unwise or, at the least, premature.

Children in the earliest stages of syntax acquisition do not parse the steady stream of events into segments that correspond to sentence-level constructions. Given that Tomasello argues that (1) children initially talk only about a constrained subset of events and (2) the only reason that children do not use the full-fledged constructions that adults use to talk about these events is because their limited cognitive abilities do not allow them to reproduce the adult form, we should expect children in the early stages of language development to be able to perceive and interpret simple events in the same basic manner as adults.

There is a considerable body of research that suggests otherwise. Early work showed that toddlers do not direct their attention equally to all parts of an event, devoting most of their attention to the agent in an event (Golinkoff & Kerr, 1978; Robertson & Suci, 1980). More recently, Cohen & Oakes (1993) have shown that 12-month-olds treat events similarly which involve the participation of similar objects, rather than grouping them together as causal versus non-causal, a distinction that should be critical for the construction grammar approach. Finally, in a review of their work on this issue, Smiley & Huttenlocher (1995) concluded that children first group events together on the basis of the similarity of the movements and changes of state in those events. Verb learning work with older children (e.g. Behrend, 1990; Forbes & Farrar, 1993) echoes these findings. Thus, a core assumption of construction grammar may be at odds with our knowledge of children's early event cognition. For sentence level constructions to be considered to be the core of grammatical acquisition, it must be the case that children can cognize events at the level at which these constructions describe events. Given that Tomasello promotes construction grammar (and criticizes lexicalist approaches) as an example of an approach to language acquisition that is based upon realistic accounts of the psychological abilities of young children, it is incumbent upon the proponents of this approach to make certain that their account is consistent with children's cognitive abilities and, in the cases where there are inconsistencies, to modify their theories or propose realistic developmental explanations that can resolve such inconsistencies. Though this approach shows great promise, construction grammar is clearly a theory under construction.

REFERENCES

Behrend, D. A. (1990). The development of verb concepts: children's use of verbs to label familiar and novel events. *Child Development* **61**, 681–96.

Berko, J. (1958). The child's learning of English morphology. *Word* **14**, 150–77.

Cohen, L. & Oakes, L. (1993). How infants perceive a simple causal event. *Developmental Psychology* **29**, 421–33.

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

Forbes, J. N. & Farrar, M. J. (1993). Children's initial assumptions about the meaning of novel motion verbs: biased and conservative? *Cognitive Development* **8**, 273–90.
Golinkoff, R. M. & Kerr, J. L. (1978). Infants' perception of semantically defined action role changes in filmed events. *Merrill–Palmer Quarterly* **24**, 53–61.
Miller, G. A. & Johnson-Laird, P. N. (1976). *Language and perception*. Cambridge, MA: Harvard.
Naigles, L., Gleitman, L. R. & Gleitman, H. (1993). Children acquire word meaning components from syntactic evidence. In E. Dromi, (ed.), *Language and cognition: a developmental perspective* (pp. 104–140), Norwood, NJ: Ablex.
Robertson, S. & Suci, G. J. (1980). Event perception by children in the early stages of language production. *Child Development* **51**, 89–96.
Schank, R. C. & Abelson, R. (1977). *Scripts, plans, goals, and understanding*. Hillsdale, NJ: Erlbaum.

Small and abstract *versus* large and concrete

IZCHAK M. SCHLESINGER
The Hebrew University

Tomasello not only presents a concise and lucid summary of Goldberg's book, but specifies what he thinks are the implications of her linguistic theory. He writes: 'The construction grammar view holds that children's initial learning does not consist of linguistic elements that are small and abstract, but rather it consists is some measure of whole linguistic constructions that are large but concrete. Smaller elements are extracted from these wholes…'. Tomasello does not consider a third possibility, namely, that the elements initially learned by children are small and concrete (that they may be large and abstract, has not yet been claimed by anyone, to my knowledge). In my comment I will argue for this possibility, but first I examine Tomasello's claim that children learn 'whole linguistic constructions' from which smaller elements are extracted. How much can children learn in this top-down way?

It turns out that the possibilities of 'extracting' smaller units from large wholes are extremely limited. Let us illustrate this for one of the constructions dealt with at length by Tomasello, following Goldberg: the ditransitive construction. According to construction grammar, this construction has a 'meaning independently of the particular words in the sentence'. In *Mummy gives daddy the tray*, *mummy* is the actor (the 'giver'), *give* – the transfer verb, *daddy* – the recipient (the 'givee'), and *tray* – the patient (the object given). What knowledge can the child extract from such a construction? Several possibilities might be considered:

1. The meaning of ONE of the nouns that are arguments of the verb. Suppose the child knows the meanings of *mummy* and *daddy* but does not yet know what the word *tray* means. Hearing this sentence may then give

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

her a clue to the meaning of this noun. But note that this would not be dependent at all on the child's knowing the meaning of the construction. The tray is salient in the situation talked about – it is one of the 'participants' in the scene – and, unlike *mummy* and *daddy* and the action of giving, the child knows no name for it. Therefore she assumes that the word *tray* stands for the tray (often, of course, several such learning situations will be required for the word to be learned). This process is the same as that of learning a word heard in isolation or in a construction the child is not familiar with; in short, this is not a top-down or extraction process.

2. The meaning of MORE THAN ONE of the nouns that are arguments of the verb. When the child does not know, say, both the noun that is the recipient and the one that is the agent in the ditransitive construction, she might learn both at one go. To illustrate, suppose the child hears, *The postman gives the officer the letter* in a concrete situation, and she knows neither the meaning of *postman* nor that of *officer*. She might then use her knowledge of the meaning of the construction to construe the meanings both of *postman* (the agent) and of *officer* (the recipient). But clearly, this is a highly contrived scenario, and one can hardly expect the child to make frequent use of this technique so as to learn more than one noun simultaneously.

3. The meaning of the verb. Suppose the child hears *Mummy throws daddy the ball* and does not know the meaning of *throw*. If she knows the meanings of the other words *mummy*, *daddy*, and *ball*, the meaning of the construction may give her a clue that *throw* stands for the action of transferring. This will be possible also for verbs – like *promise* – the meaning of which cannot be easily inferred from the situation alone (that is, in the way the meaning of *tray* may have been guessed in 1, above) and in principle, also when the child knows neither the verb nor one of the nouns (cf. 2, above). In essence, this is Gleitman's 'syntactic bootstrapping' hypothesis, which argues that a verb's appearing in several constructions may enable the child to zero in on its meaning (Gleitman, 1990). But even when all the constructions the verb appears in are taken into account, there will usually be several verbs fitting into the same constructions and their meanings will have to be differentiated by some other learning process.

4. New, extended meanings of a verb. Knowing the meaning of a construction may enable the child to construe a new meaning of a verb. For instance, having acquired the ditransitive construction, the child may be able to understand *Mary sneezed John the football* (Tomasello's example).

Moreover, the constructions themselves cannot have been learned in a top-down fashion; such learning presupposes knowledge of the words that appear in them (consider how the child might acquire the ditransitive construction from a sentence like, say, *The postman gives the officer the letter*, unless she already knows the meanings of *postman*, *officer* and *letter*). It appears,

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

then, that Tomasello is right in carefully qualifying his statement about initial learning, saying that it 'consists *in some measure* of whole linguistic constructions…' (italics mine); 'in some very, very small measure' would have been even more appropriate. Top-down processes play only an ancillary role in language learning and the main task must be carried out by bottom-to-top processes.

If language learning is not based mainly on 'large but concrete' constructions, what is the alternative? Along with many other theorists, Tomasello does not accept (rightly, I think) the approach, leaning on generativist grammar, that the initial elements are 'small and abstract', like noun and verb. But there is a third possibility: the initially learned elements may be small and concrete, that is, that the child learns words and semantic relations holding between them. When this semantic approach was first proposed in the seventies, theorists argued for case-like relational categories, like agent and patient. Later, it was realized that children's early productions licensed crediting them only with much narrower semantic categories, like movement to locatives (Braine, 1976), or 'hitter' and 'hittee' (Tomasello, 1992), which then might be extended into larger case-like ones, and ultimately into the more formal categories of adult grammar (Schlesinger, 1988).

One of the main criticisms levelled against this approach has been that the gap between such semantic relations and the formal ones of adult grammar cannot be bridged; no amount of extension on the basis of similarity will turn the agent category, for instance, into the formal subject category, the latter being semantically quite heterogeneous. However, it can be shown that the formal subject category is much more semantically homogeneous than has generally been held and that it can be defined in terms of a few cognitively primitive features; presumably this is true of other formal categories as well (Schlesinger, 1995). The child may thus build up the subject category from such cognitive properties, in terms of which she analyses the perceived environment.

There is one formal category, though, where this analysis into cognitively based features does not seem to work: the direct object. Elsewhere I propose a developmental account of the acquisition of this category (Schlesinger, forthcoming). A full presentation of this position would be beyond the scope of this comment.

REFERENCES

Braine, M. D. S. (1976). Children's first word combinations. *Monographs of the Society for Research in Child Development* **41**, (1, Serial No. 64).

Gleitman, L. (1990). The structural sources of verb meaning. *Language Acquisition* **1**, 3–55.

Schlesinger, I. M. (1988). The origin of relational categories. In Y. Levy, I. M. Schlesinger & M. D. S. Braine (eds), *Categories and processes in language acquisition theory*. Hillsdale, NJ: Erlbaum.

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

—— (1995). *Cognitive space and linguistic case : semantic and syntactic categories in English*. Cambridge: C.U.P.
—— (forthcoming). In search of the direct object.
Tomasello, M. (1992). *First verbs : a case study of early grammatical development*. Cambridge: C.U.P.

From construction to construction

HEIKE BEHRENS
University of Cologne

In his review of Adele Goldberg's book 'Constructions', Michael Tomasello brings to the attention of acquisition researchers the framework of construction grammar, which he postulates to be a suitable instrument to capture acquisition processes in a psychologically and developmentally plausible way. Construction grammar does not see sentences, clauses, or phrases as the product of an ordered application of rules, but rather as entities ('constructions') with a meaning of their own which is independent of the lexical material inserted. Though there are relations between constructions as well as constraints on the lexical elements which can take part in a particular construction, there is no *a priori* set of semantic or syntactic primitives, and there is no distinction between core and peripheral phenomena of language (cf. Fillmore 1988), or between basic and derived structures (Goldberg 1995: 107). Goldberg herself (1993, 1995) made a proposal about how construction grammar can resolve some learnability problems of argument structure acquisition. She hypothesizes that the 'no negative evidence' problem induced by rule-based lexicalist accounts can be overcome by taking the knowledge of the meaning and pragmatics of syntactic constructions into account. The child would link the lexical information provided by the verb with the slots provided by the skeletal syntactic construction itself. Argument structure acquisition is thus conceived as a usage-based process of integrating generalizations about the valency of verbs with generalizations about the nature of argument slots of syntactic constructions (see Goldberg, 1993).

In Tomasello's spelling out of the implications of construction grammar for language acquisition, the liberating and innovative aspects of this framework become obvious: if one does not work with the notion of rules, one does not have to deal with exceptions to the rules or with overly general rules. This overcomes not only one of the biggest problems of many linguistic theories but also the most unsatisfactory aspects of empirical research that explains away existing but non-fitting or unexplainable data as not being relevant for the theoretical issue under investigation. In this

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

respect, construction grammar is potentially more comprehensive than other current linguistic theory since it does not have the option of discarding disturbing or idiosyncratic facts of language use as irrelevant for the theory, but rather opts to account for ALL formal and functional properties of language.

Tomasello takes a slightly different stance than Goldberg in adopting construction grammar for language acquisition by focusing on the role of constructions in child language. Tomasello uses the concept 'construction' in a two-fold way: first, in the same way as construction grammar, as abstract macro-structures which can be used for top-down processing, i.e. by virtue of knowing the construction, the child can interpret novel verbs in the correct way (cf. Akhtar & Tomasello, 1998). These abstract, fully analysed, and productive constructions mark the endpoint of language development. Accepting the notion of abstract construction makes it possible to test the full productivity of children's system rather than the onset of productivity. The construction grammar approach to acquisition as exemplified here thus shifts the focus of attention to later stages of development, since it turns out that the generalization and abstraction of linguistic knowledge takes place rather late (cf. Akhtar & Tomasello, 1998).

Second, Tomasello uses the notion of 'construction' for children's unanalysed or partially productive chunks. These constructions are 'concrete' as the function of the construction is tied to specific lexical items. The unifying concept between these two types of constructions is that they both represent entities used for specific communicative purposes. Tying these together, Tomasello can show that the 'concrete', albeit unanalysed, constructions are an integral and important part of children's linguistic repertoire and not just deviations of an otherwise straightforward, structure-building acquisition process characterized by increasing complexity.

However, using the term construction for both concrete and abstract constructions may actually blur the acquisition or 'constructing' process. The issue which requires more fleshing out is how the child gets from 'concrete constructions' to 'abstract constructions', as the two types of constructions can be linked in different ways. In some cases, for example, the child's concrete constructions share a similar surface structure with the abstract construction. Here, the acquisition process lies in achieving productivity of the various parts of the construction: more lexical elements can be inserted into the slots of the construction, and those elements can be inflected, e.g. children may acquire a small 'past tense'-construction within a larger ditransitive construction.

In other cases, children's constructions differ from adult ones in such a way that there may not be a direct link between the two. Instances of this kind would be utterances like *mommy sock* where the communicative intent is not clear. What happens in this case? Does the child add material

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

like a verb to this noun–noun construction? Or does the child just drop this construction once he or she has learned a more appropriate one? Both cases show that there is still a lot of construction work going on from the child's side. The acquisition research of the past decades has shown that courses of acquisition are not completely random but that there is considerable systematicity between individuals. Coming back to the issue of productivity, it is quite plausible that within a wide variety of concrete constructions in the children's repertoire, there is a fairly systematic order of identification of abstract constructions. It is the appeal of construction grammar that it allows us to look at acquisition from both angles.

REFERENCES

Akhtar, N. & Tomasello, M. (1998). Young children's productivity with word order and verb morphology. *Developmental Psychology* **33**, 952–65.

Fillmore, C. J. (1988). The mechanisms of construction grammar. *Berkeley Linguistics Society* **14**, 35–55.

Goldberg, A. E. (1993). Another look at some learnability paradoxes. In E. V. Clark (ed.), *Proceedings of the 25th Annual Child Language Research Forum* (pp. 60–75). Stanford: Center for the Study of Language and Information.

—— (1995). *Constructions*. Chicago: Chicago University Press.

Does formal spell difficult?

YONATA LEVY

The Hebrew University

Goldberg (1995) is not a book about development. Although there are sporadic comments about language acquisition, this is in no way a central topic of interest to the author. However, language acquisition is central for Tomasello. In his commentary, Tomasello expresses the view that a linguistic theory along the lines of Goldberg (1995), which attributes meaning to syntactic constructions, can serve as a basis for a theory of acquisition. Furthermore, it is argued that if this approach turns out to be linguistically plausible it will free us from the need to consider formal linguistic theories, most notably, generative approaches, as potential frameworks for development.

Assuming that construction grammar or cognitive functional grammars or generative semantics succeeds in accounting for syntax in terms of form–function correspondences at the sentence level, what will be the relevance of such models to acquisition theory? This question should be answered with respect to empirical facts concerning acquisition as well as with respect to the theoretical stance that is implied.

In the section on implications for acquisition, Tomasello refers to certain

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

well-known facts about children's early productions. For example, children begin by producing single words and then go on to two-word combinations. That is, children go from smaller, lexically specific units to larger units. These facts received what was known in the literature as 'rich' interpretation, for example, by Bloom (1970) and Antinucci & Parisi (1975) who considered such utterances as reduced productions of complex underlying syntactic structures. Tomasello adopts a similarly 'rich' interpretation of single and two-word combinations yet he appeals to a different linguistic model, that of construction grammar, as underlying what he considers to be reduced productions. In other words, even if seen as reduced expressions of larger units, early one and two-word combinations lend themselves to more than one theoretical interpretation.

Tomasello cites evidence suggesting that, with respect to verbs, children's early productions are lexically specific, however, the nominal slots are general and are best described in reference to a noun category. Thus, if one does not opt for a 'rich' interpretation of children's production, the evidence suggests that at least with respect to verbs, children start with small units which may be very specific. This is contrary to the statement that 'children's initial learning does not consist of elements that are small and abstract, but rather it consists in some measure of whole linguistic constructions that are large and concrete'.

Tomasello argues further that children will move toward adult-like abstract and verb general constructions which will then pave the way to processes such as 'syntactic bootstrapping' (Gleitman, 1990). While syntactic bootstrapping may indeed be a learning mechanism available to children, I am not convinced that the use of such a learning mechanism which capitalizes on correlations between syntax and the meaning of constructions entails a rejection of formal syntax.

Tomasello argues that similar to other kinds of linguistic elements, sentence-level constructions follow the familiar U-shaped developmental pattern. However, rather few linguistic constructions, whether at the word level or at the sentence level, in fact show U-shaped developmental curves. Verb morphology in languages other than English (Hebrew, for example), syntactic phenomena such as WH-movements or NP subject omissions do not typically show U-shaped developmental curves. In general, U-shaped developmental curves are the exception, albeit an intriguing and perhaps a theoretically important one, rather than the rule.

Thus, it seems that with respect to the evidence that is being reviewed in the current commentary, construction grammar does not offer a particularly convincing interpretation of familiar developmental findings. In fact, a theory of this type which argues that constructions are the basic units of language is *a priori* an unlikely candidate for a model of language acquisition since children's productions typically go a long way before there is evidence

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

of constructions. Why then is this theory attractive to language acquisition theorists? I believe the answer concerns the most fundamental theoretical split in the field of language acquisition.

As noted by Tomasello, the view of grammar as computational and autonomous has been mostly associated with Chomsky-type generative grammars. Such a view of language suggests that children develop formal grammatical categories and learn to operate with rules that are language specific and do not necessarily appeal to meanings. This view holds that formal systems are not necessarily more difficult in development than functionally-based paradigms and that the acquisition of formal grammatical concepts and rules is routinely accomplished by the young child. Giving up the latter assumption would require that generative grammarians explain the discontinuity in development, for this would mean that children start off with a functionally-based grammar and end up as mature speakers in control of formal syntax (cf. Gleitman, 1981).

The vision of the young child as capable of formal learning that is not functionally anchored has been unacceptable to a whole school of thought in the field. Indeed, the assumption that form–function correlations are crucial for children in order to 'crack the code' of their language is intuitively appealing. Furthermore, given that important social-cognitive developments predate language, it seems plausible that those will form the basis for the child's grammar. If so, one is again faced with the problem of discontinuity in development unless functional grammars, such as Goldberg (1995) are adopted, to account for the adult system. In this case one may be able to argue that what begins as a functionally-oriented system in the child will ultimately develop into a fully-fledged functional grammar in the adult.

While it is unlikely that the debate concerning the nature of early linguistic knowledge will be settled solely by empirical considerations, mainly because early productions lend themselves to more than one theoretical account, empirical findings may nevertheless, increase the plausibility of one view over the other, hopefully not just for those who already hold a certain position…

The present state of our knowledge suggests that while children may be capitalizing on form–function correlations in the learning of certain linguistic structures, there is evidence that formal grammatical systems may be learnt very early. The relevant studies in morphology concern grammatical gender and the plural morpheme (cf. Mervis & Johnson, 1991; Caselli, Leonard, Volterra & Campagnoli, 1993; Levy, in press), grammatical case (cf. Tracy, 1986; Weist & Wilkowska-Stadnik, 1986) and verb derivations (Levy, in press). Studies in syntax relate to the acquisition of the count-mass distinction in nouns (cf. Gathercole, 1985; Gordon, 1985; Bloom, 1994), movement of wh- words in English (Philip & de Villiers, 1992) and the development of argument structure of iconic and non-iconic verbs in ASL (cf. Meir, 1981;

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

Meir & Newport, 1990). Of particular interest is the fact that although in all of these systems there is a significant overlap between form and function which children COULD capitalize on, in fact they do not; rather, such systems are approached by children as if they were local, arbitrary and self-contained, with utmost attention to their formal, non-functional properties.

The conclusion that can be drawn from these data and from the data cited by Tomasello, is that, linguistic debates aside, the issue concerning the DEVELOPMENTALLY plausible approach to language acquisition is hardly a settled one.

REFERENCES

Antinucci, F. & Parisi, D. (1975). Early semantic development in child language. In: Lenneberg, E. & Lenneberg, E. (eds) *Foundations of language development: a multi-disciplinary approach*. New York: Academic Press.

Bloom, L. (1973). *One word at a time: the use of single word utterances before syntax*. The Hague: Mouton.

Bloom, O. (1994). Syntax-semantics mappings as an explanation for some transitions in language development. In Levy, Y. (ed.) *Other children, other languages*. Hillsdale, NJ: Erlbaum.

Caselli, M. C., Leonard, L. B., Volterra, V. & Campagnoli, M. G. (1993). Toward mastery of Italian morphology: a cross-sectional study. *Journal of Child Language* **20**, 377–93.

Gathercole, V. C. (1985). He has too much hard questions: the acquisition of the linguistic count–mass distinction in much and many. *Journal of Child Language* **12**, 395–415.

Gleitman, L. R. (1981). Maturational determinants of language growth. *Cognition* **10**, 103–14.

—— (1990). The structural sources of verb meaning. *Language Acquisition* **1**, 3–55.

Gordon, P. (1985). Evaluating the semantic category hypothesis: the case of the count–mass distinction. *Cognition* **20**, 209–42.

Levy, Y. (1997). Autonomous linguistic systems in the language of young children. *Journal of Child Language* **24**, 651–671.

Meier, R. P. (1981). Icons and morphemes: models of the acquisition of verb agreement in ASL. *Papers and reports on child development* (Stanford University) **20**, 92–9.

Meier, R. P. & Newport, E. L. (1990). Out of the hands of babes: on a possible sign advantage in language acquisition. *Language* **66**, 1–23.

Mervis, C. B. & Johnson, K. E. (1991). Acquisition of the plural morpheme: a case study. *Developmental Psychology* **27**, 222–35.

Philip, W. & de Villiers, J. (1992). Monotonicity and the acquisition of weak wh- islands. Paper presented at the Boston University conference on language development, October, 1992.

Tracy, R. (1986) The acquisition of case morphology in German. *Linguistics* **24**, 47–78.

Weist, R. M. & Wilkowska-Stadnik, K. (1986). Basic relations in child language and the word-order myth. *International Journal of Psychology* **21**, 1–19.

Comments on Tomasello's comments

RUTH A. BERMAN

Tel Aviv University

This note is a commentary on the second part of Tomasello's review, the section headed *Implications for Development*, rather than on Goldberg's book

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

as such. In general, I am largely sympathetic to many of the claims entailed by what has become known as 'construction grammar' associated with Fillmore, Kay, and their colleagues, extended and explicated in the book under discussion here (and see, too, Jackendoff, 1997). Their work provides well-motivated and well-documented arguments against the narrowly formal, structuralist approach of generative grammar in its various permutations over the past few decades. And Tomasello has performed a valuable service to language acquisition research by pointing to inadequacies of generative analyses and the possible relevance of a constructionist approach to the field.

Tomasello makes a particularly important point when he argues against 'the widespread view of syntactic development as a Lego-like building up of larger structures from smaller structures'. This has its antecedents, as Tomasello notes, in what came to be termed 'taxonomic, structuralist, descriptivist' linguistics by adherents of generative grammar since the 1950s. But this 'layer-cake' view of language still exerts a powerful impact on theory and practice in linguistic analysis, and (hence, too) in the domain of language acquisition. I myself have argued for a view of development in which children proceed from single words via initial word-combinations to simple-clause structure, thence to clause-linkage by coordination, and on to embedding by finite subordination, and eventually by various types of normalizations (Berman, 1993*a*).

However, I am not at all sure, as Tomasello appears to be, that 'construction grammar' is an adequate, let alone the definitive, response to the traditional 'separation of levels' entailed by the generativist claim for 'autonomy of syntax' (currently somewhat tempered by the notion of 'interfaces'). From my perspective, a constructionist approach by its very nature tends to be particularistic rather than integrative both in principle and in its analytical procedures. There is little explanation of how different constructions might be related together or in some way generalized. And I would like to see further and more powerful evidence, both theoretical and empirical, for the important insight which Tomasello attributes to construction grammar as relying 'crucially on the psychological reality of something like sentence-level linguistic constructions'.

Paradoxically, a 'layer-cake' approach to acquisition will be espoused more by researchers with an avowedly developmentalist orientation like Tomasello and myself, rather than by advocates of generative grammar and its associated nativism. Yet, and here is the paradox, I agree strongly with Tomasello's suggestion that 'the structuralist picture [of a Lego-like building up of larger structures from smaller] may not reflect developmental processes at all'. I am less sure about his construction-based hypothesis that children may be learning linguistic structures 'on several levels of complexity at the same time'. It might, rather, be the case that they are acquiring DIFFERENT linguistic systems concurrently, each at a different level of

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

complexity. In this view, development would take the shape of each such system and each such level of knowledge becoming recurrently integrated with one another and with other linguistic systems, along the lines argued for by Karmiloff-Smith since her pioneering (1979) study showing the relation between articles, noun gender, and pronominalization in the acquisition of reference.

From a rather different perspective, I would argue for a view of language acquisition and development as being initially triggered into 'emergence' and subsequently driven via re-organizations of partial knowledge along the path to 'mastery' (Berman, in progress) by means of 'a confluence of cues' or a 'multiplicity of factors' including: perceptual processing, lexical learning, and internalization of structure-dependent symbolic rules of combination and formal alternations. This view of multifold mechanisms underlying initial acquisition and subsequent mastery of language knowledge and use has proved helpful in accounting for development of different systems of Hebrew grammar and lexicon, including complex noun phrases (Berman, 1987), null subjects (Berman, 1990), transitivity and valence (Berman, 1993*b*), endstate resultative participles (Berman, 1994), and different classes of adjectivals and nominalizations (Berman, 1997*b*). Other researchers have also proposed that language acquisition and development cannot be explained by any single kind of mechanism, and that multiple factors must be taken into account in order to explain the process. These include the idea of 'a coalition of cues' as driving young children's developing comprehension of language input and linguistic structure (Hirsch-Pasek & Golinkoff, 1996) and of 'multiple bootstrapping' (Shatz, 1987) as underlying the claim that children use what they already know in order 'to learn more'. The challenge for developmental psycholinguistics (possibly for construction grammar as well) is to define and motivate the relative weight of these multifold factors in determining the progression from early, rapid, initial acquisition to subsequent later mastery of different linguistic subsystems, across different developmental stages and in varied contexts of use.

One possible point of departure to this issue, not addressed in Tomasello's review, is the impact of target-language typology. The proposed view of a confluence of varied but universally shared principles and strategies available to the language-learning child cannot focus exclusively on language-general structural and/or semantic complexity. Rather, following Slobin (1985, 1996), we need to consider how these factors interact with the language-particular knowledge entailed by acquisition of different languages and language-types. For example, both English and Hebrew use vowel alternation to express inflectional categories like verb-tense (e.g. *yošev/yašav = sit/sat*, *oxel/axal = eat/ate*) or derivational causativeness (e.g. *yošev/hošiv = sit/seat*); but in English vowel apophany is a restricted, historically fossilized

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

device, whereas in Hebrew it serves productively for a range of grammatical alternations including verb-tense, change-of-state causativity, and active versus passive voice. Thus, Hebrew-speaking children will earlier, and more naturally, attend to the role of vowels alternating in consonantal frames to express grammatical and semantic distinctions in their language, even though internal vowel alternation may seem formally more complex than the more transparent process of external affixation to a stem. A second example from these languages: English has a large class of adjectives which end in the syllable *-iy*, as in *pretty*, *ugly*, and denominated *dirty*, *sandy*, and children coin novel adjectives from familiar nouns with this ending as early as age two (Clark, 1993). Hebrew also has a very productive way of constructing denominal adjectives, coincidentally also by adding a final *-i* vowel to the base noun, e.g. *klal-i* 'general' from *klal* 'rule', *prat-i* 'personal' from *prat* 'person, individual'. But Hebrew-speaking preschoolers have few such adjectives in their vocabulary (Ravid & Nir, 1997), they rarely coin new adjectives in this form (Berman, 1997*b*), and they gain productive command of the process only well into school age (Ravid, 1997). The difference here is not necessarily one of structural complexity. Rather, in English this suffix occurs mainly in the basic, Germanic wordstock of the language, and so is readily accessible to two- and three-year-olds; Hebrew denominal adjectives correspond more to Romance-based words in English (e.g. *industrial*, *creative*), and form part of the later lexicon, hence of the morphological means for deriving them. Thus, the specifics of the input language may counteract factors of structural complexity, interacting in nonobvious ways with the factors of lexical productivity and registers of language use. In other words, target-language typology along with matters of productivity, register variation and frequency of input, all need to be considered as playing an important role in accounting both for constructions and for how they are acquired.

REFERENCES

Berman, R. A. (1987). Learning the form and use of complex nominals: a developmental route. *Linguistics* **27**, 1057–85.

—— (1990). Acquiring an (S)VO language: subjectless sentences in children's Hebrew. *Linguistics* **28**, 1135–66.

—— (1993*a*). Crosslinguistic perspectives on native language acquisition. In K. Hyltenstam & A. Viberg (eds), *Progression and regression in language : sociocultural, neuropsychological, and linguistic perspectives*, 245–66. Cambridge: C.U.P.

—— (1993*b*). Developmental perspectives on transitivity: a confluence of cues. In Y. Levy (ed.), *Other children, other languages : issues in the theory of language acquisition*, 189–241. Hillsdale, NJ: Erlbaum.

—— (1994). Formal, lexical, and semantic factors in the acquisition of Hebrew resultative participles. In S. Gahl, A. Dolbey & C. Johnson, (eds), *Berkeley Linguistic Society* **20**, 82–92.

—— (1997). Preliterate knowledge of language. In C. Portecovo (ed.). *Writing development : an interdisciplinary view*. Amsterdam: John Benjamins.

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

Berman, R. A. (in progress). Between emergence and mastery in language acquisition: evidence from Hebrew. Tel Aviv University manuscript.
Clark, E. V. (1993). *The lexicon in acquisition*. Cambridge: C.U.P.
Hirsch-Pasek, K. & Golinkoff, R. (1996). *The origins of grammar : evidence from early language comprehension*. Cambridge, MA: MIT Press.
Jackendoff, R. (1997). Twistin' the night away. *Language* **73**, 534–54.
Karmiloff-Smith, A. (1979). *A functional approach to child language*. Cambridge: C.U.P.
Ravid, D. & Nir, M. (1997, September). On the development of the category of adjective in Hebrew. Paper presented at Child Language Seminar, Garderen, The Netherlands.
Ravid, D. (1998). Between syntax and lexicon: parallels between N-N compounds and N-A strings in acquisition. *Proceedings of GALA IV*, Edinburgh University Press.
Shatz, M. (1987). Bootstrapping operations in child language. In K. Nelson & van Kleeck, A. (eds), *Child's language, Volume 6*, 1–22. Hillsdale, NJ: Erlbaum.
Slobin, D. I. (1985). Crosslinguistic evidence for the language-making capacity. In D. I. Slobin (ed.), *The crosslinguistic study of language acquisition, Volume 2 : Theoretical issues*. Hillsdale, NJ: Erlbaum.
—— (1996). From 'thought and language' to 'thinking for speaking'. In J. J. Gumperz & S. C. Levinson (eds), *Rethinking linguistic relativity*, 70–96. Cambridge: C.U.P.

Construction grammar and its implications for child language research

ELIZABETH BATES
University of California, San Diego

Proponents of generative grammar sometimes refer to their particular theoretical framework as 'the' theory of syntax (Chomsky, 1965; Grodzinsky, 1986; Smith & Tsimpli, 1995; Rice, 1997), implying that a consensus has been reached within linguistic theory. For child language researchers who do not find this framework useful, and/or are not willing to accept the epistemological baggage that it carries (i.e. radical claims about the innateness and autonomy of grammar), this is an unfortunate situation. The old alliance between linguistics and child language, forged with great optimism in the nineteen sixties, has turned into a partisan affair, practised almost exclusively by cognoscenti of MIT linguistics. In response, many developmental psycholinguists have abandoned linguistic theory altogether, basing their explanations on more general principles of representation and learning taken from developmental psychology and cognitive science. Although these fields also have a lot to offer, they do not provide the detail or the rigour that we once derived from a fruitful relationship with linguistics.

Michael Tomasello has proposed that we revive the old alliance within a broader framework, offering construction grammar (Fillmore, Kay & O'Connor, 1988; Goldberg, 1995) as a promising alternative for linguistically-guided child language research. He provides a lucid and faithful rendition of construction grammar (CG) and its implications for language

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

development, noting that CG is compatible with an interactionist/emergentist epistemology that is more acceptable to many of us in this field than its nativist counterpart. However, Tomasello's persuasive and mildly worded account of CG understates some of its most radical implications. Because CG eliminates the traditional boundary between grammar and the lexicon, it denies both the autonomy of grammar and the need for (innate) mechanisms devoted exclusively to its learning and maintenance. As Judith Goodman and I have noted elsewhere (Bates & Goodman, 1997), all elements of linguistic form in CG are represented within a heterogeneous lexicon that contains bound morphemes, free-standing content and function words, and complex phrase structures without terminal elements (e.g. the passive). Within this framework, the same mechanisms that children use to acquire words are also used to acquire grammar. This is a direct challenge to traditional claims about grammatical autonomy, and to the extent that lexical learning reflects more general principles of learning and conceptual development (a position acknowledged by many nativists, e.g. Pinker, 1991), it is also a direct challenge to linguistic nativism.

But how can this be? Haven't we been told that words are learnable but grammatical principles are not? That grammatical and lexical deficits dissociate in adults and children with various forms of neurological impairment? That different parts of the brain light up for grammatical *versus* lexical processing in normals? These conclusions have been widely circulated, and have gained some credence in our field (as one can infer from the perplexed questions raised by child language researchers on various electronic bulletin boards). If they were true (in a strong and interesting form), they would constitute solid evidence against the central claim of CG, and obviate its utility in the field of child language. The same pessimism would have to extend to cognitive grammar (e.g. Langacker, 1995), head-driven phrase structure grammar (Pollard & Sag, 1994), and any other theory in which lexical and grammatical principles have merged. But if these claims are not true (or they are premature), then we should all feel free to follow Tomasello's advice.

With regard to the learnability issue, I would simply underscore that claims about the unlearnability of grammar are still pure conjecture at this point. There are no formal proofs that incorporate anything resembling realistic assumptions about the learning device (Bates & Elman, 1997; Seidenberg, 1997). With regard to the second two points, extensive reviews of the evidence for and against a neural dissociation between grammar and the lexicon (e.g. Bates & Goodman, 1997; Elman, Bates, Johnson, Karmiloff-Smith, Parisi & Plunkett, 1996) lead to the conclusion that there is (so far) no compelling evidence for a separate 'grammar organ'.

First, consider the claim that non-fluent Broca's aphasics suffer from a selective loss of grammar, with sparing of lexical semantics. This is the

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

empirical basis for the further claim that grammar is located in a specific part of the brain, in and around the left anterior regions referred to as Broca's area. However, evidence has accumulated that casts great doubt on a 'grammar box' interpretation of these results. For example, studies show that so-called agrammatic Broca's aphasics can still make very subtle judgments of grammaticality, and cross-linguistic studies show that these patients retain exquisite details of their native grammar, manifested in many aspects of comprehension, production and real-time language processing (Menn & Obler, 1990; Bates, 1991). In short, the grammatical deficit associated with Broca's aphasia seems to involve some aspect of performance, rather than a loss of grammatical knowledge (Milberg, Blumstein, Katz, Gershberg & Brown, 1995).

Second, the grammatical problems displayed by Broca's aphasics are in no way unique to this group. The same kind of deficit (i.e. an omission pattern) has been reported for Down Syndrome and Specific Language Impairment (SLI), while other kinds of expressive agrammatism (e.g. grammatical substitution and/or simplification) have been observed in Wernicke's aphasia, anomic aphasia, Alzheimer's disease, Williams Syndrome, and the oral language of the congenitally deaf. Furthermore, patients who display deficits in expressive and/or receptive grammar, invariably display non-grammatical deficits as well, including lexical and/or phonological impairments of various kinds. Indeed, word-finding deficits (a symptom called ANOMIA) have been observed in every form of acquired aphasia that has ever been studied (Goodglass, 1993).

Claims about specific deficits of grammar in congenital populations have also fallen on hard times. It is widely acknowledged that children with SLI display problems with grammatical morphology, but these always coexist with deficits in lexical and/or phonological processing (for reviews, see Bishop, 1997; Leonard, 1997). Furthermore, some investigators have observed subtle perceptual processing problems that are not unique to language, although they could have a particularly deleterious effect on weak elements of grammar (e.g. Tallal, Miller, Bedi, Byma, Jenkins, Wang, Nagarajan & Merzenich, 1996). In short, there is still no compelling and uncontroversial evidence to indicate that grammar can be selectively impaired, sparing all other aspects of language, perception and cognition.

What about the growing stock of findings from neural imaging of the normal brain, especially the claim that regions of the brain respond differently to lexical and grammatical stimuli? In fact, there is relatively little agreement across studies on any aspect of language localization. Language areas have multiplied at an astounding rate, implicating Broca's area and Wernicke's area on the right side as well as the left, new regions on the underside of the brain (basal temporal cortex), parts of the cerebellum, a number of subcortical structures, and high frontal and parietal areas that do

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

not result in aphasia when they are lesioned. For the most part, studies report highly distributed patterning to any linguistic stimulus. Although it is always possible to keep subtracting away until little patches are left, these patches rarely overlap when studies are compared, and none of these regions are uniquely active for language (i.e. they are all involved in other forms of processing as well). Within individual studies, one can find evidence suggesting that different kinds of stimuli (nouns vs. verbs, content words vs. function words, syntactic violations vs. semantic violations) each lead to partially non-overlapping patterns of activation. However, this is also true for differences that no one wants to build into a linguistic theory, e.g. high vs. low frequency words, long vs. short words, or different degrees of syntactic complexity within a single class.

The bottom line is that different things are different. But these variations are not sufficient to justify claims about some kind of 'mental organ' for each structural type. Just as we configure our hands differently to pick up a pin, a book or a ball, we must configure the mind/brain differently to access and produce a bound morpheme, a content word, a function word or a phrase structure. Not every difference is a difference in kind.

In summary, I believe that the world is still a safe place for radically lexicalist theories of grammar, including construction grammar. There is no compelling evidence in favour of a modular distinction in the mechanisms that mediate words and grammar. As Tomasello notes, construction grammar is a promising linguistic framework for the analysis of child language, and it is an approach that is fully compatible with the current psycholinguistic and neurolinguistic evidence.

REFERENCES

Bates, E. & Elman, J. (1996). Learning rediscovered. *Science* **274**, 1849–1850.

Bates, E. & Goodman, J. (1997). On the inseparability of grammar and the lexicon: evidence from acquisition, aphasia, and real-time processing. *Language and Cognitive Processes* **12**: 5/6, 507–86.

Bates, E., Wulfeck, B. & MacWhinney, B. (1991). Crosslinguistic research in aphasia: an overview. *Brain and Language* **41**, 123–48.

Bishop, D. V. M. (1997). *Uncommon understanding : development and disorders of comprehension in children*. Hove, UK: Psychology Press.

Elman, J., Bates, E., Johnson, M., Karmiloff-Smith, A., Parisi, D. & Plunkett, K. (1996). *Rethinking innateness : a connectionist perspective on development*. Cambridge, MA: MIT Press/Bradford Books.

Fillmore, C. J., Kay, P. & O'Connor, C. (1988). *Regularity and idiomaticity in grammatical constructions : the case of Let Alone*. Language **64**, 501–38.

Goldberg, A. E. (1995). *Constructions : a construction grammar approach to argument structure*. Chicago: University of Chicago Press.

Goodglass, H. (1993). *Understanding aphasia*. San Diego: Academic Press.

Grodzinsky, Y. (1986). Language deficits and the theory of syntax. *Brain and Language* **27**, 135–159.

Langacker, R. (1987). *Foundations of cognitive grammar*. Stanford: Stanford University Press.

Leonard, L. B. (1997). *Specific language impairment*. Cambridge, MA: MIT Press.

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

Menn, L. & Obler, L. K. (eds). (1990). *Agrammatic aphasia : cross-language narrative sourcebook*. Amsterdam/Philadelphia: John Benjamins.
Milberg, W., Blumstein, S. E., Katz, D., Gershberg, F. & Brown, T. (1995). Semantic facilitation in aphasia: effects of time and expectance. *Journal of Cognitive Neuroscience* **7**(1), 33–50.
Pinker, S. (1991). Rules of language. *Science* **253**, 530–5.
Pollard, C. & Sag, I., (1994). *Head-driven phrase structure grammar*. Center for the Study of Language and Information, Report # CSLI-88-132. University of Chicago.
Rice, M. (ed.). *Towards a genetics of language*. Hillsdale, NJ: Erlbaum.
Seidenberg, M. (1997). Language acquisition and use: learning and applying probabilistic constraints. *Science* **275**, 1599–1603.
Smith, N. & Tsimpli, I-M. (1995). *The mind of a savant : language learning and modularity*. Oxford: Basil Blackwell.
Tallal, P., Miller, G., Bedi, G., Byma, G., Jenkins, W. M., Wang, X., Nagarajan, S. S. & Merzenich, M. M. (1996). Language comprehension in language-learning-impaired children improved with acoustically modified speech. *Science* **271** (5245), 81–84.

Constructions in syntax and canonical forms in phonology

LISE MENN
University of Colorado

The Tomasello/Goldberg approach to clause syntax, like the 'canonical form' approach to child phonology, is primarily an emergentist (data-driven) rather than an innatist (UG-driven) way of looking at language acquisition; considering the parallels yields some interesting hypotheses about early syntax. Since there are plenty of discussants for this paper who know more about the acquisition of syntax than I do, I will try to justify the proposed analogy between phonology and syntax; show how canonical forms in phonology are like constructions in syntax; and then show how integral they are to an emergentist view of the acquisition of phonology, now best exemplified by Queller (1994). Finally, I will offer my hypotheses and the hope that they can soon be tested – because if they are true, they will strongly support an emergentist approach to the development of syntax.

Some terminology

The familiar terms 'child phonology rules' or 'processes' apply to relatively regular mappings from the sounds of an adult target word to the way a child renders the sounds of that word in her own more limited phonetic repertoire. Children also often have quasi-regular but recognizable classes of ways of

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

rendering adult words which are too messy to be called 'rules', as well as rules which do not apply to their full potential domain; therefore, child phonology patterns often cannot be described by well-formed general rules.

Justifying the analogy

Phonology is a simpler domain than syntax, both because the elements of phonology are (virtually) meaningless, and because its extra-grammatical constraints are motoric and auditory instead of semantic and pragmatic. But still, learning the sound patterns of the words of one's language is a cognitive task that requires memory for and segmentation of the input. Also, words are not built up as sequences of isolated phoneme units: learning to produce a new sound sequence or a new prosodic frame is as much a challenge as learning to produce a new sound. Note Tomasello's statement that Goldberg's theory 'undermines the widespread view of syntactic development as a Lego-like building up of larger structures from smaller structures'. Strategies for dealing with these phonetic challenges are consciously or unconsciously devised; at least some of the successful strategies must be exploited, and unsuccessful ones discarded. Motor control limitations underdetermine the rich variety of ways that children rearrange the sounds of their language before they master adult pronunciation (*pace* MacNeilage, 1997): there are many potential strategies which a child may use to deal with an adult form that falls outside her current articulatory abilities, and some are far removed from phonological processes. Indeed, children may apply their strategies of sound rearrangement to words which they 'ought' to be able to say – words that make articulatory demands no greater than those posed by words that they do in fact say (Smith, 1973; Menn, 1983). Most conspicuously, young children do sometimes regress from pronouncing a word (relatively) correctly to pronouncing it less correctly. U-shaped curves exist in phonology as well as in morphosyntax.

Canonical forms are like constructions

What most sources say about early child attempts to produce words is that children have small (but cross-linguistically similar) repertoires of stop consonants, tend to stick to CV or CVCV word forms, and have rules/processes that replace many adult consonants with others that are 'simpler'. There are some natural, widespread positional constraints: e.g. voiced stops are more likely to appear as the first sound of a word, while unvoiced ones are more likely to appear as the last sound. Though these things are true, the awkwardness of real longitudinal child phonology data seldom appears in either theoretical (e.g. Rice & Avery, 1995) or introductory treatments. This awkwardness is not just a matter of the individual differences between children, but concerns such phenomena as the within-child variability from token to token, the progressive and regressive exceptional words, the

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

gradualness with which new rules take hold, the failure of newly-acquired features to generalize across phonemes, the failure of rules to apply to all the words in their potential domains, and the restriction of particular sounds to particular positions in a word (some children learning English have sibilants only at the ends of words). In short, what is typically not brought out is the fact that the young child's lexicon is not a fully regular system. Instead, it is a kind of mosaic of different patterns for dealing with adult-language target words – in fact, a dual set of such patterns, one for input and one for output (Schwartz, Leonard, Frome, Loeb & Swanson, 1987).

Each element of this mosaic is a set of words of similar syllable shape and perhaps similar phonetic content. One set might consist of /CVCV/ words in which the same stop consonant is repeated; another might be a group of /s/-final words with low vowels; a third might be a group of words that begin with nasals and have no final consonant. The sound pattern abstracted from such a set and used to describe it is usually called a 'canonical form', a 'template' (Macken, 1979), or a 'prosody' (Waterson, 1971). Output templates for words may include 'melodic' patterns like 'first vowel higher than second vowel', 'medial consonant = glottal stop', 'first consonant labial, second alveolar' (Macken, 1992).

Why should the child's lexicon be such a mosaic of separate canonical forms? Apparently, a young child wanting to say a target word has limited means at her disposal. Children's earliest phonological 'units' appear to be whole words, each one laboriously mastered as an individual entity, unless their sounds are directly carried over from the vocal motor schemes of late babble (Vihman, 1996). Canonical forms come next: each of them seems to be a kind of recipe for word production, derived either by generalization from one 'seed' word that the child has managed to learn to say, or by a pattern coalescing/emerging from a small set of similar words (Menn, 1973). Once the child has a few such recipes, she has the phonological basis for a vocabulary explosion. As Queller (1994: 106) says, 'as the active lexicon expands, the exigencies of formulability ... will tend to exert a strong overall pressure in the direction of more formulaic behaviour'. If a new target word matches one of the output canonical forms exactly, it may be produced correctly; if it doesn't match, but falls into the potential domain of that form, it may be produced in accordance with the mappings that the child has already devised. If the target word falls outside the set of domains of canonical forms that the child has already mastered, it may be avoided (Schwartz *et al.*, 1987) or attempted. If the word is attempted, the child may reach beyond the repertoire and try the new sound sequence, or may adapt the word by omitting, changing, or rearranging some of its sounds so that it fits an available canonical form (Menyuk, Menn & Silber, 1986; Gerken, 1994; Menn & Stoel-Gammon, 1995).

For example: words requiring two different places of articulation, such

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

as *boot* or *duck*, present challenges to young children, so it appears that many of them have not developed a recipe for changing place of articulation during the production of a word; those who have done so may have managed it only for one such sequence, such as 'Velar-vowel-Alveolar', 'Labial-vowel-Velar', or 'Labial-vowel-Alveolar-vowel'. A given child may deal with some such words by assimilation of the first consonant to the second, with another subset by deleting the first consonant; a third subset may be produced accurately, while others may be avoided.

The domain of target words to which a particular rule applies may be rather odd by adult standards: it may hinge on idiosyncratic partial resemblances, instead of being defined by a neat set of phonological features. If the words in a set do all have a set of properties in common, these properties may be an unorthodox mixture of rhythmic, syllabic, and segmental specifications which ignores the conventional organizational levels of phonology, e.g. 'two-syllable words beginning with [k]′ (Menn, 1976).

As mentioned above, some mappings from the adult word to one of a child's canonical forms are not systematic enough to be expressed as rules or processes. In addition, a child may have several different ways of saying the same word – e.g. the child studied by Priestly (1977), who had several different ways of mapping certain adult words into a [CVjVC] canonical form, e.g. [majos] and [mɛjan] for 'monster', [tajak] and [tajaɤ] for 'tiger'.

On beyond zebra

> Ferguson & Farwell (1975: 36) assume: 'that a phonic core of remembered lexical items and articulations that produce them is the foundation of an individual's phonology and remains so throughout his linguistic lifetime … we assume the primacy of lexical learning in phonological development, even though it may be heavily overlaid or even largely replaced by phonologically organized acquisition processes in later stages … since children have different inputs and utilize different strategies, the gradual development of phonological organization and phonological awareness may proceed by different routes and at different paces so that adult phonologies may differ from one another just as the lexical stocks of individuals may differ.'

Now, if syntax is also instance-based (as Tomasello suggests), and if the mapping from the semantics of adult constructions to a child's constructions is validly analogous to the mapping from adult target words to a child's output words, then the child's set of constructions will include some that have arisen by generalization from different adult models. I predict that the following unruly situation will arise: a child's constructions will sometimes be incompatible with one another; similar semantic intents will then end up being represented by two different output constructions. These two con-

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

structions may apply to disjoint sets of verbs and arguments, giving a grammar that precludes strong generalizations. Furthermore, they may apply to some of the same sets of verbs and arguments, so that the child will vacillate between competing ways of saying the same thing. In addition, widely differing semantic intents may be mapped into the same output construction. This is very different from a well-formed grammar, one might say, and not compatible with UG. That should rule it out, according to a continuity hypothesis.

Unless, of course, the same properties are true of adult syntax – which I think they are. Construction grammar can deal with this; I don't know of any other approach that can.

REFERENCES

Ferguson, C. A. & Farwell, C. B. (1975). Words and sounds in early language acquisition. *Language* **51**, 419–39.

Gerken, L. (1994). Child phonology: past research, present questions, future directions. In M. A. Gernsbacher (ed.), *Handbook of psycholinguistics*. San Diego: Academic Press.

Macken, M. A. (1979). Developmental reorganization of phonology: a hierarchy of basic units of acquisition. *Lingua* **49**, 11–49.

—— (1992). Where's phonology? In C. A. Ferguson, L. Menn & C. Stoel-Gammon (eds), *Phonological development : models, research, implications*. Timonium, MD: York Press.

MacNeilage, P. (1997). Acquisition of speech. In W. J. Hardcastle & J. Laver (eds), *Handbook of phonetic sciences*. Oxford: Blackwell.

Menn, L. (1973). On the origin and growth of phonological and syntactic rules. *Papers from the Ninth Regional Meeting of the Chicago Linguistic Society*, 378–85.

—— (1979). *Pattern, control, and contrast in beginning speech : a case study in the development of word form and word function*. Bloomington: Indiana University Linguistic Club.

—— (1983). Development of articulatory, phonetic, and phonological capabilities. In B. Butterworth (ed.), *Language production* **2**. London: Academic Press.

Menn, L. & Stoel-Gammon, C. (1995). Phonological development. In P. Fletcher & B. MacWhinney (eds), *Handbook of child language*. Oxford: Blackwell.

Menyuk, P., Menn, L. & R. Silber (1986). Early strategies for the perception and production of words and sounds. In P. Fletcher & M. Garman (eds.), *Language acquisition*, 2nd ed. Cambridge: C.U.P.

Priestly, T. M. S. (1977). One idiosyncratic strategy in the acquisition of phonology. *Journal of Child Language* **4**, 45–66.

Queller, K. (1994). *Scheming and manipulating : how phonological structure emerges out of children's explorations of surface lexical form*. Doctoral dissertation, Linguistics Department, Stanford University.

Rice, K. & Avery, P. (1995). Variability in a deterministic model of language acquisition: a theory of segmental elaboration. In J. Archibald (ed.), *Phonological acquisition and phonological theory*. Hillsdale, NJ: Erlbaum.

Schwartz, R. G., Leonard, L. B., Frome Loeb, D. M. & Swanson, L. A. (1987). Attempted sounds are sometimes not: an expanded view of phonological selection and avoidance. *Journal of Child Language* **14**, 411–18.

Smith, N. V. (1973). *The acquisition of phonology : a case study*. Cambridge: C.U.P.

Vihman, M. M. (1996). *Phonological development : the origins of language in the child*. Oxford: Blackwell.

Waterson, N. (1987). *Prosodic phonology : the theory and its application to language acquisition and speech processing*. Newcastle upon Tyne: Grevatt & Grevatt.

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

DISCUSSION

Constructions and conversation*

EVE V. CLARK
Stanford University

In his review essay Michael Tomasello makes a compelling case for a return to looking at constructions in the study of how children acquire the syntax of their first language. In this comment, I point out some further connections among linguistic units at different levels, and raise the question of what counts as a construction in different language types. I also suggest that we need to look more closely at conversation as the setting in which children isolate, identify, and eventually produce constructions at all levels.

What counts as a construction?

Tomasello proposes children learn linguistic structures on several levels simultaneously. One of these levels, of course, coincides with the linguist's sentence level (the construction level). What are the other levels? One is the word, where one type of construction consists of the stem plus its inflectional affixes, as in the English past tense (*jump-ed, climb-ed, wait-ed*) or the Turkish progressive (SG: *al-ıyor* 'he is taking'; PL: *al-ıyor-lar* 'they are taking'). But not all word stems are simple or unitary in nature. While verbs like English *climb* or Turkish *al* 'take' consist of single morphemes, many other base-words consist of several, e.g. English nouns like *light-switch, water-ing-can*, or *shoe-mak-er*; verbs like *complex-ify* or *decor-ate*; or adjectives like *tower-ing, argument-ative* (from *: argue+ment*), or *celebrat-ed*. Nouns and verbs with complex internal structure in a language typically take the same inflections as single-morpheme terms. In both word-types, children must learn which inflections to add when, but, for complex words, they must also analyse the internal structure of the word-forms themselves in order to learn how to construct new words.

And they do. Children offer spontaneous analyses of complex words from an early age, isolating specific morphemes and commenting on them (e.g. Aimard, 1975; Clark, 1993). They also demonstrate their knowledge of constituent morphemes by glossing novel agentive nouns, for instance, identifying the base and the agentive suffix *-er* in a novel noun like *thrower*, glossed as 'he throws things' or 'he likes to throw things'. Children as young as 3;0 are near ceiling on this for some suffixes (Clark & Hecht, 1982; see also Mulford, 1983; Clark & Berman, 1984). The same children do less well in constructing novel words themselves, but again, as young as three, for some

[*] Preparation of this paper was supported in part by the Max-Planck-Institut für Psycholinguistik, Nijmegen.

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

word types, they can construct new words with specified meanings, upon demand. And in their spontaneous speech, they coin new word-forms as they need them to fill gaps in their lexicons (Clark, 1993). In short, the available evidence suggests that, from as young as age 2;0, children could be viewed as working on constructions within words as much as they do on constructions made up of words.

When we consider data from a range of language types, this point becomes important, since what counts as a syntactic construction may be unclear. In many languages, utterances are built up around one or more nominal or verbal roots to which the speaker can add a variety of derivational and inflectional affixes that may do much of the work done by the syntax in other languages. In these languages, the line between word and sentence can become blurred. Take a polysynthetic language like West Greenlandic. This language has over 300 inflectional affixes and between 400 and 500 derivational affixes. The latter carry out much of the work assigned to external syntax in other language types. Greenlandic words are of three kinds: verbs, nominals, and uninflected particles. Verbs and nominals are each made up of a stem to which inflections are added, with up to eight derivational affixes insertable between a stem and its inflections. That is, children learning this type of language must focus most of their analyses inside word boundaries, since that is where much of the syntax lies (for acquisition, see Fortescue & Lennert Olsen, 1992; Allen, 1996).

On the other hand, in an isolating language like Mandarin Chinese, there is virtually no inflectional morphology, but there are clear word classes, strict word orders, various time adverbs and aspect markers that can be suffixed to the verb, plus topicalization and sentence-final particles linking utterances within a discourse. In this type of language, children will have to focus above the word level in their acquisition of syntax, and will have virtually no analysis to do within words (for acquisition, see Erbaugh, 1992). Other language types lie between these two extremes, typically requiring that children analyse both the internal structure of complex words and sentential-level combinations of words, as in English or Turkish (see further Slobin, 1985).

Do language types represent a continuum? If so, is it always clear what we would wish to count as A CONSTRUCTION? Consideration of other language types will be critical in assessing how to apply the general notion of construction, and in deciding whether there are constructions below the level of the word as well as above it.

Constructions and conversation

Several decades ago, with his customary prescience, Roger Brown noted that: 'The changes produced in sentences as they move between persons in discourse may be the richest data for the discovery of grammar' (Brown

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

1968: 288). Utterances move among speakers in conversation and are often shared among them:

> 'In conversation, whether between adult and child or child and child, the linguistically defined sentence unit and the grammatical and semantic relations it reflects (or organizes) may be apportioned across speakers, as, in the most obvious case, when one speaker completes a fragment begun by the previous speaker' (Garvey 1979: 364).

The contribution of conversational exchanges to the identification of linguistic units during acquisition has been echoed in different ways by other researchers since. Adult speakers essentially display structures and their relationships in the course of talking to children and in encouraging them to make appropriate contributions to a conversation. Conversation offers children a wealth of structural information about how to express particular meanings lexically and syntactically, what the parts of a structure are, and how they can be combined, in addition to information about the give-and-take of turn-taking and the making of appropriate contributions in a timely manner (e.g. Garvey, 1984; McTear, 1985; Galloway & Richards, 1994).

Conversation simultaneously offers children extensive information about the frequencies of different forms, both words and constructions – in child-directed speech. Children are very sensitive to frequency, a factor that may be of critical importance in assessing what they are likely to know, at different stages, about the constructions compatible with specific lexical items. For example, de Villiers (1983) showed that children used specific verbs only in constructions they had heard from their mothers, and not in other constructions they had not yet heard. In fact, the connections between a verb meaning and the set of constructions that verb can appear in are very close (e.g. Gross, 1975). And in word-formation, children are sensitive to differential frequency and typically opt for the most productive affixes (the most frequent) first, and only later master less productive (less frequent) ones within a specific semantic domain (e.g. Clark & Berman, 1984; Clark & Cohen, 1984).

In short, the research on constructions in language provides a welcome impetus for us to take a fresh look at what children are acquiring when they acquire syntax. It also challenges us to ask a broader range of questions about the acquisition of syntax, and to think in more detail about learning in language acquisition. For instance, to what extent is the learning of specific words linked directly to the learning of the constructions those words can appear in? Earlier studies have hinted at such a link (e.g. Bloom, Tackeff & Lahey, 1984), but only recently have researchers taken a fresh look at the earliest stages of lexical and structural acquisition where indeed the early

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

acquisition of structure seems to depend quite directly on children's knowledge of specific words (e.g. Tomasello, 1992; Pine, Lieven & Rowland, in press). Although learning (nurture) and innateness (nature) have provided some of the main debates about acquisition, there have been remarkably few attempts to assess just how much structure COULD be learnt. The notion of construction promises us a new tool for assessing what syntax is learnt during acquisition.

REFERENCES

Aimard, P. (1975). *Les jeux de mots de l'enfant*. Villeurbanne: Simép Editions.

Allen, S. E. M. (1996). *Aspects of argument structure in Inuktitut*. Amsterdam: John Benjamins.

Bloom, L., Tackeff, J. & Lahey, M. (1984). Learning *to* in complement constructions. *Journal of Child Language* **11**, 391–406.

Brown, R. (1968). The development of WH questions in child speech. *Journal of Verbal Learning & Verbal Behavior* **7**, 279–90.

Clark, E. V. (1993). *The lexicon in acquisition*. Cambridge: C.U.P.

Clark, E. V. & Berman, R. A. (1984). Structure and use in the acquisition of word-formation. *Language* **60**, 547–90.

Clark, E. V. & Cohen, S. R. (1984). Productivity and memory for newly-formed words. *Journal of Child Language* **12**, 611–25.

Clark, E. V. & Hecht, B. F. (1982). Learning to coin agent and instrument nouns. *Cognition* **12**, 1–24.

De Villiers, J. G. (1985). Learning how to use verbs: lexical coding and the influence of input. *Journal of Child Language* **12**, 587–95.

Erbaugh, M. S. (1992). The acquisition of Mandarin. In D. I. Slobin (ed.), *The crosslinguistic study of language acquisition* (vol. 3, 373–455). Hillsdale, NJ: Erlbaum.

Fortescue, M. & Lennert Olsen, L. (1992). The acquisition of West Greenlandic. In D. I. Slobin (ed.), *The crosslinguistic study of language acquisition* (vol. 3, 111–220). Hillsdale, NJ: Erlbaum.

Galloway, C. & Richards, B. J. (eds) (1994). *Input and interaction in language acquisition*. Cambridge: C.U.P.

Garvey, C. (1979). Contingent queries and their relations in discourse. In E. Ochs & B. B. Schieffelin (eds), *Developmental pragmatics* (363–72). New York: Academic Press.

—— (1984). *Children's talk*. Cambridge, MA: Harvard University Press.

Gross, M. (1975). On the relations between syntax and semantics. In E. L. Keenan (ed.), *Formal semantics of natural language* (389–405). Cambridge: C.U.P.

McTear, M. (1985). *Children's conversation*. Oxford: Blackwell.

Mulford, R. C. (1983). On the acquisition of derivational morphology in Icelandic: learning about *-ari*. *Islenskt mál og almenn málfraeði* **5**, 105–125.

Pine, J. M., Lieven, E. V. M. & Rowland, C. F. [in press] Comparing different models of the development of the English verb category. *Linguistics*.

Slobin, E. I. (ed.). (1985). *The crosslinguistic study of language acquisition* (vols. 1 & 2). Hillsdale, NJ: Erlbaum.

Tomasello, M. (1992). *First verbs : a case study of early grammatical development*. Cambridge: C.U.P.

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

DISCUSSION

Some observations on construction grammar and language acquisition

EDITH L. BAVIN
La Trobe University

Tomasello's review focuses on the value of the theoretical approach to language presented by Goldberg (1995) over the universal approaches which have developed based on Chomsky's works, and the implications for the study of child language development, particularly syntactic development. Goldberg discusses the cognitive basis of the approach, and how participant roles fuse with argument roles in a construction, illustrating throughout the book how the constructions themselves add meaning. The examples are selected almost exclusively from English. For researchers interested in the process of acquisition of language, the construction grammar approach has clear advantages over the principles and parameters approach, and Tomasello is convincing in his enthusiasm for Goldberg's work.

That the meaning of an expression depends not only on the verb used but also on the inherent meaning of the particular argument structure in which it is used is an assumption made by Goldberg and other followers of construction grammar. Adults are able to generalize verbs to atypical constructions and these novel utterances can be interpreted; this suggests that meaning can be derived from a particular construction. Otherwise all the necessary components of meaning would need to be included in the lexical entry of the verb, and this would entail multiple entries for some verbs to accommodate all the components. For example, *sneeze* would have to be coded as a causative verb of motion to accommodate the sentence *He sneezed the handkerchief off the table* (Goldberg, 1995).

Acquisition data support the view that meaning is derived from constructions. Some children create novel utterances by using a verb in a non adult-like way, but the utterance can still be interpreted. *Don't put me the duck* would follow adult patterns of usage if *give* were substituted for *put*. The verb *put* is not typically used with a recipient or benefactor as the goal of the transaction. The end-point of the transfer is a location, and a locative argument is used with the verb as in *Put the duck on my hand*. But the interpretation that an adult gives to the novel utterance, that the child does not want the duck, is made from the construction in combination with the meaning of the verb *put*, a construction that typically uses a dative alternation verb. An example is the verb *give* which includes a meaning component of transfer; other verbs such as *make* use a benefactive goal as in *Don't make me any breakfast* or *Don't make any breakfast for me*. That a construction adds to the interpretation is clear from an adult

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

interpretation of *Don't open me the box* as the child not wanting the addressee to perform the action on the child's behalf or for her benefit. The verb *open* does not include this component of meaning, which is derived from the construction.

Researchers who have worked from a crosslinguistic approach to language acquisition, often with children in native language settings, will surely find Tomasello's statement 'Linguistic competence is nothing more or less than competence with the constructions of a particular natural language' rather refreshing. Languages encode grammatical categories in language-specific ways and thus different developmental paths can expected across languages, depending on the particular constructions available and the accessibility of these constructions. There are many examples available to illustrate typological and language particular developmental paths, for example, in the chapters included in Slobin's five volume series *The crosslinguistic study of language acquisition* (Slobin, 1985, 1992, 1997). By adopting the assumptions of construction grammar it is a straightforward matter to show that when children underdifferentiate categories or overgeneralize they have not yet gained competence with particular constructions in their language. Such patterns are revealing about which aspects of a language are more accessible. Because gradual mastery of language specific patterns would be predicted in a construction grammar approach, and because language development depends to some extent on the data available in the input to individual children, individual differences would be predicted as well as language differences. This is a main advantage of the approach. A second advantage is that the emphasis is on actual language constructions rather than abstractions.

In outlining how a child might come to know the constructions of her language, Tomasello draws upon Slobin's 1985 arguments that children initially talk about a limited set of events and states of affairs, including manipulative activity scenes and figure-ground scenes. He also draws upon the evidence that some children initially learn and reproduce whole chunks following the prosodic patterns in the input, indicating that some children are sensitive to constructions as opposed to words which are then built up into longer utterances. It should be added that even with a limited amount of exposure to a language children become attuned to language-specific properties, as shown by the studies on discriminations of sounds and prosodic features of language by children in their first year of life (e.g. see Werker & Desjardins, 1995), and also to properties and ways of conflating and encoding, as for example, shown by Choi and Bowerman (1991) for Korean. Even early productions are likely to indicate that children internalize patterns from the language they hear around them, before they start producing their own representations of these patterns.

In discussing whether the syntactic bootstrapping hypothesis (e.g. Gleitman 1990) can be supported, the assumption of this being that the

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

meaning of a verb can be derived from the syntactic frame in which it appears, both Goldberg and Tomasello argue that a child must already know the meanings of some verbs and have had some experience with them in particular syntactic frames. This raises a question that all acquisition researchers must ask: how much exposure is needed for a child to know a construction? We might assume that in a language that allows ellipsis of arguments, there might not be enough data for a child to detect the argument structure for a verb. In a language with varied word order it is not possible to rely on syntactic position alone to determine the role of the arguments: other cues must be used, such as case marking. A language that has varied word order and ellipsis of core arguments seems to pose a double problem. If the subject or object of a sentence is not overt in many of the utterances in the input, how does the infant determine the argument structure for the verbs in the language because the case markings will also not be overt? Once the child knows a verb and its argument structure, even if the arguments are non-overt she will be able to interpret an utterance using the verb. For example, an unexpressed object is assumed in *She ate* because *eat* is transitive; something gets eaten.

Warlpiri, a case marking language with flexible word order, is useful for illustrating some of the specifics that need to be considered when ellipsis of core arguments is a common feature in a language. A Warlpiri transitive verb generally has an ergative subject and absolutive object, while an intransitive verb has an absolutive subject. The ergative case is marked with one of four morphemes but there is no marking for absolutive case. If a child hears an utterance with two nouns, one ergative and one absolutive, the construction can be interpreted as someone caused a change in state or location of another entity. However, it is not typical to hear both core arguments in one sentence. Either one or both may be non-overt. If only one noun is overt and it is absolutive it may be unclear as to whether this is the object of a transitive verb or the subject of an intransitive verb, since word order is varied and the listener can not rely on word order to determine the role of the overt argument. A child hearing sentence (1), which consists of a verb, an absolutive noun, and a noun with allative case marking, does not have sufficient data on which to determine if someone caused the child (*kurdu*) to change location or if it was a spontaneous movement. This will only be determined if the listener ALREADY has a lexical entry for the verb which specifies both its lexical meaning and whether it has an ergative-absolutive case frame or an absolutive frame. Since the construction used does not specify the agent, the caused nature of the change of location could not be part of its meaning of the construction. Knowledge about an unspecified agent would only come from the lexical entry of the verb. In context, however, the child can match the real-life situation to the utterance and observe whether the action is spontaneous or not, and this would aid the child

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

in acquiring the lexical entry for the verb. With new verbs, the non-linguistic context would be crucial in assigning the intended meaning.

(1) wantija kurdu walya-kurra
fall(PAST) child ground-ALL
'A/The child fell to the ground.'

An additional clue in interpreting whether an utterance has a missing agent nominal would be provided if a noun with locative case marking was also case-marked with an ergative marker. Such double case marking is possible, and can help to eliminate ambiguity. With such double marking, the agent is located at the place specified with the locative marker, whether the agent noun is overt or not. This would give information to a child as to the argument structure of the verb: the verb would require an ergative subject. However, the child would need to be able to detect the case forms and their meanings, which requires they hear them in the input. Similarly, it is necessary to be able to detect the dative case form to interpret another construction. If an object appears in a Warlpiri sentence with a dative case marker instead of the expected absolutive, the resulting meaning is 'attempted action'. So with the verb *pantirni* 'spear' and a dative object instead of an absolutive object, the meaning provided by the construction is an attempted spearing of something or someone by an agent.

Thus knowledge of the case morphology is crucial in interpreting the constructions in the language. Warlpiri children know not just that a noun+case ending is a construction in the language but also what the functions of the case forms are. That Warlpiri children do acquire the verbs in their language as rapidly as in other languages, indicates that even when there is frequently ellipsis of core arguments in the input, the data provided is sufficient for the case frames to be acquired (see Bavin, 1995). However, the nonverbal context of acquisition is important in helping the children map events in the real world onto the construction they hear. The data from Warlpiri are important in showing that the acquisition of verbs and their argument structures is not separate from the acquisition of the morphology of the language.

The construction grammar approach to language is not a theory of language acquisition: acquisition is concerned with how and when children acquire knowledge of the constructions of their language. However, construction grammar focuses on actual language constructions in languages, and in this respect it provides us with a basis for empirical investigation. Much of the crosslinguistic acquisition research in the past 15 years or so has been concerned with investigating the acquisition of form–function mappings and the language specific factors that influence their acquisition. Bates & MacWhinney (e.g. 1989) have illustrated in their competition model that children detect the patterns that their language provides, and that languages

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

provide different cues. Researchers working with languages other than English have been concerned with constructions in their languages that do not neatly fit into an English-based model.

REFERENCES

Bavin, E. L. (1995). Inflections and lexical organisation: some evidence from Warlpiri. In Pishwa, H. & Marold, K. (eds) *The development of morphological systematicity*, 39–53. Tübingen: Gunter Narr Verlag.

Bates, E. & MacWhinney, B. (eds) (1989). *The crosslinguistic study of sentence processing*. Cambridge: C.U.P.

Choi, S. & Bowerman, M. (1991). Learning to express motion events in English and Korean: the influence of language specific lexicalization patterns. *Cognition* **41**, 83–121.

Goldberg, A. (1995). *Constructions: a construction grammar approach to argument structure*. Chicago: University of Chicago Press.

Gleitman, L. (1990). The structural sources of verb meanings. *Language Acquisition* **1**, 3–55.

Werker, J. F. & Desjardins, R. N. (1995). Listening to speech in the first year of life: experiential influences on phoneme perception. *Current Directions in Psychological Science* **4**, 77–81.

Slobin, D. I. (ed.) (1985). *The crosslinguistic study of language acquisition*, volumes 1 & 2. Hillsdale, N.J.: Erlbaum.

—— (ed.) (1992). *The crosslinguistic study of language acquisition*, volume 3. Hillsdale, N.J.: Erlbaum.

—— (ed.) (1997). *The crosslinguistic study of language acquisition*, volumes 4 & 5. Mahwah: N.J.: Erlbaum.

Not revolutionary enough

WILLIAM CROFT

University of Manchester

Tomasello argues that construction grammar, as described in Goldberg 1995, is a revolutionary theoretical breakthrough in syntactic theory that will have an important impact on research in language development. I am basically in agreement with this point of view: there are important fundamentals of construction grammar which represent a significant break with generative grammar. However, I also believe that construction grammar, at least the version described in Goldberg's book, does not go far enough to be genuinely revolutionary.

The fundamental principle of construction grammar is that a speaker's knowledge of the grammar of his/her language consists of a set of constructions organized in a knowledge network of some sort. These constructions vary in their degree of abstraction, from a totally specified idiom like *kick the bucket* to a completely schematic structure such as the ditransitive *Subject Verb Object1 Object2*. One can think of constructions as being like complex and/or schematic lexical items. Equally fundamental is the hypothesis that constructions specify not only their syntactic structure but also

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

their semantic and discourse-functional (pragmatic) conditions of use – again, like lexical items, which consist of a word form joined with its meaning and conditions of use.

These two principles define varieties of construction grammarians as opposed to grammarians working in other syntactic theories. (It is worth noting that some non-construction syntacticians are moving towards a construction grammar-like approach; compare Jackendoff, 1990, Pollard & Sag, 1993). And these two principles represent a radical break with generative grammar, for the reasons that Tomasello gives. Construction grammar reunites syntax and semantics, the signifier and the signified. One of the major contributions of Goldberg (1995) is to present arguments that argument-structure constructions have unique semantic and pragmatic conditions of use that require syntacticians to recognize the existence of constructions as symbolic units (see also Jackendoff, 1997).

By treating constructions as schematic complex symbolic units, the sharp distinction between syntactic 'rules' and lexical items is erased. The existence of idioms has indeed caused problems for rule-based syntactic theories for quite some time, leading to calls for construction grammar from linguists and artificial intelligence researchers for at least two decades (e.g. Becker, 1975; Bolinger, 1976). This allows for a uniform representation of grammatical knowledge from word to syntax. It also suggests that syntactic knowledge is learned not unlike lexical items and idioms, that is, without an innate component providing highly specific properties of constructions (as in generative grammar).

Goldberg (1995) also contains other valuable insights not found in all construction grammar research. She argues that constructions are organized in a hierarchy, so that more specific constructions inherit grammatical properties from more schematic constructions in the network; but that the specific constructions redundantly represent this information. This position is plausible and developmentally significant: it seems plausible that children build up constructional knowledge inductively, proceeding from the more specific to the more general, as Tomasello notes. Goldberg elaborates this in a neural-network-style model of partial productivity, resembling the past tense acquisition models proposed by connectionists (Rumelhart & McClelland, 1986; Plunkett & Marchman, 1993).

One of Goldberg's most insightful observations is the role of metaphor in explaining anomalies in the semantics of constructions. The recognition of constructional metaphors provides a brilliant solution to many problems in specifying the range of use of the argument structure constructions that Goldberg analyses, and should not be underestimated.

Nevertheless, there are important respects in which Goldberg's version of construction grammar still shares features with generative grammar and is not radical enough. Goldberg posits a series of 'principles' (some of which

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

are listed in Tomasello's review) without motivation in terms of cognitive processing or communicative function. Some of them can be reformulated or motivated by general functional principles, but they are not presented as such. Others, such as the Correspondence Principle, are reminiscent of 'principles' of generative grammar which are essentially unmotivated stipulations to get the mechanics of the formal representation to work.

Another problem with Goldberg's presentation is the (mis)use of the cognitive linguistic notion of profile vs. base or frame. A profile is cognitive linguists' way of recognizing that concepts do not exist in a vacuum but only against a background of conceptual knowledge (the base or frame; see Fillmore, 1985, Langacker, 1987). The semantic frame provides the background meaning, and the profile designates the concept within the semantic frame actually denoted by the word. Yet Goldberg uses profiling of participant or argument roles in verb entries and constructions in an *ad hoc* way: roles in verb entries are profiled if they are syntactically obligatory; roles in constructions are profiled if they core arguments. Neither of these uses has anything to do with the relation between a concept and its semantic frame; they hide essentially *ad hoc* stipulations behind the name of an accepted theoretical construct. (I believe that the proper analysis of argument structure is to recognize that EVENTS have different profiles in different constructions, since, after all, verbs and clausal constructions profile events; see Croft, 1991, 1997.) This criticism does not undermine the construction grammar model; it is a relatively secondary technical point. But the style of argumentation is reminiscent of unattractive aspects of many generative grammatical analyses, where such unexplanatory stipulations are common.

A third 'throwback' to generative analyses is Goldberg's use of an argument from simplicity or elegance to claim that verbs occurring in different constructions are not polysemous. She argues that one should not have to posit two distinct verb meanings for verb like *sneeze* to account for its occurrence in the intransitive construction *She sneezed* and the caused-motion construction *She sneezed the napkin off the table*. Instead, the difference in meaning (bodily reflex vs. caused-motion) comes from the construction, so by elegance one should not posit two separate meanings for the verb *sneeze*. Goldberg is arguing here against non-construction grammarians like Levin & Rappaport Hovav (1995) who claim a lexical rule can do what a construction is being asked to do, and hence there is no need for constructions: Levin & Rappaport Hovav argue that there is a lexical rule deriving the caused-motion meaning of *sneeze* from its basic meaning, and the derived meaning allows it to be used in the caused-motion construction. But both are right. There are significant idiosyncrasies in which verbs enter into which constructions. Goldberg notes the anomalous occurrence of *forgive* and *envy* in the ditransitive construction (*He envied the prince his fortune*) – they do not fit with the constructional meaning of transfer of

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

possession – and treats their acceptability in the construction as a historical relic (Goldberg 1995: 131–2). Relic it may be, but it is lexically specific and it is conventionalized in the language. In fact, Goldberg's argument for redundant representation of grammatical knowledge for more specific construction types (referred to above) should be extended to fully specified verb + construction combinations as in *Subject envy Object1 Object2*. The activation network model of (partial) productivity that Goldberg endorses will handle the production and comprehension of novel verb meanings such as caused-motion *sneeze* in *She sneezed the napkin off the table*.

Finally, the model of construction grammar that Goldberg uses still adheres to the BUILDING BLOCK view of syntax, where constructions are built out of units such as subject, predicate, object, etc., which are posited as an independently existing inventory of atomic syntactic primitives. A truly radical construction grammar would posit constructions as syntactic primitives and treat their component categories and relations as derivative (Croft, to appear *a*, to appear *b*). Tomasello appears to believe that Goldberg's construction grammar does that but it does not. Goldberg moves in this direction for the semantic participant roles of verbs, arguing that they must be derived from each particular event type. For example, the predicate *rob* has roles *robber, victim, goods* which are specific to just that predicate. But Goldberg does not extend this approach to the semantic roles of constructions, let alone to syntactic categories and relations of any type. Doing so would genuinely put constructions at the centre of a revolutionary new theory of syntax.

REFERENCES

Becker, J. (1975). The phrasal lexicon. Bolt, Beranek and Newman Report No. 3081, Artificial Intelligence Report No. 28.

Bolinger, D. (1976). Meaning and memory. *Forum Linguisticum* **1**, 1–14.

Croft, W. (1991). *Syntactic categories and grammatical relations : the cognitive organization of information*. Chicago: University of Chicago Press.

—— (1997*a*). Event structure in argument linking. In M. Butt & W. Geuder, *The projection of arguments : lexical and compositional factors*, 1–43. Stanford: Center for the Study of Language and Information.

—— (to appear a). Some contributions of typology to cognitive linguistics (and vice versa). To appear in T. Janssen & G. Redeker, *Foundations and scope of cognitive linguistics*. Berlin: Mouton de Gruyter.

—— (to appear b). Major syntactic categories as typological universals vs. language particular categories. To appear in B. Comrie and P. M. Vogel (eds), *Anthology of word classes*. Berlin: Mouton de Gruyter.

Fillmore, C. J. (1985). Frames and the semantics of understanding. *Quaderni di semantica* **6**, 222–54.

Goldberg, A. E. (1995). *Constructions : a construction grammar approach to argument structure*. Chicago: University of Chicago Press.

Jackendoff, R. (1990). *Semantic structures*. Cambridge, MA: MIT Press.

—— (1997). Twistin' the night away. *Language* **73**, 534–54.

Langacker, R. W. (1987). *Foundations of Cognitive Grammar, Vol I : theoretical prerequisites*. Stanford: Stanford University Press.

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

Levin, B. & Rappaport Hovav, M. (1995). *Unaccusativity : at the syntax-lexical semantics interface*. Cambridge, MA: MIT Press.
Plunkett, K. & Marchman, V. (1993). From rote learning to system building: acquiring verb morphology in children and connectionist nets. *Cognition* **48**, 21–69.
Pollard, C. & Sag, I. A. (1993). *Head-driven phrase structure grammar*. Chicago and Stanford: University of Chicago Press and the Center for the Study of Language and Information.
Rumelhart, D. E. & McClelland, J. L. (1986). On learning the past tenses of English verbs. In D. E. Rumelhart & J. L. McClelland (eds), *Parallel distributed processing : exploration in the microstructure of cognition, Vol. 2 : Psychological and biological models*, 216–271. Cambridge, MA: MIT Press.

Constructions have been in child language all the time

DAVID INGRAM
The University of British Columbia

Tomasello's review of Goldberg (1995) is correct in characterizing modern syntactic theory as overlooking the importance of constructions. It is important, however, that a distinction be made between the theoretical status of certain perspectives in linguistics proper and their status in the field of child language. It is not the case that child language is 'trickle down' linguistics. Rather, it is a distinct discipline that picks and chooses from linguistics in ways that are not always commensurate with linguistics *per se*.

A case in point can be seen in the distinction between phonological theory and child phonology. For instance David Stampe generated an interesting but short lived theory in the late 1960's referred to as natural phonology. While generating some interest among linguists, it was never a dominant theory and, at its peak, was practiced by only a handful of phonologists. Such was not the case in child language, however, where the notion of phonological process was adopted and widely discussed and applied. Within the field of phonological impairments in children, it is still discussed and in many cases applied despite the pressures of more modern nonlinear models (e.g. Hodson & Paden, 1991).

A similar case can be made for constructions. The impact of generative syntax in child language is noticeable, but it never replaced in all corners the notion of construction. Indeed, the early attempts by Bloom, Brown and McNeill to apply generative syntax (at least the standard model) met with limited success. By the mid 1970's child language researchers had abandoned rules and fell back on constructions. Brown's famous ten semantic relations are a good example of this. The notion of construction has also remained healthy in the field of language impairments in children. Laura Lee (1974)

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press

developed a construction-based procedure for assessing language levels, as did Crystal, Fletcher & Garman (1975). These approaches are still in use today. Indeed, the use of constructions has proven to be a far more useful diagnostic procedure than any rule based approach that I am aware of.

My impression is that Tomasello is particularly concerned with the more recent influence of government binding theory in our field. It is true that this approach has led to a new journal, Language Acquisition, and a dominance at meetings such as the Boston University Conference on Language Acquisition. Lois Bloom, for example, has expressed a similar concern during her invited address to the American Psychological Association where she states 'A cold wind has blown down from the Northeast, casting a chill on the study of language acquisition' (Bloom, 1997). I am not sure, however, that Goldberg's book will stop this trend, or have a revolutionary impact on first language acquisition as Tomasello suggests. Rather, those who do GB theory will continue to do so, and those who use construction based approaches will continue to do so as well. What Goldberg's book may do, however, is provide fresh ideas for those in the field who have believed in constructions all along. In this sense then, Tomasello's review might more appropriately named 'In defense of constructions' since they have never really departed.

REFERENCES

Bloom, L. (1997). Putting child development (back) into the study of language acquisition. Invited address to the American Psychological Association, August, 1997.

Crystal, D., Fletcher, P. & Garman, M. (1976). *The grammatical analysis of language disability*. London: Edward Arnold.

Lee, L. (1974). *Developmental sentence analysis*. Evanston, Ill.: The Northwestern University Press.

Hodson, B. & Paden, E. (1991). *Targeting intelligible speech: a phonological approach to remediation*, 2nd edition. Austin, Texas: Pro-ed.

https://doi.org/10.1017/S030500099800350X Published online by Cambridge University Press