LANGUAGE ACQUISITION IN THE LIGHT OF COGNITIVE LINGUISTICS

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1. Early interest in language acquisition from a cognitive perspective and basic level categories

In a sense, investigation of language acquisition from a cognitive perspective predated the development of cognitive linguistics. Lakoff (1987) and Langacker (1987) unanimously highlight the importance of research on natural categorisation undertaken by E. Rosch for the subsequent development of Cognitive Grammar. Investigating the so-called basic level categories, Rosch and Mervis noticed that precisely these categories are cognitively and linguistically more specific than others and are acquired relatively earlier by three-year-olds, who at exactly the same time have considerable difficulty with superordinate categories (in the speech of three-year-olds the latter are used correctly in only 55% of the attested usages, a year later the score improves substantially: 96%) (cf. Rosch et al. 1976). According to Rosch et al. (1976) distinctions drawn at the basic level are “generally the most useful distinctions to make in the world”, since it is at this level that we most readily perceive different phenomena and objects with which we have sensori-motor interactions. Mervis (1984) showed that even two-year-olds use basic level categories and that although their categories often differ from those of adults, they are nevertheless based on the same principles (cf. Lakoff 1987: 70).

Hypotheses developed by Rosch and other cognitive psychologists on natural categorisation, basic level effects and prototypes served as the starting point for Lakoff and Langacker, and their views on language acquisition were incorporated into the newly established Cognitive Grammar along with the concept of natural categorisation they were bound up with. However, what we would describe today as the cognitive approach to language acquisition developed somewhat later as a result of the merger of two independent research traditions. On the one hand, a number of researchers (mostly linguists) inspired by the writings of Langacker, Lakoff, and Bybee, began to turn to child language as an area that could provide empirical verification of the concepts they were developing. On the other hand, numerous child language researchers (mostly psychologists), dissatisfied with the increasingly theoretical, top-down and unempirical approach of the Chomskyan school, started groping around for a framework more in
tune with the issues they were investigating. The paths of the two groups were bound to intersect, intertwine and ultimately merge.

2. Lexical semantics: prototype effects

Much of the early research from which cognitive linguistics was to emerge focused on lexical semantics. It is not surprising, therefore, that the earliest cognitively motivated research on language acquisition also centred on word learning. Two issues were particularly focal in this early research. The first of these is another reminder of the importance of the work of Rosch and other cognitive psychologists for the subsequent development of cognitive linguistics, since it involves the application of the notion of prototype to the analysis of word acquisition in the early phases of child language development. Barrett (1995), Meints, Plunkett and Harris (1999), and Southgate and Meints (2000) argue that children initially connect a newly learned linguistic label with prototypical exemplars only. In consequence, early errors tend to be underextensions, which usually involve applying a word to typical referents only (c.f. Kay and Anglin 1982). Overextensions tend to occur comparatively late in the developmental history of a word (cf. Dromi 1987), and various uses of a word usually share features with the prototype but may have nothing in common with each other (which is obviously reminiscent of the notion of “family resemblance” originally proposed by Wittgenstein (1953) and “radial category” suggested by Lakoff (1987)). Bowerman (1978) describes a typical case of such developmental sequence. Her daughter initially used the verb close only to talk about closing gates, doors and drawers (underextension). At a later stage, she also used it to talk about closing boxes and other containers, and, later still, when pushing handles of scissors, tongs or tweezers together and when getting people to put their arms or legs together, as well as when folding up a towelette, fitting a piece into a jigsaw puzzle, and so on (overextension). Similar effects were also noted in grammatical development (Taylor 1989, Marchman, Bates and Good 1991, Meints 1999), although research in this area is much less systematic.

3. Lexical semantics: cross-linguistic differences and construal

Early research on lexical development took lexical concepts for granted: the child’s task was seen as learning labels for pre-existing concepts (cf. Clark 1977, Johnston and Slobin 1979). The concepts themselves could be either simple or complex, innate or learned, but they were
invariably prelinguistic. However, as cognitive linguists demonstrated that lexical concepts have a rich internal structure and cross-linguistic differences are vast and often subtle (cf. Pederson et al. 1998, Levinson 1996, Talmy 1985, 1991), it became increasingly clear that lexical development involves much more than learning labels for prelinguistic concepts. In fact, lexical development raises the same kinds of learnability issues as syntactic development (cf. Levinson 2000, Dąbrowska in press). In spite of the fact that lexical meanings are often very difficult to pin down (as witnessed by the grossly inadequate dictionary definitions of many everyday concepts), words are acquired quickly and almost without errors. In the early and middle childhood, children learn more than ten new words a day – i.e. one for every waking hour (Miller 1986, Miller and Gildea 1987). Words are often learned after just a few presentations in ambiguous conditions – and occasionally after a single presentation, (Carey 1978, Dickinson 1984, Markson and Bloom 1997). They are usually without overt teaching. Furthermore, lexical development exhibits some striking regularities (for example, colour terms are acquired at a specific maturational stage); and children acquire words for concepts of which they have had no direct experience (see e.g. Landau and Gleitman 1985 on acquisition of visual terms by blind children). Children are also are very good at picking up on language-specific features and are sensitive to subtle aspects of construal and to lexical patterns encoded in their language (cf. Bowerman 1989, Slobin 1996).

We do not know exactly how children discover the meanings of the words of their language, particularly those which designate abstract relational concepts. However, it is instructive to draw some parallels between lexical and grammatical development. The generativist solution to the learnability problem in syntax is the postulation of a “universal grammar” – a rich array of innate structures (“parameters”) with different options for different languages (Lightfoot 1989, Crain and Wexler 1999). However, such a solution is hardly feasible in the case of lexical development – unless we assume that all or almost all notions lexicalised in any natural language are innate. While there do exist extreme nativistic theories which make precisely this claim (cf. Piattelli-Palmarini 1989, Chomsky 1991), most researchers would agree that a statement to the effect that notions such as coca-cola, scanner or soap-opera are innate is simply absurd. But if

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1 In fact, attempts to teach vocabulary at school sometimes result in very odd errors. Miller and Gildea (1987) give some rather amusing examples of sentences produced by children participating in vocabulary-building programmes, such as I was meticulous about falling off the cliff and Our family erodes a lot. The reasons for the errors become apparent when we consider the definitions given in the dictionary that the children were using. According to the dictionary meticulous means ‘very careful’ and erode means ‘eat out’.
children are naturally endowed to create complex semantic structures without external assistance, then it is also quite feasible that they may also learn syntactic rules in a similar fashion.

4. Morphosyntax: empirical foundations

4.1 Language-specific aspects of morphosyntax

Generativist tradition emphasises language universals and tends to gloss over language particular features, which are usually relegated to grammatical peripheries. Universal features of language tend to be covered by the blanket notion “core grammar” and are the subject of proper grammatical description. The core-periphery opposition was to remain one of the cornerstones of several models of generative grammars advocated on different occasions by Chomsky. But empirical analysis of cross-linguistic differences yields a quite different image. Grammatical differences between languages are vast and neither syntactic categories nor syntactic relations are universal (cf. Croft 2001). Furthermore, universality is a theory-dependent phenomenon. As Tomasello (1995: 138) observes, “Many of the Generative Grammar structures that are found in English can be found in other languages—if it is generative grammarians who are doing the looking. But these structures may not be found by linguists of other theoretical persuasions because these structures are defined differently, or not recognised at all, in other linguistic theories.“ Whatever the status of universals, many features which are undeniably language-particular (e.g. the mapping from semantic function to the morphological exponents of case in Polish, see Dąbrowska 2000a) do, nevertheless, pose serious learnability challenges. A learning system which is capable of acquiring these non-universal features, would also be able to learn at least some aspects of universal grammar (cf. Culicover 1999, Dąbrowska 2000a).

4.2 Individual differences

According to generative orthodoxy, language acquisition is extremely uniform: children acquiring typologically similar languages go through essentially the same stages, and acquire structures in the same order, while any individual differences are negligible (cf. Stromswold 2000). However, empirical research does not confirm this conviction, as demonstrated by the vast literature on individual differences (cf. Nelson 1981, Goldfield and Snow 1989, Richards 1990, Bates, Dale and Thal 1995).
Such differences were discovered in all areas and at all stages of language acquisition (cf. Lieven 1997). Perhaps most readily perceived are differences in the pace of language acquisition. In the early phases of lexical development (12-30 months) the comprehension vocabulary of the fastest developing children is 10-15 times that of the slowest learners (Benedict 1979, Bates et al. 1995, Goldfield and Reznick 1990); and the differences in active vocabulary are even larger. Some children produce their first utterances consisting of more than one word as early as 14 months, while others may take two years or more to reach this developmental milestone (Bates et al. 1995). Similar developmental asynchronies have been observed in grammatical development: for example, a large longitudinal study by Wells (1985) found that at the chronological age of 42 months the differences in the “linguistic age” of the children in the sample he studied amounted to 30-36 months.

Even more interesting from the theoretical point of view are qualitative differences between learning styles. The earliest utterances produced by the so-called “analytic” children are single words (mainly nouns); these are later combined with other words to form more complex utterances. On the other hand, “holistic” children start with whole phrases – often not very clearly articulated, though with adult-like intonation – which only are later divided into words and morphemes (Nelson 1981, Peters 1977, Peters and Menn 1993). Some children begin to use inflexional endings while they are still in the one-word stage; others first combine words into sentences and only later learn the morphological markers required in their language; and in some children, the beginnings of inflection and syntax coincide (Smoczyńska 1985, Thal et al. 1996). Some children are very cautious learners, while others form generalizations after hearing just a few instantiations of a pattern; as a result, there are substantial differences in the frequency of errors in utterances produced by different children.

4.3 Formulaicity and piecemeal learning
The generativist tradition emphasises creativity, or language user’s ability to produce and understand sentences which they have never heard before. Linguistic creativity is an undeniable fact which must be accounted for in every theory of language development. However, it is important to note that while children do produce novel word combinations, child language researchers have tended to massively overestimate the extent of their creativity. There is a growing consensus that children’s early output is fact highly stereotypical, and that more flexible and creative usage emerges very gradually (cf. Braine 1976, Lieven et al. 1997, in press,
Tomasello 1992, 2000, Dąbrowska 2000b). Lieven et al. (1997), for example, noted that 92% of the children’s earliest multiword utterances are either frozen phrases or low-scope formulas such as *I want X, more X*. In a later case study of a high density developmental corpus (5 hours of spontaneous speech a week for 6 weeks) Lieven et al. (in press) traced the developmental history of all the multiword utterances that the child produced in the last recording (age 2;1.11). 63% of these (186 out of 295) were repetitions of an adult utterance which occurred in the immediately preceding discourse or of an earlier utterance that the child produced herself during one of the 27 preceding recording sessions. A further 81, or 27%, could be derived from an established utterance schema by one of four ‘usage-based syntactic operations’, such as ‘filling in’ a gap

*Where's X? + butter = Where's the butter?*

or ‘adding on’ an element

*I got one + here = I got one here.*

22 multiword utterances (7%) required resorting to two operations simultaneously (e.g. a combination of gap filling and addition of an element), and only 6 (about 2%) necessitated the implementation of three or more operations. The conclusion is that children acquire a vast store of prefabricated chunks and their utterances, largely composed of these chunks, take the form of highly stereotypical formulas. Creativity emerges gradually, and development is not across-the-board (cf. Richards 1990, Gathercole et al. 1999, Tomasello 2003, Dąbrowska 2000b): that is to say the “same” aspect of grammatical knowledge can manifest itself at different times in different constructions. For example, a child may consistently use the Aux-Subj word order with some auxiliaries, consistently producing ‘inverted’ questions such *Can I get up? Can I read this book? Can I feed you?* etc., while at the same time using the declarative word order in sentences containing other auxiliaries, e.g. *I’m drawing cloud? He’s sitting? You are crying?*

### 4.4 Relationship between lexical and grammatical development

Although historically researchers have tended to study lexical and grammatical development in isolation from each other, it has become increasingly clear that the two are closely interconnected. Anisfeld et al. (1998) pointed out that the vocabulary spurt coincides with the onset of grammatical speech. Elizabeth Bates and her collaborators have shown, in a number of large-scale studies using both longitudinal and cross-sectional data, that there are very high correlations (0.83-0.84) between vocabulary size and various measures of morphosyntactic development (Bates, Bretherton and Snyder 1988, Bates and Goodman 1999). It is worth noting that these correlations are as high as correlations between different measures of grammatical development,
or even correlations between the same measures calculated on the basis different samples of the child’s speech. Marchman and Bates (1994) furthermore noted the existence of a close relationship between the number of verbs in the child’s lexicon and the development of regular past tense marking. Interestingly, the relationship is non-linear: the child must first acquire a “critical mass” of rote-learned forms before pattern extraction can begin. Finally, grammatical development, just like lexical development, is subject to frequency effects: type frequency is a major determinant of productivity while token frequency leads to entrenchment of a particular word (Bybee 1995).

5. Morphosyntax: theoretical contributions

5.1 Language as a “structured inventory of conventional linguistic units”

The inventory of conventional linguistic units, which is the proper object of description in Cognitive Grammar, comprises units varying in size (from single morphemes to formulaic utterances), abstraction (from fully specified lexical units to constructional schemas of various degrees of schematicity) and degree of entrenchment (cf. Langacker 1987, 1988, 2000). It should be noted that Langacker, perhaps in reaction to (not altogether justified) criticism that he presents “a very static, representation-oriented (as opposed to process-oriented) picture of language” (Nuyts 1996: 155), has recently more forcefully emphasised that the model of cognitive grammar he has been advocating is a dynamic, usage-based model. Of course, this is not an absolutely new statement, since all the elements of the conception that the user extracts grammar from real usage events can be found in Langacker (1987). Langacker (2002) merely reiterates an already well advertised stance when he states: “In the usage based perspective of Cognitive Grammar (Langacker 2000), linguistic units are abstracted from usage events by the reinforcement of recurring commonalities. Lexical items occur in particular contexts – which for our purposes can be identified as structural frames, or constructions – and their recurrence in a set of such contexts provides the basis for their acquisition.“ One of the consequences of the adoption of this standpoint is greater centrality of developmental research. The dynamic usage-based model offers a framework for explaining a number of issues crucial to the understanding of language acquisition. For example, the above-mentioned links between lexical development and grammatical development are a natural consequence of the fact that in Cognitive Grammar words, formulas, lexical categories and construction schemas are all treated as structures of essentially the same type, i.e. symbolic units. Since both formulas and construction schemas have the same
internal structure (differing only in degree of abstractness), the model naturally explains the transition from formulaic usage to more flexible usages. As the child gradually acquires more formulas, their commonalties undergo selective reinforcement, yielding schemas. Frequency of usage plays a crucial role in this process, with frequent schemas emerging and becoming established earlier. Individual differences are partly attributable to differences in phonological memory span, which determine the size of the units that children initially extract from the input (children with longer spans are likely to extract larger units) and partly to differences in the input (different children are exposed to different adult utterances, and hence each child acquires somewhat different lexically specific units; since these are the point of departure for grammatical development, in that they serve as the raw material from which constructional schemas are extracted, the child’s developmental path is determined by the initial repertoire of rote-learned formulas).

5.2 Grammatical constructions

Both Cognitive Grammar as developed by Langacker and other cognitively-inspired approaches to language, including Construction Grammar (Fillmore 1988, Fillmore, Kay and O’Connor 1988, Goldberg 1995) and Radical Construction Grammar (Croft 2001) emphasise the importance of complex symbolic units or constructions. This is because, as shown by Croft (2001), grammatical categories and relations are not universal. They do not match up cross-linguistically (for example, English verbs are different from Japanese verbs; and the grammatical relation we call “subject” is realised differently in different languages) or even within the same language (for example, a transitive subject differs from an intransitive subject). Therefore, it is not categories and grammatical relations which are the basic units of language, but constructions: categories and relations are defined in terms of the roles they play in constructions. It follows that constructions are also basic units of language acquisition (cf. Tomasello 1998, 2000, Dąbrowska 2000b, Goldberg 1999).

Children’s earliest utterances are holophrases (single words or unanalysed phrases such as *whassis*? or *whatchadoing*?). At about the age of eighteen months most children begin to produce novel two-word utterances; and still later, utterances consisting of three or more words. Common sense suggests a rather obvious conclusion: children learn words first, and then find out how to combine them to form complex utterances.
However, on this, as in so many other occasions, common sense turns out to be wrong. Children rarely hear words in isolation: only about 10% of the input consists of single words (Tomasello 2003). They are usually exposed to utterances in context – that is to say, pairings of a complex unit (clause or phrase) and communicative intention. Thus, smaller units (words or morphemes) must be extracted from longer utterances. Relational words (e.g. verbs, prepositions) can only be learned in the context of larger units – not just because they tend to be used in combination with other units (parents don’t go around saying things like has or in), but also because they don’t make sense in isolation (it is impossible to conceptualise possession without a possessor and the object possessed, or containment without container and the thing contained). So the linguistic context isn’t a hindrance (i.e. something that the child must discard to get to the word) but provides crucial clues to word meaning. It is context which brackets the relation for the child: the child cannot see behind, but upon hearing an utterance such as The box is behind the table, his/her attention may be drawn to the relationship between the two objects referred to (provided s/he already knows the words box and table). Furthermore, context provides clues about construal, thus helping the child to distinguish between distinct relationships that “look” identical: e.g. buying and selling, giving and receiving, being in front and being behind, etc. These relationships “look” identical in the sense that each act of buying is at the same time an act of selling, each event which could be described as giving is at the same time an instance of receiving, and numerous spatial configurations which can be described by means of the preposition behind, may be also characterised with the help of in front of (The Fiat is in front of the Volvo = The Volvo is behind the Fiat). So, in order to acquire the verb buy, it is not enough to associate this phonological form with a “commercial event scene”: the child must also link parts of the relevant semantic representation with appropriate parts of the sentence (the role of the buyer with the subject noun phrase, the purchased commodity with the direct object, and so on – see Fillmore 1977). The other examples mentioned above, of course, require a similar analysis. Children attempt to reproduce such contextualised utterances even if, due to processing and articulatory limitations, the units they actually utter are single words. For example, having heard several adult utterances which contain the phonological fragment home (want to go home?, let’s go home, etc.) the child may acquire this form and start using it in the sense ‘I want to go home’. Somewhat later children acquire a more complex and partly schematic construction such as ANIMATE go home, where the element ANIMATE in a schematic way represents expressions which may appear in the construction. By assembling such a partly schematic construction with a more precise expression the child may create new utterances such as, e.g. auntie go home, kitty go
home, Betty go home, etc. It must be emphasised that such utterances are not constructed by linking with each other word and morphemes according to the rules of adult grammar (auntie + go + home), but by assembling a complex lexical unit ANIMATE go home with a simple lexical unit (auntie, kitty, etc.). On subsequent stages of language development children gradually learn to decompose earlier acquired formulas into constituent units and acquire more abstract schemas (e.g. ANIMATE go DESTINATION, ANIMATE GO DESTINATION, where GO represents all the possible forms of the lexeme go, i.e. go, went, goes, going, etc.) However, constructions continue to serve as the basic units: they are just more abstract, and hence allow the child to produce a wider variety of utterances. It follows that the basic task for the cognitive theory of grammatical development is to explain how abstract construction schemas emerge from phrases or formulas memorised at an earlier phase of language acquisition.

It may be concluded from the above deliberations that after defining the basic premises of Cognitive Grammar (Langacker 1987, Lakoff 1987), mainly on the basis of earlier works on natural categorisation in psychology (Rosch), anthropological linguistics (Berlin and Kay), philosophy (Wittgenstein) and sociolinguistics (Labov), cognitive linguists turned to issues which had been the main object of linguistic inquiry before the advent of generative theory. Langacker (1991) offered a number of analyses of different linguistic phenomena utilising the earlier defined notions and premises of cognitive linguistics. It has become necessary to verify theoretical constructs and predictions in terms of new empirical data. Two areas of research seem to be particularly promising in this context: cognitive analysis of discourse (Langacker 1999, Langacker 2001) and cognitive description of the language acquisition processes. Both of these research domains offer massive corpora of unidealized, raw linguistic data. Attempts to describe discourse may serve to demonstrate how linguistic knowledge is utilised by real users in real context, while attempts aimed at describing the process of language acquisition may demonstrate how this knowledge is really shaped in contextualised grammatical ontogenesis under the pressure of various mental and environmental factors. On the other hand, Langacker’s (2000) dynamic usage-based model may well provide a more adequate framework for an insightful and comprehensive description of the mechanisms of language acquisition. The future of cognitively motivated research on language acquisition seems to be promising.
Bibliography


