**Learning to structure sentences through the acquisition of grammatical words: Introduction to the special issue on the role of grammatical words in young children’s syntactic development**

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Until recently, grammatical words such as determiners, auxiliary verbs and prepositions have been considered marginal for the early stages of syntactic development. For a long time, most authorities believed that such ‘function words’ (FWs) are acquired late by typically-developing children (e.g., Radford, 1990) and that, at the early stages, syntactic development relies on ‘content words’ (CWs) or ‘lexical words’ (nouns, verbs, adjectives and adverbs) that carry semantic relations which can be expressed as patterned speech (e.g., Bowerman, 1973; Brown, 1973; Schlesinger, 1971). In the last few years the trend has turned, and recently some authors have been arguing for the opposite view, according to which FWs have a central role in syntactic development. For instance, studies have shown that for deaf children with cochlear implants, the early use of gender-marked articles is a better predictor of their overall grammatical level two years later than vocabulary size (Szagun & Schramm, 2016).

This special issue is devoted to the hypothesis that FWs bootstrap syntactic development in children. In the first paper, *From lexical to functional categories: New foundations for the study of language development*, Cristina Dye, Yarden Kedar and Barbara Lust lay the grounds for this special issue in the form of a comprehensive review of the state of the art. Their paper reviews the transformation that has occurred in the field, that is, from lexical categories being assumed foundational to functional categories now being considered to play a foundational role in syntax and in syntactic development. Their paper embraces the Chomskian proposal according to which functional categories carry the major grammatical weight in sentence construction, possibly providing a skeleton for the sentence which CWs fill. Although the theoretical concept of functional categories is not identical to the closed-class or grammatical/functional words we are exploring in this special issue, in particular because the abstract category is expressed not only by grammatical words but also by bound inflectional morphemes, there is sufficient overlap for their review to serve as background to the topic we are focusing on.

Dye et al. consider a wide range of evidence emerging from various methods, languages, and developmental periods that suggests that language acquisition in the child involves the continuous acquisition of functional categories. Their conclusion is that acquisition of functional words and morphemes, and not lexical growth, bootstraps grammatical development.

Apart from their proposed role as expressions of functional categories in the Chomskian theory, FWs are somehow odd drivers of syntactic development. On the face of it, these words appear to fulfil a quite marginal role in determining the meaning and structure of the sentence. In concrete terms, the various FWs add grammatical features to CWs; for example, auxiliaries provide tense/aspect and modality features to lexical verbs, determiners add definiteness and plurality to common nouns, and so forth. Other than that, FWs are devoid of semantic content, and some authorities call them “empty words” (e.g., Tesnière, 1959). We may wonder what exactly it is in FWs that makes them likely agents of bootstrapping syntactic development rather than CWs (i.e., the lexical vocabulary). Paradoxically, their semantic emptiness may be the major reason. However, as a first step, we need to establish that FWs are indeed participants in the sentence’s syntactic structuring.

In the second paper of the special issue, *Complement or adjunct? The syntactic principle English-speaking children learn when producing determiner-noun combinations in their early speech*, Anat Ninio explores the kind of syntactic relationship that exists between FWs and their CW associates. Taking the determiner-noun relation as an exemplar of the FW-CW relationship, Ninio demonstrates that the syntactic relation of FWs to the CWs they are associated with is probably identical to the syntactic relation of Head-Dependent complementation (or Merge) that constitutes the major building process of syntax. As Ninio’s study demonstrates, the determiner-noun combination is a type of complementation, the same syntactic operation that underlies, for example, the combination of a verb with its direct object. According to Szagun and Schramm (2016) and several other studies, among the FWs the category of determiners plays a particularly major role in enabling syntactic development. The strong predictive power of determiners on syntactic development raises the probability tested in this study that some generalized knowledge of how words relate to one another is learned when producing early multiword utterances and, through transfer and facilitation, it drives the construction of grammar. It seems that children learn syntactic principles through specific constructions; in this case, they apparently learn the syntactic principle underlying determiner-noun combinations, which then can be transferred to other syntactic constructions employing the same combinatory operation.

We still need to understand why these early combinations of determiners and their complement nouns provide the best exemplars for learning the principle of complementation. Children do learn verb-object combinations early. Nevertheless, it is the determiners and not the verbs that best predict a child’s syntactic development. The only explanation that can be offered is that, paradoxically, the rich semantics of verbs hinders the extraction of an abstract form-structuring principle from the sentences in which they participate. Grammatical words such as articles serve to express grammatical content and not semantics; as such they are more suitable to serve as the source of learning and transfer of formal content. It appears that this also applies to one of the primary combinatory operations by which syntactic structure is built, namely, head-dependent complementation. Apparently, FWs’ semantic emptiness pushes to the forefront their syntactic behaviour, the grammatical words with their strong valency requirement for a complement embodying the principle of the basic syntactic combining operation. Future studies should explore how general this finding is with respect to other grammatical rules and principles. It is possible that grammatical words are in general the best channels for the acquisition of formal linguistic knowledge.

After establishing the background and offering evidence that FWs may be the source of transfer and facilitation of major syntactic principles, the remainder of the special issue is devoted to five studies that offer an empiricist model of learning a vocabulary of FWs and the associated syntactic principles from the linguistic input. Evidence comes from studies of development in several languages: English, French, German, Spanish, Bantu and Hebrew; of development in typically and atypically developing child populations; and of monolingual as well as bilingual development. Each of the studies examines a different aspect of such a learning theory.

In the third paper of the special issue, *Productive use of syntactic categories in typical young French children,* Marie-Thérèse Le Normand investigates the productive use of syntactic categories in French children. Her particular focus is on the question of what are the syntactic environments facilitating young children’s use of grammatical words, and she employs linear regression analyses to find the best predictors of young children’s use patterns. Her study provides evidence for the gradual acquisition of basic grammatical relationships. She shows that FWs guide and facilitate syntactic knowledge; thus early grammar is based not on the lexicon of CWs but on FWs that that young children use to gradually build syntactic relations. In the learning process, children extract grammar from the input, making use of the formal distributional properties of their native language.

A similarprocess, which is based not on innate knowledge but on distributional learning, is proposed in the fourth paper, *Lexically driven or early structure building? Constructing an early grammar in German child language*, byGisela Szagun, Barbara Stumper and Satyam A. Schramm. In their study they explore the question of whether early determiners are used in a lexically-specific way in early German child language or whether the acquisition patterns suggest rule construction. In addition, they examine whether grammatical words predict sentence complexity more accurately than lexical words, in a normative sample of young children. Their results are strongly suggestive of early grammatical structure building by grammatical words.

In a further exploration of children’s use of determiners, they examine whether children use articles and other determiners by freely combining different determiner types with the same noun. They find that children use both types of articles as well as multiple kind of determiners before a specific noun to the same extent as adults. As they conclude, such determiner use is indicative of a generalized syntactic determiner category, not an innate one but, rather, one learned from the input.

In the fifth paper, *Prosodic constraints on children’s use of grammatical morphemes,* Katherine Demuth aims to understand the variable appearance of grammatical morphemes during development. She offers an explanation in terms of complex interaction effects at the phonology/syntax interface. Children’s late acquisition and partial omission for a long time of FWs as well as bound morphemes is hypothesized by some nativist theoreticians to stem from the lack of some general syntactic principles. For example, Radford (1990) proposed that the late acquisition is due to syntactic deficits, that is, children initially lack the syntactic structures needed to support grammatical marking for tense and agreement. This view was later defined by Wexler (1994) in terms of the Optional Infinitive Hypothesis, where children’s lack of access to syntactic processes allows them to occasionally produce verbs in an infinitive form instead of a finite inflected form. According to Radford and Wexler, the consistent and stable use of grammatical words and bound morphemes requires the maturation of the relevant syntactic abilities. However, Demuth argues that there is no such syntactic deficit to account for the partial use of FWs but, rather, children’s early use is prosodically conditioned. In contexts where the insertion of the relevant FWs creates an easy-to-pronounce phonological stream, children tend to insert the FWs, but to omit them where their expression presents prosodic difficulty. To support her anti-nativist stand, Demuth presents three studies. The first is a study of the acquisition of noun class prefixes in the BantulanguageSesotho, the second the emergence of articles and other determiners in English, French and Spanish, and the third the acquisition of 3rd person singular tense marking in English. These findings point to the important role of phonological/prosodic factors in understanding the course of morphosyntactic development. Demuth suggests that the study of children’s syntactic knowledge must proceed in a more integrated fashion, where syntax is only part of the larger whole of learning language.

In the sixth paper, *Reciprocal relations between syntax and tense/agreement morphology in children's interpretation of input: A look at children with specific language impairment,* Laurence B. Leonard explores the reciprocal relations between syntax and tense/agreement morphology in the speech of children with and without language impairments. He reviews evidence showing how children’s misinterpretation of syntactic details in adults’ input may contribute to children’s inconsistent use of tense/agreement morphology. He argues that a better sense of the roles played by tense/agreement morphology can alert children to important syntactic distinctions in the ambient language. In a comparison of English-speaking children with and without language impairments, Leonard finds evidence for a very gradual learning process that leads to a slow incremental change in the children’s syntactic knowledge as well as in their tense/agreement use.

According to the studies he reviews, grammatical morphemes are cues to syntactic interpretation;various grammatical words correlate with syntactic structure and help to determine whether or not children need to use tense/agreement morphemes. Leonard lists such grammatical words as the fronted auxiliaries, accusative pronouns, and the complementizer *that* – all of which, he claims, connect to specific syntactic constructions. That is, the grammatical markers are important cues to correct sentence interpretation. According to Leonard, there is a reciprocal relation between successfully mastering grammatical markers and syntactic structure. On the one hand, success at grasping particular syntactic structures is essential for identifying morphologically-marked verbs as parts of the structure; a failure can lead to the extraction and inappropriate use of verbs lacking tense and agreement. On the other hand, the tense and agreement morphemes and other grammatical elements in such syntactic structures can serve as important cues for interpreting the syntactic structure.

Leonard proposes that this intertwined system of grammatical words, grammatical bound morphemes and syntactic structures is learned from the input in a slow and gradual process. In his review, he discusses possible input-related reasons for the relatively late mastery of tense and agreement morphology in children, and the especially protracted period of tense and agreement inconsistency in the speech of children with specific language impairment. He claims that the very gradual increase seen in children’s tense/agreement use in obligatory contexts is due in part to a structure-by-structure learning of the dependency relationships between the matrix verb/auxiliary verb and the nonfinite lexical verb appearing later in the utterance. Some of these structures might be learned before others, and each resolution might lead to an incremental change in the children’s tense/agreement use. Such phenomena are part and parcel of a learning process.

As a further point, we have indications of bilingual acquisition showing the learning processes of facilitation and interference, learning being a trial and error process influenced by degree of similarity between the two languages. In the seventh and final paper of the special issue, *Interaction between two determiner systems: The acquisition of English articles by a Hebrew-speaking child,* Yarden Kedar examines the interaction of two determiner systems in a bilingual child’s developing language system, specifically the acquisition of determiners in English by a Hebrew-speaking child. He documents complex phenomena of facilitation as well as interference in the bilingual pattern of development. Inter-language influences indicate that learning occurs in a complex context in which the input and output of both languages effect the process of learning.

The seven papers of this special issue provide varied evidence that FWs have a central role in structuring sentences and hence in syntactic development. All contributors assume that besides providing grammatical content, e.g., tense/aspect/modality of verbs, or definiteness and plurality of nouns, grammatical words also fulfil some global role in structuring the syntax of sentences. The tension between local and global roles makes the acquisition of FWs such a complex and fascinating topic of research.

In summary, in this special issue a group of researchers take on the exploration of the complex relationship of grammatical words and syntactic structure in young children’s language development. The major conclusion is that this interrelated complex system is learned from the input. A thorough knowledge of these relations is important theoretically in order to understand the process of acquisition, and it is equally important from an applied point of view in order to serve as the basis for remedial teaching and intervention. We are hopeful that the seven papers of this special issue will advance our understanding and make a contribution to the clarification of this topic.

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