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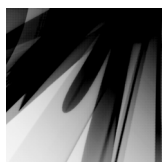
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Language and the Learning Curve: A New Theory of Syntactic Development

By A. Ninio (Oxford: Oxford University Press, 2006). Pp. 206. ISBN 978-0-19-929982-9 (Pbk).

What do we learn when we learn a language? How one chooses to answer this question has extensive implications for one's theory of language development. It shapes what aspects of development are interesting, what counts as evidence, and how one interprets patterns present in children's early language. Ninio's answer to this question is a somewhat unorthodox combination of elements which leads her to a novel approach to language development.

What does Ninio think needs to be learned? First, despite the title of the book, Ninio is only concerned with the acquisition of argument structure and word order. No other aspects of syntax (such as binding, agreement or question formation) are considered. So what does she think argument structure and word order consist of? She argues for a generative, lexicalist position. The generative component is the Merge operation from the Minimalist programme (or the Dependency relation from Dependency grammar). This operation is the essential rule of structural combination and can generate an infinity of sentences. The lexical component arises out of the need to specify how many elements need to be merged for a particular item, such as a verb. In her terms, each verb has a valency which identifies the number of syntactically necessary arguments. Valencies are lexically specified. She argues strongly that valencies are not abstract elements of the grammar themselves; the VO valency does not constitute an independent construction, or a kind of a rule. Further, she argues that the valencies are solely syntactic in nature and cannot be derived from (or even consistently linked to) semantic regularities. This separation from the semantic realm combined with the dependency on individual lexical items demands a strong lexicalist position: specific lexical items are the only means by which valencies can be coded. One additional feature of Ninio's vision of language is that it is exclusively concerned with the processes of language production. As she states (p. 128): 'we are attempting to predict ... what children will say next, out of

the relevant repertoire of items.' Processes related to language comprehension are outside the scope of this work.

To learn this sort of language, Ninio takes a general processing approach and argues that children learn the valencies of lexical items as a kind of skill. She draws on the literature in cognitive psychology on skill learning and centres her arguments around the so-called Power Law of Practice. This law is a function – an exponential power-law function – that describes the course of learning of skills in many domains. It is the classic learning curve: shallow at the beginning, then rising steeply. Critically, there is a single function that describes both the shallow and the steep parts of the curve. There are no 'inflection points' at which the function itself changes, and therefore no points at which one would appeal to a change in the system (such as the acquisition of a construction, or the induction of a rule).

Ninio then examines the time-course of children's use of different valency patterns with different verbs and shows that their productive use is best fitted by a power-law function. For example, the SVO valency pattern is initially used by children with only a small handful of verbs. As the child gets older, however, the number of different verbs that appear in this pattern increases sharply. When the age of the child is plotted against the cumulative number of verbs appearing in the SVO valency pattern, the data show a power-law function. Ninio's work with the data is very careful: she documents the power-law function for several different valency patterns and rules out alternative interpretations, such as general language ability. Moreover, in Chapter 4, she considers in detail the possibility that children might have a semantic basis for their skill learning. She examines the earliest verbs of a child appearing in the VO valency pattern and shows that the thematic roles associated with the direct objects are quite varied. Grouping those roles as best one can by semantic types does not predict the rates at which the child extended the VO valency: knowing how to use the VO valency pattern with, say, a perceived object ('I saw the toy') does not facilitate its use with other perceived objects, or with an affected object ('I fixed the toy'). She concludes, therefore, that the skill in extending valency patterns is not grounded in semantics, but solely in syntactic form.

Ninio's theory is interesting and certainly thought-provoking. However, to me – as someone who disagrees with her about what it means to learn a language – the approach seemed limited and the interpretation of the results a bit misguided. To begin with, there is the question of what is meant by skill learning. Ninio insists that there is no abstraction taking place with the valency patterns, but only increased skill in using those patterns with new verbs. In Chapter 3 Ninio argues (pp. 85–86) that the increase in skill depends on similarity-based analogies and not on abstract rules. However, her arguments are not very convincing. In part, this is because she does not explain in much detail the cognitive theories on which she bases her arguments; but it is also, in part, because she is resistant to seeing abstractions in language. For example, she sees it as simply part of the meaning of the verb *sit* that it requires a sitter, so that its associated SV valency pattern is merely a semantic fact, not a linguistic abstraction of the event. However, she fails to see that a language could syntactically abstract the event in other possible ways: sitting also requires a seat (a true part of the meaning of the verb) even though the location of the seat is not an obligatory syntactic argument. More generally, she appears to be hiding

some notion of abstraction under the cover of the notion of skill. Skill learning is not an ever-increasing function in any domain; at some point, it is reasonable to say that a skill has been mastered. Mastery may not require an inflection point in the function (it may simply be some kind of threshold), but it surely reflects an interesting shift, perhaps even a qualitative shift, in ability.

The true test for the existence and semantic content of valency patterns (or, as they are more commonly called, constructions or argument structures) that is independent of individual lexical items comes from children's ability to use them with nonce words. In Chapter 2 Ninio reports existing data on priming studies (pp. 59–62) showing that children's ability to use particular valency patterns with novel verbs increases in ways reasonably consistent with the power-law function: at age 2;6, children extend the valency pattern only occasionally while by the age of 4 years, they are quite consistent with their extensions. As Ninio is willing to consider only production data, she stops here and rests content that valency patterns are extended to novel verbs on an item-by-item basis in accord with the skill level predicted by the Power Law of Practice.

However, relying solely on production data overlooks a large body of research on comprehension which shows that: (1) children are able to interpret various constructions with novel verbs much more consistently at a much younger age, and (2) both adults and children have consistent semantic associations for given constructions. That is, the comprehension data do not obviously follow the Power Law of Practice, and they appear to be sensitive to semantic features of constructions. Once our ability to understand sentences is accepted as relevant data, constructions appear to be much more abstract, independent and semantically grounded.

A critical phenomenon – one which is scarcely even mentioned by Ninio – is that of syntactic bootstrapping. Syntactic bootstrapping refers to the way that children (and adults) associate syntactic constructions with general classes of meaning which aids in the process of lexical acquisition. For example, if a novel verb such as *moop* is used in a di-transitive construction (or with an NP V NP NP valency), both children and adults expect the meaning of *moop* to be related to some kind of transfer. This knowledge does not come from any particular similarities between *moop* and other verbs which appear in this construction (such as *give*) beyond the similarity that they both appear in the same construction. The construction alone does not determine the meaning of the verb, but it provides enough information to focus a child's attention on the relevant aspects of the situation (in this case, the transfer aspects) from which they can learn the specific meaning of the verb. This process of using constructions to derive meaningful information about nonsense verbs has been shown to be a potent factor in both adult and child learning (including children under 2 years old), over a range of languages and in a range of environments including looking-time studies, act-out studies and descriptions of situations. For the reader who is unfamiliar with the substantial results in this domain, I recommend beginning with two overview papers in this tradition: Gleitman (1990) and Gleitman, Cassidy, Nappa, Papafragou & Trueswell (2005).

To be fair, the results from this programme do not suggest that the mappings between syntax and semantics are simple or that all constructions have equal status for children or are acquired in the same way. But the fact that the comprehension

data offer complications in addition to insights should reassure Ninio: incorporating this source of data does not blindly commit one to every kind of abstraction or semantic link. Comprehension is, however, a real source of data and one that should be incorporated into any theory that purports to account for our knowledge of language.

It is possible to argue, in fact, that Ninio's reliance on production data makes her central finding – namely, that production tracks the Power Law of Practice – an almost foregone conclusion. Language production clearly has the properties of a skill like many others: it requires not only knowledge of linguistic valency structures, but also the integration of that knowledge with processes of lexical retrieval and selection, and also motor control. The fact that children improve in their speech production capacities, as they do with other skills, is not especially surprising.

Despite these misgivings, this book has much to offer. There is a wealth of ideas here and a great deal to spark future research. To pick one example: Ninio lays out a terrific research programme in Chapter 4. This chapter is aimed at showing that children do not use semantics to ground their valency patterns but generalize them purely on a syntactic basis. Ninio states her position very strongly, but the data it rests on are actually quite limited: just two experimental studies and a close analysis of a single child's first utterances. Based on this scant evidence, the issue seems far from settled. However, Ninio has identified a critical question and even begun to sketch out the relevant parameters that need to be investigated. Graduate students looking for a good dissertation topic should read this chapter closely!

In conclusion, this book does not present a complete view of language acquisition, and, in my view, some of the central tenets are flawed. But Ninio's presentation of the ideas and evidence is sufficiently rich in insight and ideas to make the book well worth reading.

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