

WILLIAM O'GRADY, *Syntactic carpentry: an emergentist approach to syntax*. Mahwah, NJ: Erlbaum, 2005. pp.: XXX + 248.

Owing largely to Chomsky's distinction between competence and performance, there has been a prevailing tendency in the language sciences to distinguish grammatical theory from processing theory. In the extreme, the *Minimalist Program* argues for perfection in language design; processing phenomena are the realm of psycholinguists, who study language use. Other approaches take a less extreme line. For instance, Jackendoff's (2002) model is amenable to processing theory, and usage-based approaches such as Goldberg's (2005) reject the competence–performance distinction altogether, instead arguing that language generalisations are made on the basis of general cognitive learning principles. In *Syntactic carpentry* O'Grady offers a radically different yet thought-provoking thesis.

O'Grady's central argument is that there is NO syntax, only an efficiency-driven parser that seeks to resolve dependency relations between arguments and predicates as quickly as possible. Syntax, he claims, is an epiphenomenon of the information processing pressures placed on the parser. In O'Grady's terms, 'when it comes to sentences, there are no architects, only carpenters' (p. 2), which is to say that languages are the way they are because we must identify and resolve the relationships between words in a linear speech stream using our limited resource capacity under real time pressure. Only the tools required to build sentences are necessary; no blueprint (i.e. UG) is required.

Chapters 1 & 2 outline the central thesis of the book. O'Grady takes a standard view of the lexicon, whereby words are tagged with information about the kinds of roles (category and thematic) they can take and/or license in a sentence. The computational system, the parser, makes use of two operations that are driven by the EFFICIENCY REQUIREMENT, which states that dependencies between words should be resolved at the first opportunity.

The two operations are (i) COMBINE, which states that adjacent words are combined together regardless of their relationship to each other, and (ii) RESOLVE, which involves resolving argument dependencies between arguments and predicates. Predicates search to fulfil their argument requirements either to their left or to their right. When dependent items are separated by intervening words (as in English *wh*-dependencies) a predicate's argument dependency is passed upward through the previously formed representation to make contact with its nominal, a process referred to as FEATURE PASSING. The strength of O'Grady's approach is in its simplicity. In the next six chapters he tackles a range of grammatical phenomena using only these tools.

Chapter 3 addresses pronoun interpretation. O'Grady's computational system deals with coreference in two ways. Reflexives and reciprocal pronouns, which require a nearby antecedent, are resolved directly by the computational system during the business of argument resolution. Consider sentence (1):

(1) Gordon_i taught himself_i to play guitar.

According to O'Grady, the referential dependency between *Gordon* and *himself* is resolved as soon as the pronoun is attached to the verb. Once the pronoun enters into a dependent relationship with the verb, it encounters its antecedent in the argument grid of the verb. This is argued to follow from the efficiency principle. Plain pronouns, however, are a different matter entirely. As we know from Principle B in binding theory, plain pronouns cannot be coreferential with an antecedent within the same syntactic domain, ruling out interpretations like (2).

(2) *Gordon_i taught him_i to play guitar.

Therefore, unlike reflexive pronouns, plain pronouns cannot be resolved at the first possible opportunity, which can lead to cases where the antecedent of the pronoun is fully ambiguous (3).

(3) Gordon_i taught Brian_j guitar before he_{ijj} moved to Milwaukee.

As plain pronouns cannot be resolved at the first possible opportunity, O'Grady argues that the efficiency principle does not apply; their interpretation is handled by the PRAGMATIC SYSTEM. Thus there are two forms of pronoun interpretation, one handled by the computational system and one that is pragmatically driven. There is a sense in which this is rather obvious; however, what matters is that O'Grady has an independently motivated architecture that predicts these effects without recourse to additional principles. The remainder of the chapter considers pronoun interpretation within various syntactic environments.

Chapters 4 & 5 consider control and raising structures, respectively. Just as certain types of pronoun resolution are handled outside of the computational system, so too, O'Grady argues, are some types of control structures. Clear-cut cases, like that in (4), are handled by the computational system.

(4) Gordon tried [to play guitar].

O'Grady argues that the covert argument of control structures is encoded as a referential dependency on the lexical entry for the matrix verb. The verb *try* is argued to be represented as in (5), in which the symbols in brackets represent the verb's subject and object arguments, respectively

(5) *try*: V, <N, TO>

Since the subject argument, the controller, is the sole nominal argument, it also serves as the subject of *play*; following the efficiency requirement the verb searches for a nominal argument and finds one in the thematic grid of the matrix verb. However, there are cases when it is not possible to immediately resolve a dependency associated with an infinitival verb, as in (6).

(6) Brian asked Gordon [how to play the guitar].

The subordinate clause has two interpretations, a specific one where *Gordon* is the controller, and a more generic interpretation (*how one plays the guitar*) (see also Jackendoff & Culicover, 2003). O'Grady argues that cases like this are not resolved by the computational system; they are instead resolved pragmatically, like plain pronouns.

Chapter 6 applies the computational architecture of the emergentist position to agreement phenomena. O'Grady makes a very convincing case for the argument that agreement is driven by efficiency, not grammar. The argument, once again, is very simple: the parser attempts to fulfill predicate–argument relations as quickly and efficiently as possible, and subsequently checks agreement relations. This explains why most agreement is between the subject and the verb: the preverbal argument, if marked with agreement features, has first look at the verb, and agreement occurs if possible. When it is not possible, as in, for instance, *there* constructions like (7) and (8), the parser looks downward to the verb's second argument. Further evidence for this case is given by considering partial agreement, with some particularly compelling linguistic facts drawn from Moroccan Arabic and Brazilian Portuguese.

(7) There was glass on the floor.

(8) are glasses on the floor.

Chapter 7 considers *wh*-questions. Instead of postulating syntactic analyses of *wh*-phenomena, O'Grady argues that *wh*-words look for a predicate whose argument grid contains an unresolved dependency of a matching type. For instance, consider (9):

(9) Guess what [he played next].

Once the parser encounters *played* there are two operations. First, *he* satisfies the subject argument of the verb, and second, the *wh* dependency is resolved when the parser encounters the unresolved nominal argument (the object argument) in the thematic role grid of the verb. Using only these tools, O'Grady then tackles tougher *wh*-phenomena, including island effects, the *that*-trace effect, and relative clauses. These tougher phenomena have only been studied intermittently in child language research. O'Grady's account provides a useful non-transformational approach on which future work could be based.

In Chapter 8 O'Grady argues that the effects of the computational system are felt beyond morphology, syntax, and semantics, in particular, in the phonological system, in the form of contraction. Here he focuses on the 'syntax' of contraction. The argument is that contraction is most natural where the computational system is able to combine the two elements involved immediately, as is the wont of the efficiency-driven parser. For the traditional notion of constituent structure, contraction is an odd phenomenon, since auxiliary and modal verbs are standardly assumed to combine with the main verb, but when contracted they combine with the subject, as in (10).

(10) She will \Rightarrow She'll

The argument is that phonological contraction is a reflex of combination – a sign that two (or more) words have combined at some point in the course of sentence formation. O'Grady considers a wide range of contraction phenomena in English. Particularly relevant to the child language audience is his treatment of *wanna* contraction. Much has been made of young children's ability to correctly produce the *wanna/want to* contrast (e.g. Crain, 1991). O'Grady's treatment will sit well with researchers who argue that this contrast is learnable.

Chapters 9 to 11 will be of most interest to child language researchers and psycholinguists in general. Chapter 9 considers syntactic processing. In particular, O'Grady seeks psycholinguistic evidence for his approach and concludes that it explains many effects reported in the literature. O'Grady is keen to emphasize that the emergentist thesis he forwards does not begin to provide answers to many of the current controversies troubling sentence processing researchers. Indeed, the approach is consistent with most sentence processing theories, with one exception: it denies the existence of a

substantive grammar. In many ways this liberates processing researchers from the tyranny of constantly evolving grammatical theory. Theories of sentence processing that have maintained the implementation of a grammar during processing have been open to the criticism that their models are not consistent with current syntactic theorising (e.g. Frazier & Clifton, 1996); to do away with syntactic theorising as psychologically relevant could leave researchers to concentrate on the data rather than fitting their explanations to often unfalsifiable concepts. Of course, this is highly controversial, which O'Grady admits, quoting Newmeyer (1998): '...[it is] hopeless to think that one can derive grammatical principles from parsing principles'. (p. 152). O'Grady is not alone in arguing to the contrary. Hawkins (1994, 2004), for instance, has long claimed that grammatical phenomena are reducible to parsing principles. Such attempts seek to increase the psychological plausibility of linguistic theory, which is surely a goal that takes high priority in the cognitive sciences.

Chapter 10 will be of greatest interest to readers of *Journal of Child Language*. O'Grady reviews familiar claims about the innateness of syntax from two dominant perspectives (nativist, empiricist/constructivist) and rejects foundational claims of both. His treatment is exhilarating in its ruthlessness. His basic claims are these:

- (i) As there is no syntax there cannot be innate grammar.
- (ii) However, following claims about the poverty of stimulus, some syntactic regularities are too rare to be learned from the input.

So where does this leave us? Herein lies the beauty and power of the emergentist thesis: such regularities (e.g. structure dependence) emerge from the properties of the computational system, nothing more and nothing less. Some readers may see this position as a middle ground between current approaches to language acquisition, and often the middle ground is seen as an unsatisfying attempt at unification. This would be an unfair criticism. Instead, O'Grady presents an alternative account that captures a great deal of the data, even 'hard cases' we have struggled with for some time.

However, many questions remain. For instance, O'Grady stakes much of his claim on the notion of WORKING MEMORY: growth in capacity is argued to result in improvements in efficient language use. At the very least, there is a very superficial truth here. However, as MacDonald & Christensen (2002) argue, we clearly do not know enough yet to stake everything on this claim.

Chapter 11 concludes the monograph. Here O'Grady considers how the emergentist thesis fares against traditional requirements of linguistic theory – notably, capturing acceptability and language diversity. The discussion of typology is particularly interesting, and will be familiar to readers of Hawkins (2004). O'Grady ends with a quote by Nobel laureate

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Steven Weinberg on the adequacy of explanation, which states that explanations should be elegantly simple and, to a great extent, intuitively appealing. With much modesty, O'Grady wonders whether he has achieved these desiderata. Even if the reader takes only his appeals to simplicity and efficiency away from reading the book, O'Grady has achieved a great deal. The more positive and open-minded reader will take away a great deal more.

The subject matter of the book crosses many sub-disciplines of the language sciences, and so will appeal to a broad range of researchers. The book would make an excellent addition to graduate-level courses on syntax, language processing, and language acquisition.

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