**Hagit Borer**, *Structuring sense*, vol. III: *Taking form*. Oxford: Oxford University Press, 2013.

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*Taking Form* is the third volume of Hagit Borer's *Structuring Sense* trilogy. In this book, Borer discusses the syntax of derivational affixes. She advocates that they merge with their base in narrow syntax. As such, the book reacts against lexicalist approaches. It consists of two parts. In the first four chapters after the introduction, Borer discusses deverbal nominalizations with a particular focus on Grimshaw's (1990) eventive nominals. Chapters 6–12 build on the conclusions of the first chapters to address the syntactic properties of derived words. Chapter 13 concludes.

The first chapter of the book is an introduction in which Borer starts with a cental question on the ontology of roots. She wonders whether the root is assigned a phonological form, a meaning and syntactic properties that determine its merger possibilities. As readers may remember from the previous two volumes of the trilogy, she denies that any syntactic properties should be associated with the root. A central claim in this volume is that roots can be identified by means of a phonological index present in syntax, but they lack a conceptual identity. The author proposes that the domains of content assignment are defined syntactically. Her claim opposes to the lexicalist view, according to which listed items are syntactic atoms with complete phonological, conceptual and syntactic properties. This position becomes a leitmotif in the book.

After introducing the theme of the book, Borer reviews other approaches to word-formation known as realizational models, such as Beard (1981, 1995), and

Disitributed Morphology (Halle & Marantz 1993 and subsequent literature). With these models, she shares the assumption that inflection is realizational (see Halle & Marantz 1993) and even amorphemic (see Anderson 1982, 1992, *pace* Halle & Marantz 1993). She thus submits that *walked* and *sang* are non-complex and their form results from a spell-out rule. Yet, she takes derivation to be strictly morphemic (*pace* Beard 1981, 1995). She argues that derivational affixes merge and project in syntax. In short, as in the previous two volumes of the trilogy, Borer distinguishes theoretically between inflection and derivation (*pace* Halle & Marantz 1993). Inflection is amorphous, while derivation is morphemic.

Finally, the chapter introduces specific, idiosyncratic terminology and abbreviations, and it clarifies some central concepts. For example, Borer clarifies her view on a central innovation in the book, viz. equivalence classes. The reader might recall from the previous volumes that categories are defined distributionally in the Exo-Skeletal Model. For example, those roots which occur below nominal projections, such as D°, become nominal in that specific structure through distribution. In other words, the structure renders the root EQUIVALENT to a noun. Similarly, derivational affixes may define their complements as equivalent to a specific category. For example, *read* becomes equivalent to a verb when it merges with *able*, itself being adjectival. The notion is to be interpreted distributionally, not featurally. It is thus not the case that *able* assigns verbal features to *read*, just like *D*° does not assign any nominal features to the root. Note, interestingly, that the concept of equivalence classes allows Borer to do without zero categorial affixes to categorize a root. This consequence is developed in detail later in the book.

Chapters 2–5 constitute the first part of the book. They contain an in-depth study of deverbal nominals. In Chapter 2, Borer adopts Grimshaw's (1990) distinction

between two groups of nominals. Borer calls them Argument Structure Nominals (AS-nominals), as in (1), and Result/Referential Nominals (R-nominals), as in (2).

(1) the instructor's intentional examination of the student

(2) the instructor's examination

Even though a deverbal noun is systematically ambiguous between an AS-nominal and a R-nominal, the syntactic properties of each type of nominal are well-defined. The first group is systematically richer than the second one as it allows for those properties that one associates with event structure, such as an event reading, agent-oriented modifiers and other specific modifiers, and it obigatorily contains arguments (see Grimshaw 1990 and the volume under review here for detailed discussion).

Borer argues that the nominal affix in AS-nominals and R-nominals defines its complement, i.e. the root, as equivalent to a verb through the equivalence classes. Both types of nominals thus contain a root which became equivalent to a verb in the structure. They differ in that AS-nominals contain a verbal extended projection, whereas R-nominals do not.[1] Needless to say, most previous proposals on AS-nominals include the intuition that they must contain a source of verbal properties. In contrast with earlier proposals, Borer emphasizes that the source of the eventive interpretation is not the nominal affix or the noun itself (in a lexicalist view), but functional structure which is contained below the nominal affix. She further rejects the idea that an embedded, listed verb gives rise to the eventive intepretation as the structure contains a root rather than a verb.

The proposal is developed carefully in the succeeding chapters. Chapter 3 mainly presents evidence for the proposal, whereas Chapters 4 and 5 flesh it out. Chapter 4 discusses the licensing of arguments and case assignment in AS-nominals. Among other

things, it argues that in English the logical subject may be licensed by the Saxon Genitive and the object by *of*. Via the postulation of a *Double-of Filter* it follows that English bans ditransitives in AS-nominals. English is contrasted with other languages, such as Romance languages, Polish, German and Hebrew. Hebrew, for example, lacks a pre-nominal genitive and it does not contain a filter parallel to the *Double-of Filter*.

In addition, the chapter contains a comparison of AS-nominals with the suffix *-ing*[2] and those with other suffixes, such as *-ation*. There is a tradition in the literature of distinguishing between these two types of AS-nominals structurally (see e.g. Grimshaw 1990, van Hout & Roeper 1998, Alexiadou 2009, Sichel 2010). Borer argues that such a structural distinction is unjustified. Instead, she proposes that the suffix *-ing* differs semantically from the others. More specifically, it expresses homogeneity and implies an originator, whereas the others are semantically vacuous. Finally, the chapter addresses nominals without an overt nominal affix, such as *the form*. Borer denies the existence of productive null nominalizing affixes and submits that nouns such as *form* in *the form* are simply roots under a nominal functional sequence.

Chapter 5 discusses AS-nominals without an overt logical subject or with a logical subject contained in a *by*-phrase. Borer rejects the hypothesis that they contain a PRO subject. Instead, she proposes that their event domain contains a passive structure. Note that the AS-nominal does not consist of passive morphology. It is argued explicitly that passive participial morphology does not express passive voice or passive arguments (*pace* Baker, Johnson & Roberts 1999).

Chapter 6 is the first chapter of the second part of the book. Its first section points out that Bare Phrase Structure (BPS) is more suitable for deriving complex words in the syntax than X′-theory as X′-theory presupposes specifiers and semantic selection of complements, two properties which suit clauses more readily than complex words (see Ackema & Neeleman 2004). It therefore aims to reconcile BPS with the concept of

roots. By definition, BPS is incompatible with roots, as roots are categoriless and BPS assumes a categorial projection of terminals. Borer proposes that, given that the root is incapable of projecting, the affix projects and labels the structure with its category in complex words. The root is assigned a category through categorial equivalence (see above).

The second section gives attention to the syntax of derivational affixes, 'C-functors' in Borer's terminology. They have a category and they define their complement as belonging to a specific category. For example, *-able* is adjectival and it has a verbal complement (see above on categorial equivalence). They may have a specific semantics, e.g. *-less* means 'lacking', but their semantics determines neither their category nor the category of the complement. Finally, they are minimal projections and therefore must project, according to BPS. Borer points out that, given these properties, derivational affixes are the only items that have properties traditionally associated with lexical entries (see Chomsky 1965). The section further provides technical details on C-functors, such as their distributional properties and locality restrictions. The chapter introduces a linearization principle according to which internally merged constituents are linearized to the left of their merge target and it comments on its consequences for prefixes and compounding.

Chapter 7 discusses how roots are categorized in the structure. It explains in detail the concept of categorial equivalence (see above) and it strongly denies the existence of productive zero C-functors, i.e. zero derivational affixes.

Chapter 8 substantiates the claim that roots are present in syntax as phonological indices. In other words, roots are individuated phonologically. This has consequences for suppletion; suppletive pairs, of which the members have distinct phonological forms, cannot be two instantiations of the same root. It is pointed out that the present approach contrasts sharply with Harley's recent ideas according to which roots are not individuated

on phonological grounds (see Harley to appear). Borer and Harley both agree on the fact that roots have no content, though, a point which is spelled out in the following chapter. Note that the claim that roots have no content deviates from the claim in Borer (2005a, b) according to which roots do have content even though it is syntactically unavailable.

Chapter 9 presents a derivational account of content assignment to complex words. Borer postulates a reservoir of stored meaning called Encyclopedia and an interface mediating between a phonologically realized string and individual content units called En-search. En-search operates on structures containing C-functors; the root itself is not a domain of content assignment. En-search can be applied iteratively, but content matching is optional at each step. As content matching is never obligatory, the structure thus may end up being nonsensical. The system thus includes *Jabberwocky* as a grammatical option. Listed meaning is only available in a local domain; En-search is blocked by segments of extended projections. The proposal is illustrated by a discussion of a semantic contrast between AS-nominals and R-nominals. It is observed that AS-nominals cannot be idiomatic, whereas R-nominals can get a listed meaning. This follows from the fact that AS-nominals involve the merger of a verbal extended projection above the root and below the C-functor, blocking En-search and thus preventing the assignment of listed content. In R-nominals, in contrast, the root merges directly with the C-functor. Hence, idiomatic content assignment is possible.

The technical side of the approach is developed in Chapter 10, which discusses spell-out and phases. It is proposed that every instance of merge creates a phase and the precise consequences of the approach for content assignment are developed in detail. It is argued that roots spell out in the phase immediately containing them. It is further emphasized that idiomatic content assignment and phonological idiosyncracy belong to different realms. Whereas content assignment is based on derivation, i.e. per step, phonological irregularities in derived words take the entire representation into account.

Chapter 11 discusses verbal derivatives in Hebrew. The chapter aims to illustrate that the results which were mainly derived on the basis of English data can be extended to a language with a very different morphology, such as Hebrew. As such, it demonstrates the universal potential of the framework and it suggests how the approach can be adopted by linguists concentrating on Semitic languages.

Chapter 12 is yet another extension of the empirical scope of the proposal. It presents an account of synthetic compounds, such as *truck driving*. The question is raised whether they are related to AS-nominals, as one might interpret the compound as containing an argument of a verbal projection, as in *the driving of the truck*. Such a relation is denied. It is, rather, proposed that synthetic compounds are instances of R-nominals. In other words, their structure is devoid of a verbal extended projection. The conclusions are used to support the view that word formation takes place at syntax proper.

Finally, Chapter 13 concludes. It summarizes the main claims, repeats how the present proposal contrasts with lexicalist views, and points out how the present proposal relates to the two earlier volumes in the trilogy. Interestingly, it is noted that the trilogy – and thus also the present proposal – is in full compliance with the thesis put forth in Borer (1984) stating that variation solely depends on the properties of functional vocabulary.

With more than 600 pages, *Taking Form* is a heavy volume and one cannot escape the impression that it actually contains two books, one on deverbal nominals and one on the theory of derivational affixes in general. It is understandable that they were nevertheless published together because the first part provides the empirical case study on which the second part elaborates. Yet, I can imagine that each part may appeal to different audiences depending on their particular interests. This should not be a problem. As long

as the reader does not skip the introductory chapter, these two parts can be read independently.

It is absolutely imperative to read the introductory chapter and to keep the glossary at hand as the text contains a whole range of idiosyncratic terminology and abbreviations referring to in fact familiar concepts. For example, derivational affixes are referred to as C-functors, Grimshaw's complex event nominals are called Argument Structure nominals and a specific set of nominal affixes are called ATK, short for '*-ation and kin*'. Moreover, a great deal of the analyses presuppose knowledge of preceding sections. Simply reading a single section *in media res* may not be a rewarding experience. The reader who desires to appreciate the text in full detail, will therefore have to show some commitment. She will be rewarded. Fully aware of the length and the complexity of the book, Borer humourously congratulates the surviving reader on pages 238 and 522.

The persevering reader will not only discover more examples of Borer's sense of humour,[3] but also a discussion of many of the morphological puzzles which have emerged since Chomsky (1970) and some of the most carefully crafted solutions known to the contemporary field. *Taking Form* resembles a highly complex, yet beautiful puzzle of which each chapter provides some pieces. As such, reading the volume is a challenging, but rewarding task. The text is written with great care. Major claims are contrasted with other approaches in the literature and each thesis is accompanied by a series of arguments and data. Every single consequence is considered and discussed. The result is a remarkably consistent and ingenious approach to word formation with an excellent empirical coverage. For anyone working on theoretical word formation in generative grammar, the present volume is impossible to ignore.

To support major claims a great deal of interesting analyses pass by. For example, while arguing against productive zero derivational affixes in Chapter 7, Borer presents the reader with an interesting novel analysis of *growth* as an allomorph of *grow*, argues

against a structural distinction between *hammer* and *tape* (*pace* Kiparsky 1982), and provides suggestions on how to understand the various categorial faces of *-ing*. I expect some of these supporting analyses to influence the field as substantially as some of the major claims they support.

One of the major claims in the trilogy and in the present volume is the view that segments of extended projections merge as featureless projections that are assigned range by a so-called S-functor. An S-functor is a functional vocabulary item that binds the empty position. The proposal was already present in the previous volumes and, to the best of my knowledge, it has not been widely adopted by the field, unlike other ideas presented in the trilogy. This may be attributed to the fact that the idea is idiosyncratic and as such raises a great deal of technical and theoretical questions. Sadly, the curiosity of the reader is not satisfied in the present volume either. A thorough and careful discussion that would allow an easy implementation of these ideas is still lacking.

It is interesting to read how Bare Phrase Structure can be modified to accommodate the derivation of derived words and it is tempting to adopt the proposal. Yet, as Borer herself notes (303–304) the proposal faces some technical problems that make it difficult to implement it as it stands. For example, one problem is that complex words are derived through head incorporation. Now, head incorporation cannot be applied to more than two heads in BPS. When two minimal projections incorporate, the result is by definition non-minimal and thus ceases to be a head. Thus, the implementation of BPS in word formation awaits further fine-tuning.

When reading Chapters 1, 7, 8 and 9, the reader will undoubtedly note that Borer's proposal differs substantially from Distributed Morphology, a cognate approach. In the first chapter it is emphasized that inflection is amorphous, a stance that is irreconcilable with the most basic assumptions in Distributed Morphology.

The ideas on categorization presented in Chapter 7 are unique in the field. By introducing the concept of categorial equivalent classes (see above), Borer succeeds at categorizing a root while avoiding the postulation of productive zero affixes. This is a significant result. It reunites the observation that the root that has merged with *-able*, for example, has a verbal distribution with the fact that there is no direct proof of a zero morpheme and with the claim that the root itself is categoriless. The exclusion of zero affixes has consequences for locality. In Borer's system, the first overt derivational affix is effectively the one that has merged directly with the root, whereas this is not necessarily the case for Distributed Morphology (Embick 2010). Fully aware of these consequences and the empirical data sets they involve, Borer does not fail to address these issues.

In Chapter 8, it is proposed that the root is present at syntax as a phonological index. As such, the proposal contrasts sharply with recent work by Harley who claims, on the basis of suppletive pairs, that roots are not defined phonologically. Yet, Borer argues that a phonological index serves to guarantee phonological faithfulness among various instantiations of the same root. As a result, she needs to assume that the members of suppletive pairs are separate roots. The idea that indices are inserted before the actual phonological realization of the structure takes form is well argued for. What is lacking in the account, though, is the need for the presence of indices in syntax proper. One might equally derive the ordering between indices and the actual phonological realization at PF by assuming that PF is an ordered set of rules. Yet, Borer explicitly uses the claim that phonological indices are present at syntax to reject De Belder & van Craenenbroeck's (to appear) proposal according to which roots are empty positions as they are the empty derivational workspace the first element of the numeration has merged with.

Finally, the local domain for listed content assignment presented in Chapter 9 differs radically from the dominant approach in Distributive Morphology, according to which the first categorial head that merges with the root defines the outer limit for idiosyncratic meaning (Marantz 2001, Arad 2003).

In sum, the work under review here differs substantially from proposals in Distributed Morphology. Most notably, it differs in its views on categorization, the identity of the root and the domain of content assignment.

In short, *Taking Form* is a must-read for anyone working on deverbal nominalizations and on theoretical morphology in general. It addresses the most urgent questions of the field and contrasts its innovative ideas with a well-documented review of the literature. In addition, it contains a wealth of novel analyses of canonical issues.

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[1] Strictly speaking, this implies that the root in the AS-nominal is already verbalized by the eventive functional structure and does not have to await the merger of the nominal affix to become equivalent to a verb. In this respect, they contrast with the R-nominals, in which the affix merges directly with the root, thereby verbalizing it directly.

[2] Under discussion here is the nominal affix *-ing*, not the gerundive *-ing*. Borer discusses the gerundive *-ing* in Chapter 4, Section 7.1.

[3] Do not forget to read the footnotes. Unlike this one, they may contain jokes.