



Words: Syntactic structures and pragmatic meanings

Robyn Carston¹

Received: 4 March 2022 / Accepted: 16 August 2022 / Published online: 18 October 2022
© The Author(s) 2022

‘... words have complex meanings precisely because neither words nor their meanings are entirely linguistic objects, but rather the bastard offspring of language and the real or imagined world; it is this union of sparse linguistic resources with the vastness of the nonlinguistic universe that makes all words so rich from birth’ (Aronoff, 2007: 813–814).

1 Introduction

It’s quite widely agreed that the hallmarks of human language are syntactic recursion and semantic compositionality. For instance, a phrase like ‘the girl who loves the horse which she bought from Jack Saunders who lives in Jevington’ involves iterative application of a syntactic rule for making relative clauses, a rule which could, in principle, be applied any number of times, and its semantics or meaning is a compositional function of the semantics/meaning of its basic elements and the way in which they are combined. Any such system has to bottom out in a set of basic elements, its primitives, which are unstructured and semantically non-compositional (atomic). If that is right, then words are clearly not the basic elements of human language.¹ Many words are transparently structured and semantically compositional, e.g. the word ‘childishness’ is made up of the morpheme/word ‘child’ and the two affixes,

¹ My focus is entirely on the substantive vocabulary, typically nouns, verbs, and adjective, which have a conceptual meaning that is stable but context-sensitive and flexible, with ever-evolving families of related senses. Grammatical or functional items are quite different – they are small closed sets of items e.g. inflectional affixes (for number, tense, aspect), derivational affixes (for nominalization, verbalization, etc.), articles, demonstratives, quantifiers, modals and others. These are of critical importance to the meaning of the structures in which they occur (sentences, phrases, sometimes ‘words’), but their semantics is quite different from that of the substantive items – it is rigid, formal, non-conceptual – and has to be given a separate treatment.

✉ Robyn Carston
robyn.carston@ucl.ac.uk

¹ University College London, Chandler House, 2 Wakefield St, WC1N 1PF London, UK

‘-ish’ and ‘-ness’, with constraints on their ordering, and a compositional semantics: roughly, the property or state (meaning of ‘-ness’) of being similar to (meaning of ‘-ish’) a child. What about the noun ‘hammer’ and the verb ‘hammer’, which are apparently mono-morphemic – are they both basic, that is, unstructured and semantically non-compositional? Their meanings are clearly related and it seems likely that the verb has been in some way derived from the noun as it denotes an action apparently involving use of the tool denoted by the noun, so perhaps it should be analyzed as structured, that is, as containing the noun and a verbal categorizer that is not phonologically realized. This leaves the nouns ‘child’ and ‘hammer’ as candidates for basic elements, that is, unstructured semantic atoms. But even this is disputed in current generative linguistics where nouns of this sort are treated as phrasal structures consisting of a root and a nominal affix or categorizer. So the root $\sqrt{\text{child}}$ is the basic element and it occurs in a range of structures: the nouns ‘child’ and ‘children’, the adjectives ‘childish’, ‘childlike’, ‘childless’, ‘unchildish’, perhaps the verbs ‘to child’, ‘to unchild’, the nouns ‘childishness’ and ‘childlikeness’ (and compounds, e.g. ‘brainchild’, ‘grandchild’, ‘stepchild’, ‘childbirth’, ‘childproof’, and many more either in current use or yet to be coined).²

On this way of looking at things, all of those entities which we intuitively think of as words are really phrases – they have an internal structure and a compositional semantics. This is the current stance of a number of linguists, across a range of frameworks (Halle & Marantz, 1993; Marantz, 1996, 1997, 2001; Borer, 2005a, b, 2013a; Harley, 2009, 2014; Ramchand, 2008, among others), which otherwise differ in important details and perspectives. Abstracting away from these differences, on this view, there is a single system for generating all structures (so it is known as ‘the single engine’ hypothesis), that is, there is no distinction between phrase structure rules and word-formation rules, and the lexicon is stripped down to nothing more than a repository for storing basic items (roots and functors³). This is a lean elegant architecture, but (setting aside the many issues of a technical or implementational sort, best left to syntacticians) it raises some significant broad conceptual questions, concerning the following:

1. The status of the notion of ‘words’. On the ‘single engine’ account, ‘words’ are not primitives of the system as they are phrases (syntactic structures), so they have no distinctive status within the grammar, but to the ordinary language user, they are highly salient as basic units of language. Of course, folk notions and scientific concepts often come apart, but given that the language faculty is a

² I don’t look at compounds in this paper, a complex topic with a large literature. The meaning of compounds is virtually never semantically compositional, requiring pragmatics, at a minimum, to determine the relevant relation between their component parts (see Bezuidenhout 2019).

³ There are two kinds of functors, a point which will be of interest in Sect. 3 on delimiting the domain of non-compositional content: (i) categorizers (nominal, verbal, adjectival) which may be phonologically realized by various affixes, including ‘-tion’, ‘-ize’, ‘-al’, and (ii) functional items that project further levels of structure like the determiners (e.g. ‘the’) and number (e.g. plural) for nominal structures; or tense (e.g. past) and aspect (e.g. the perfective/imperfective contrast, as in ‘has eaten the apple’ vs. ‘was eating the apple’) for verbal structures.

- component of human psychology, it would be nice to find an explanation for this apparent tension.
2. The nature of ‘the lexicon’ and its contents. On this ‘single engine’ account, there are lists of basic elements: roots and functors, each item consisting, at most, of just a phonological form and a meaning. However, as with the previous point, ordinary language users appear to store and retrieve as ready-mades (rather than to generate or build) complex words like ‘inflation’, ‘reactionary’ and ‘breakfast’ (and also some more obviously phrasal structures, known as idioms, e.g. ‘kick the bucket’, ‘spill the beans’).
 3. The apparently *non-compositional* (atomic or holistic) semantics of some internally complex words. For instance, the word ‘reactionary’ means, roughly, *BACKWARD-LOOKING*, which is *not* semantically composed from the meaning of its parts: ‘react’, ‘-ion’, and ‘-ary’. This is an important issue for the ‘single engine’ advocates, as they themselves acknowledge, because it breaks the neat structure-compositionality connection.

In this paper, I start with and focus primarily on this non-compositionality issue, then look more briefly at its implications for the lexicon, and finally, even more briefly, consider the status of words. My position in a nutshell is that pragmatics plays a key role in the advent of non-compositional (atomic) meanings of words, and that, in addition to the lists of basic elements that feed the syntax, there is a user-based lexicon of established communication units, which includes as a major component what we as language users think of as ‘words’ together with their established (pragmatically-interrelated) senses. So this paper is an attempt to bring work in generative grammar on the syntax and semantics of words together with work in lexical pragmatics on the creation of new (ad hoc) words and senses in online communication, a small subset of which are subsequently conventionalized and stored in a pragmatic (communication-based) lexicon.

The next section gives an overview of the syntactic word-building view, the issue of non-compositional meanings for these syntactic objects, and approaches to explaining it. In Sect. 3, the relevance-based account of lexical pragmatics is presented, but is extended beyond its usual focus on apparently simple words like ‘child’, ‘run’, and ‘fresh’, to clearly structurally complex cases like ‘reactionary’, ‘examination’, and ‘recital’, and to cases of what is often called ‘conversion’, where an existing noun is used as a verb (e.g. ‘hammer’) or vice versa. In Sect. 4, I try to pull these distinct domains (in fact, largely distinct disciplinary endeavors) into a single big picture, encompassing the generative computational linguistic system and the pragmatic innovations that arise in linguistic communication, drawing here on a view of the language faculty as narrowly construed and as broadly construed (Hauser et al., 2002). Some implications for the nature of ‘the lexicon’ are drawn out and for the nature of polysemy (multiple established meanings for a word or categorized root). In Sect. 5, I sum up and conclude with some reflections on the nature of words as a folk linguistic category.

2 Syntactic word-building and polysemy: compositional and non-compositional meanings

2.1 Words as syntactic entities

As Levinson (2019: 265) puts it: “The traditional boundary between ‘idiosyncratic’ words and ‘generated’ sentences breaks down when one considers idiosyncrasy at the phrasal level such as idioms, on the one hand, and structure and compositional meaning within words, such as derivational morphology, on the other ...”. Here I focus on the second of these points of breakdown and the consequent redrawing of the boundary between idiosyncratic (or basic) elements and generated structures, such that words are subsumed into the latter, making for a ‘single computational engine’. To give an idea of what this change of perspective involves, consider the noun ‘activation’, plausibly made up of four parts: ‘act’, ‘-ive’, ‘-ate’ and ‘-tion’. Looking at the third level, one of the properties of the verb ‘activate’ is its ability to enter into several syntactic structures, including the transitive structure in (1a) and the inchoative structure in (1b):

1. a. The children activated the alarm.
- b. The bomb will activate at 6pm.

And, moving to the fourth level, in parallel with this, the nominalization ‘activation’ may take the same two argument structures:

2. a. [The activation of the alarm by the children] was annoying.
- b. [The bomb’s activation] will occur at 6pm.

By way of contrast, consider the possible argument structures of ‘congratulate’ (and correlatively the derived nominal ‘congratulation’):

3. a. The teacher congratulated the successful students.
- b. The congratulation of the students by the teacher
- c. * The successful students congratulated.
- d. * The successful students’ congratulation

On traditional ‘lexicalist’ accounts of word structure, information about these ‘structural projections’, as they are called, was logged in the lexicon, probably in the lexical entries for ‘activate’ and ‘congratulate’ and via a productive word-formation rule for the ‘-tion’ nominalizations.⁴ On the more recent ‘single engine’ approaches, the

⁴ The lexicalist tradition in generative grammar (arising largely from two key works by Chomsky: 1965 and 1970), was geared towards formulating a system of lexical entries and lexical rules to capture all the particularities of words, thereby ensuring the maximal generality of the syntax. Each entry contained specific phonological, syntactic and semantic information, including ‘insertion frames’ (specifying arguments such as subject, object, indirect object). Lexical rules (distinguished from the much more general syntactic operations), relating one class of words to another, could introduce category label changes (e.g. the rules relating the verbs ‘destroy’ and ‘perceive’ to the nouns ‘destruction’ and ‘perception’). See Borer

words ‘activate’ and ‘activation’ are not lexically stored but are either generated in the syntax (the ‘distributed morphology’ approach, e.g. Halle & Marantz 1993; Marantz, 1996, 1997, 2010, 2013a) or formed by insertion of roots into constructions or templates generated by the syntax (‘constructivist’ approaches, e.g. Borer 2005a, 2005b, 2013a; Ramchand, 2008), based on the assumption ‘that argumental interpretation is configurational and independent of selecting words’ (Borer, 2017: 127). It follows then that, as for all phrasal structures, the semantics of words is composed from the semantics of their constituent parts (roots, affixes, and other grammatical primitives) and their mode of combination. So for the complex nominal ‘act-ive-ate-ion’, we get a compositional semantics roughly along the following lines: RESULT (-ion) OF MAKING (-ate) [some entity X] of CAPABLE OF PERFORMING (-ive) ITS FUNCTION (act). Here the internal structure of the word maps, joint for joint, onto its meaning parts.

However, it is a clear and striking fact about many structurally complex words that they have *non-compositional meanings*. Here is a sample of cases (variously taken from Harley 2009, Borer, 2013b, 2017, and Levinson 2019):

4. ‘editor-ial’, ‘univers-ity’, ‘institutional-ize’, ‘revol-ution’, ‘recit-al’, ‘social-ism’, ‘reaction-ary’, ‘recep-tion’, ‘natur-ism’, ‘natural-ize’, ‘classifi- eds’, ‘verb-al’

The meaning of ‘editorial’ is OPINION ARTICLE, which is not a compositional function of the meaning of ‘editor’ and the suffix ‘-ial’ (cf. ‘tutorial’); one of the meanings of ‘revolution’ is the OVERTHROW OF A GOVERNMENT OR SOCIAL ORDER, which is not a compositional function of the meaning of ‘revolve’ and ‘-tion’; the meaning of ‘naturalize’ is to RECOGNIZE A FOREIGNER AS A CITIZEN OF A COUNTRY, which is not a semantic composition of ‘natural’ and ‘-ize’; one meaning of ‘verbal’ is RELATING TO LANGUAGE USE, which is not a semantic composition of ‘verb’ and ‘-al’; and similarly for the other cases. On the face of it, then, these non-compositional meanings present a challenge for theories that generate words syntactically and so predict compositional meanings for these structures. Indeed, the need to list and store such idiosyncratic, unpredictable meanings was a primary motivation for the view that word formation should be kept out of syntax (Chomsky, 1970; Halle, 1973).

The issue has certainly been confronted by the advocates of the syntactic account of word-building and proposals have been developed to explain it, some of which claim to show that these exceptions to compositionality are only apparent. Levinson (2019: 267) describes the position as follows: “... the ‘trick’ is that they [the words at issue] demonstrate a special kind of compositionality which involves a great degree of polysemy or flexibility of interpretation ... Thus, I will coin a less biased term for words or phrases with this surface appearance of noncompositionality: Apparent Compositionality Exception or ACE.”

Talk of polysemy and flexibility of interpretation immediately directs my thinking away from syntax to work in the field of lexical pragmatics, whose domain is modulations of word meaning, the creation of new senses for words, and the coining

(2017) for a clear account of developments within the lexicalist approach and of the issues that led to a radical redrawing of the lexicon/syntax boundary on constructivist and other root-based accounts.

of new words on-the-fly, all considered to be commonplace occurrences in communication, with some (rather few) subsequently becoming established in the language, creating various kinds of polysemy. So, in Sect. 3, I will suggest that these ‘apparent compositionality exceptions’ are in fact as they appear, i.e. non-compositional, and that, in many cases at least, these meanings have been derived by pragmatic inference in contexts of use (with subsequent conventionalization). First, though, in Sect. 2.2, let me outline the general proposal from within the syntactic word-building frameworks that there are specific ‘domains of semantic content’ that delimit the kind of syntactic structures to which a non-compositional (atomic, holistic, idiosyncratic, unpredictable) meaning can be assigned. My hope here is that the right notion of a syntactic domain of content⁵ will mesh with the ordinary user’s intuitive grasp of words as a salient basic unit, amenable to inferential pragmatic meaning adjustments, and so will provide the necessary link between the formal computational system and what I call the pragmatic or communicational lexicon (discussed in Sect. 4).

2.2 Syntactic domains of content

At the end of her survey of the status of words within generative grammar from the 1960’s to the present day, Borer (2017) presents the constructivist position mentioned above, in which words are, in effect, syntactic structures consisting of roots and a hierarchy of grammatical elements. On her view, roots “consist of little more than indices tracking their derivational history” (ibid.: 129), hence they themselves are categoryless and meaningless,⁶ and it is only once they are categorized (as a noun, verb, adjective, etc.) that a match with meaning (atomic content) arises, as for [_N √horse], [_V √smile], [_A √yellow], and thousands of other familiar ‘simple words’. Borer then discusses several of the many cases of complex words which have meanings that are not predictable from their parts and so also require listing (in some sort of lexicon), including ‘recital’ (SOLO CONCERT), as in ‘a piano recital’ and ‘civilization’ (CULTURE/SOCIETY), as in ‘the Mayan civilization’. She maintains that the pairing of transparently structured constituents (complex words) with unstructured (non-compositional) meanings does not undercut the syntactic word-building account nor, therefore, does it require that word-formation be relegated to the lexicon. As Borer sees it, structurally complex words (and phrases) that can only have a compositional meaning are associated with one kind of syntactic structure and those that can have a non-compositional meaning with a different kind of structure. So nouns like ‘recital’ and ‘civilization’ have a specific kind of structure, which although it has a compositional meaning (like all syntactic structures) allows for assignment of a special (non-compositional) meaning. She concludes: “There is no challenge here to the need to list

⁵ Syntacticians use the word ‘content’ (sometimes ‘Content’) to refer to a non-compositional (atomic) meaning of a word. When discussing their work I will use the same term and take it to be equivalent to my use of the word ‘sense’ (an atomic concept which is an established meaning of a word).

⁶ It is a key part of Borer’s account of roots that these indices are phonological, that is, they provide “a reference constant across all their occurrences to a specific phonological information package, where [e.g.] both /*thief*/ and /*thieve*/ could be accessed under the relevant syntactic circumstances ...” (Borer, 2013a: 381). I cannot pursue this important point here and refer the reader to the comprehensive discussion in Borer (2013a, Chap. 8).

unpredictable meanings, whether that of *cat* or of *recital*. The challenge, rather, is to the claim that listedness entails the absence of syntactic complexity. The task facing root-based approaches is to successfully delimit the syntactic domains within which listed [non-compositional] meaning could emerge.” (ibid.: p.131).

There are currently several proposals on the table concerning the right way to delimit the structural domains allowing non-compositional meaning. The technical details are formidable for the non-specialist and the proposals are typically formulated within syntactic frameworks that differ from each other in significant ways, so assessing the correctness of different proposals will ultimately require judging whole frameworks against each other (see Levinson 2019 for discussion of how different domain proposals have arisen as syntactic frameworks have evolved). Thus, I confine myself here to a brief indication of two proposals for such domains within syntactic (root-based) approaches to word structure, with a view to extracting a general idea of the approach which is sufficient to connect it usefully to the lexical pragmatic account of how non-compositional meanings of words arise (Sect. 3) and to the user-based pragmatic lexicon, a component of the overall architecture of the broad language faculty, as discussed in Sect. 4.

Perhaps the simplest proposal for the syntactic domain of atomic meaning or content is that of Arad (2003), who suggests that it is structures consisting of a root and a single categorizer (noun, verb, adjective): “... roots are assigned an interpretation in the environment of the first category-assigning head with which they are merged. Once this interpretation is assigned, it is carried along throughout the derivation.” (ibid: 747). Whatever the merits of this constraint for the case of Hebrew roots, her analysis of which motivates it, it seems clear that it does not work for English. For instance, the content assigned to the verb ‘react’ or the noun ‘reaction’ is not carried along to the derived adjective ‘reactionary’, and the same point holds for the other cases discussed above (and many others) where non-compositional content is associated with complex words beyond the domain of ‘first categorization’, e.g. ‘editorial’, ‘naturalize’, ‘transmission’ (car’s gearbox), ‘socialism’, etc. Thus Borer (2013a, 2013b, 2014) proposes a different, larger domain than that of the first level of categorization, while also emphasizing that the structural boundary must be clearly delimited so as to preclude cases that cannot have non-compositional content (as for typical phrases).

Here a key role is played by a distinction between two different kinds of ‘functor’ (see footnote 3), which together with roots are the basic (terminal) elements of the syntax. Simplifying considerably, the C-functors are categorizers (conferring a syntactic category: n, v, a) and the S-functors are a disparate set of elements that are crucially implicated in the projection of further structure, so for nominals they include determiners like ‘the’ and number-marking such as plural, and for verb phrases they include tense and aspect markers. These two kinds of functors are central in the determination of structural domains that either allow or preclude the assignment of atomic (non-compositional) meaning. While categorizations at multiple levels do allow this (as in ‘reactionary’, ‘transmission’, ‘naturalization’, and the other cases noted above), the structures associated with S-functors do not, so, for instance, conferring past tense on a verb, e.g. ‘jump-ed’ as a possible value of a tense phrase, produces a new meaning which must be compositional; so also for pluralizing a noun, e.g.

‘book-s’, and even more obviously the determiner phrase ‘the book’. That is, the functional structures which are headed by these S-functores preclude a non-compositional meaning. Again omitting much detail (see Borer 2013b, 2014), the structures in which S-functores occur consist not only of S-functional elements (determiners, number, tense, etc.) but also have a core of C-labeled nodes that falls below (is dominated by) the functional structure. Special (non-compositional) meaning can be assigned at each of these C-labeled nodes, but not beyond them, so in (5) each of the C-labeled domains, underlined, can have (but does not have to have) non-compositional content while the determiner phrase headed by ‘the’ cannot:

5. [_{DP} the [_N [_V [_A [_N √nature] al] ize] ation]]

Compelling support for Borer’s position comes from two kinds of complex verb-derived nominals, which she discusses in detail (Borer, 2013a, 2014). She notes a distinction in the acceptability (grammaticality) of the members of such pairs as the following, where the (a) cases are semantically compositional, while the (b) cases have a special non-compositional meaning:

6. a. The constitution of the committee by the government (in Philadelphia)
[cf. The government constituted the committee to investigate cyber fraud.]
b. *The Constitution of the US by the Founding Fathers (in Philadelphia).
[cannot mean: *the Constitution of the US as produced* by the Founding Fathers]
7. a. The reading of the lecture notes by the students
[cf. The students read the lecture notes]
b. * The reading of the world by Aristotle.
[cannot mean: *the reading (=interpretation) of the world as done* by Aristotle]
8. a. The referral of Mary by her doctor to a rheumatologist
[cf. The doctor referred Mary to a rheumatologist]
b. * The referral [=person referred] by her doctor to a rheumatologist [has arrived for her appointment]

The nominals in (b), which have a special (non-compositional) meaning, do not enter into the argument structures that are available to the compositional nominals in (a), known as AS-nominals, which inherit the Argument Structure of the verb from which they are derived together with its meaning. Note that, for each of the pairs, the nominals are derived from the same verb, ‘constitute’, ‘read’, ‘refer’, with an identical nominalizing affix, ‘-tion’, ‘-ing’, ‘-al’, respectively, so the difference in acceptability between them seems to be clearly a matter of syntax, hence of the different kinds of structures into which the roots √constitute, √read and √refer are inserted. Radically simplifying for current purposes, the two kinds of structure can be indicated as follows, where (9a), similar to the structure in (5) in consisting of a core of categorizers without intervening functional structure, allows non-compositional meaning, while the structure in (9b), with its layers of intervening S-functional structure (abbreviated here as F1 and F2) necessitated by the presence of the verbal arguments (subject and object), precludes assignment of a non-compositional meaning to ‘constitution’:

9. a. [_N -tion [_V constitute]]
 b. [_N -tion [[_{F2} subj [_{F1} obj [_V constitute]]]]]

Assignment of atomic content is a local process, so while it is possible at each of the categorization points in the structure in (9a), it is only possible for the *v* categorization in (9b), beyond which functional structure blocks (or ‘blinds’) the search for atomic content and thus leaves only the ever-possible compositional semantics.

Borer’s final general characterization of the syntactic domain that allows and delimits mapping to a special (non-compositional) meaning is given in more technical terms (2014: 85–88), but I hope the idea has emerged sufficiently from the largely non-technical exposition given here.⁷ It encompasses all words of whatever complexity, not only the derived nominals in (6)–(8) but also derived verbs and adjectives which can have non-compositional meanings, e.g. the verbs ‘institutionalize’, ‘naturalize’, ‘liquidate’, ‘houdini’ (and other so-called ‘conversions’ from nouns and proper names, discussed more below), and the adjectives ‘reactionary’, ‘socialist’, ‘verbal’, and ‘flakey’. If this approach is right, it not only provides information to the language learner on where to look for atomic (non-compositional) meanings, as Borer notes, but it also places significant structural constraints on the linguistic unit on which (non-compositional) pragmatic meaning can be constructed by the language user (the communicator), as discussed in the next section.⁸

3 The pragmatics of lexical creativity in communication

3.1 Lexical modulation, ad hoc word senses, and polysemy

A starting assumption here is that language users have an awareness of words (that is, words comprise a psychologically real category) while the internal structure of words is much less salient to them (Julien, 2007). This is especially so for simple words like ‘dog’, ‘fresh’ and ‘run’, which, although consisting of a root plus grammatical structure, according to the syntactic approach outlined above, are treated as basic linguistic elements by language users. The point also holds for clearly complex words (e.g. ‘recital’, ‘conservative’, ‘liquidate’, and even many compounds, e.g. ‘blackmail’, ‘breakfast’, ‘afternoon’), which are apprehended and employed as

⁷ As per footnote 6, a significant omission from my exposition here is any discussion of ‘the phonological domain of Content’, which plays a crucial role in Borer’s account (2013a, 2014: 93–94).

⁸ See Levinson (2019) for an overview of these and other proposals that fall under the broad umbrella of the ‘syntactic word building’ approach. She herself, along with Marantz (2010, 2013a) and others, favours the approach known as ‘allosemy’, based on a claimed symmetry with allomorphy, that is, the phenomenon of a single morpheme or lexical item having two or more different phonological realizations depending on its linguistic context (e.g. the different phonological realizations of the prefix ‘in-’: ‘immortal’, ‘inconsistent’, ‘illegible’, ‘irregular’, etc.; the different forms of the root √(de)stroy in ‘destroyer’ and ‘destruction’, etc.). Whether there really is such a symmetry between phonological alternatives and semantic alternatives (e.g. the different meanings of the categorized root √(re)act in ‘reaction’ and ‘reactionary’) is highly contentious, let alone whether the locality domains for contextual allomorphy and contextual allosemy are the same.

atomic units of communication.⁹ Starting with apparently unstructured words like ‘child’, ‘green’ and ‘see’, I’ll briefly demonstrate the relevance-based pragmatic process of word meaning adjustment in context, which yields ad hoc meanings some of which become established senses and so are stored in the user’s pragmatic lexicon. Although this sort of account of new senses and subsequent polysemy has been around for some time (e.g. Carston, 2002, 2010; Wilson & Carston, 2007), somewhat surprisingly, it hasn’t been applied to more complex words such as ‘transmission’, ‘reading’ and ‘institutionalize’, which, as discussed above, have special non-compositional meanings, as well as compositional meanings. I want to suggest that the same sort of pragmatic processes of meaning adjustment may account for how these special meanings arise.

Consider possible utterances of the following two sentences, focusing on the underlined words:

10. a. You should try to meet some bachelors
- b. I can’t reason with Dave – he’s a child.

Suppose (10a) is uttered by Mary to her friend Jane who wants to get married and have children but has a tendency to develop crushes on unsuitable men (married, or gay, or otherwise unavailable). Then the concept/sense communicated (and intended) by Mary’s use of the word ‘bachelor’ and, let us assume, grasped by Jane, is not the general definition ‘unmarried adult male’ but a more specific concept of an unmarried heterosexual man who is eligible for marriage, which we can label BACHELOR*.¹⁰ Its denotation excludes a range of individuals who are unmarried men, hence bachelors. Suppose (10b) is uttered by the frustrated partner or friend of a forty-year-old man, Dave. Then the concept/sense communicated and understood by the word ‘child’ is denotationally broader than CHILD (human being below the age of puberty), as it has to be applicable to someone considerably older; here the concept CHILD* is roughly paraphraseable as ‘human being whose psychological development and behavior is immature’. Its denotation then includes not only actual children but other human beings whose behavior/psychology is of the appropriate sort.

According to the relevance-theoretic account, the way this sort of meaning adjustment (ad hoc concept formation) works for the hearer is as follows. Retrieval of the established sense (or senses) of the word from the lexicon provides immediate access to an ‘encyclopedic entry’ or file of information (arbitrarily large) about the denotation of that concept/sense. This information is activated to varying degrees depending on a range of factors, including its centrality to the concept (e.g. BACHELORS ARE

⁹ A degree of proviso is needed here as there is a lot of individual variation in this area; some people can and do play around with internal structures and there are certain highly productive derivational affixes like ‘-ness’, ‘non-’, ‘-er’ and ‘re-’ which are accessible and available for manipulation and innovative use by most native speakers.

¹⁰ Following work in relevance-based lexical pragmatics, I use small caps for concepts/senses and the asterisk indicates an ad hoc concept or sense, that is, one that is pragmatically derived by an inferential process from another (established) sense of the word. If the ad hoc concept becomes a conventionalized sense of the word, then the asterisk merely serves to distinguish it from the other sense and the two are members of a polysemy family.

UNMARRIED) and its connections to other concepts activated in the current context (in the example above, Jane's desire to get married, mutually known to speaker and hearer, will cause increased activation of the information concerning eligibility for marriage in the file for the concept BACHELOR). The hearer's pragmatic system whose goal is to find the optimally relevant interpretation (which, all going well, is the one intended by the speaker) accesses items of information in order of their degree of activation and uses them to derive implications; for the hearer of (10a), Jane, these would likely include 'you need to meet a man who is eligible for marriage', 'seek out men who are unmarried, heterosexual and want a committed relationship'. By a process of backwards inference, implications of this sort shape the forming of the ad hoc (context-specific) concept BACHELOR*, whose denotation excludes certain kinds of bachelors. On another occasion of use, in a different context, the sense communicated by an utterance of 'bachelor' might be a broadening of bachelor: consider the long-suffering woman who says of her husband 'He's still a bachelor', such that the sense she communicates includes in its denotation certain married men whose behavior is typical (or stereotypical) of bachelors. A new sense might be both a narrowing and a broadening, excluding some actual bachelors and including some non-bachelors. Whatever the denotational outcome, this pragmatic process of 'lexical modulation' works the same way in each case: items of information in the BACHELOR file are accessed in order depending on their degree of activation, which is in turn dependent on contextual priming (among other things), so the accessibility ranking is different in different contexts; these items of bachelor-related information are deployed as premises in deriving implications and making conceptual adjustments until the pragmatic criterion (of optimal relevance) is satisfied at which point the process ends. This is very broad sketch of the way the process is hypothesized to work, but is, I hope, sufficient for current purposes.¹¹

Given the diversity and indefinite range of utterance contexts and of the thoughts we would like to express within them, word sense adjustments/modulations of this sort are going on all the time in linguistic communication. Some are one-off uses, pragmatically inferred on the specific occasion but transient; some create a precedent and recur, and the word may become frequently used with that sense so that the pragmatic inference becomes routinized; some become fully conventionalized and are stored as one of the senses of the word in a lexicon, from which they can be directly retrieved (thus creating instances of 'semantic polysemy'). A plausible example of each is given here:

11. a. We're going to need *semtex* to extract that tooth!
- b. My aunty Joan was a *second mother* to me.
- c. I can't *drink* because I'm driving.

¹¹ An interpretation of an utterance meets the pragmatic criterion of 'optimal relevance' when (a) it provides the hearer with a sufficient level of cognitive effects (in particular, cognitive implications) to be worth his attention and processing effort, and (b) modulo the speaker's abilities and preferences, it requires no gratuitous processing effort from the hearer. For much more explanation and step-by-step derivations, see Carston (2002), Wilson & Sperber (2004), Wilson & Carston (2007).

Returning to the issue of compositional versus ‘special’ (non-compositional) meanings, it is clear that all the new pragmatically-derived senses discussed here fall into the latter category. The two senses of ‘bachelor’ (the definitional sense and the narrower one involving eligibility for marriage) are semantically-pragmatically related but the pragmatically-derived sense BACHELOR* is not a compositional function of the sense BACHELOR and the meaning of some other structural component – such a possibility is precluded as they are both senses of a single structure, [$\sqrt{\text{bachelor}+n}$], that is, of one and the same ‘word’. However, there is an apparently distinct kind of on-the-fly lexical creativity that arises in communication, where a single phonological form is used to introduce a new sense together with a formally distinct structure, hence it is a new (ad hoc) word, which may (or may not) subsequently become an established communication unit for the language user and be stored in her lexicon as a distinct word.

3.2 Lexical innovation: words derived from other words, ‘conversions’ and metonymy

Sources of new words are multifarious. Consider, for instance, the recent mainstream use of the adjective ‘woke’, with its origin in a particular African-American dialect, in which it meant being ‘woken up to’ or being alert to issues around racial injustice, or the verb ‘to gaslight’, now widely used with the meaning to psychologically undermine someone in a sustained and systematic fashion, with its origin in a film called ‘Gaslight’ in which one character inflicted this process on another and used flickering gaslight as an instrument in his endeavour. There’s a degree of historical accident and serendipity in this kind of creativity, limited only by human associative and imaginative capacities.

Here, I will focus on a rather more staid, but nonetheless very productive and interesting, process of new coinages: nouns used as verbs and verbs used as nouns, a process known by the intuitive, if not fundamentally accurate, term ‘conversion’, as in the following:

12. a. The factory horns *sired* midday.
 - b. Max *houdinied* his way out of the prison cell.
 - c. Joan used to *jam-spoon* her son regularly.
 - d. I need a quick *fix* for my broken watch strap.
 - e. Hiring Joe was a really good *get*.
 - f. Marie was an *embed* for two years in Afghanistan.
- ((12a)-(12c) adapted from Clark & Clark 1979)

We can think of these as ‘ad hoc words’, that is, new on-the-fly coinages: [*siren*]_v, [*houdini*]_v, [*jam-spoon*]_v, [*fix*]_n, [*get*]_n, [*embed*]_n, with each of which comes an ad hoc concept/sense, distinct from, although clearly related to, the senses of the word from which it was derived. Focusing on the noun-to-verb conversions, it seems clear that grasping the intended sense is a matter of pragmatic inference using information provided by the encyclopaedic entries linked to the noun senses (e.g. knowledge about the sound and purposes of sirens; knowledge about the man Harry Houdini), plus the

immediate discourse context, all crucially constrained by the semantics of the verbal structure that the new word occurs in and its wider syntactic environment. There is a case, then, for talking of families of senses whose relatedness crosses syntactic categories, so that the formal polysemy-tracking unit is more basic than the word (noun, verb, adjective); it is the (categoryless) root they share: $\sqrt{\text{siren}}$, $\sqrt{\text{houdini}}$, $\sqrt{\text{fix}}$, $\sqrt{\text{stone}}$, etc.¹²

Just as for the new senses of existing words discussed above, some of these ad hoc words may be one-off uses (e.g. ‘jam-spoon’ used here to denote the action of hitting someone with a large wooden spoon used in making jam), some will become established words in the language (perhaps the verb ‘siren’ is now one of these) and others will be somewhere in between (the verb ‘houdini’ may be on its way to becoming established).¹³ Each verb is potentially polysemous in its own right; for instance, the verb ‘houdini’ has distinct (albeit related) senses in the following examples; in (13b), it denotes frantic twisting movements of the body; in (13c), it denotes ingenious ways of releasing something (here money) from an apparently secure location:

13. a. Max houdinied his way out of the prison cell.
- b. The toddler wailed and houdinied in his push-chair.
- c. The manager houdinied the company funds into his own bank account.

Acknowledging a relevant body of work in Cognitive Linguistics, Bauer (2018) makes the case that ‘conversions’ are best accounted for as instances of metonymy, that is, as involving a semantic-pragmatic relationship of contiguity, whether spatial, temporal or causal (metonymy often contrasted with metaphor, which is based on resemblances). Metonymy is widespread in ordinary language use, e.g. ‘all hands on deck’, where the hands are part of (spatially contiguous with) the bodies/persons who are denoted on this use; ‘the 1980’s were conservative and decorous’, where what is denoted is people living in the 1980’s; ‘the building’ or ‘the destruction’, where the building/destruction is the result of (caused by) a process of building/destruction that gave rise to it, and so on (Dirven, 1999; Bauer, 2018). As Bauer

¹² Recall that, on the syntactic approach adopted in this paper, roots themselves have no meaning and consist of just a distinguishing index or address. Thus we might suppose that the homonymous nouns ‘bank’ (each of which is itself polysemous) have distinct roots (distinct indices). However, this is not what emerges from Borer’s account as her root indices are specifically phonological (see footnote 6) and so are identical for cases of homonymy, which entails that the polysemy/homonymy distinction must be captured in some other way in the overall account. For further discussion of roots and the polysemy/homonymy distinction, see Acquaviva, 2014: 283.

¹³ Proper names are a particularly interesting case, being usable not only as verbs but also common nouns (e.g. ‘All the Houdinis I know are con-artists’, ‘Tall Houdinis outnumber short Houdinis’, ‘Max did a houdini at the kids’ party’). In fact, the ‘conversion’ goes both ways: common nouns can be used as proper names, as in ‘We invited Dog to the party’ or ‘Hope, Faith and Charity are on their way’, as can virtually any linguistic expression, in fact: e.g. ‘Punish-the-body is scaling two mountains this weekend’. The fact that ‘dog’ is conventionally a common noun and ‘Fred’ is conventionally a proper name is information that is associated with these items as listed in the language user’s pragmatic lexicon (see Sect. 4), but as far as the grammar is concerned, they are roots that can occur in a range of syntactic constructions, which render them names, common nouns, or verbs, and other possibilities. See Borer (2005a, Chap. 3) on the syntactic structures involved and Bowerman (2021) on the pragmatics of proper names and their ‘conversions’ to common nouns and verbs.

points out, the relation of result is common in cases of verb-to-noun conversion: ‘answer’, ‘boast’, ‘break’, ‘cough’, ‘dare’, ‘dream’, ‘laugh’, ‘ride’, ‘walk’, ‘win’, and many more (ibid: 177), in line with a metonymic analysis. In the reverse type of case, noun-to-verb conversion, the denotation of the noun typically plays a key role in the action or process denoted by the verb, e.g. ‘porch a newspaper’, ‘shackle the prisoners’, ‘shell the walnuts’, ‘button one’s coat’, ‘starch the shirts’, etc. So there is some initial plausibility to the idea that conversions just are cases where speakers coin a new word (e.g. the verb ‘shell’) identical in phonology to an existing word (e.g. the noun ‘shell’), relying on their hearers’ capacity to use the context (say, Mary is preparing ingredients to make a cake) and highly activated information about the denotation of the existing word (walnut shells are inedible and have to be removed before the nut can be used in baking) to pragmatically infer the contextually relevant meaning of the new verb.

Bauer’s main concern is to adjudicate between what he sees as two alternative explanations of how ‘conversions’ arise: (a) from application of a word-formation rule or (b) from a metonymic process. He opts for the metonymy account on the grounds that the range of meanings that conversions can have are essentially unrestricted (and cannot be predicted ahead of their actualization in a specific context). This degree of flexibility makes them more like metonymic uses (and other non-literal uses of language) than applications of rules of derivational morphology where possible meanings are very restricted (even when an affix has more than one meaning, the range is typically small and circumscribed). Bauer’s observations seem essentially right to me – conversion is a creative pragmatic process and the resulting meanings look very much like metonymic contiguity shifts - but with one important proviso. By doing away with a formal rule of any sort to explain the shift from noun to verb or vice versa, he has left us with no explanation for the change of syntactic category (which is not necessary to or even typical of metonymy, recalling standard cases like ‘the suits’, ‘all hands on deck’, ‘the measles in bed 3 wants his breakfast’, etc.). Furthermore, the metonymy account alone does not and cannot explain why the verb ‘nationalize’ cannot be converted to a noun (meaning ‘result of nationalizing’) nor the noun ‘nationalization’ to a verb as in ‘to nationalization the refugees’. So the account is incomplete in crucial respects.

On the sort of framework adopted in this paper, there are no word-formation rules as distinct from syntax, but that doesn’t mean that an explanation of ‘conversions’ requires a choice between a rule of syntax and a metonymic process. These are utterly different kinds of mechanisms, belonging to different kinds of account, in fact, accounts of different phenomena - the one being the operations of the generative structural system, the other the pragmatic capacities of the language user/communicator – and both are essential in the explanation of ‘conversions’. Bauer’s metonymy view is the way to go *as an account of lexical innovations introduced by language users in communicative interactions*; metonymy, like other creative non-literal uses of language, is quintessentially a pragmatic phenomenon. So the picture I suggest is as follows. With regard to syntax, adopting the constructivist view as discussed above, what we are calling ‘conversions’ do not involve any special operation but are instances of roots, e.g. $\sqrt{\text{porch}}$, $\sqrt{\text{fix}}$, $\sqrt{\text{shell}}$, being inserted into different syntactic templates such that their nominal and verbal forms are freely generated. Then, at the

level of the innovative language user, metonymy, which is a cognitive pragmatic process widely employed in on-the-fly communication, accounts for the actualization of the new word in the language user's repertoire. It is an economical way for a speaker to coin a new word with a new sense, relying for its uptake on an existing word in the hearer's lexicon, which is accessed on the basis of the familiar phonological form, e.g. /porch/, /fix/, /shell/, the word's associated file of encyclopedic information being thereby activated and providing the conceptual materials which, together with the formal meaning constraints of the syntactic structure it occurs in, usually enables the hearer's swift construction of the sense of the new word.¹⁴ As far as the grammar is concerned, there are indefinitely many *possible words* (phrasal structures of a certain sort) generated via insertion of roots into structures, e.g. a verb 'camel', a noun 'put', which may or may not become *actual words* depending on the innovations of language users.

Note that on the constructivist account there is no 'conversion' process, the noun and verb pair 'hammer', for example, simply arising from insertion of the root $\sqrt{\text{hammer}}$ into two distinct formal structures, each of which is a domain for atomic meaning/content. It's obviously irrelevant to the syntactic system which 'came first', noun or verb, in terms of its coinage and usage by communicators and its storage in their lexicons. However, it has been proposed by Arad (2003) that a distinction should be made between root-derived and noun/verb-derived cases of conversion. So, for instance, she suggests that while the verb 'hammer' is root-derived, the verb 'tape' is noun-derived, drawing on the following as evidence (Arad, 2003: 756):

14. a. She hammered the nail into the wall with her shoe.
- b. He anchored the ship with a rock.
- c. I paddled the canoe with a shovel.
15. a. * She taped the poster to the wall with pushpins.
- b. * They chained the prisoner with a rope.
- c. * Jim buttoned his coat with a zipper.

Acknowledging work by Kiparsky (1982), she says: "The verbs in [15] entail the existence of the corresponding noun – there is no way to tape, chain or button without using tape, a chain, or a button. In [14], on the other hand, the meaning of the verb does not entail that of the noun. As Kiparsky notes, *to tape* roughly means 'apply tape'. *To hammer*, by contrast, does not mean 'to strike with a hammer', but rather,

¹⁴ In recent work on standard cases of metonymy, such as the use of 'suit' to mean business executive, or 'the measles' for the patient with the condition, or 'Watergate' for the event that took place there, Wilson & Lossius Falkum (2020) have proposed that metonymy typically, perhaps always, creates new words, even when as in these cases there is no category change, so what we have here are 'denominal nouns'. If this is right, it provides further support for the proposed account of language users' 'conversions' in terms of metonymy, but what it entails for a constructivist syntax is not clear and probably it entails nothing at all since the category 'word' has no status in the syntax. Another issue that arises is that the 'figurative' quality of metonymy (its often humorous or emotive effects) seems to be confined to these 'denominal noun' cases (e.g. 'The gin and tonic in the corner smiled enigmatically'), while the category-changing cases seem differently motivated (perhaps by economy of processing considerations). Typically there's nothing very figurative/humorous in using a noun as a verb, even when it's new, e.g. 'They should 25th Amendment Trump as soon as possible' (attested case). For further discussion, see Bowerman (2019, 2021).

‘to strike with a flat surface of a solid object’.” She concludes that the verbs in (14) and their noun counterparts are independently derived from a common root, while the verbs in (15) are derived from their noun counterparts (which are derived from the root). The structures of the two classes of verbs are, therefore, roughly as follows:

16. a. [$\sqrt{\text{hammer}} + v$]
 b. [[$\sqrt{\text{tape}} + n$] + v] (Arad, 2003: 757).

However, it turns out that the apparent distinction between *hammer*-type and *tape*-type denominal verbs is not, after all, a syntactic matter, but a matter of pragmatics. Harley & Haugen (2007) present the following entirely acceptable usage of the verb ‘tape’ which does not entail the involvement of tape, the stuff denoted by the noun ‘tape’:

17. She taped the poster to the wall with band-aids / mailing labels.

As they put it: “It is the *manner of use* associated with the conflated root [i.e. the categorized root (RC)], rather than the specifically ‘nominal’ character of the verb derived from that root that is at issue. ... the characteristic manner of use of push-pins is quite distinct from the characteristic manner of use of tape.” (ibid: 9). They point out that the apparent distinction between *hammer*-type and *tape*-type denominal verbs is a matter of the “semantic/ encyclopaedic generality associated with the different roots. The semantic neighbourhood for *tape*-type roots is sparse: there are few distinctly named items usable in the manner specified by these roots [as compared with the *hammer*-type].” They conclude that all English instrumental denominal verbs involve roots conflating directly with *v*, and that the ill-formedness in (15) is pragmatic rather than syntactic.¹⁵

An implication of the ‘single engine’ constructivist view on which the structures that we call ‘words’ are derived syntactically is that intuitive talk of ‘words derived from words’, prevalent on the lexicalist position, is not legitimate because there are only roots and functors (grammatical/functional items). However, it may well be entirely appropriate at the level of the innovations made by ordinary language users in the process of communication, for whom ‘word’ is a psychologically real category, comprising a basic unit of communication. As I see it, words take their place in a pragmatic or communicational lexicon, from which they are accessible *as such* to language users and can thus provide the basis for many of their lexical innovations, including ‘conversions’ (Carston 2019, and Sect. 4 below).¹⁶

¹⁵ Note that Arad’s (2003) claim of two structural classes of denominal verbs – root-derived and noun-derived – extends well beyond these ‘instrumental’ verbs to include ‘location’ verbs like ‘house’ and ‘shelve’ (root-derived), ‘bottle’ and ‘box’ (noun-derived), and ‘locatum’ verbs like ‘dust’ and ‘powder’ (root-derived), and ‘sugar’ and ‘starch’ (noun-derived). I would expect the differences here to also turn out to be pragmatic rather than syntactic, but that remains to be shown.

¹⁶ In his important and prescient ‘prolegomena to a theory of word formation’, Halle (1973) says that word formation rules which derive words from other words (as opposed to roots or stems), ‘must have access to the dictionary’ (p.10), where his ‘dictionary’ is the set of *actual words* in the language. This is akin to what

3.3 Complex words and their senses (compositional and non-compositional)

I return now to the central issue of the paper, that of structurally complex words that have a non-compositional meaning/sense (alongside a compositional meaning) and how this arises. Recall that, as outlined in Sect. 2.2 above, this is an issue that on the face of it looks like a challenge for those syntacticians who subsume word structure into syntactic structure, as the semantics of phrasal structures is compositional.¹⁷ Their solution is to posit particular structure points (local syntactic domains) at which content (that is, atomic, non-compositional, idiosyncratic sense/meaning) can be assigned. On Borer's (2013a, 2014) account, these are points at which there is a search of what she calls the 'Encyclopedia' for a matching content (an *en-search*). The 'Encyclopedia' is a component of the Chomskyan conceptual-intentional systems with which the syntactic engine interfaces, and it is the locus of atomic contents (non-compositional meanings).¹⁸ Others have different, albeit related, ways of construing this, e.g. Sperber & Wilson (1995) posit a set of atomic conceptual addresses some of which have lexical entries (so when a word form is accessed it is mapped to such an address), and below I set out my construal of a pragmatic, user-based lexicon, in which words (and perhaps other communication units) are stored with their conventionalized senses (atomic concepts).

What I want to do in this section is to try to make the case that the non-compositional meanings of 'complex words' (e.g. 'reactionary', 'recital', 'reading') can, at least in many cases, be accounted for as arising from a process of pragmatic/contextual inferential adjustment of their compositional meaning, just as proposed above for 'simple words'. As for those simpler cases, there can be various denotational outcomes: narrowing, broadening, or metonymical shift of meaning. Ultimately, the aim is to put this pragmatic account of non-compositional meaning together with the idea of a syntactic domain of content at which such meanings can be assigned.

Consider the complex word 'detectorist', which has the structure [detect-or-ist] and the non-compositional meaning DETECTORIST (roughly paraphraseable as 'person who uses a metal detector as a hobby'). While here are various kinds of 'detectors': smoke detectors, gas detectors, metal detectors, contraband detectors, the word 'detectorist' refers only to someone who uses a metal detector (to look for pieces of precious metal), although the '-ist' suffix obviously does not impose any restriction of this sort. A plausible reason for this very specific meaning to have arisen is that, in England at least, metal detecting is a fairly common hobby and the word 'detectorist'

I am calling the pragmatic/communicational lexicon, although I situate this outside the narrow language faculty and see it as subject to cultural conventions and individual variations.

¹⁷ Clearly, phrasal idioms (e.g. 'spill the beans', 'hit the roof', 'cry wolf') are an exception to this; given their obvious functional structure, it is clear that they do not fall into the syntactic domain of atomic content delimited in Sect. 2, so another account of how their non-compositional meanings (often metaphorical) arise has to be given. See Nunberg et al., (1994) and Borer (2013a: 480–488) for evidence indicating there are good independent reasons to expect that non-compositionality for 'words' and non-compositionality for 'phrases' should be handled by different formal mechanisms.

¹⁸ Note that this is a different notion of 'encyclopedia' from that of the relevance-theoretic notion of 'encyclopedic' entries of concepts; as discussed above in Sect. 3.1, the latter are files of information about the denotation of the concept to which they are attached, which information plays a key role in the pragmatic process of ad hoc concept formation.

has occurred frequently enough in discussions of people who pursue this particular activity (and not in contexts of other kinds of detecting activity) that it has acquired this narrowed (non-compositional) meaning. Consider the following conversation:

18. A: What does your husband do at the weekends?

B: He goes out with his metal detector scouring the local beaches. He found some old coins last year and got very excited. He's become a super keen detectorist.

Even if A didn't already have the word 'detectorist' in her lexicon, it's pretty clear what its meaning is from this context, as the utterance carries various implications about B's husband's having a time-consuming hobby, which involves use of an instrument that can detect metal, and which can lead to finding valuable metal artefacts, and so on, all of which can be used to infer the non-compositional meaning of 'detectorist'.

No doubt, we can concoct similar 'just-so' (but plausible) stories for how at least some of the cases mentioned in Sect. 2 arose via repeated use in particular kinds of context: e.g. 'naturalize' with its very specific non-compositional meaning NATURALIZE (=make a foreigner into a citizen of a country) is a pragmatic narrowing of the compositional meaning of the syntactic structure [natural+ize], meaning roughly 'to make natural'. The case of 'reading' with its non-compositional meaning READING (=interpretation), e.g. 'His reading of the novel was more allegorical than hers',¹⁹ is probably best analyzed as involving a metonymical shift, given that arriving at an interpretation of a text is typically a result of a process of reading (=READ+ing) that text, followed by some sort of broadening such that one can have a reading(interpretation) not only of texts but of situations and people's behavior, e.g. 'My reading of their relationship is that it's based on mutual convenience rather than love'. In fact, this case may have become compositional inasmuch as the verb 'to read' seems to have also acquired the meaning of 'to interpret', e.g. 'As I read the situation, we are in big trouble', perhaps through some sort of back-formation process from 'reading' with its non-compositional meaning. For people for whom this is so, the verb 'read' is polysemous, with two (related) atomic meanings, READ and READ*, and the derived nominal 'reading' also has two meanings, both of which are, after all, compositional. This kind of process may not be particularly rare; likely other cases are 'execution' on its non-compositional meaning (state-sanctioned killing) and the verb 'execute', or 'demonstration' on its non-compositional meaning (organized march to support a cause) and the verb 'demonstrate'.

It is not too hard to envisage a similar account of how the non-compositional meaning of 'transmission' (=car's gearbox) arose, via a narrowing of denotation (to the specific kind of transmission that takes place in the engine of a car) and a metonymical transfer to the object responsible for this specific kind of transmission (the gearbox); similarly, for the non-compositional meaning of words used as jargon in

¹⁹ Although deverbal nominalizations with the affix '-ing' seem less prone to developing a non-compositional sense than those with '-tion' or '-ment', there are some others, e.g. 'a hearing' (in a court of law), 'a riding' (as a path or track for horse-riding).

particular specialized fields, e.g. ‘transformation’ in linguistics (=a syntactic operation of a specific kind), a case discussed in some detail in Borer (2014, 2017), or ‘transference’ in psychoanalysis (=redirection of emotions originally felt in childhood relationships onto the therapist).

Let’s consider now a hypothetical case of a speaker coining a new complex word in a particular utterance context. Of course, from the point of view of the grammar, there are no *new* words, because there are *no words*, just roots and phrasal structures, so whatever becomes a new word in the communicative repertoire of language users is an existing syntactic structure which inevitably has a compositional semantics. However, as discussed above, there are certain syntactic domains to which non-compositional content may be assigned, so that a ‘new complex word’ with a meaning that has been pragmatically derived, say, by a denotational narrowing and/or a metonymical shift from the compositional meaning, should, if the account is correct, have the structure of such a domain. Consider as a possible new word, the nominal ‘sturdification’, as coined by manufacturers of building materials to refer to a particular kind of steel rod used to make walls and foundations stronger. There is a discernible (semantic-pragmatic) relation here to the meaning of the adjective ‘sturdy’, and to the verb ‘sturdify’ (also probably new, with the compositional meaning ‘to make STURDY’), but the meaning of the nominal has been derived by first a narrowing down to the specific process of making buildings and walls sturdy, with then a metonymic shift to a specific entity for achieving this (a shift from the process/action to a key component of that process/action). Let’s assume the verb ‘sturdify’ with its general compositional meaning has a subject-object argument structure: ‘He sturdified the wall’, perhaps among others (‘The wall sturdified’). Then, derived from this, there is a nominal ‘sturdification’ which has a compositional meaning made up of the atomic content STURDY plus the meanings of the affixes ‘-ify’ and ‘-cation’, and this nominal has the same argument structure as the verb, as shown in (19a). However, as we should expect on the basis of the syntactic domain of content claims made in Sect. 2.2, the nominal with the non-compositional meaning STURDIFICATION (roughly paraphrasable as ‘steel rod of such and such a sort’) has a different structure and is unable to take such arguments, as shown in (19b):

19. a. The sturdification of the wall by the builder [STURDY + ify + cation].
 b. * The sturdification(s) of the wall by the builder [STURDIFICATION].
 [cannot mean: the steel rods done/made by the builder to strengthen the wall]

So while speakers may produce utterances of (19a), where ‘sturdification’ has to be understood compositionally, the prediction is that they will not utter nor find comprehensible (19b), where ‘sturdification’ has its special non-compositional meaning.

What I’ve tried to do in this section is indicate (a) how existing work on the pragmatics of ad hoc concept formation and new word coinage extends to words of arbitrary complexity, and (b) how this account of the origin of new non-compositional meanings meshes with work in current constructivist syntax delimiting the structural domains within which such ‘special’ meanings can arise. I move in the next section to a discussion of the language user’s mental lexicon, where words are stored with their pragmatically-derived conventionalized non-compositional meanings.

4 The pragmatic lexicon, polysemy, and the interface with syntax

Philosophers of language tend to focus on language as a social competence, a system of external signs which has evolved for communication, and to see particular languages as consisting of a web of shared (public) conventions each of whose relative ongoing stability is due to its specific communicative function (e.g. Millikan 2005, Lepore & Stone, 2015). Generative linguists, on the other hand, see language as an individual's internal system of recursive computational operations (syntax), a faculty of mind which interfaces with conceptual-pragmatic capacities, on the one hand, and perceptual/articulatory systems, on the other. It is not essentially communicative, although, as a matter of fact, it is widely and productively employed in communication, as enabled by its interfaces. These very different stances are more a matter of preferred focus than of incompatibility or rival positions – of course, we want an account of language as a faculty of the mind *and* an account of how it is used in communication. As Hauser et al., (2002) emphasize, language is not a monolithic entity, and fruitful investigation requires carving up the broad folk notion of language into tractable domains of study, separating out “questions concerning language as a communicative system and questions concerning the computations underlying this system, such as those underlying recursion.” (ibid.: 1567). Hauser et al.'s focus is on the latter, the narrow I-language (syntax and its perceptual/conceptual interfaces), while most philosophers focus on language as a shared system for communication. What I am attempting to do here is to bring some components of the ‘narrow’ syntactic view, as represented in the work of Borer, Marantz, Harley, Acquaviva, and others, on the syntax of words together with some components of the ‘broad’ communication-oriented view, as represented by relevance-theoretic work in ‘lexical pragmatics’ (Carston, Wilson & Sperber) and some philosophical work on meaning modulation (e.g. Recanati 2003, 2017).²⁰

Philosophers of language focus virtually entirely on ‘words’, with syntax seldom mentioned and, unsurprisingly, never in the context of discussions of social meaning conventions. Even within the general category of words, the focus is usually narrowed down to structurally simple cases: common nouns like ‘water’, ‘dog’, ‘table’, proper nouns, and various closed-classes of functional items like indexicals and quantifiers, each of which has its own intriguing semantic properties. In generative linguistics, on the other hand, as discussed in Sect. 2 above, there is sustained work on complex words (‘nationalization’, ‘reactionary’, ‘government’) and compound words (‘skateboard’ ‘grasshopper’, ‘part-time’) and, on many recent approaches, all ‘words’ are seen as having internal structure and are subsumed into syntax. Words

²⁰ As noted by an anonymous reviewer of this paper, the distinction I’ve been making here between the philosophers’ social-public-communication oriented approach and the generative linguists’ internalist-computational focus is somewhat crude. Specifically, as he/she pointed out, relevance-theorists encompass aspects of both camps, as their focus is centrally on communication and comprehension/interpretation (as is that of Grice, Lewis, Recanati and other philosophers) but they share internalist assumptions with the generativist camp concerning the architecture of the language faculty and they place little emphasis on convention, normativity and other traditional philosophical notions. These points are well taken, but I hope that the distinction may still be useful here as a backdrop to the more specific distinction I want to make between a pragmatic/user-oriented and essentially word-based lexicon and the lists of primitives (roots, etc.) that feed the computational linguistic system.

as such have no theoretical significance in the single syntactic engine approach to structure building, which applies to words (whether complex or simple) and phrases alike. The Argument Structure (AS) nominals (e.g. ‘transformation’, ‘governance’, ‘destruction’, ‘development’) are an especially nice illustration of the validity of this approach, because while they look like words, they are like typical phrases in having a compositional semantics and not being amenable to the acquisition of special (non-compositional) meaning.

As for the philosophers, so for the folk: words have a particular salience for ordinary language users as the basic units of communication. They are learned by young children at a remarkably fast rate, stored in memory, readily retrieved and used; they continue to be acquired, albeit more slowly, throughout life (unlike syntax) and, as discussed in Sect. 3, are flexibly manipulated and adapted by speakers to express new concepts in ever-evolving contexts of communication (again unlike syntax). Whatever the exact status of this store of words is, it clearly lies outside the language faculty (or linguistic module), as narrowly construed, its contents consisting of phonologically spelt-out forms and conceptual meanings, whose pairings are established for a given user, overlapping with others in their language community but with a fair amount of individual variation. We are aware of words, many of us consciously think about them, ‘look them up’ to check our understanding of them, and they accrue cultural, personal and emotive associations, none of which holds for the syntactic structures of our language.²¹

In his work on the mental lexicon, Jackendoff (1997) characterizes it as the ‘store of *memorized elements* of language’, as distinct from those aspects of language which are generated afresh on each use by combinatorial rules (syntax). On this construal, the lexicon contains not only words (with their various stored senses), but also larger multi-word items: phrasal idioms (e.g. ‘spill the beans’, ‘see eye to eye’, ‘jump on the bandwagon’), frozen phrases (e.g. ‘by and large’, ‘in cahoots with’, ‘kith and kin’), and even certain whole sentences (e.g. ‘May the force be with you’). This is a very disparate array of items and, although all of them are indeed stored (memorised), language users readily discriminate the word cases, whether simple, complex or compound (‘child’, ‘activate’, ‘transformation’, ‘nationalization’, ‘door-mat’, ‘baby-sitter’), from the phrasal cases. Marantz (2001) criticises the inclusion of units large than words/phrases, saying that although we may have stored these items in some way or other, this doesn’t mean they are stored in ‘a special linguistic Lexicon’. It’s also clear, as already noted, that phrasal idioms with their non-compositional meaning are not included in the ‘syntactic domain of content’ account outlined in Sect. 2, so another explanation is needed for them. The overall concern, then, as I see it, is that while we have an account of how the items we call ‘words’ interface with the narrow linguistic system, this has yet to be shown for the more obviously phrasal/

²¹ A number of philosophers have considered the ‘ontological status’ of words and the ensuing question of how words are to be individuated. Some maintain that they are Platonist types (eternal abstract entities like numbers, concrete tokens of which occur in utterances and inscriptions), e.g. Wetzel (2009); others claim that they are some other kind of abstract entity, so Irmak (2019), for instance, argues that words are ‘abstract artifacts’, created intentionally by humans to fulfil various kinds of purposes. For a critique of his view, see Miller (2020).

sentential cases. So I omit them from my brief discussion here of the ‘pragmatic lexicon’, although it may be that this is ultimately where they belong.

An individual’s pragmatic lexicon, then, is a store of words that she has acquired as a result of her communication history. Most of these words are polysemous, that is, they have multiple meanings whose interrelatedness is transparent to the individual, forming a family of senses (Recanati, 2017, Carston 2019, 2021). So, for instance, the noun ‘face’ has at least the following five senses: body part, facial expression (as in ‘to put on a brave face’), apparent character/personality (as in ‘she has many faces’), front surface (of an object), metaphorical front surface (as in ‘on the face of it’), sense of self/ego (as in ‘he didn’t have the face to ask her out’). Assuming the body part meaning came first, the others can be explained as having arisen over time through the kind of pragmatic processes discussed in Sect. 3: narrowing/broadening, metaphor and metonymy; some are the result of conceptual adjustments to the body part sense, while others may have taken one of the derived senses as its input, e.g. the metaphorical ‘on the face of it’ seems most likely derived from some kind of broadening of the ‘front surface of an object’ sense. As with other cases of multiple polysemy, a family of related senses has arisen over time, from chains of often very context-sensitive inference such that individual senses in the family can differ quite markedly and unpredictably from each other. Langacker (1991) depicts polysemy as involving a network of senses, that is, a system of connected nodes, with some nodes directly connected, others separated by several intermediate nodes, thus reflecting varying degrees of semantic-pragmatic closeness among the senses. The *verb* ‘face’ (likely a metonymic conversion from the noun) is a distinct word and so is stored as such in this pragmatic lexicon, yet its senses are transparently related to at least some of the senses of the noun. That they are related is tracked by the shared root $\sqrt{\text{face}}$, which is a basic element of the syntax, but we may reasonably assume that typical language users are not aware of roots as such and that for them what is key is both relatedness of meaning and, crucially, phonological relatedness (after all, the meanings of the noun ‘leg’ and the verb ‘walk’ are related, but no-one would want to treat these as forming a polysemy family).

Turning now to complex words: the cases which have figured centrally in this paper, those which have a non-compositional (atomic) sense, must be listed in the pragmatic lexicon with that sense; for instance, ‘reactionary’, ‘naturism’, ‘institutionalize’, ‘recital’, ‘transmission’, ‘naturalize’, ‘reading’, ‘flakey’, and potentially ‘sturdification’ (with its atomic meaning, paraphrased as ‘steel rod for strengthening walls’) if it becomes an established usage for the speaker/hearer. Each of these also has a compositional meaning, a function of the sense assigned to its smallest domain of content (e.g. [$\sqrt{\text{nature}} + \text{n}$], [$\sqrt{\text{recite}} + \text{v}$], [$\sqrt{\text{read}} + \text{v}$], [$\sqrt{\text{flake}} + \text{n}$]) plus the further levels of categorization in its structure. Such meanings are always available because they are a function of the generative system, but they may or may not emerge as meanings in use: the compositional meanings of ‘transmission’ and ‘reading’ are well-established and frequently used, but those of ‘reactionary’ and ‘naturism’ are not (the reasons for which are probably quite disparate and not subject to any interesting generalization). Only those that are in frequent use (conventionalized) are candidates for storage in the pragmatic lexicon, and if stored, they make the word polysemous.

Now, what about the A-S (Argument-Structure) nominals (discussed in Sect. 2.2)? Recall that these are deverbal nominals that cannot have a non-compositional (atomic) content due to their structure, in which the verb's argument structure is incorporated, blocking the assignment of atomic content to structures beyond the verbalized root, e.g. 'The reading of the course notes by the students', 'The transmission of the latest bad news by the BBC'. Of course, the verb 'read' with its atomic content READ is stored in the pragmatic lexicon, but the compositional content of the AS-nominal 'reading' is a product of its syntactic structure applied to READ and is thus always available from that source. It does not need to be lexically stored and, from the point of view of parsimony in theorizing, that is, avoiding the redundancy of postulating two means to the same end, the conclusion would have to be that AS-nominals are not logged in the lexicon. However, given that the entries in this lexicon are determined by usage (frequency, conventionalization), it is ultimately an empirical matter whether users retrieve these senses from the lexicon or generate them via their syntactic capacity.²²

The pragmatic lexicon may be somewhat akin to Borer's conception of the 'Encyclopedia' (as mentioned in Sect. 3.3), which is external to the 'narrow' linguistic system, being a component of the conceptual interface systems. She describes it thus: 'Suppose we assume the existence of a reservoir of atomic, indivisible Content units, call it the *Encyclopedia* ... [these Content units] are not specifically linguistic or language-determined units. Rather they are conceptual and are constrained as such. Interfacing between the Encyclopedia, a non-linguistic module, and the linguistic system we find a 'reading device' that is capable of recognizing syntactic strings of particular size and matching them with individual Content units. A successful single encyclopedic search – *en-search* – thus returns a single atomic Content unit for a qualifying linguistic domain.' Borer (2013b: 238–239). Doubtless, there are some significant differences between the Encyclopedia and my pragmatic lexicon, which I conceive of as very much a component of linguistic 'performance' or communicative use (as opposed to 'competence', in Chomsky's classic terms). So, for instance, an important performance property of words and senses is their varying frequencies of use, well-known to impact on their accessibility and on other aspects of their processing, such that for many psycholinguistic experiments it is essential to control for this when constructing lexical materials for tasks measuring accuracy and speed of processing. I take it that this property is registered in an individual's pragmatic lexicon, but it is irrelevant to Borer's Encyclopedia. Another difference may arise from a possible tension between compositionality and conventionality (i.e. stable established usage). If a word sense is established/conventional we might reasonably expect it to be listed in the pragmatic lexicon, and if a word sense is atomic (non-compositional) it has to be listed in the lexicon, but it's not at all clear that these two criteria converge on the same set of cases. As noted above, a given compositional meaning might have become an established meaning (with an established word form) for some language

²² The point here is akin to the idea that just because one sense of a word *can* be pragmatically inferred from another sense of that word it does not follow that it always *is* pragmatically inferred; it may have become sufficiently conventionalized that it too is stored in and directly retrieved from the lexicon (see Carston (2021) for arguments against general adherence to the parsimony principle known as Modified Occam's Razor).

users (e.g. the compositional meaning of ‘activation’ or ‘jogger’ or ‘legalize’) and thus be stored in their lexicon, but presumably not in Borer’s Encyclopedia in which only the sense/concept associated with the first syntactic domain of content, e.g. [$\sqrt{\text{jog} + v}$], would be found.

I have talked elsewhere of a distinction between two kinds of lexicon, a narrowly linguistic lexicon (L-lexicon) and a C-lexicon (communicational or pragmatic, as just discussed) (Carston 2019). Among various concerns people have raised about this are (a) the apparent lack of economy and whether we really need two lexicons, and (b) if we do, what the connection between them is, as surely there must be one. Both issues seem a little clearer to me now. Regarding the first, the so-called L-lexicon (a misleading term, I now think), is just the list of categoryless roots, each consisting of little more than a distinguishing index or address, e.g. $\sqrt{4170}$, and meaningless in and of themselves,²³ but which enter into syntactic structures as basic elements and provide distinct addresses or hooks on which to hang conceptual content as licensed within particular syntactic domains. There is no issue of redundancy or lack of parsimony here: the list of roots and the pragmatic lexicon are independently necessary, with completely different roles in the overall architecture of the broad language faculty. The answer to the second question concerning the connection between them requires more discussion than I can offer here, but it essentially follows from the account presented: roots track derivationally/syntactically related words in the pragmatic lexicon and thereby families of related senses that can be distributed across different word categories.

The phenomenon of polysemy, often thought of as a property of words (nouns, verbs, adjectives), in fact, appears to be spread over an individual’s broad language system. Some cases are a function of narrow syntax, which enables compositional meanings for all words as well as providing structural domains for the assignment of non-compositional meanings (atomic contents). Some are stored as the senses of words listed in the pragmatic lexicon, having their origins in context-sensitive pragmatic processes of denotation narrowing/broadening, metonymy, and metaphor.²⁴ Still others may be a function of the broader syntactic environment of a construction into which a root is inserted; for instance, the functional structure projected by such properties of verbs as tense, aspect, and participants (creating different event tem-

²³ Whether roots are meaningless or rather have some sort of (abstract semantically-underspecified) meaning has been debated; for instance, Arad (2003, 2005), focusing on Hebrew consonantal roots, has argued for the semantic underspecification view, while Aronoff (2007, 822), after setting out the full set of nouns, verbs and adjectives (with their established senses) that are based on the root $\sqrt{\text{kbj}}$, concludes: ‘It is logically impossible to show that underspecification is wrong, but trying to find a common meaning shared by pickles and highways brings one close to empirical emptiness’ See also Panagiotidis (2014), who argues for the meaninglessness of roots quite generally. I have argued similarly against any common core meaning for polysemous words, a meaning that seems to have no role in constraining new (pragmatically-derived) senses and which would have to grow ever more attenuated and abstract the more new senses that a word acquires (Carston, 2021).

²⁴ Metaphorical use is an especially productive source of new, ad hoc senses, some of which become established senses of a word, e.g. the ‘double function’ adjectives (‘cold’, ‘warm’, ‘hard’, ‘soft’, ‘rigid’, ‘flexible’ and dozens more) and many other words with both a physical and a, metaphorically-derived, psychological sense (e.g. ‘disarm’, ‘journey’, ‘chicken’, ‘break’ (a plate, a promise), ‘kill’). For discussion, see Asch (1958), Carston (2021), and Pethő (2001).

plates) seems to be the source of some of the different meanings that verbs acquire, e.g. the verb ‘siren’ in ‘The factory sired middy’ is understood as ‘signaling by means of emitting a siren noise’, while in the very different structure (hence a different kind of event template) of the sentence ‘The police sired the Porsche to a stop’ it is understood as ‘bringing about a result by means of emitting a siren noise’. Similarly, the verb ‘pile up’ is understood as involving an intentional action in the transitive structure ‘Mary piled up the stones’ (due to the agent participant ‘Mary’) but not in the different (inchoative) structure ‘The stones piled up in the hurricane’. For deeper discussion of these examples, see Borer (2005b: 69–70) and Marantz (2013b: 259), respectively. Any complete account of polysemy has to acknowledge these various ways (syntactic and pragmatic) in which it can arise.

5 Conclusion

In this paper, I have presented the single syntactic engine approach to word structure, taking roots rather than simple words as its basic component, and have looked at some of the responses of advocates of this position to the significant fact that these structurally complex items can have an atomic (non-compositional) meaning. I have adopted the proposal from Borer (2013a, 2013b, 2014) that there is a circumscribed categorization core beyond which non-compositional meaning cannot be ascribed, a position supported by the behaviour of two structurally distinct kinds of deverbal nominal, one of which cannot be assigned such meaning because the verb’s argument structure blocks it. Having thus delimited the syntactic domain of atomic meaning, I moved to an account of how atomic meanings come to be associated with words, suggesting that well-established pragmatic accounts of ad hoc sense/concept construction in communication can also explain these more complex cases. Finally, I suggested that the appropriate construal of a lexicon, a listing of pairings of phonological forms and atomic meanings, is that of a pragmatic usage-based lexicon in which those structures salient to ordinary language users as ‘words’ are stored.

The question ‘what are words?’ has been long debated in the linguistic and philosophical literature (e.g., Di Scullio & Williams 1987, Kaplan 1990, 2011, Hawthorne & Lepore 2011, Julien 2007, Bromberger, 2011). A convincing answer has not been forthcoming and both Julien (2007) and Bromberger (2011) conclude that ‘words’ are not scientifically real but are some sort of epiphenomenon.²⁵ Nevertheless, there is little doubt that words do have psychological reality for language users and that the structures that comprise words are manipulated as basic units of communication, on the basis that they are carriers of atomic meaning. Julien (2007) acknowledges that words do have some sort of existence: “The psychological reality of words is probably a consequence of their distributional properties: since words are the minimal morpheme strings that can be used as utterances and that may be permuted more

²⁵ Julien (2007: 234) puts this particularly strongly: “... the elements that are commonly termed words are [not] grammatical entities [nor do] they form a homogeneous class in any theoretically interesting way. Popular classifications are not necessarily tenable in science —recall that whales and fish were once taken to form a class. In my view, the class of words is just as spurious.”

or less freely, words are the minimal linguistic units that speakers can manipulate consciously. It is therefore no surprise that speakers are generally aware of words” (ibid: 83). I believe that the delimiting of those syntactic domains that allow for the pragmatic creation of particular atomic senses goes some way toward an account of what words are and where they are to be located within the language faculty broadly construed.

Chomsky has suggested that “it is possible that natural language has only syntax and pragmatics; ... In this view, natural language consists of internalist computations and performance systems that access them along with much other information and belief, carrying out their instructions in particular ways to enable us to talk and communicate, among other things.” (Chomsky, 1995: 26–27). Since he made this remark, there has been a vast amount of productive work within the generative syntactic programme that he initiated, and, quite separately, there has been productive work in cognitive pragmatic frameworks such as Relevance theory. There has, however, been little in the way of collaborative or interface work, probably for several reasons, including, on the one hand, the difficulty for non-specialists to grasp the technicalities of formal syntax, and, on the other, the apparent irrelevance to the formal enterprise of the online processing orientation of cognitive-conceptual pragmatics. The topic of ‘words’, their internal structure and their atomic meanings or senses, seems to be a promising one for fruitful interaction between the two disciplines.

Acknowledgements I am grateful to Nicholas Allott, Tim Pritchard and Deirdre Wilson for encouragement and helpful comments on an earlier draft. Two anonymous reviewers of the paper for *Synthese* did a particularly excellent job, giving me much to think about for the next stages of this research. The paper was written as part of the project ‘Lexical Innovation: Conceptual Flexibility and Grammatical Constraints’, funded by a Leverhulme Research Fellowship (RF-2021-078).

Conflict of interest I confirm that I, Robyn Carston, have no conflict of interest with regard to the writing or publication of this paper.

Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article’s Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article’s Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

References

- Acquaviva, P. (2014). Distributing roots: Listemes across components in Distributed Morphology. *Theoretical Linguistics*, 40(3/4), 277–286
- Arad, M. (2003). Locality constraints on the interpretation of roots: The case of Hebrew denominal verbs. *Natural Language and Linguistic Theory*, 21, 737–778
- Arad, M. (2005). *Roots and Patterns*. Springer
- Aronoff, M. (2007). In the beginning was the word. *Language*, 83(4), 803–830

- Asch, S. (1958). The metaphor: A psychological inquiry. In R. Tagiuri, & L. Petrullo (Eds.), *Person Perception and Interpersonal Behavior* (pp. 86–94). Stanford: Stanford University Press
- Bauer, L. (2018). Conversion as metonymy. *Word Structure*, 11.2, 175–184
- Bezuidenhout, A. (2019). Noun-noun compounds from the perspective of Relevance Theory. In K. Scott, et al. (Eds.), *Relevance, Pragmatics and Interpretation* (pp. 174–186). Cambridge University Press
- Borer, H. (2005a). *In Name Only. Structuring Sense, Vol 1*. Oxford: Oxford University Press
- Borer, H. (2005b). *The Normal Course of Events. Structuring Sense, Vol.2*. Oxford: Oxford University Press
- Borer, H. (2013a). *Taking Form. Structuring Sense, Vol.3*. Oxford: Oxford University Press
- Borer, H. (2013b). The syntactic domain of content. In M. Becker, J. Grinstead, & J. Rothman (Eds.), *Generative Linguistics and Acquisition: Studies in Honor of Nina M. Hyams* (pp. 205–248). Amsterdam: John Benjamins
- Borer, H. (2014). Derived nominals and the domain of content. *Lingua*, 141, 71–96
- Borer, H. (2017). The generative word. In J. McGilvray (Ed.), *The Cambridge Companion to Chomsky* (pp. 110–133). Cambridge University Press. DOI: <https://doi.org/10.1017/9781316716694.006>
- Bowerman, J. (2019). What's really going on with the ham sandwich? An investigation into the nature of referential metonymy. *International Review of Pragmatics*, 11(1), 22–55
- Bowerman, J. (2021). *Referential Metonymy: Cognitive Cases and Communicative Functions*. PhD dissertation, University College London
- Bromberger, S. (2011). What are words? *Journal of Philosophy*, 108(9), 486–503
- Carston, R. (2002). *Thoughts and Utterances*. Oxford: Blackwell
- Carston, R. (2010). Explicit communication and 'free' pragmatic enrichment. In: B. Soria & E. Romero (eds.) *Explicit Communication*. Palgrave, pp. 217–287
- Carston, R. (2019). Ad hoc concepts, polysemy and the lexicon. In K. Scott, et al. (Eds.), *Relevance: Pragmatics and Interpretation* (pp. 150–162). Cambridge: Cambridge University Press
- Carston, R. (2021). Polysemy: Pragmatics and semantic conventions. *Mind & Language*, 36, 108–133. <https://doi.org/10.1111/mila.12329>. First published online December 2020
- Chomsky, N. (1965). *Aspects of the Theory of Syntax*. Cambridge, MA: MIT Press
- Chomsky, N. (1970). Remarks on nominalizations. In R. Jacobs, & P. Rosenbaum (Eds.), *Readings in English Transformational Grammar* (pp. 184–221). Waltham, MA: Ginn
- Chomsky, N. (1995). Language and nature. *Mind*, 104(413), 1–61
- Clark, E., & Clark, H. (1979). When nouns surface as verbs. *Language*, 55, 767–811
- Dirven, R. (1999). Conversion as conceptual metonymy of event schemata. In K. Panther, & G. Radden (Eds.), *Metonymy in language and thought* (pp. 275–287). Amsterdam: Benjamins
- Di Scullio, A. M., & Williams, E. (1987). *On the Definition of Word*. Cambridge MA: MIT Press
- Halle, M. (1973). Prolegomena to a theory of word formation. *Linguistic Inquiry*, 4, 3–16
- Halle, M., & Marantz, A. (1993). Distributed morphology and the pieces of inflection. In K. Hale, & S. J. Keyser (Eds.), *The View from Building 20: Essays in Honor of Sylvain Bromberger* (pp. 111–176). Cambridge, MA: MIT Press
- Harley, H. (2009). *Roots and locality. Talk given at the Roots workshop*. University of Stuttgart
- Harley, H. (2014). Reply to commentaries, "On the identity of roots". *Theoretical Linguistics*, 40(3/4), 447–474
- Harley, H., & Haugen, J. (2007). Are there really two different classes of instrumental denominal verbs in English? *Snippets Issue*, 16, 8–10
- Hauser, M., Chomsky, N., & Fitch, W. T. (2002). The language faculty: What is it, who has it, and how did it evolve? *Science*, 298, 1569–1579
- Hawthorne, J., & Lepore, E. (2011). On words. *Journal of Philosophy*, 108, 447–485
- Irmak, N. (2019). An ontology of words. *Erkenntnis*, 84(5), 1139–1158. doi: 10.1007/s10670-018-0001-0
- Jackendoff, R. (1997). *The Architecture of the Language Faculty*. Cambridge Mass: MIT Press
- Julien, M. (2007). On the relation between morphology and syntax. In: G. Ramchand & C. Reiss (eds.) *The Oxford Handbook of Linguistic Interfaces*. <https://doi.org/10.1093/oxfordhb/9780199247455.013.0008>
- Kaplan, D. (1990) Words. *Proceedings of the Aristotelian Society* 64: 93–119
- Kaplan, D. (2011). Words on Words. *Journal of Philosophy*, 108, 504–529
- Kiparsky, P. (1982). Word formation and the lexicon. In: F. Ingeman (ed.), *Proceedings of the Mid-America Linguistics Conference*, University of Kansas, pp. 3–29
- Langacker, R. (1991). *Concept, Image and Symbol*. Mouton De Gruyter
- Lepore, E., & Stone, M. (2015). *Imagination and Convention*. Oxford University Press

- Levinson, L. (2019). Semantic domains for syntactic word-building. In R. Truswell (Ed.), *The Oxford Handbook of Event Structure*. Oxford University press
- Marantz, A. (1996). "Cat" as a phrasal idiom: Consequences of late insertion in Distributed Morphology. Ms., Massachusetts Institute of Technology
- Marantz, A. (1997). No escape from syntax: Don't try morphological analysis in the privacy of your own lexicon. *University of Pennsylvania Working Papers in Linguistics* 4(2): Article 14
- Marantz, A. (2001). Words. Paper presented at WCCFL XX, University of Southern California
- Marantz, A. (2010). Locality domains for contextual allomorphy in words. Handout, New York University. Available at: <https://blogs.mcgill.ca/mcling/files/2012/03/marantz-alloseme.pdf>
- Marantz, A. (2013a). Locality domains for contextual allomorphy across the interfaces. In O. Matushansky, & A. Marantz (Eds.), *Distributed Morphology Today: Morphemes for Morris Halle* (pp. 95–116). Cambridge, MA: MIT Press
- Marantz, A. (2013b). Verbal argument structure: Events and participants. *Lingua*, 130, 152–168
- Millikan, R. G. (2005). *Language: A Biological Model*. Oxford: Oxford University Press
- Miller, J. T. M. (2020). On the individuation of words. *Inquiry*, 63(8): 875–884. doi: <https://doi.org/10.1080/0020174X.2018.1562378>
- Nunberg, G., Sag, I., & Wasow, T. (1994). Idioms. *Language* 70: 491–593
- Panagiotidis, P. (2014). A minimalist approach to roots. In P. Kosta, et al. (Eds.), *Minimalism and Beyond. Radicalizing the interfaces*. Amsterdam: John Benjamins
- Pethő, G. (2001). What is polysemy? – A survey of current research and results. In: K. E. Bibok & T. Németh (eds.), *Pragmatics and the flexibility of word meaning*. Oxford: Elsevier, 2001, pp. 175–224
- Ramchand, G. (2008). *Verb Meaning and the Lexicon: A First Phase Syntax*. Cambridge: Cambridge University Press
- Recanati, F. (2003). *Literal Meaning*. Cambridge University Press
- Recanati, F. (2017). Contextualism and polysemy. *Dialectica*, 71(3), 379–397
- Sperber, D., & Wilson, D. (1995). *Relevance: Communication and Cognition*. Oxford: Blackwell
- Wetzel, L. (2009). *Types and Tokens: On Abstract Objects*. Cambridge: MIT Press
- Wilson, D., & Carston, R. (2007). A unitary approach to lexical pragmatics. In N. Burton-Roberts (Ed.), *Pragmatics* (pp. 230–259). Palgrave Macmillan
- Wilson, D., & Lossius Falkum, I. (2020). Understanding metonymy. Talk given at UCL Graduate Pragmatics seminar, London, UK, December 2020
- Wilson, D., & Sperber, D. (2004). Relevance theory. In L. Horn, & G. Wards (Eds.), *The Handbook of Pragmatics* (pp. 607–632). Oxford University Press

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.