Introduction

Olivier Bonami

Université Paris Diderot

Gilles Boyé

Université Bordeaux-Montaigne

Georgette Dal

Université de Lille

Hélène Giraudo

CLLE, Université de Toulouse, CNRS, Toulouse

Fiammetta Namer

Université de Lorraine

1 Introducing the lexeme

It is customary (see for instance Aronoff 1994: 4) to associate the notion of a lexeme with Peter H. Matthews (1965, 1972, 1974, 1991). Matthews (1972: 160-161) contrasts three uses of the term *word* that may be differentiated as follows.

• The term *word* may denote a certain type of syntactic constituent. In this sense, the term unambiguously designates a kind of Saussurean sign, possibly complex: it associates a phonological representation with a meaning.

¹Matthews (1972: 160) himself notes that the use of the word *lexeme* in this sense originates in Lyons (1963), and that his understanding of the lexeme is very close to that of the *semanteme* in Bally (1944: 287). See also Trnka (1949: 28). On the other hand, the use of *lexeme* in the tradition starting with Matthews has little to do with Martinet's *lexème* (e.g. Martinet 1960), which designates what in the English-speaking world would be called a morpheme with lexical meaning, or a root.



- The term word is used to denote the phonological sequence that is the shape of a word in the first sense. Matthews coins the term wordform to designate this and avoid ambiguity.²
- The term *word* often denotes that lexical object dictionaries talk about: an item characterized by a stable lexical meaning and a set of syntactic properties, but that abstracts away from inflection. This unit is what Matthews calls the *lexeme*.

One may illustrate these definitions by saying that the French lexeme VIEUX 'old' is associated with four words filling the four cells in its paradigm: M.SG vieux, F.SG vieille, M.PL vieux, and F.PL vieilles. To these four words correspond only three wordforms, since the M.SG and M.PL are phonologically identical. This characterization of the lexeme is deliberately silent on phonology: the lexeme is defined in terms of the syntactic and semantic cohesion of a family of words, ignoring phonology. Literature from the 1990s was not so prudent, and presented the lexeme as an underspecified sign. The following quote is representative of the dominant view:

Each lexeme can be viewed as a set of properties, which will in some sense be present in all occurrences of the lexeme. These crucially include some semantic properties, some phonological properties [...], and some syntactic properties. (Zwicky 1992: 333)

Such a definition is obviously not adequate if one wants to be able to take into account the full spectrum of stem allomorphy, including suppletion. In some cases, there is no phonological property that is shared by all forms of the lexeme; e.g. there is nothing common between the 3sg forms of the French lexeme ALLER 'go' in the imperfect (allait), present (va) and future (ira). This example shows that lexemes are ineffable: one can't utter a lexeme, but only one of its forms. It also highlights the importance of cleanly distinguishing lexemes from their CITATION FORM. The French grammatical tradition happens to use infinitives as citation forms, and the infinitive of ALLER happens to use the al- stem. From this, no conclusion can be drawn as to al- being a more reflective of the fundamental phonological identity of that lexeme: if French grammarians had kept the Latin tradition of using the present 1SG as a citation form, we would call the lexeme vais, and the v- stem would seem crucial.

Because the definition of a lexeme derives from that of an inflectional paradigm (lexemes abstract away from inflection), using the notion commits one to a particular view of morphology. It presupposes the existence of a split between inflectional and derivational

²Lyons (1968) and some more recent authors use *phonological word* instead of *wordform*. This is problematic, "phonological word" being standardly used to denote a particular type of prosodic constituent, which may or may not be coextensive with a wordform. Matthews is explicit on the difference between wordforms and phonological words, both in Matthews (1972: 2, 96, 161) and in the second edition of his textbook (Matthews 1991: 42, 216). Unfortunately, the first edition was somewhat confusing on this particular issue (Matthews 1974: 32-33, 35). Adding to the confusion, Mel'čuk (1993) and Fradin (2003) use the French term *mot-forme* (litteraly, "word-form") to denote what Matthews, and after him the whole English-speaking literature, simply calls *word*.

³The unfortunate use of the term *lemma* in many discussions in psycholinguistics and Natural Language Processing rests on such a confusion between lexeme and citation form.

morphology (Matthews 1965: 140, note 4; Anderson 1982; Perlmutter 1988). Delineating the sets of words instantiating the same lexeme, such as the one shown in (1a), requires one to distinguish it from a set of words that merely belong to the same morphological family, as the one in (1b).

a. { vieux 'old' M.SG, vieille 'old' F.SG, vieux 'old' M.PL, vieilles 'old' F.PL }b. { vieux 'old' M.SG, vieillard 'old man' SG, vieillesse 'old age' SG }

As characterised above, the lexeme is a descriptive category. As such it is compatible with diverse models of morphology, as long as they implement a notion of structured paradigms and split morphology. In practice, however, the notion of a lexeme is mainly used within theoretical frameworks that adopt a constructive view of morphology (Blevins 2006) and use the lexeme as the pivot of the theory, linking inflection and derivation. Following Fradin (2003), we may call this family of frameworks LEXEMIC MORPHOLOGY, and assume that they rely on the series of key hypotheses in (2). The wording is deliberately noncommittal as to how inflection is to be modeled, since proponents of lexemic morphology have assumed either *Item and Process* or *Word and Paradigm* approaches (Hockett 1954).

- (2) a. Atoms of morphological description are SIMPLE LEXEMES.
 - b. Lexeme formation rules predict the possibility of complex lexemes from either a single pre-established lexeme (derivation) or a pair of pre-established lexemes (composition).
 - c. Inflectional morphology deduces, for each lexeme, the set of words constituting its inflected forms.

It is noteworthy that such a conception of morphology predates the coining of the term *lexeme*. It is very clearly outlined by Kuryłowicz (1945–1949), where *theme* plays a role analogous to *lexeme* as used by lexemic morphology:

When we say that *lupulus* is derived from *lupus*, or, more precisely, that the theme *lup-ul*- is derived from the theme *lup*-, this means that the *paradigm* of *lupulus* is derived from the *paradigm* of *lupus*.

[...]

The derivation process for *lupulus* takes the following concrete form:

lupus-i, -o, -um, -orum, -is, -osoulup-(-us, -i, -o, etc.)
$$\downarrow$$
 \downarrow lupulus-i, -o, -um, -orum, -is, -oslupul-(-us, -i, -o, etc.)(Kuryłowicz 1945–1949: p. 123; my translation)

2 Morpheme, lexeme, and the recent history of morphology

The notion of a *morpheme* is without doubt the most popular theoretical innovation of 20th century morphology. Although questions about its usefulness were raised from the 1950s, most notably by Hockett (1954, 1967), Robins (1959), Chomsky (1965) and Matthews (1965), morphemic analysis firmly occupied the center of the stage until the 1990s. Accordingly, the notion of a lexeme barely figured in discussions of morphology. For example, although he adopts a word-based (vs. morpheme-based) approach of morphology, Aronoff (1976) claims in his preface that he has "avoided the term *lexeme* [instead of *word*] for personal reasons" and used "the term *morpheme* in the American structuralist sense, which means that a morpheme must have phonological substance and cannot be simply a unit of meaning".

In the 1980s, most generative morphologists (Lieber 1981, Williams 1981, Selkirk 1982) explicitly reject word-based models and assume that the traditional morpheme is a legitimate unit of analysis (Lieber 2015b). Aronoff (2007) claims that the classical lexicalist hypothesis (Chomsky 1970) holds instead that the central basic meaningful constituents of language are not morphemes but lexemes. However, even among supporters of the lexicalist hypothesis, things are not so clear. Some of them, such as Halle (1973), explicitly adopt a so-called *Item-and-Arrangement* (IA) model while others, such as Jackendoff (1975), adopt a so-called Item-and-Process (IP) model. Hockett (1954) coined these two terms IA and IP to refer to two different views of mapping between phonological form and morphosyntactic and semantic information. In IA models, complex words are viewed as arrangements of lexical and derivational morphemes; in IP models, they are viewed as the result of an operation, called a Word Formation Rule (Aronoff 1976), applying to a root paired with a set of morphosyntactic features and possibly modifying its phonological form. In such models, a complex word is not a concatenation of morphemes but is considered as a single piece. IA models clearly reject lexemes as a pertinent unity. IP models are not so consensual and hesitate between morpheme-based and word (or lexeme)-based theory, and some of them continue to involve morphemes. Corbin's position illustrates this hesitation. While adopting the lexicalist hypothesis, Corbin (1987) never uses the term lexeme: she claims "une morphologie du morphème (...) ou plus exactement une morphologie du morphème-mot" (p. 183) and treats affixes as morphemes

Indeed, "this conflict between morpheme-based and lexeme-based theories has haunted generative grammar ever since" (Lieber 2015a).

The work collected in this volume is representative of the growingly dominant view that the lexeme is an unavoidable component of useful morphological descriptions as well as theorizing. The high number of French scholars represented in the volume re-

⁴Although the term *morpheme* was coined by Baudouin de Courtenay in 1895 with a meaning close to the contemporary one, its widespread usage with that meaning can be traced back to Bloomfield (1933) and his immediate readers. See Anderson (2015) and Blevins (2016) for relevant discussion of the history of the morpheme.

flects the importance that the notion of a lexeme has played for that community for the past twenty years, mostly under the impulsion of Bernard Fradin (1993, 2003), and the group of researchers involved in the CNRS cooperation network *Groupe de Recherche Description et modélisation en morphologie* he coordinated between 2000 and 2007. We are happy to dedicate this volume to him.

3 Presentation of the volume

While the notion of lexeme is in widespread use in contemporary descriptive and theoretical morphology, many questions remain unresolved. Among others: what is exactly a lexeme: a theoretical description or an object manipulated by rules? Is the difference between lexemes and word-forms as clear as in Matthews' definition? Are lexemes and Lexeme Formation Rules (LFR) always sufficient to explain the formation of lexicon? Do LFR always apply to lexemes?

The twenty papers collected in this volume address the previous questions and some others. They are organized in four sections:

3.1 Lexemes in standard descriptive and theoretical lexeme-based morphology

Three papers centrally deal with this first theme.

In his atypical but stimulating contribution based on his own intellectual biography, Aronoff traces the emergence of lexeme in descriptive and theoretical morphology since the 1960's in Generative Grammar.

In his paper, Boyé focuses on French cardinals and their place in Word and Paradigm models. He argues that, like simple French cardinals, complex cardinals are lexemes, and that their phonological idiosyncrasies can better be modeled in a morpholexical system than in syntax.

Rainer studies the linguistic history of two keywords of economics and politics, viz. Capitalist and Capitalism, in which semantic change, calques and word formation – suffixation, conversion, suffix substitution – interacted in a complex manner. He argues that, within a morpheme-based model, it would not be possible to account for this history, which, consequently, supports the hypothesis of a lexeme-based conception of the word.

3.2 Lexeme Formation Rules

Lexeme Formation Rules (LFRs) are the main theme of four contributions.

Amiot & Tribout deal with the category of outputs of French suffixation(s) in -iste: are they basically adjectives, nouns, lexically underspecified or do we need two different suffixations to account for data-observation? Their proposal is the last one. They consider that, categorically and semantically, the French morphological system contains two suffixations: one of them forms basically professional nouns, the other basically adjective

meaning "in relation to (a practice, an ideology, an activity, a behavior)". They argue that, because such properties can apply to humans, these adjective can easily converted in nouns.

In her contribution, Dal addresses the status of French adverbs in -*ment*. Although they are usually considered derivational, she shows that this status is highly questionable. For her, neither inputs nor outputs respect undoubtedly constraints imposed by a LFR and her conclusion is that they can be regarded as word-forms belonging to the paradigm of adjectives.

Villoing & Deglas focus two morphological patterns in Creole languages based on nouns to form verbs: suffixation N-é and parasynthetic verbs dé-N-é. The hypothesis is that these two patterns emerged following the reanalysis of converted and prefixed French verbs.

Strictly speaking, clipping of deverbal nouns is not a standard LFR. However, the treatment proposed in Štichauer's paper, which applies Fradin & Kerleroux's (2003) Hypothesis of a Maximal (Semantic) Specification, conforms to standard conception of LFRs: in case of polysemous lexemes, clipping applies to specific semantic features of lexemebases, and outputs inherit these features, without being synonymous to the full parental form.

3.3 Troubles with lexemes

Six of the contributions centrally address the issue of the definition of lexeme and its use in morphological theories.

Bonami & Crysman's contribution reevaluates the role of the lexeme in recent Head-Driven Phrase Structure Grammar (HPSG) integrating a truly realisational theory of inflection within the HPSG frameword (Bonami & Crysmann 2016). After having distinguished two notions of an abstract lexical object: lexemes, which are characterized in terms of their syntax and semantics, and flexemes (Fradin 2003: 159; Fradin & Kerleroux 2003), which are characterized in terms of their inflectional paradigm, they show how the two notions interact to capture various inflectional phenomena, most prominently heteroclisis and overabundance.

Cruz & Stump deal with essence predicates in San Juan Quiahije Chatino: do they fall in the domain of morphology or in the domain of syntax? Their conclusion is that, even though their structure comprises a predicate base and a nominal component, their inflectional morphology differs from that of simple lexemes.

In his paper on traces of feminine agreement within complex words in Norwegian and Istro-Romanian, Enger tries to overcome troubles with lexemes. He combines a modified version of the Agreement Hierarchy (Corbett 1979) and grammaticalisation to explain what he considers as intra-morphological meaning.

Kihm examines the realization of the copula in Haitian Creole, suggesting that the absence of an overt copula in some contexts should be modeled by postulating an empty stem alternant. He outlines a formal account based on Crysmann & Bonami's (2016) Information-based Morphology, but extending that framework to the analysis of periphrastic inflection.

Spencer questioned whether lexemes are abstract representations of properties unifying a set of inflected word-forms or objects manipulated by rules. Using the architecture of his model of lexical relatedness Generalized Paradigm Function Morphology (GPFM) (Spencer 2013), he proposes an answer to verb-to-adjective transpositions (participles), which can be seen as lexemes-within-lexemes according to their double status of word-forms in relation to verbs, and lexemes in relation to their adjective properties. His proposal is that a lexeme is not a theoretical observation but is best regarded as a maximally underspecified object, bearing all and only those properties which are not predictable from default specification.

Flexemes are also the central issue of Thornton's paper. After reviewing the development of this notion since Fradin (2003) and Fradin & Kerleroux (2003), she focuses on the concept of overabundance in inflectional paradigms and presents data illustrating cases in which a single lexeme maps to two distinct flexemes.

3.4 Troubles with Lexeme Formation Rules

LFRs are questioned in seven papers.

In their study on reduplication in Mandarin Chinese where difference between lexemes and word-forms is less apparent than in languages with clear inflection, Basciano & Melloni claim that the domain of application of reduplication is below the level of the word, or below X° in the standard X-bar approach: for them, in Mandarin Chinese, base units do not have a lexical category and should be vague enough to make them compatible with nominal, verbal and adjectival meanings.

Hathout & Namer explore limits of LFRs to explain and predict the formation of the lexicon. They confront parasynthetics lexemes, in other words complex lexemes that apparently result from simultaneous application of a prefixation and a suffixation, with different hypothesis. This recurrent theme leads them to propose the system ParaDis (for: Paradigms and Discrepancies). ParaDis is a model particularly useful to analyze, explain and predict noncanonical formations (Corbett 2010). It is lexeme-based and combines independency of the three dimensions of LFRs (Fradin 2003) and constraints on outputs founded on derivational families and derivational series (Hathout 2011, Blevins 2016).

Giraudo validates this double view of complex words articulating syntagmatic and paradigmatic dimensions, from a psycholinguistic perspective. She identifies two levels in processing of complex lexemes: the first decomposes complex lexemes into pieces called "morcemes"; the second deals with the internal structure of words according to LFRs and contains lexemes. Her model poses family clustering as an organizational principle of the mental lexicon. She argues that, during language acquisition, growing of family size consecutively continually strengthens links between complex lexemes.

Montermini is devoted to variation of derivational exponents. Adapting the frame developed in Plénat & Roché (2014) and Roché & Plénat (2014, 2016), he argues that this variation obeys to the same constraints as those which explain forms of complex levemes

Plag, Andreou & Kawaletz tackle a recurrent and central problem with LFRs: polysemy. They rely frame semantics (Barsalou 1992a,b; Löbner 2013), an approach to lexical

semantics based on elaborate structured representations modelling mental representations of concepts. They hypothesize that the semantics of a derivational process can be described as its potential to perform certain operations on the frames of the bases to which they apply.

Schwarze deals also with the semantic outputs of LFRs. His hypothesis is they are semantically underspecified. The model he proposes is multilayered: it comprises four layers of representation: phonology, constituent structure, functional feature structure and lexical semantics. The meaning of complex words is treated in the framework of two-level semantics. It is assumed that LFRs derive underspecified semantic forms, parting from which the actual meanings are construed by recourse to conceptual structure. Three morphological processes are studied: French \acute{e} - prefixation, Italian denominal verbs of removal, and French noun-to-verb conversion.

Strnadová addresses the issue of apparent rivalry between French denominal adjectives and prepositional phrases in de+N where N is the lexeme-base of the adjective (or in relation to it). She discusses some motivations explaining the choice between the former and the latter strategy, and shows that they usually do not have the same distribution and, therefore, are not interchangeable.

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