PARADIGMS AND THE ROLE OF SERIES IN DERIVATIONAL MORPHOLOGY

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ABSTRACT: Adopting the viewpoint of abstractive morphology, and in line with Blevins (2016), the article shows that the classification of sets of words along the pattern of inflectional paradigms can be inferred from clues provided by the words themselves (internal evidence). This situation is not observed with derivational series because the coherence of a given series is based on information that comes from other series or context (external evidence). As for derivational paradigms, which are conceived of as conceptually rooted networks, derivational series play a crucial role in the way the various cells they involve can be discriminated.

KEYWORDS: abstractive morphology, derivational paradigm, derivational series, external evidence, internal evidence

1. INTRODUCTION

Paradigms can be defined in a more or less strict way.[1] Definition (1), for instance, is very broad and echoes the associative proportions (*rapports associatifs*) alluded to by Saussure (1916, 175, 177-179) in his *Cours*. As Booij's quotation makes clear, the important point is that paradigms matter for morphology, however loose their conception.

(1) The term 'paradigm' is used here in a general sense to denote a set of linguistic elements with a common property. (...) When we speak about morphology as the study of the systematic form-meaning correspondences between the words of a language, we take a paradigmatic perspective, since we take properties of classes of words as the starting point of morphological analysis. (Booij 2005, 8)

Inflectional paradigms, on the other hand, can be given a stricter definition that allows one to identify all the inflected forms correlated with a given unit. Definition (2), proposed by Stump (2017) in a realizational perspective, achieves precisely this goal (see also Finkel & Stump 2009). Such a definition is possible because inflectional links between related words are tighter than derivational or lexical links.

(2) The inflectional paradigm of a lexeme L may be seen as a set of cells, where each cell is the pairing $\langle w, \sigma \rangle$ of a word form w with a morphosyntactic property set σ. (Stump 2017)

From what has just been said, it could be possible to conclude that the notion of paradigm has to be conceived of as a cline between two poles: inflectional paradigms at the one end and derivational or lexical paradigms at the other. However, from the studies that compare inflectional and derivational paradigms (Bauer 1997, Štekauer 2014), it is not obvious to determine how the dimension(s) along which the various paradigms types could be ranked would be. Besides, scalarity does not help much to grasp how paradigms types are articulated with series and families (to be defined below), be they morphological or lexical.

Definitions are useful to the extent that they provide us with operational tools. The idea according to which "paradigms are about predictability", which is vividly put forward by (Bonami 2017) can be seen precisely as a way to make people tackle morphological paradigms

[1] Abbreviations for glosses: ABL ablative, ADESS adessive, AGT agent, ALL allative, COM comitative, ELAT elative, ESS essive, GEN genitive, ILL illative, IND indicative, INESS inessive, INS instrument, MNS means, N noun, NOM nominative, PART partitive, PAT patient, PL plural, PRIV privative, PRS present, SG singular, TERM terminative, TRSLAT translative, V verb. For languages, they follow the norm ISO 639-3. My thanks to the anonymous reviewers for their valuable remarks and to Anna Thornton for helpful comments and suggestions.

with the right questions in mind. This idea is not new, however, since it has been shared by all proponents of the classical Word and Paradigm approach, as their use of 'proportional analogy' reminds us (Kuryłowicz 1949, Matthews 1972). As Blevins (2016, 200) puts it, "in a classical WP approach, exemplary paradigms provide the model for the deduction of un-encountered forms". Predictability is even more consubstantial in the framework of implicative morphology since it is based on words and relations that can been drawn from the place they occupy in networks of words: "contrasting pairs of words (...) may sanction reliable deductions about other forms of an item that cannot be deduced from the parts of those words that exhibit the alternation" (Blevins 2016, 111-112).

In keeping with the view presented here, Bonami (2017) defines two types of paradigms. Paradigmatic system 1 is a "collection of morphological families structured by the same system of oppositions of content characterized by morphosyntactic property sets", a morphological family being a (not necessarily exhaustive) set of words that are morphologically related. In a complementary way, paradigmatic system 2 is a "collection of morphological families structured by the same system of oppositions of content characterized by morphosemantic relations." Bonami defines paradigmatic systems as collections of partial morphological families (see also Bonami & Strnadová 2018). Morphosyntactic vs. morphosemantic content is then the key opposition that structures the distinction in question.

Blevin's efforts to define the term 'paradigm' show how this notion is interlinked with those of lexeme and morphological family. Blevins (2016, 64) defines the lexeme as a "union of paradigms". At a first level 'paradigm' denotes the smaller set of word-forms (what he calls 'grammatical words') correlated with a set of morphosyntactic features that discriminates, at a higher level, a coherent grammatical partition of all the word forms associated with a given unit. In this sense the term 'paradigm' would denote, for instance, the set of the six forms instantiating the 'indicative present' of the Croatian verb *žèljeti* 'want, desire'. In a parallel way, the six forms that exist for the 'aorist indicative' and 'imperfect indicative' also constitute basic paradigms of this verb. The full set of inflected forms referred to as the 'conjugational paradigm' of *žèljeti* would be subsumed by the notion of 'lexeme' itself: "the term 'paradigm' is reserved for the first, smaller, set of forms, and 'lexeme' is applied to the complete set of forms in the paradigms." (Blevins 2016, 65). As for the 'morphological family' of *žèljeti*, it includes the imperfective lexeme *žèljeti* and all lexemes derivationally related to it e.g. *žèlja* 'desire', *žèljan* 'desirous', *žèljen* 'desirable', including perfective lexeme *požèljeti* and lexemes derived from it e.g. *požèljan* 'desirable, welcome'.

Blevin's and Bonami's definitions mostly differ in granularity and therefore can be seen as complementary. Both viewpoints agree to claim that the distinction between inflectional and derivational paradigms stems from the nature of content, and Bonami articulates morphological families with paradigms to take advantage of the regulating and predictive power of the latter. These claims are compatible with the idea according to which, at a very general level, paradigms are networks. The point is to identify the properties of such networks and to see how they cluster.

In order to have a point of comparison, I start by recalling how abstractive morphology accounts for inflectional paradigms (section 3). I then discuss the role of derivational series as predictive systems and the way they are abstracted from data in an implicative approach to morphology (section 4). I then briefly examine how derivational families interact with paradigms conceived as networks, which structure sub-parts of morphological families, as proposed in some recent works (Štekauer 2014, Bauer 2017, Roché 2017a) (section 5). Even if the definitions recalled above might suffice for discussing most paradigm-related issues, I find it safer to start with a more complete and finer-grained terminology in order to move on a firm ground when establishing future distinctions. For this reason, I begin with a presentation of the conceptual and terminological distinctions proposed by Hathout (2011) (section 2), which is the most detailed proposal existing so far.

2. TERMINOLOGICAL DISTINCTIONS

These distinctions result from the intersection of three dimensions: (i) family vs. series, (ii) inflection vs. derivation, (iii) morphology vs. lexicon. Before introducing the terminology, Hathout defines the scalar notion of 'morphological proximity'. "Two forms jointly sharing semantic and formal properties are morphologically proximate", and this proximity is all the more strong as the number of properties is large or their nature highly specific (Hathout 2011, 255)[2]

"Morphological inflectional families include words that pairwise share formal properties and are linked by inflectional relations". Such families are illustrated by fra *lavons*, *lavez*, *lavera* (forms of) 'wash' but not *relavera* 'wash again' or eng *go*, *gone*, *going* but not *went* (Hathout 2011, 261). Inflectional relations are relations where variations in morphosyntactic content are correlated with formal variations. Morphosyntactic content is the information which is relevant for syntax (or higher levels of discourse / textual organization). Lexical inflectional families group together words linked by inflectional relations even if they do not share formal properties." (Hathout, 2011, 261); an example is eng *went* and *go*, *gone*, *going*. Lexemes are abstract units which subsume lexical inflectional families i.e. sets of word-forms sharing the same (category and) lexical content (Matthews 1974). For example, eng GO subsumes *go*, *goes*, *going*, *went*, *gone* and fra ALLER subsumes *aller*, *allait*, *allons*, *va*, *vont*, *ira*, *irons*, etc. Morphological derivational families are sets of lexemes pairwise correlated together through derivational morphological patterns based on series of forms exhibiting recurrent form / meaning correlations (see below).[3] Example: fra TRANSFORMER 'transform', RETRANSFORMER, TRANSFORMABLE belong to the same morphological derivational family, whereas the set TRANSFORMATION, TRANSFORMATIONNEL, TRANSFORMATOIRE, TRANSFORMATEUR, TRANSFORMATIF, POST-TRANFORMATIONNEL does not because the latter cannot be correlated with the same phonological base. This is why lexical derivational families are defined as the union of units belonging to several morphological derivational families, provided that these units share the same core meaning. Example: fra CHEVAL 'horse', CHEVALIER 'knight', CHEVALET 'easel', CHEVALIN 'horsey (profile)'; CHEVAUCHER 'sit astride'; ÉQUIN 'equine', ÉQUIDÉ 'equid', ÉQUITATION '(horse)-riding', ÉQUESTRE 'equestrian'; HIPPIQUE 'equestrian' (and learned compounds HIPPOMOBILE 'horse-driven', HIPPODROME 'hippodrome'). In this view, the former sets that involved respectively bases /tʁɑ̃sfɔʁm/ and /tʁɑ̃sfɔʁmat/ constitute the same lexical derivational family; often enough, elements showing an allomorphic alternation of this type are simply considered as belonging to the same morphological derivational family (Fradin 2017, section 1).

Morphological inflectional series group together word-forms expressing the same morphosyntactic content and exhibiting the same formal marking. French forms *lavons*, *transformons*, *chantons*, *finissons*, *allons*, etc. belong to the same morphological inflectional series insofar as they all share marking /ɔ̃/ and are associated with the morphosyntactic property set 'indicative present 1st person plural'. The lexical inflectional series containing the previously mentioned word-forms also includes *sommes* be:IND.PRS.1PL, which does not exhibit marking /ɔ̃/ even though its morphosyntactic content is identical to the one of the preceding forms. A morphological derivational series is constituted of lexemes instantiating the same derivational pattern. A morphological derivational pattern (or derivational pattern) is a schema that can be abstracted from recurrent correlations observable between the meaning, the form and the category exhibited by series of lexemes (words), as shown in (3).

(3) DÉRIVER: [deʁiv], V, 'derive' / DÉRIVATION: [deʁivasjɔ̃], N, 'action of deriving' = TRANSFORMER: [tʁɑ̃sfɔʁm], V, 'transform' / TRANSFORMATION: [tʁɑ̃fɔʁmasjɔ̃], N, 'action of transforming' = COMPILER: [kɔ̃pil], V, 'compile' / COMPILATION: [kɔ̃pilasjɔ̃], N, 'action of compiling' = etc.

[2] This accounts for the fact that the relations in inflectional paradigms are tighter than in derivational paradigms.
[3] Compare with Baayen (2014, 107)'s definition: "(a morphological family) is the set of all words sharing that word as constituent".

Nouns such as CONFECTION ‘confection’ or LOCOMOTION ‘locomotion’ do not belong to morphological derivational series (3) even though they end in *-ion* and denote an action, because the corresponding verb is lacking. Nevertheless, they can be grouped in the same lexical derivational series as nouns in (3). Lexical derivational series generalize morphological derivational series inasmuch as they group together lexemes (or words) uniquely on the basis of their form or meaning (Hathout 2011, 263).[4]

Not all these distinctions are equally used or useful. Some of them can be conflated in description without much harm, provided the adjustment is made explicit. For example, studies devoted to morphology frequently extend ‘morphological inflectional families’ to encompass ‘inflectional lexical families’. It also happens that elements of ‘lexical derivational series’ which show only a phonological and semantic similarity with elements instantiating a ‘morphological derivational series’ be dealt with in a similar way as the latter (see Riehemann 1998).

3. INFLECTIONAL PARADIGMS

In an implicative approach to morphology, word-form is basic. Word-forms, or words for short, function as parts of larger networks whose prototype is inflectional paradigms: “Paradigmatic relations (...) operate over larger sets of words, from inflectional paradigms, to lexemes and derivational families. It is the affiliation with these larger sets of forms that principally constrains uncertainty in the association between individual word-forms and grammatical properties” (Blevins 2016, 170). Constraining uncertainty amounts to discover the system forms are parts of or, as Ackerman, et al. (2016, 137) expresses it, “a consequence of permitting words to be contrasted with words is the possibility of discovering morphological organization in the system of relations between words”.

	QUANTITATIVE			
CASE	SG	PL	SG	PL
NOM	kool	**koolid**	kukk	**kuked**
GEN	**kooli**	koolide	**kuke**	kukkede
PART	kooli	koolisid	kukke	kukkesid
ILL	**kooli**sse	koolidesse	**kuke**sse	kukkedesse
INESS	**kooli**s	koolides	**kuke**s	kukkedes
ELAT	**kooli**st	koolidest	**kuke**st	kukkedest
ALL	**kooli**le	koolidele	**kuke**let	kukkedele
ADESS	**kooli**l	koolidel	**kuke**l	kukkedel
ABL	**kooli**lt	koolidelt	**kuke**lt	kukkedelt
TRSLAT	**kooli**ks	koolideks	**kuke**ks	kukkedeks
TERM	**kooli**ni	koolideni	**kuke**ni	kukkedeni
ESS	**kooli**na	koolidena	**kuke**na	kukkedena
PRIV	**kooli**ta	koolideta	**kuke**ta	kukkedeta
COM	**kooli**ga	koolidega	**kuke**gat	kukkedega
	‘school’		‘rooster’	

TABLE 1. FRAGMENT OF THE 1ST DECLENSION OF NOUNS IN ESTONIAN. BLEVINS (2006)

In this perspective, the goals of morphology for inflection are (i) to discover the system of relations between word-forms, taking into account not only their form inventories but also the

[4] Cf. the grouping of fra *éducation* ‘education’ with *apprentissage* ‘learning’ in the same associative series in Saussure (1916, 175).

association they have with paradigm cells (what corresponds to the various declensions, conjugations, etc.); (ii) to predict the set of all word-forms a lexeme has on the basis of implications existing between surface (word-)forms. This is the so-called Paradigm Cell Filling Problem (Blevins 2016, 199).

The first goal can be illustrated with the implicational structure Blevins (2006, 551) puts to light by the investigation of 1st declension in Estonian. The relevant fragment is given in Table 1, where grammatical cases are listed in the three upper rows of the table and the semantic ones below. Stems with a geminate consonant are strong, whereas those with a short counterpart are identified as weak.[5] What we observe is that the grade of a case form correlates with the grade of other forms in a systematic way. For instance, "if the partitive singular is strong, so are the forms that it implies" (Blevins, 2006, 550). The implicational patterns that relate the forms of the first declension paradigm are given in Table 2 (Blevins, 2006, 551).

These implicational patterns provide us with crucial clues about the organization of inflectional paradigms. It is important to realize that the discovering of morphological organization in inflectional morphology is based on internal evidence only. Clues stem from the inspection of recurrent similarities vs. differences between phonological forms to the extent that (i) these forms are all correlated with the same lexeme and thereby share the same lexical content, and (ii) the morphosyntactic content in question is not associated with the word-forms themselves but with the place they occupy in the network. In the present case this network is constituted by the cells forming the abstract structure of the relevant declension or conjugation, what Carstairs (1987) called Paradigm 1, inasmuch as the bundles of morphosyntactic features specify the dimensions according to which the cells of paradigm 1 are distinguished. Insofar as implicative (or abstractive) morphology rejects using abstract stems and diacritics, for good reasons, discovering how word-forms are displayed in paradigms can only be settled through the inspection of the forms themselves, what I call the 'internal evidence'. This is an essential property of this approach, which clearly emerges from the following quotation: "The key assumption of an abstractive approach are that exemplary paradigms and principal part inventories contain word forms, and that grammatically distinctive patterns **are resident in these actual forms**" (Blevins 2006, 544)[my emphasis BF]. To sum up: actual forms provide us with all the information necessary to discover the grammatically distinctive patterns embodied in inflectional paradigms. There is no need to take into account forms outside the paradigm in question (internality).

PART SG				GEN SG	
→	NOM SG			↔	NOM PL
↔	PART PL			↔	SEMANTIC SG
↔	GEN PL				
	↔	SEMANTIC PL			

TABLE 2. IMPLICATIONAL STRUCTURE OF 1ST DECLENSION PARADIGM IN ESTONIAN

How can the abstractive approach be extended to derivational morphology? What does this imply? These are the two questions which come to mind that I would like to address now. In order to better assess the similarities and differences existing between the organization of forms in inflectional paradigms and in derivation, I focus on units for which the sound / meaning correlation is crucial.

4. MORPHOLOGICAL SERIES

There is no trivial transposition from inflection to derivation, as Blevins (2006, 540) himself acknowledges: "One cannot in general characterize the derivational paradigm of an item by

[5] This case illustrates the quantitative weakening, which contrasts with the qualitative weakening of e.g. PIDU 'party' and the absence of weakening of e.g. PESA 'nest'. I refer to Blevins (2006, 548) for details.

defining a set of abstract feature bundles that are subsequently interpreted by spell-out rules". I would like to argue (i) that the empirical background from which derivational regularities obtain is derivational series;[6] (ii) that the organization of derivational series is based on external instead of internal evidence; (iii) that this situation is tied to inherent properties of morphological derivational series.

Roughly speaking, a morphological derivational series is a set of lexemes analogically formed on the same pattern. A more accurate characterization has been given in section 2 (cf. (3)). Derivational series reflect the entrenchment of derivational patterns in the existing lexicon. Series and sub-series of word-forms / lexemes play a crucial role in the selection of morphophonological stems in derivation. Capitalizing on Plénat and Roché (2014), this point can be illustrated by the French names of status in *-at,* a sample of which is given in (4).

(4) VIZIR 'vizier' / VIZIR-AT 'status of vizier' = MARQUIS 'marquis' / MARQUIS-AT 'status of marquis' = MARÉCHAL 'marshal' / MARÉCHAL-AT 'status of marshal' = VOIVODE 'voivod' / VOIVOD-AT 'status of voivod', etc.

For lexemes ending in [ɑ̃], whose spelling is either *-ent*, *-ant*, or *-an*, two series are observed:

(5) a. PARENT 'parent' / PARENT-AT 'status of parent' = RÉGENT 'regent' / RÉGENTAT 'status of regent' = ASSISTANT 'assistant' / ASSISTANT-AT 'status of assistant', etc. (series A)
b. SULTAN 'sultan' / SULTAN-AT 'status of sultan' = KHAN 'khan' / KHAN-AT 'status of khan' = ARTISAN 'craftsman' / ARTISAN-AT 'crafstmanship', etc. (series B)

If the base N follows pattern (5a), its morphological derivational family generally contains units complying with patterns of type (6), where a /t/ that is not pronounced when the noun is used in isolation obligatorily appears at the end of the stem of the derived noun.

(6) PARENT 'parent' // PARENTÈLE 'relatives' / PARENTAILLE 'the whole relatives' / PARENTÉ 'kinship' / PARENTAL 'parental' / APPARENTER 'to relate'
RÉGENT 'regent' // RÉGENTER 'to regulate' / RÉGENTEUR 'regulator'

In addition to its occurrence in pattern (5a) ASSISTANT much more frequently occurs in pattern (5b), illustrated anew in (7), as shown by the number of Google hits (accessed 9.2017): ASSISTANTAT = 120, ASSISTANAT = 742,000.

(7) ASSISTANT 'assistant' / ASSISTAN-AT 'status of assistant' = FIGURANT 'extra, bit player' / FIGURAN-AT 'status of bit player' = POSTULANT 'applicant' / POSTULANAT 'status of applicant', etc.

The reasons why assistant shifted for pattern (5b) and became a leading-word for this pattern will be explained in a moment. Beforehand, we need to examine more accurately how French derived nouns of status are differentiated on the basis of regular patterns and series.

The (sub-)series that the (sub-)patterns are abstracted away from are lists of pairs of lexemes showing a recurrent correlation between their form, their meaning and their syntactic category. Insofar as the innovation illustrated in (7) confines itself to morphophonology, it is worth recasting the patterns in question focusing on the phonological information only to see better what is at stake.[7]

(8) a. Series A. Xɑ̃ ↔ Xɑ̃ta, e.g. *parent* 'parent' / *parentat* 'status of parent'
b. Series B. Xɑ̃ ↔ Xana, e.g. *sultan* 'sultan' / *sultanat* 'status of sultan'

The point is that knowing that the phonology of a noun ends in /Xɑ̃/ does not allow one to predict what the phonological form of the corresponding N of status will be. Both patterns (8) can apply. What we need in addition is to know whether the N in question enters the list of

[6] In this section I focus on morphological derivational series. In section 5, lexical derivational series will be dealt with as well.
[7] Series (5), (6), or their corresponding patterns, can be considered as morphophonological sub-series (sub-patterns) expressing the various ways the phonology of the derived nouns of status in French may be realized.

lexemes satisfying pattern (9a) or (9b).

(9) a. Series C. Xɑ̃ ↔ Xɑ̃tV, e.g. *arpent* 'acre' / *arpenter* 'to stride along'
b. Series D. Xɑ̃ ↔ Xan, e.g. *sultan* 'sultan' / *sultane* 'sultan's wife'

Pattern (9a) is widespread and subsumes cases where a noun ending in /ɑ̃/ can be correlated with a lexeme constructed on the same stem to which a /t/ has been added (cf. (6) above).[8] Lexemes such as *arpent*, *tourment* 'torment', *parent*, etc. satisfy this condition. Consequently, *parent* belongs to series A and the corresponding N of status will be *parentat*, as shown in (5a). Pattern (9b), on the other hand, correlates a nasal vowel with a string /Vn/ where V is the corresponding oral vowel. Several nasal / oral correlations of this type are embedded in morphological derivational patterns that express a gender shift: the N with the nasal vowel denotes a male human, whereas the N ending in /Vn/ denotes its female counterpart (I refer to Roché (1994) for a thorough investigation of the phenomenon). Lexemes such as *sultan* / *sultane*, *artisan* 'craftsman' / *artisane* 'female craftsman', *courtisan* 'courtier' / *courtisane* 'female courtier', etc. fit into this pattern and therefore belong to series B with respect to the derived nouns of status. Hence *sultanat* and *artisanat*.[9]

The case that has just been discussed somehow reminds us of cases of joint predictiveness in inflectional morphology, where predicting the word-forms of a lexeme starting from one cell of a paradigm is difficult or even impossible, whereas taking into account two (or more) such cells greatly improves predictiveness (Bonami & Beniamine 2016). The two cases are different however. To make the comparison clearer, let us admit that paradigms are networks. In the case of inflection, the network's nodes correspond to the cells of the paradigm whereas, in the case of derivation, they correspond to the lexemes constituting the morphological derivational family of the lexeme in question. In the inflectional case, the prediction concerns a form that supposedly fills a given cell of paradigm 1, whereas in the derivational case, it concerns the extension of the family: which lexeme (for nouns of status in the present case) should be included in the morphological family in question? In the case of inflection, the (word-)form that you want to predict the existence of and the (word-)forms you have to inspect to achieve this goal belong to the same set of (word-)forms, namely the (union of all sets of) word-forms of the lexeme[10] (cf. section 1): the system which makes these forms exist qua signs is the morphosyntactic system relevant for the lexeme type in question e.g. the set of conjugational patterns relevant for a given verbal lexeme. In the case of derivation, the lexemes you have to inspect to predict whether a related lexeme actually belongs to the same morphological family does not belong to the same set of lexemes, because they are included in morphological derivational series which are different. For instance, *apparenter* is crucial for *parent* because it legitimates *parentat* and, in a parallel way, *sultane* is crucial for *sultan* because it legitimates *sultanat*. But *apparenter* and *sultane* belong respectively to morphological derivational series C and D, which are completely unlike each other, the former correlating nouns with verbs, while the latter correlates nouns with nouns. The morphological patterns that makes lexemes *apparenter* and *sultane* exist as signs are different systems, contrary to what we observed with inflection (and this obviously extends to *sultanat* and *parentat*). In conclusion, it can be claimed that the mere inspection of a set of forms is not enough to predict which lexeme can be a member of a morphological derivational family, because morphological series and morphological families are articulated in a way which has no counterpart in inflection.

Coming back to ASSISTANT, we see that the phonology of this lexeme fits both in series A and B, which leaves us with no clue as to the form of the corresponding noun of status. If we

[8] This /t/ is traditionally considered to be a 'latent consonant' in the literature. For a discussion of this phenomenon and existing accounts, see Bonami and Boyé (2005).
[9] *Courtisanat* is absent from the *TLFi* and FrWaC (French Web as a Corpus), although several examples are attested on the Web (10.2017) e.g. *le courtisanat des grands seigneurs* 'the courtiership of high lords', *courtisanat (obséquieux | culturel)* '(cultural | obsequious) fawning'.
[10] What Carstairs (1987) calls 'paradigm 2', which corresponds to the "complete (inflectional) morphological family" of Bonami and Strnadová (2018).

take into account other morphological derivational series that lexeme appears in, we see that neither C nor D can play a role: no verb or adjective can be derived from assistant e.g. **assistanter*, **assistantal*; more generally, nouns in *-ant* can hardly be used as a base for other complex lexemes.[11] As for the noun denoting its female counterpart, it is *assistante* and not **assistane* as D would predict. This noun follows derivational pattern (10), which is the only one that may involve nouns ending in *-ant*:

(10) Series E. Xɑ̃ ↔ Xɑ̃t, e.g. *commerçant* 'shopkeeper' / *commerçante* 'female shopkeeper'

Series E is more akin to series C than to series D, and consequently one would expect *assistant* to follow pattern A exclusively. This is not the case however, since *assistant* shifted to pattern (5b) viz. to derived nouns of status ending in *-anat*. The reason of this innovation probably stems from the strong dissimilatory constraints existing in French (Plénat 2015), which make speakers tend to avoid deriving sequence [Xtɑ̃ta] for these nouns.[12] Another reason is the fact that nouns modeled on pattern (5b) are quite numerous and some of them occur very frequently in discourse, whereas nouns in *-ent* denoting human beings with a status are few.[13]

Discussing the morphophonology of derived nouns of status has shown us that the continuation of derivational series requires to take into account elements and correlations external to the series. This conclusion is strengthened if we examine the role played by meaning in the construction of derivational series.

In the derivational series examined so far, the meaning correlated with the exponent was kept constant while the latter could be slightly altered (Type 1). In those that we will investigate now, the form is kept constant while the meaning changes (Type 2). Examples (11) illustrate the case at hand.

(11) a. *Parmi les différentes étapes de construction, celle de l'étaiement*$_1$ *fait partie des plus essentielles.* (Web)
'Among the various construction phases, underpinning is one of the most important'
b. *Réaliser le montage de l'étaiement*$_2$ *(...) d'un ouvrage d'art*. (Web)
'Mounting the shoring system (...) of a work of art'

The occurrences of *étaiement* in (11) belong to two distinct derivational series illustrated in (12) and (13) respectively.

(12) *étayer*$_1$ 'to underpin' / *étaiement*$_1$ 'underpinning', *rapiécer*$_1$ 'to patch' / *rapiécement*$_1$ 'action of patching', *renforcer*$_1$ 'to reinforce' / *renforcement*$_1$ 'reinforcement', etc

(13) *étayer*$_2$ 'to underpin' / *étaiement*$_2$ 'prop', *renforcer*$_2$ 'to reinforce' / *renforcement*$_2$ 'what reinforces', *rapiécer*$_2$ 'to patch' / *rapiécement*$_2$ 'patch', *affleurer* 'to show on the surface' / *affleurement* 'what shows on the surface', etc.

The fact that the two occurrences of *étaiement* in (11) are not members of the same derivational series cannot be deduced from the inspection of the forms themselves, contrary to what happens in inflectional paradigms. This deduction must be based on external evidence. In the present case, this evidence follows from the fact that the kinds of entities denoted by the two occurrences of *étaiement* are correlated with verbal lexemes that head two distinct constructions, expressing an eventive (14) and a stative (15) eventuality, and thereby denote an action and a

[11] These nouns have an ending which is non-distinct from that of present participle e.g. l*es membres assistant à la réunion* 'members attending the meeting'. Both adjectives *assistantiel* and *assistanciel* (2 and 20 attestations in FrWaC respectively) derive from *assistance* 'assistance'.

[12] Simplex nouns in [Xtɑ̃ta] do exist and raise no problem e.g. *attentat* 'assassination attempt, attack', *potentat* 'potentate'. See also Kerleroux (2007)

[13] Sorting 40 pages of the results provided by FrWaC (more than 1,316,000 occurrences), I found *adhérent* 'member', *agent* 'agent', *client* 'customer', *président* 'president', *sergent* 'sergeant', and *parent* 'parent'. Only the last one is correlated with a name of status in *-at*.

'means' (Fradin 2012) or 'effector' (Van Valin & Lapolla 1997) respectively. The relevant properties of the constructions are given in a broad outline in (14) and (15) and illustrated in (16).[14] Verbs in (13) corresponds to Kratzer (2000)'s causal statives and denote a Kimian state according to Maienborn (2005)'s and Rothmayr (2009)'s criteria.

(14) a. NP^0 étayer$_1$ NP^1 ($_{PP}$[avec NP^2])
b. $NP^0 = x$, $NP^1 = y$, $NP^2 = z$
c. **use**$(x,z,e^1) \wedge AGT(x) \wedge MNS(z) \wedge CAUSE(e^1,e^2) \wedge$ **underpin**$(z,y,e^2) \wedge PAT(y) \wedge CAUSE(e^2,s^3) \wedge$ **stronger**(y,s^3)

(15) a. NP^0 étayer$_2$ NP^1
b. $NP^0 = x$, $NP^1 = y$
c. **underpin**$(x,y,e^1) \wedge MNS(x) \wedge PAT(y) \wedge CAUSE(e^1,s^2) \wedge$ **stronger**(y,s^2)

(16) a. *Il faut étayer$_1$ votre balcon sans perdre de temps.* (Web)
'You must underpin your balcony without delay'
b. *Les quatre colonnes qui étayent$_2$ le toit du sanctuaire de Thoutmosis III, sont cannelées.* (Web)
'The four columns underpinning the roof of Thoutmosis III's sanctuary are fluted'

Standard tests used to discriminate the semantic nature of nominal referents (Godard & Jayez 1993, Huyghe 2011) corroborate that *étaiement* denotes an event in (11a) and a functional object or device in (11b).

To sum up about derivational series, it was shown that the forms of the units that make them up give us no clue as to how continue the series, because the relevant clues are external to them: they are provided by the constructions of the verbal lexeme the derived noun is correlated with. To that extent, the series themselves are useless to make predictions. As for constructions, they are syntactically projected in actual discourses or texts and constitute the material out of which the derivational series, and thereby the interpretation of derived lexemes, can be predicted. For that reason, the association of new meanings with morphological patterns can be deemed to be a discourse rooted process. Needless to say, procedures taking advantage of the distribution of words on large corpora or electronic resources to discriminate the semantic proximity between words should be of great interest to detect the appearance of new meanings (Onnis, et al. 2008, Baroni, et al. 2014).

5. DERIVATIONAL PARADIGMS

Morphological (and lexical) derivational families are linked with derivational series by the fact that lexemes which make them up belong to distinct derivational series. In some recent works (Štekauer 2014, 358, Roché 2017b, a), derivational paradigms have been conceived of as (subparts of) derivational families organized as networks with a fixed number of cells (or nodes) implicating one another. For instance, the network 'Action' would involve, in addition to the verbal cell, cells place-N, action-N, agent-N, and instrument-N (Roché 2017a). The network as a whole functions as a pattern and to that extent has a predictive power. But contrary to inflectional paradigms, "the individual members of these paradigms are not held together formally but semantically" (Štekauer 2014, 359). In brief, derivational paradigms are conceptually rooted, whereas inflectional paradigms are grammatically rooted. These 'paradigms' have a predictive power because once a member of the network is instantiated in a lexical derivational family, all other members of the network are expected to exist or be possible. The fact that this expectation is based on semantic instead of formal links has the advantage to

[14] Representations (14)-(15), where *e* = eventuality, are based on Koenig, et al. (2008). Subject NPs in (16b) do not denote an instrument because foregrounded NPs entail control, but instruments are deprived of control by definition, see Schlesinger (1989)'s Deliberation Condition; cf. the contrast between (a) *Sue wrote the letter with a fountain pen* and (b) **The fountain pen wrote the letter* compared with (c) *The fountain pen smudged the letter.*

allow extending the set of forms by choosing any cell/node of the network as the origin and to make licit incomplete networks of forms. There is no requirement that the units be pairwise morphologically correlated. This can be observed if we compare two lexical derivational families based on verbs that denote types of technical activities which are similar to a large extent and which both instantiate an 'Action' network designed with a slightly broader number of cells than the precedent one.[15] These families, which are based on French attested data, are the following: (i) *riveter* 'to rivet', *riveterie, rivetterie* 'rivet-factory' (place), *riveteur* 'riveter' (agent), *rivet* 'rivet' (means), *riveteuse* 'riveting machine' (instrument), *rivetage* 'action of riveting' (event), *rivetage* 'riveting technique' (process), *rivetage* 'riveting activity' (activity); (ii) *souder* 'to weld', *soudeur* 'welder' (agent), *soudeuse* 'welding machine' (instrument), *soudage*, *soudure* 'action of welding' (event), *soudage* 'welding technique' (process), *souderie*, *soudure* 'welding activity' (activity). Cells Place and Means are not instantiated in the derivational family based on verb *souder*, which illustrates the previously mentioned possibility of having gaps. But this possibility obviously weakens the predictive capacity of derivational paradigms.

These families also point out two phenomena that are common for paradigms in general. First, the fact that the same cell can be occupied by more than one form (actually a lexeme) e.g. *souderie*, *soudure* (activity) or *soudage*, *soudure* (event)' (multiple realization). Second, the fact that forms with the same suffix appear in different cells of the network, both within the same family e.g. *rivetage* (event) vs. *rivetage* (process), and across families e.g. *soud-erie* (activity) vs. *rivet-erie* (place). The important point is that to associate the lexemes of these families with the relevant meaning, and thereby assign them to distinct cells of the network, one must rely on (morphological) derivational series, insofar as these are based on external evidences, viz. linguistic contexts, that allow us to distinguish the various meanings. For instance, *soud-erie* (activity) patterns with *chapell-erie* 'headwear' because both occur in context (17a), whereas *rivet-erie* (place) patterns with *bijout-erie* 'jewelry shop', as (17b) shows (examples extracted from FrWaC).

(17) a. (…) *permettra d'acquérir les compétences nécessaires en (souderie | chapellerie)*
'(…) will allow one to acquire the required competence in (welding | headwear)'
b. *Les flammes ravagent la dernière (riveterie | bijouterie)*
'The fire ravages the last (rivet factory | jewelry shop)'

6. CONCLUSION

The coherence of prototypical paradigms, namely inflectional paradigms, is based on internal evidence carried by the very words that instantiate the paradigm. On the contrary, both the morphophonological and semantic coherence of a given derivational series come from external evidence, that are provided either by constructions or other derivational series. These derivational series allow us to discriminate the nodes (or cells) that constitute derivational paradigms and thereby the way the later are organized as conceptual and formal networks.

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[15] An event is an eventuality which happens in the world, an action an event involving an agent, and a process a sequence of techniques and/or methods that have to be carried out in order to achieve a given result. Cells Event and Process seem to be two faces of the same coin to the extent that the event in question is an instantiation of a type of process.

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