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Characterizing Derivational Paradigms

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1. Introduction

At the beginning of *The grammar of words*, Booij (2005: 8) characterizes the term *paradigm* very broadly as “a set of linguistic elements with a common property”, and goes on saying that “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”.¹ Even though I totally agree with Booij’s viewpoint, my characterization of paradigm will be slightly more restrictive insofar as I shall speak of *network* instead of *set* to the extent that the elements of a paradigm are related with one another, and networks can be defined in a way that allows us to make predictions. Actually, what for should we pay attention to paradigms if they would not help us to better predict the behavior of word classes? Such a predictive power is indeed expected to follow from an appropriate description of paradigms.

The first goal of this article is to recall the properties paradigms should abide in order to be predictive tools (§2). Usually tools have a domain of relevance within which their use is optimal. It is crucial to know what empirical conditions have to be satisfied for the notion of derivational paradigm to be efficiently employed and all the more so as the flimsiness of this notion is frequently pointed out. Otherwise it might be criticized or discarded for inappropriate reasons. Delimitating the domain of relevance of the notion of derivational paradigm is the second issue addressed here (§3). Taking advantage of the properties that have been regularly associated with derivational paradigms in the literature (Bauer, 1997; Štekauer, 2014), the conceptual organization of derivational paradigms is the next issue that will be addressed (§4). Since it is important to root discussions in empirical data, I will discuss recent proposals that argue for distinguishing several types of derivational paradigms (Roché, 2017a; Roché, 2017b). Although it focusses on French, the discussion’s outcome is relevant for other languages as well, where similar data can be observed (§5). A conclusion will sum up the main ideas of the article and raise a few questions for the future (§6).

2. Properties of paradigms

Paradigms will be viewed here as networks of morphologically related words. Morphological relatedness is defined as follows by Bonami and Strnadová (2018).

Two words w and w' are morphologically related if and only if there exists a nontrivial content relation R_c relating the two words (...) and there exists a non-

¹ I would like to thank Fiammetta Namer and Fabio Montermini for their relevant remarks and insightful comments about a first version of this paper.

trivial form relation R_f relating the two words (...) and there are multiple pairs of words related by that same pairing of content relation and form relation.

Although differences between derivational and inflectional paradigms is a much emphasized topic, it seems fruitful to focus on what these notions have in common instead on what distinguishes them. Bonami and Strnadová (2018) shows that derivational paradigms share all the properties exhibited by inflectional paradigms: suppletion, defectiveness, heteroclisis, overabundance, etc., and that a quantitative approach to predictiveness works for both types of paradigms. This leads them to adopt an extended view of this notion, according to which a paradigm is a collection of morphological families structured by the same system of oppositions of content. More formally:

A morphological family is a tuple $F = (w_1, \dots, w_n)$ of words such as any member w_i of the family is morphologically related to any other member w_j (Bonami and Strnadová, 2018).

The content may be morphosyntactic or morphosemantic. In the first case, we have an inflectional paradigm, in the second a derivational paradigm. If we adopt an implicative view of morphology (Blevins, 2006; Blevins, 2016), paradigms are networks constituted of implications between the pairs of word-forms which structure these networks. The case of inflection is illustrated by a fragment of the Russian nominal declension (Annex, Fig. 1), where the word-forms corresponding to lexemes *IZBA* 'izba', *LICO* 'face' and *LES* 'forest' are contrasted in the dimensions of CASE and NUMBER.² The forms in question are correlated by content relations such as: 'x is the ACC.SG word-form corresponding to the NOM.PL word-form y', 'x is the ACC.PL word-form corresponding to the ACC.SG word-form y', etc., that structure the paradigm. The case of derivation is illustrated by families of words correlated by relations such as 'x denotes the set of individuals acting as agent in events like those denoted by verb y', 'x denotes a set of individuals that have the property to be potential patient in the event denoted by verb y', etc. These relations, which are captured by the tags Agent_N, Action_N, ADJ in Fig. 2 of the Annex, are typical of the content relations associated with morphological derivational patterns.

In the implicative perspective, establishing what the form in cell C_k can be, knowing what the form in cell C_i is (conditional entropy of cell C_k given C_i is known) becomes one of the main goals of studies.³ Paradigms conceived of in this way have a predictive potential. They allow to express morphological regularities in a non-categorical way, through the application of the same statistical tools to both types of paradigm (quantitative approach. See Bonami and Strnadová (2018) for an illustration).

² The morphological families constituting the paradigm in question are partial (and so is the paradigm): "A morphological family F is COMPLETE if there exists no larger morphological family that contains all members of F . A morphological family is PARTIAL if it is not complete" (Bonami and Strnadová, 2018)(emphasis in the original).

³ Actually Bonami and Beniamine (2016) shows that the implicative entropy, which pays attention to the shape of the form filling a given paradigm's cell, is a more accurate predictor than conditional entropy. I refer to Bonami and Beniamine (2016) and Bonami and Strnadová (2018) for the definition and application of this concept.

Paradigms (networks) presented in Figures 1 and 2 show that alignment is a crucial property of paradigms:⁴ each word of a given morphological family must have a correlate in the other morphological families. Without alignment, no prediction can be made. Bonami and Strnadová (2018) defines alignment as follows:

Given two ordered pairs of morphologically related words (w_1, w_2) and (w_3, w_4) , we say that the two pairs are aligned if the same content relation holds between them: there is some content relation R_c such that $R_c(w_1, w_2)$ and $R_c(w_3, w_4)$. We call R_c the aligning relation.

Examples of alignment relations are given in (1). We see that *pliable* ‘folding’ has the same content relation with its base verb as *prédicible* ‘predictable’ does, even though the exponent of the relation is different. This exponent variation is observed in languages with distinct inflectional classes, such as Russian (cf. (1a)).

- (1) a. $R_{\text{NOM.SG-ACC.SG}}(\textit{izba}, \textit{izbu}), R_{\text{NOM.SG-ACC.SG}}(\textit{les}, \textit{les})$
 b. $R_{\text{V-AGT}}(\textit{plier}, \textit{plieur}), R_{\text{V-AGT}}(\textit{prédire}, \textit{prédicteur})$
 c. $R_{\text{NZN-A}}(\textit{pliage}, \textit{pliable}), R_{\text{NZN-A}}(\textit{prédiction}, \textit{prédicible})$

If alignment is crucial, what kind of content relationships may guarantee a sound alignment in derivational paradigms? This is one of the main issues that have to be tackled in the rest of this article. This issue will be addressed in §4, which investigates the organization of paradigms, and continued in §5 when I will discuss the existence of various types of derivational paradigms that have recently been distinguished in the literature. But before undertaking this task, we have to delimit the domain of relevance of the notion of derivational paradigm. This will be done in §3.

In the present section, it has been argued that it was justified and fruitful to deal with the derivational paradigms examined so far with the same tools as the ones employed with inflectional paradigms. This does not imply, however, that these two kinds of paradigms are equivalent. Some of their properties show that they have to be kept distinct. The first one is the fact that the elements are more tightly linked in inflectional paradigms than in derivational paradigms. This property has to do with morphological proximity’ (Hathout, 2011: 255), which is a scalar assessment of the morphological relationship defined above: “Two forms jointly sharing semantic and formal properties are morphologically proximate” and this proximity increases in proportion to the number of properties and their specificity. Think to the difference between a feature like CASE, which is specific to nouns, whose values may be quite numerous⁵ and primarily motivated by distinctions internal to the language itself (Sapir, 1921) e.g. ACC, and content ‘agent’ which may be associated, without any formal correlate, to many units in addition to derived nominals in *-eur*, for instance, agentive verbs or subject oriented adverbs e.g. *voluntarily* (Geuder, 2003).⁶ The second

⁴ The terms *paradigm* and *network* are conceptually equivalent here, even though their domain of reference is distinct (linguistics / graph theory). Nodes in networks correspond to cell in paradigms.

⁵ These values (e.g. ACC, DAT, INS, LOC, ALL, etc.) should not be confused with the semantic function they may have in actual contexts.

⁶ This echoes Bybee’s remarks according to which “the results of derivational processes usually have a few lexical counterparts, that is, lexical items in which the same combination of meanings are expressed monomorphologically [= lexematically]. For example, *sad* for *unhappy*, *pilot* for *flyer*” (Bybee 1985: 83).

property is the fact that, in inflectional paradigms, the content relations link elements that both belong to the word-form type; in derivational paradigms instead, the elements in question are of the lexeme type (Matthews, 1974). While the first property is generally satisfied, it may happen that the second be not, which has some consequence for the applicability of the notion of paradigm, as we will see now.

3. The domain of relevance of derivational paradigms

The distinction between content words (units) and grammatical words (units) has to be drawn for every language. Content words introduce discourse referents under the form of individuals, properties or eventualities and are used to make claims about the world. Grammatical words provide us with information about coding: the markers expressing syntactic functions, speech act properties, temporal deixis, quantification, etc. and their interaction (Mel'čuk, 1993, ch. 5).⁷ In isolating languages, both types of words are realized as independent units. Zwicky (1990) hypothesizes that inflection is the morphologization of grammatical information (Zwicky's conjecture). *Morphologization* means first, that some words may convey grammatical information and thereby change their shape in function of the nature of this information; and second, that this change occurs in a systematic way: the information is organized along dimensions associated with a range of values (e.g. NB: {SG, PL}), and these dimensions are relevant for all units of a given lexical category.⁸ Nominal declensions are a typical illustration of this case (cf. Fig. 1). Once one assumes Zwicky's conjecture, the domains of inflectional and derivational morphology become clearly distinct from a conceptual point of view, and this distinction is difficult to deny. The common view is that, conceptually, derivational morphology is used to build new items, which will enrich the lexicon in case they become lexicalized. Inflectional morphology, on the other hand, is syntax-dependent (at least for contextual inflection) and makes explicit the phonetic correlates of morphosyntactic content.

However, the way paradigms are organized qua semiotic systems does not reflect this clear-cut conceptual distinction. We already mentioned this lack of parallelism for fusional languages (Bauer, 1997; Bonami and Strnadová, 2018). At a higher level, various situations can be observed. Languages without inflectional morphology (isolating languages) may nonetheless have derivational paradigms provided they have derivational patterns. A case in point seems to be Vietnamese, if we rely on Panfilov et al. (2001), from which the following examples are borrowed.

(2) Prefixation (N~N)

| | | |
|-----------------|---|---------------------|
| <i>chín trị</i> | → | <i>nhà chín trị</i> |
| 'politics' | | 'politician' |
| <i>khoa học</i> | → | <i>nhà khoa học</i> |
| 'science' | | 'scientist' |

It must be noted that in Bybee's text *specificity* denotes the range of applicability of morphological patterns: "The greater specificity in derivational meaning restricts the applicability of derivational processes" (Bybee, 1985: 86).

⁷ The proposed distinction intersects with the traditional distinction between lexical vs. grammatical units. As Bickel and Zuñiga (2017: 165-167) underlines, the later distinction is far from clear-cut.

⁸ Carstairs-McCarthy (2010)'s account of the origin of inflection classes complements Zwicky's view.

- (3) Suffixation (N~V)
công nghiệp → *công nghiệp hóa*
 'industry' 'industrialize'
tự động → *tự động hóa*
 'automat' 'automatize'
- (4) Prefixation (A~V or V~V)
bẩn → *đánh bẩn*
 'dirty' 'pollute'
thức → *đánh thức*
 'wake' 'awake'
khổ → *làm khổ*
 'painful' 'torment'

The existence of larger paradigms depends on the existence of families built around units such as *chính trị* 'politics', *công nghiệp* 'industry', *tự động* 'automat', *thức* 'wake', etc. Except the fact that these paradigms are not morphological by construction, they would perfectly meet the alignment condition imposed on derivational paradigms.

Languages possessing an inflectional morphology may have paradigms similar to those mentioned in Fig. 1 and 2 or different: everything depends on the way these paradigms are organized as systems of signs. I limit myself here to presenting a case found in agglutinative languages.

The variety of sign systems depends on the way the sound / meaning relationship is settled in the language in question. Plungian (2001: 669) argues that the distinction between agglutinative and fusional languages involve three independent parameters: (a) the way in which inter-morpheme boundaries are handled within a word-form; (b) the extent to which non-phonologically conditioned variation of stem and grammatical markers is attested, and (c) the extent to which a symmetry between semantic and formal organization of grammatical markers is observed. The way these parameters combine is given in Table 1. Column 1 corresponds to maximally agglutinative languages, and 8 to maximally fusional languages.⁹

| Type | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--------------------------|---|---|---|---|---|---|---|---|
| (a) clear-cut boundaries | + | - | + | + | - | - | + | - |
| (b) one form only | + | + | - | + | - | + | - | - |
| (c) 1/1 correspondence | + | + | + | - | + | - | - | - |

Table 1. Distinction between agglutinative vs. fusional languages

According to Plungian, these parameters result from "the greater autonomy of morphemes in agglutinative languages", which make "agglutinative affixes [...] much closer to roots than non-agglutinative affixes as far as their phonological, morphological, syntactic and grammatical properties are concerned" (Plungian, 2001: 674). Rules combining units in agglutinative languages are then more syntactic than morphological i.e. more like rules that combine words. Several well-known properties

⁹ It should be kept in mind that a language may be agglutinative / fusional in one domain and not (or less so) in another.

of agglutinative languages follow from the syntactic autonomy of their markers. The one that interests us here is the fact that affixes with a semantic content may be adjoined immediately after grammatical markers, as shown in the following examples.

- (5) Dogon (Plungian, 2000: 184; Plungian, 2001: 675)
- a. *dɔŋɔ-dɛ*
 sell-PRS.HAB(3SG) 'he sells'
dɔŋɔ-dɛ-nɛ
 sell-PRS.HAB-AGT 'one who sells, seller'
- b. *wal-a be*
 cultivate-ANT be:PST(3SG) '(s)he had cultivated'
wal-a be-nɛ
 cultivate-ANT be:PST(3SG)-AGT 'an ex-farmer'

- (6) Rikbaktsa (Silva, 2011: 310-311)
- ka-kɔɔ-tʃi=ʒa*
 1POSS.SG-burn-PL=F.PL
 'those[female] who burned me'
ka-tʃi-hi-tʃa=bo *iktʃa* *∅-mi*
 3POSS.SG-smoke_dry=NF=ALL see 1SG-NPASS+AUX
 'I go and see my buccaneer'

In Rikbaktsa, the clitics *tʃa* 'non-feminine' and *ʒa* 'feminine plural' change the sentence into a nominal entity. In a parallel way, the Dogon agentive marker *nɛ*, *dɛ* transforms a sentence into an agent noun. Languages of this type (tend to) have no derivational morphology. Any sentence headed by an action verb can potentially be transformed into a definite description denoting the agent (patient, instrument, etc.) of the action: agent formation is not handled by a derivational process. In Rikbaktsa, the markers that trigger the relevant interpretation convey a meaning, which is not clearly morphosemantic.

Could units the meaning of which is 'seller' in Dogon or 'buccaneer' in Rikbaktsa appear in a network similar to the derivational networks / paradigms mentioned in §2? The answer seems to be negative if we stick to the definitions of morphological family and alignment given above. The problem is that one element of the relationship is not a word but a phrase or a sentence and, more generally, that this relationship is not between lexemes (the second property evoked in §2 is not respected). This case would not be in the realm of the notion of paradigm defined in §2. Nevertheless, a well-formed network based on alignment relations involving PRS.HAB(3SG) verbs and the forms denoting agents can be conceived of in the case of Dogon.

Transposition offers another, very common, example of markers completely encapsulated within an inflectional paradigm that create lexemes endowed with a distinct syntactic category e.g. participles, masdars (nominal non-finite form of a verb Mel'čuk (1994: 215-219)), etc. I refer to Haspelmath (1996), who drew the attention to this issue and Spencer (1999); Spencer (2013); Spencer (2018), who discusses transposition at length in many works. The more general problem these forms raise "is

that an inflected form unexpectedly participates in derivational processes” (Blevins, 2001: 215).¹⁰

4. The organization of derivational paradigms

If we agree that the semantic content between pairs of words constitutes the foundation of derivational paradigms (Štekauer, 2014), the question that comes to mind is: what is the nature of this semantic content? This section will try to give an answer to it.

4.1. Nature of the semantic content

Among the derivational paradigms that have been proposed in the literature, very few are rooted in purely lexical meaning (‘meaning-rooted’ for short). Such meaning implies that the relationship involves no information that would be syntactically relevant in the language in question. But what counts as ‘syntactically relevant’ is not easy to define and may vary from language to language; it is wiser to consider this notion as a cline. At first glance, paradigm schemes (7)-(9) seem to be good illustrations of what meaning-rooted paradigms are, even though one could quibble about the fact that the concept Agent may happen to be relevant for syntax while concept ‘plant_N’ may not (more on this below).

- (7) fruit_N, plant_N, place_N (Boyé and Schalchli, 2017)
pomme, pommier, pommeraie
‘apple, apple-tree, apple orchard’
- (8) V, male_AGT, female_AGT (Booij, 2002: 102)
wandel, wandelaar, wandelster
‘walk, walker(male), walker(female)’
- (9) proper_N, DA, supporter_N/DA, doctrine_N (Roché, 2007)
Proudhon, proudhonien, proudhoniste, proudhonisme
‘Proudhon, Proudhonian, Proudhonist, Proudhonism’

The important distinction here seems to be between derivational paradigms that are event-related and those that are not. Event-related paradigms tend to be organized around verbs or event denoting lexemes. This is the case in (8), where the gender dimension is cross-classified with that of agentivity. In (7), on the contrary, the paradigm scheme involves concepts that directly stem from basic properties of fruits, namely the fact that they are the natural product of plants (here apple-trees) and that they later grow in some specific places (an apple-orchard). This content can be captured through inference patterns such as those in (10), where LOC is the locative function which relates a figure and a ground specified by LOC(z).¹¹

¹⁰ Blevins shows that the way the common view distinguishes between inflection and derivation is erroneous, but discussing the changes he proposes, however important, would lead us too far afield.

¹¹ The value of LOC can be any of the locative relations denoting a stative ground e.g. inessive, adessive, superessive, subessive, etc. (cf. Kracht, 2002; Mel'čuk, 1994: 280-282). Spatial relationships are captured

- (10) a. **fruit**(x) $\Rightarrow \exists y[\mathbf{plant}(y) \wedge \mathbf{produce}(y,x,e)]$
 b. **plant**(x) $\Rightarrow \exists z[\mathbf{grow}(x,e) \wedge \mathbf{LOC}(e, \mathbf{LOC}(z))]$

On a par with (7), paradigm scheme (9) is not verb related, but unlike (7) the relations it involves are artifactual instead of being natural. Once we know that Proudhon was a philosopher, the fact that he had a doctrine and followers that support him and his doctrine is either expected or at least in the nature of things.¹² In a way parallel to (10), one might formulate inferences such as (11), the difference between the two being that while the truth of (10) is categorical, that of (11) is generally less than 100%.

- (11) a. **philosopher**(x) $\Rightarrow \exists y[\mathbf{doctrine}(y) \wedge \mathbf{teach}(x,y,e)]$
 b. **philosopher**(x) $\Rightarrow \exists y[\mathbf{follow}(y,x,e) \wedge \mathbf{people}(y)]$

On the basis of the above examples, it seems fair to claim that the more the element denoted by the pivot item of the paradigm (usually the origin) exhibits natural kind properties, the less the paradigm is event-related.

As shown in (8), (9) and (12) below, derivational paradigms often introduce concepts such as agent, instrument, action, etc. that cannot be characterized independently of the event they are part of. Their definition is holistic and involves parameters such as initial causation, control, performing actor, and so on. These parameters are ultimately settled through linguistic tests and criteria, which have been worked out for years in many studies (Cruse, 1973; DeLancey, 1985; Dowty, 1991; Koenig et al., 2008, just to mention a few; Van Valin and LaPolla, 1997). The grammatical incidence of each criterion vary from language to language (Mithun, 1991) and this is why it is more appropriate to consider the concepts in question as partly grammatically rooted instead of simply lexically rooted.

- (12) V, place_N, action_N, AGT_N, INS_N (Roché, 2017a)
semer, —, semailles, semeur, semoir
 'sow, —, sowing, sower, seed drill'

The first partial conclusion we can draw is that no pure semantic content can be observed in event-related paradigms. The semantic content the later involves is established on the basis of criteria, which are generally relevant to other domains of the grammar (e.g. pronoun selection, activity hierarchy, etc.).

4.2. Within vs. out of human reach

A closer inspection of event-related paradigms reveals that most of them are human-centered: their elements denote activities that are typically those that humans control, at least partly, or that benefit to them. This points towards the 'force dynamic approach' (Croft, 1991; Gärdenfors, 2000; Talmy, 2000), where an agent is the initiator

more accurately and efficiently by vector semantics (Gärdenfors, 2000; Gärdenfors, 2014; Zwarts and Winter, 2000). But introducing that framework is beyond the scope of this article.

¹² Scheme (9) includes denominal adjectives (DA), which have the same form as the noun. Forms ending in *-iste* have an axiological value and the N is basic, whereas for those in *-ien*, the adjective is basic.

and/or effector of the action that affects a patient, with the eventual help of an instrument. The force dynamic approach involves a ‘causal chaining’ and assumes that, cross-linguistically, typical verbs “reflect segment of causal structure, not any other kind of structure” (Croft, 1991: 191). This causal chaining seems to be supported by psycholinguistic experiments (Gärdenfors, 2014; Wolff, 2003; Wolff, 2007).¹³ Indeed, most derivational paradigms proposed in the literature involve either an agentive event e.g. ‘weld / welding’ or a functional artifact / substance e.g. ‘spade’ / ‘paint’ that requires an agent to be properly used. The discussion in §5 will shed more light on this point.

It is important to realize that human-centeredness has to be dissociated from force dynamics. Such a dissociation happens when the interaction with humans is not expressed through a specific verbal predicate, as is (generally) the case with causal chaining. Let us consider the case of animals. They can be grouped into three categories: (a) domestic animals, with which humans have mostly been having strong interactions for a long time; (b) wild animals with which humans are having in predatory interactions (hunting, fishing); (c) wild animals with which the human interaction is reduced or nonexistent. What we observe, is that the more the man interacts with an animal species, the finer-grained the distinction of various sub-types of individuals within the species is. These sub-types depend on distinctions useful to humans in their trade with the animals of the species in question. For instance, pets are usually sorted in function of their sex and age, and in livestock farming more distinctions operate: sex, age, reproductive capacity, finality, etc. (cf. Boyé and Schalchli, 2017). Each of these sub-types could be classified in the way illustrated in Table 2.

A classification like this one constitutes a paradigm since the same content relations link the elements of each family e.g. ‘x is the Male item corresponding to the Female item y’, ‘x is the Young item corresponding to the Species item y’, etc. However, it does not constitute a morphological paradigm for the following reasons:

| | Species | Male | Female | Young |
|-------|---------------|----------------|----------------|-----------------|
| DOG | <i>chien</i> | <i>chien</i> | <i>chienne</i> | <i>chiot</i> |
| CAT | <i>chat</i> | <i>chat</i> | <i>chatte</i> | <i>chaton</i> |
| GOAT | <i>chèvre</i> | <i>bouc</i> | <i>chèvre</i> | <i>chevreau</i> |
| HORSE | <i>cheval</i> | <i>cheval</i> | <i>jument</i> | <i>poulain</i> |
| COW | <i>vache</i> | <i>taureau</i> | <i>vache</i> | <i>veau</i> |

Table 2. Partial classification of pets and farm animals in French

(i) The elements in the cells either are independent simple lexemes e.g. *cheval* ‘horse’ / *jument* ‘mare’, or their formal link is not an exponent of a dedicated meaning, as the content relation requires and in contradistinction to what we observed in (7)-(9). It can be a diminutive exponent e.g. *chat-on*, *chevr-eau*, or take the shape of the feminine marker used in some conversions e.g. *chienn-e*, *chatt-e* (Roché, 2005).¹⁴

¹³ In their thorough survey of theories dealing with argument realization, Levin and Rappaport Hovav (2005) argue that the force dynamic approach better accounts for the data than others.

¹⁴ In Old French, *-eau* was a diminutive suffix used, among others, to form names of young animals e.g. *lionc-eau* lion-DIM, *fauconn-eau* hawk-DIM. This extension is common for diminutives (Jurafsky, 1996).

(ii) The concepts which structure the paradigm of Table 2 do not follow from basic properties of the animals listed in first column: it is impossible to postulate inferences on the model of (10), since they would be either meaningless e.g. **Species(x) ⇒ Young(x)** or uninformative e.g. **Species(x) ⇒ male(x) ∨ female(x)**. These concepts are not either abstract nodes in a larger scheme, as is the case with the force dynamic approach. They are rather imposed by the organization of the domain of activity (livestock farming, hunting, etc.), such as man designed it. This is all the more true as classifications become more specific whenever the activity in question requires more purpose-oriented distinctions. The classification given in Table 2, and other more sophisticated ones, rather fall in the realm of semiotic analyses such as those that were proposed in the heydays of structural semantics (Lehrer, 1974; Pottier, 1963; Rastier, 1987). These approaches are better suited to account for them.¹⁵ As a rule, paradigms like those of Table 2 have little to do with derivational morphology, since the elements they involve are mostly, and sometimes exclusively, simple lexemes. The argumentation that has just been developed about domestic animals extends to wild animals interacting with humans.

Other animals, and natural kinds in general, are domains on which the man's grip is less strong or even inexistent. This offers the opportunity to reverse the perspective and examine which morphological possibilities exist for nouns denoting these kinds without worrying about human-centeredness. One striking fact about nouns denoting a (wild) natural kind is the reduced number of derived lexemes in comparison with the amount we observe for morphological families based on verbs or artifacts. For instance, whereas about 80 lexemes can be derived from Russian *zvenet'* 'to ring' / *zvon* 'ringing, chime',¹⁶ only 30 can be from *zver'* 'beast' (of which several are diminutives) (Tixonov, 1985). The same contrast is repeatedly observed for other families e.g. *suslik* 'gopher' (3), *caplja* 'heron' (1), *žuravl'* 'crane' (10 of which 4 are diminutives), *volk* 'wolf' (4), *voron* 'raven' (9 of which 3 evaluatives), vs. *bežat'* 'to run' (138; 153 with compounds), *maslo* 'butter, oil' (100, 148 with compounds). Even in French, derivational families based on artifacts are larger e.g. *balle₂* 'bale' (16) vs. *renard* 'fox' (4). The contrasts put to light here are not numerous enough to be conclusive, but they suggest a working hypothesis that deserves further investigation.

A cursory survey of the lexemes that can be derived from the nouns denoting a natural kind shows that the range of possible types of derived V and A seems to be fixed by the grammar of the language in question. For example, in Russian, nouns of this type are generally correlated with (a) the so-called possessive adjective (which modifies Ns denoting inalienable property) e.g. *lisa* 'fox' → *lisij* e.g. *lisij xvost* 'fox tail', *suslik* 'gopher' → *susličij*; (b) and a (set of) relational adjective(s), which have a wider range of meanings e.g. *suslik* → *suslikovyj*; *zver'* 'beast' → *zverskij* 'brutal', *medved'* 'bear' → *medvežatij* 'strong (as a bear)', *volk* 'wolf' → *volčinyj* 'intended to hunt wolf'. French has no possessive adjectives but has relational adjectives. The same holds for English, but with far fewer relational adjectives, since compounds fulfill their role. As for relational adjectives, in all examined languages their meaning involves a property,

¹⁵ See for instance Bonan Garrigues and Elie (1971), which analyzes the various denominations of riding animals in Old French. All distinctions but one that the authors postulate are purpose-oriented and specific to the semantic field in question.

¹⁶ The total figure of complex lexemes formed on *zvon* / *zvenet'* reaches 92, if compounds are included (Tixonov, 1985: 364-365).

real or invented, associated with the referent of the base noun (shape, color, behavior, etc. cf. Fradin (2017a)) cf. Russian *zverskij*, *medvežatyj*; French *chenille* ‘caterpillar’ → *chenillé* ‘whose aspect resembles a caterpillar’, *héron* ‘heron’ → *héronné* ‘that looks like a heron’. As for verbs, both Russian and French build verbs whose meaning expresses a property associated with the referent of the base noun e.g. Russian *zveret’* (ipf) / *ozveret’* (pf) ‘behave in a bestial way’ (← *zver’* ‘beast’), *lisit’* ‘flatter’ (← *lisa* ‘fox’), *zmeit’sja* ‘meander’ (← *zmeja* ‘snake’); French *se lézarder* ‘to crack’ (← *lézard* ‘lizard’) *mur lézardé* ‘crannied wall’, *singer* ‘to fake, to feign’ (← *singe* ‘monkey’), *moucheter* ‘speckle (a fabric)’ (← *mouche* ‘fly’), *serpenter* ‘meander’ (← *serpent* ‘snake’). But unlike Russian, French can easily form verbs, generally based on the young animal’s name, to express the meaning ‘give birth (to a young of kind X)’ e.g. *chatonner* / *chaton* ‘kitten’, *agneler* / *agneau* ‘lamb’, *faonner* / *faon* ‘fawn’, *vêler* / *veau* ‘veal’. The (un)availability of such derivational patterns is entrenched in the grammar of the languages in question, which means that the meaning they convey can be impossible to express derivationally in other languages. This is the first point. But as we saw above, the situation is different with verbs derived from nouns denoting animal species, since the nature of the content relation attached to each derivational pattern seems to depend on the properties attributed to the base noun’s referent (as was the case in (7)). This contrasts with derived lexemes whose meaning implies that the activity they describe is human-centered, as is the case with the French derivational pattern <wild animal X> ↔ <hunter of X> e.g. *loup* ‘wolf’ ~ *louvétier* ‘wolf hunter’, *loutre* ‘otter’ ~ *loutrier* ‘otter hunter’, etc. This is the second point. The third and most important one is that the non-human-centered morphological families derived from natural kind nouns cannot easily be stacked to form paradigms, because no alignment relations hold between the elements that constitute them. For instance, each pair of the following collection exhibits a distinct content relation and the first two seem to be specific to the pairs in question: *serpent* / *serpenter* ‘to meander’, *mouche* / *moucheter* ‘to speckle’, *agneau* / *agneler* ‘to lamb’, *héron* / *héronner* ‘to hunt heron’, *singe* / *singer* ‘to fake’.¹⁷ More work is needed to see whether generalizations can be established.

4.3. Three types of content relations

Two sources that feed content relations have been identified up to now: event-rooted schemes and properties associated with the entity denoted by the base noun. Developing an idea sketched above, I would like to suggest that derivational paradigms imposed by the grammar constitute a third source of content relations. Some well-entrenched morphological patterns that correlate various types of lexemes offer correlations available in the language in question. These patterns indicate which nodes “pre-exist”, as it were, in derivational networks of languages (Kos, this volume, §5). Examples are given in (13) and (14) for Russian and English respectively. Four properties distinguish these patterns: their content is rather abstract and to a large extent instructional; they apply across the board; they are characteristic “of the word-

¹⁷ The situation looks like what we have with the series of derived English verbs in *-ize* (Plag, 1998) e.g. *hospitalize*, *fossilize*, *satirize*, *ionize*, etc. (Štekauer, 2014: 358), where the semantic relationship between the base and the derived V varies. However, for natural kinds the meanings are less predictable and the series may be very small.

formation system of a language as a whole” (Štekauer, 2014: 363); their availability, in the sense of Bauer (2001), is great.

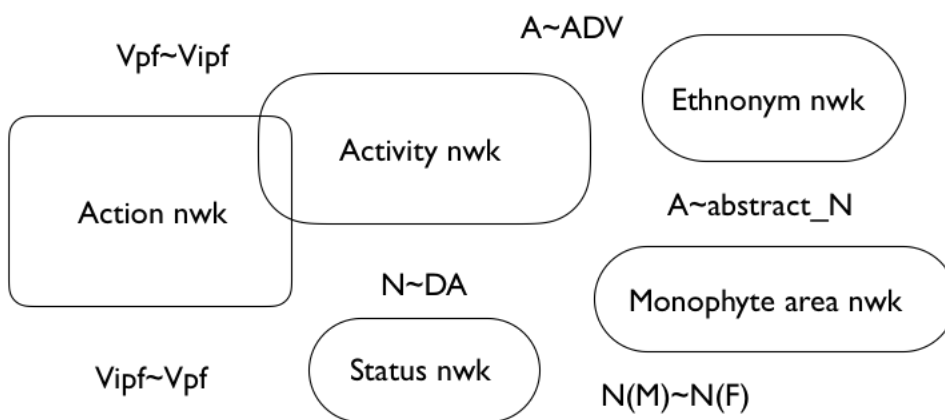
- | | | | |
|---------|--------------|-------------------------------|------------------------|
| (13) a. | A~Abstract_N | <i>zvonkij~zvonkost'</i> | 'sonorous, sonority' |
| b. | A~ADV | <i>zvonkij~zvonko</i> | 'sonorous, sonorously' |
| c. | N~DA | <i>zver' ~zverskij</i> | 'beast, brutal' |
| d. | Vipf~Vpf | <i>zvonit'~pozvonit'</i> | 'ring up' |
| e. | Vpf~Vipf | <i>vyzvonit' ~vyzvanivat'</i> | 'give a call' |
-
- | | | |
|---------|--------|--------------------------|
| (14) a. | A~ADV | <i>apt~aptly</i> |
| b. | V~Ving | <i>to match~matching</i> |

Actually, it would be more appropriate to conceive of the above patterns as meta-patterns inasmuch as most of them subsume particular, properly defined, derivational patterns. These meta-patterns are so central in the morphology of the language in question that speakers cannot avoid using them, much in the way compounding is central in German.

In fusional languages, the domain covered by inflectional paradigms is coextensive with lexical categories: conjugational paradigms concern verbs and differ from nominal declensions, etc. This is why inflectional paradigms are category-rooted. Derivational paradigms are semantically rooted instead. This means first, that they are semantically motivated as the preceding section tried to show; and second, that derivational paradigms, obviously, do not cover all items of a given category: derivational paradigms are like islands, even though overlaps between paradigms are possible (see §5).

A picture of the situation is given in Figure 3. The first type of paradigm corresponds to event-related networks, such as action and activity networks illustrated in (15) that will be discussed in detail in §5. Four examples of non-event-related networks are given in (16): the ethnonym network, the monophytic area network,¹⁸ the status network and the gender network (in Czech). Finally, the grammatically entrenched networks are illustrated by (13) and (14).

Figure 3. Paradigms' types



¹⁸ This network was dubbed “nom de lieu monophyte” i.e. name of place where one type of plant grows by Corbin (1987).

- (15) Action network: *dorer, dorure, doreur* 'gild, gilding, gilder'
 Activity network: *chapeau, chapellerie, chapelier* 'hat, hat making, hatter'
- (16) Ethnonym network: *Malaisie, Malaisien, malais* 'Malaysia, Malaysian, Malay'
 Monophytic area network: *houx, houssaie* 'holly, hollywood'
 Status network: *vizir, vizirat* 'vizier, status of vizier'
 Gender network: *biolog, bioložka* (ces) 'biologist(M), biologist(F)'

5. Discussion of existing proposals

I will mainly discuss the proposal made by Roché (2017a); Roché (2017b), according to which two varieties of paradigms are worth distinguishing, the 'action network' (*réseau action*) and the 'activity network' (*réseau activité*). These varieties will be discussed in turn in §§5.1 and 5.2. It must be clear that this discussion is undertaken less because I fully agree with Roché than because his proposal is rich enough to fuel an exchange that could contribute to clarify what derivational paradigms are.

I will confine myself to event-related paradigms and leave aside a variety of other paradigms discussed in the mentioned articles. Roché remains highly allusive about the way to distinguish the various nodes and to design the networks' structure. These issues constitute the core of the present section.

5.1. The conceptual foundations of the action network

Roché (2017a) contends that the verb is the pivot in the action network, both from the formal and semantic point of view. The schema he proposes to capture this idea is reproduced in (17) and some examples are provided in (18). In (18) the sequence of words begins with the V and then follows the second line of the table; a dash indicates a gap in the morphological family.

| | | | |
|---------|----------|---------|--------------|
| (17) | Verb | | |
| place_N | action_N | agent_N | instrument_N |

Action network, version 1

- (18) a. *laver; lavoir, lavage, laveur, laveuse*
 'to wash, wash-house, washing, washer, washing machine'
- b. *tondre; —, tonte, tondeur, tondeuse*
 'to shear, —, shearing, shearer, shears'
- c. *biner; —, binage, bineur, binette*
 'to hoe, —, hoeing, hoer, hoe'
- d. *souder; —, soudage, soudeur, —*
 'weld, —, welding, welder, —'

As illustrated in (18), many morphological families lack an item for the 'place' or 'instrument' nodes. On the other hand, others include lexemes that instantiate a 'result' or 'means' nodes. This seems to support introducing two additional nodes in the action network, as in (19). But examples (20) show that the more the network

includes nodes, the less there will be morphological families whose members will fit into all these nodes.

| | | | | | |
|---------|----------|-------|-------|-------|--------|
| (19) | | Verb | | | |
| place_N | action_N | agt_N | ins_N | mns_N | rslt_N |

Action network, version 2

- (20) a. *peindre; peinture₂, peindre, —, peinture₁, peinture₃*
 ‘to paint, painting₁, painter, —, paint, painting₂’
 b. *riveter; rivetage, riveteur, riveteuse, rivet, —*
 ‘to rivet, riveting, riveter, riveting machine, rivet, —’
 c. *paver; pavage, paveur, —, pavé, pavement*
 ‘to pave, paving, paver₁, —, paver₂, pavement’

Is there a principled way to fix the number of nodes of the action network and their nature? This is the main question we have to answer to now. Notice that what is at stake is the abstract structure of a sub-type of derivational paradigms, what Carstairs (1987) called Paradigm 1.¹⁹ Paradigm 1 conditions the predictive capacity of paradigms, since it determines which slots are available for a given paradigm (Štekauer, 2014: 361).

Insofar as the paradigms in question are event-related, the idea is to take advantage of the argument structure of the pivot verb to establish the nodes that belong to the network. If we agree that the pivot V denotes an event that involves a causal chaining, it follows that the V has an agent, a patient and, potentially, an instrument argument. Leaving aside the place_N for the moment, we see that the nodes constituting network (17) correspond to the possible arguments of the verb.²⁰

- (21) a. $\lambda x.\exists y\exists e[V(e) \wedge \text{AGT}(e,x) \wedge \text{PAT}(e,y)]$ agent
 b. $\lambda y.\exists x\exists e[V(e) \wedge \text{AGT}(e,x) \wedge \text{PAT}(e,y)]$ patient
 c. $\lambda z.\exists x\exists e_1e_2[V(e_1) \wedge \text{AGT}(e_1,x) \wedge \text{use}(e_2) \wedge \text{AGT}(e_2,x)$
 $\wedge \text{PAT}(e_2,z) \wedge \text{CAUSE}(e_2,e_1)]$ instrument
 d. $\lambda e.\exists x[V(e) \wedge \text{AGT}(e,x) \dots]$ action

In an event e involving both an agent and a patient, (21a) and (21b) respectively state that agent is argument x and patient argument y ; we can infer that e corresponds to an eventive event (not a state), since it includes an agentive argument. The criteria for agenthood and patienthood have been much debated in the past, but most people nowadays agree on the properties that characterize them: sentience, control, effectedness, initiator, autonomous existence, for agent; non-sentience, affectedness, incrementality, non-autonomous existence, for patient (Ackerman and Moore, 2001; Dowty, 1991; Fradin, 2005; Mithun, 1991; Van Valin and LaPolla, 1997). The semantic role assigned to verbal arguments depends on the verb that heads the construction they occur in (Beavers, 2008; Beavers, 2011, among others; Davis, 2001). The concepts

¹⁹ Carstairs’s complementary notion Paradigm 2 denotes the set of inflected forms (word-forms) that occupy the cells (nodes) of Paradigm 1.

²⁰ Argument structures given in (19), where e is the event argument, are couched in a neo-Davidsonian formalism (Carlson, 1998; Landman, 2000). Nothing crucial hinges on this choice.

of instrument and place mentioned in network (15) are more intricate.

According to Koenig et al. (2008: 180-181), one can ascertain that argument *z* is an instrument only if inferences (22) prove to be valid, for a given verb *V*. This test allows us to infer (23a), and thereby (23b-c), since 'pen' entails 'writing instrument'.

- (22) a. $XVY \Rightarrow XVY \text{ with } Z$
b. $XVY \text{ with } Z \not\Rightarrow X \text{ and } ZVY$ (comitative reading excluded)
c. $XV\text{-ed } Y \Rightarrow X \text{ used } Z \text{ to } V\text{inf}$
- (23) a. Jane wrote a letter \Rightarrow Jane wrote a letter with a <writing instrument>.
b. Jane wrote a letter with a pen $\not\Rightarrow$ Jane and a pen wrote a letter.²¹
c. Jane wrote a letter \Rightarrow Jane used a pen to write a letter.

Since typical instruments are objects, Fradin and Winterstein (2012) introduces condition (24) to set instruments apart from means. The referent of Ns governed by *with* in (25) will therefore be identified as means and not as instrument.

(24) REUSABILITY CONSTRAINT: An instrument is an object that must exist as a separate entity before and after it has been used (as an instrument).

- (25) They built the wall with bricks.
The cook flavored the sauce with oregano.

On the contrary, *microscope* in (26a) is arguably an instrument (examples (26) and (27) come from Davis (2001: 143)). As such, it cannot occur in subject position (cf. (26b)) because foregrounded NPs entail control, but instrument are by definition deprived of control (see Schlesinger, 1989's Deliberation Condition). However sophisticated instruments, which can function by themselves, do things humans cannot do and can even be endowed with control capacities, may occur in subject position, as illustrated in (27). Booij (1986) considers them 'quasi-agents'.

- (26) a. The researchers examined the specimen with a microscope.
b. *A microscope examined the specimen.
- (27) a. The researchers detected the earthquake with a seismograph.
b. The seismograph detected the earthquake.

In (27), the detector is the seismograph: without it, the researchers cannot detect anything (but they interpret the measurement). In other words, the seismograph is the performer. The situation is the reverse in (26): a microscope is unable to examine anything by itself (it cannot be the performer); the examiners are unquestionably the researchers. At this point, it is important to see how means arguments enter the picture.

A verbal argument is a means when its referent, by its mere existence or functioning, allows the event denoted by the verb to reach its term (telic event) or to

²¹ The inference works for comitatives (a) *Jane wrote the letter with Bob* \Rightarrow *Jane and Bob wrote the letter*.

continue its activity (unbound event). This is the case in (25a), since without the bricks the construction stops and without oregano the sauce lacks its flavor. But this is also the case in (28a), where a countable N is embedded in the PP[with]: since it is a heating device, the mere functioning of the stove keeps the room warm. In contradistinction to instruments, means of this type may occur as subject, as (28b) shows (cf. Fradin, 2012). This is linked with the fact that, in (28a), Bob is in no way the source of heat (even though he can control it, he is not the performer).

- (28) a. Bob heats his room with a wood-burning stove.
 b. A wood-burning stove heats his room.

Coming back to (21), we see that formula (21c) identifies verbal argument z as an instrument, provided that the agent of an event e_1 uses z (as a patient) and that this using event e_2 causes event e_1 to be achieved or to go on.²²

As for the node ‘place’ appearing in the action network, two distinctions have to be made. The first one is between verbs, which imply a spatial relationship and those, which do not. The second has to do with the argument that instantiates the figure in the spatial relationship. A sample of English and French verbs that imply a spatial relationship and thereby have a built-in locative structure is given in (29).

- (29) a. *to store / entreposer, to enter / entrer, to display / disposer, to shelter / protéger (de), to hide / cacher*
 b. *to stop / s'arrêter, to entwine / s'entortiller (autour de), to lie / reposer*

Verbs of each type are illustrated in (30a) and (30b) respectively. In (30a), the tea (figure) is located in the cupboard (ground) once the storing event has culminated. This is captured in (31a), which represents a first type of place, by the fact that the verb's patient argument instantiates the figure in the spatial relationship. In (30b), the whole event itself, i.e. the bus stopping, is the figure and it takes place at some place under the bridge (ground). The corresponding representation is (31b), where the figure argument is e . It says that z is the set of entities that have the property to be a ground where some event e takes place (s = state).

- (30) a. Elsa stores the tea in the cupboard.
Elsa entrepose le thé dans le placard.
 b. The bus stops under the bridge.
Le bus s'arrête sous le pont.

- (31) a. $\lambda z. \exists y \exists x \exists e \exists s [V(x, y, e) \wedge \text{LOC}(y, \text{LOC}(z), s)]$ store / entropôt
 b. $\lambda z. \exists x \exists e \exists s [V(x, \dots, e) \wedge \text{LOC}(e, \text{LOC}(z), s)]$ (bus)stop / arrêt

Action networks with a place_N corresponding to (31a) and (31b) respectively are given in (32).

²² Alternative formulation: ‘... makes event e_1 be achieved or go on’. Koenig et al. (2008) discusses in depth the notion of instrument but fails to distinguish it correctly from the ‘means’ notion.

- (32) Verb; place_N, action_N, agent_N, instrument_N
 a. *entreposer, entrepôt, entreposage, entreposeur, —*
 b. *s'arrêter, arrêt₂, arrêt₁, —, —*

However, the place node in the action network rarely corresponds to a built-in ground argument of the V, because verbs rarely imply a locative relationship (Fradin, 2017b). On the contrary, it is quite common to characterize a place by the type of event or activity, which takes place therein. This is all the more frequent as the activity in question is useful or socially valuable. Examples of this third type of place_N are provided in (33). Most instantiation of the 'place' node are of this type.

- (33) a. *laver; lavoir, lavage, laveur, —*
 'to wash, washhouse, washing, washer, —'
 b. *rôtir; rôtisserie, rôtissage, rôtisseur, rôtissoire*
 'to roast, rotisserie, roasting, seller of roast meat, roaster'

For the sake of completeness, a few remarks are in order about the verbs, which appear in networks. The term *verb* denotes two concepts: the morphological verb, defined by its inflectional paradigm; and the verbal lexeme, defined by the construction(s) that it heads (Fradin and Kerleroux, 2003). In (34), we have two verbal lexemes SOUDER₁ and SE SOUDER₂, but one morphological verb. What we are interested in for derivational paradigms is the verbal lexeme.

- (34) a. *L'ouvrier[AGT] a soudé le tuyau[PAT].*
 'The workman welded the pipe'
 b. *Les os[PAT] du crâne se soudent entre 9 et 18 mois.*
 'Cranial bones knit together between 9 and 18 months'

By construction, two verbal lexemes corresponding to the same morphological verb give rise to distinct morphological families (Fradin, 2018 (in press)). Therefore, their alignment possibilities are not equivalent. This is why SOUDER₂ cannot appear in the action network, contrary to SOUDER₁:

- (35) a. *souder₁; —, soudage, soudeur, —* 'to weld'
 b. *se souder₂; —, soudure, —, —* 'to fuse, be knit together'

5.2. The organization of the action network

The action network conceived of as a mere skeleton is too general to be useful. In what follows, a few suggestions are made to improve the situation.

Insofar as the V plays a central role, it would be wise to calibrate the number and nature of the cells appearing in the network in function of the constructions the V is associated with. We know that only verbs of creation are expected to have a result argument; that only verbs whose semantic representation includes a spatial relationship may have a place argument; that causative verbs of emotion, e.g. *befriend* have a result state but no instrument (Davis, 2001), etc. If verbal properties are

hierarchically represented (Koenig, 1999), a set of expected derivational networks could be associated at each relevant level in the hierarchy.

The social relevance of a denomination for a place, a type of action, an agent, etc. may also determine whether the corresponding nodes should be integrated in the action network. For instance, insofar as hiding is not a socially entrenched activity, there is no point to have an AGT_N node for *cache* ‘to hide’. The same holds for *peigner*₁, which denotes the action of ‘untangle or arrange the hair by drawing a comb through it’ (Online Oxford Dictionary of English), but not for *peigner*₂, which denotes the preparation of a natural substance (wool, hemp, cotton...) for manufacture with a comb.

- | | | | |
|------|----|--|--------------------|
| (36) | a. | <i>cache</i> ; <i>cache</i> ₂ , <i>cachage</i> , <i>cacheur</i> , — | ‘to hide’ |
| | b. | <i>peigner</i> ₁ ; <i>peignerie</i> , <i>peignage</i> , <i>peigneur</i> , <i>peigne</i> | ‘to comb’ |
| | c. | <i>peigner</i> ₂ ; <i>peignerie</i> , <i>peignage</i> , <i>peigneur</i> , <i>peigne</i> | ‘to card, to comb’ |

Instead of conceiving of derivational paradigms as rigid schemes, which have to be satisfied to become predicative tools, it would be more appropriate to see how controlled variation can be introduced into the picture. The action network could be devised as a cluster of networks, the core of which would be (37a), but which could aggregate or ignore various other nodes in function of the construction types allowed by the V (or the V type).

- | | | |
|------|----|---|
| (37) | a. | verb; action_N, agt_N, ins_N |
| | b. | verb; action_N, agt_N, ∅ |
| | c. | verb; place_N , action_N, agt_N, ins_N |
| | d. | verb; action_N, agt_N, ins_N, rslt_N |
| | e. | verb; action_N, agt_N, ins_N, pat_N |
| | | etc. |

In a complementary way, it seems crucial to have an idea of the number of derivational families that fit each network (for French, using *Démonette* (Hathout and Namer, 2014)) and of the frequency of their occurrences in corpora. Derivational paradigms can help to make inferences only if these figures are known.

5.3. The conceptual foundations of the activity network

The ‘activity network’ (*réseau activité*) is based on an activity noun, the corresponding verb (or verbal expression) being a secondary formation. For many activities, professional or for leisure, the (creation) verb does not even exist e.g. *pottery*₂ ‘craft of making pottery₁’. The activity noun somehow is more than the mere nominalization of an agentive verb, since it generally does not denote a process but “an accumulation of processes or the systematic repetition of the same process” (Roché, 2017a: §2.1.) cf. nouns such as *harvest*, *sailing*, *dance*. Whereas the action network puts to the fore a process and its participants, the activity network is motivated by the fact that human occupations are classified (or classifiable) in distinct types of activity. Activity networks involve human beings, generally agents, and objects (or substances) specifically linked

with the activity in question. The schema proposed by Roché (2017a) is reproduced in (38).

(38)

| | |
|------------|---------|
| Objet | |
| activity_N | human_N |
| activity_V | |

The activity network

The initial object or substance, when it exists, is what makes the activity possible e.g. paint for painting (39b) or what motivates it e.g. journal for journalism (39c). But for many activity networks, especially those that can be performed without any object correlate at the beginning (e.g. paint) or at the end (e.g. jewel), this initial object is absent.

- (39)
- | | | |
|----|--|------------|
| a. | —, <i>boxe, boxeur, faire de la boxe</i> | boxing |
| b. | <i>peinture₁, peinture₂, peintre, faire de la peinture</i> | painting |
| c. | <i>journal, journalisme, journaliste, faire du journalisme</i> | journalism |
| d. | <i>bijou, bijouterie₁, bijoutier, —</i> | jewelry |
| e. | <i>voilier, voile₂, —, faire de la voile₂</i> | sailing |
| f. | —, <i>judo, judoka, faire du judo</i> | judo |
| g. | <i>jardin, jardinage, jardinier, faire du jardinage</i> | gardening |

Roché does not pay much attention to the grammatical status of the activity nouns that appear in activity networks. He overlooked van de Velde (1997),²³ which convincingly shows that two types of activity nouns have to be distinguished. Those of the first category (Type I ActNs) denote an event, as attested by their possibility to appear as subjects of event predicates such as *se produire* ‘to take place’, *avoir lieu* ‘to happen’ e.g. *la promenade a eu lieu ce matin* ‘the walk took place in the morning’. The only property that makes them distinct from accomplishment nouns in Vendler’s classification is that they remain in the singular when they have a measure specifier, as illustrated in (40a). For nouns denoting spatially extended entities, this possibility is observed only for mass nouns (cf. (40b))(van de Velde, 1997: 372).

- (40)
- | | |
|----|---|
| a. | <i>deux heures de (promenade discussion)</i> ‘two hours of (walk discussion)’ |
| b. | <i>trois cents grammes de (pain sel)</i> ‘three hundred grams of (bread salt)’ |

Activity nouns of the second type (Type II ActNs) can also appear with a measure specifier, e.g. *deux heures de judo* ‘two hours of judo’, *trois ans de journalisme* ‘three years of journalism’, but unlike Type I they cannot be individualized as shown in (41a), which indicates that they can only be conceived of as atelic processes.

- (41)
- | | |
|----|--|
| a. | <i>une (promenade discussion) de deux heures</i> ‘a (walk discussion) of two hours’ |
|----|--|

²³ Van de Velde’s argumentation is based on French. But the distinction she draws seems so deeply rooted in the category noun that it probably exists in other languages as well. See also Huyghe (2011).

- b. **un (judo | journalisme | jardinage) de huit ans*
 ‘a (judo | journalism | gardening) of eight years’

In accordance with other mass nouns (cf. (42a)), Type II activity nouns take the so-called ‘partitive article’ (masculine *du*, feminine *de la*, plural *des*, cf. (42b)), while this possibility is out for Type I ActNs (cf. (42c)).

- (42) a. *Il a acheté (du beurre | de la confiture)*
 ‘He bought (butter | jam)’
 b. *Faire du (jardinage | judo) lui ferait du bien.*
 ‘Doing (gardening | judo) would be good for her’
 c. **Faire de la (promenade | discussion) lui ferait du bien.*
 ‘Doing (walk | discussion) would be good for her’

According to van de Velde (1997: 374), Type II ActNs “have all properties of non-countable nouns”. Even though both types without any doubt denote “activities, that is actions that proceed along the time axis in a homogenous way and do not have a necessary end” (“d’activités, c’est-à-dire d’actions se déroulant dans le temps de manière homogène, et sans comporter de terme nécessaire”), she claims that “types I and II represent two poles [...] which behave in opposite ways for what regards the manner that the nominalized activity is completed [...] Type I groups together activities directed toward an end. [...] On the contrary, activity nouns of type II denote a homogenous and continuous type of action without any other finality than itself.” (“les types I et II représentent deux pôles [...] Le type I regroupe les activités orientés vers une fin. [...] A l’opposé, les noms d’activité de type II dénotent un type d’action homogène et continu qui n’a plus d’autre finalité que soi-même”)(van de Velde, 1997: 375-376, my translation BF). In (40a), *promenade* and *discussion* are viewed as uncountable nouns. In (41a), they are viewed as countable nouns. But (41a) is possible because the end happened, because a limit has been reached. Expressions (41b) are impossible because the activity remains unaccomplished, but unlike actions called ‘accomplishment’, it can stay unaccomplished without stopping being what it is (van de Velde, 1997: 375-376). Van de Velde sorts out two important properties of Type II activity nouns. The first is the specific syntactic structures (43) that they occur in (*faire* ‘to do’, *jouer* ‘to play’, DEF = definite article).

- (43) a. *faire de DEF activity2_N faire du (jardinage | piano)* ‘do gardening’
 b. *jouer à DEF activity2_N jouer au bridge* ‘play bridge’

These structures are the only way to predicate the activity of the agent. The second is that a Type II activity noun cannot take a complement in the same way as the corresponding verb can, when it exists, because what we obtain is a new kind of activity predicate. Whereas in (44a) *à la gare* can be parsed as an allative complement of the manner of motion verb *courir*, it is not the case in (44b), even though *course* is the activity noun correlated with *courir*: *course à la gare* is interpreted as a type of race in the same way as, for instance, *course à pied* ‘running, footrace’, *course hippique* ‘horse race’, *course automobile* ‘car racing’, *course de haies* ‘hurdle race’, are. Since such a race does not exist and is difficult to think up, (44b) is utterly weird.

- (44) a. *Pierre a couru à la gare.*
 ‘Peter ran to the station’
 b. *?*Pierre fait de la course à la gare.*
 ‘Peter made running to the station’

This leads us to van de Velde’s main conclusion: constructions involving structures (43) allow one to create taxonomies in the domain of action, and they are the only ones to do so in French (van de Velde, 1997: 382-385). They offer us a way to classify activities.

As regards activity networks, these constructions imply that the person they are predicated of is an agent. For instance, while (45a) is sound, (45b) is impossible because *chuter* ‘to fall’ is an unaccusative verb. The patientive nature of its subject is inherited by *chute*. This clashes with the conditions imposed by the V *faire* ‘to do’, which requires an agentive subject. This is why activity nouns appearing in structures (43) imply that an agent is involved (whose degree of agentivity may vary cf. §4).

- (45) a. *Pierre fait du saut à ski.*
 ‘Peter is a ski-jumper’
 b. **Pierre fait de la chute.*
 ‘Peter (does falling | is a faller)’

From the preceding discussion, we conclude that the activity noun in activity networks corresponds to type II activity noun.

5.4. Distinguishing the two networks

The distinction between the two networks clearly appears whenever the same morphological family has to be split between the two. Examples (46)-(47) illustrate this case:

- (46) a. (object); activity_N, human_N, activity_V
 b. *parachute; parachutisme, parachutiste, faire du parachute* ‘skydiving’
- (47) a. V, action_N, agent_N, instrument_N
 b. *parachuter, parachutage, parachuteur, parachute* ‘to parachute’
 e.g. *parachuter des vivres* ‘parachute supplies’

Obviously, skydivers parachute nothing, except themselves, and a ‘parachuteur’ is a plane (*avion parachuteur*) or a man who makes a particular parachuting take place. This example shows that networks can overlap (here through *parachute*) and this certainly happens for other networks as well.

The more an activity is a long-established one, the more likely its morphological family will tend to instantiate some nodes through idiosyncratic terms. Fencing and rowing are cases at hand.²⁴

²⁴ In (48a), several weapons can instantiate the node ‘object’ in addition to *épée* ‘sword’, e.g. *fleuret* ‘foil’, *sabre* ‘sabre’. Such a situation is not peculiar to fencing (cf. *palet* ‘puck’ for hockey in (51)).

- (48) (object); activity_N, human_N, activity_V
 a. *épée; escrime, escrimeur, faire de l'escrime* 'fencing'
 b. *aviron₁; aviron₂, rameur, faire de l'aviron₂* 'rowing'

Note that *rameur* 'rower' appears in an action network in (49): one can row without doing that as a pastime or hobby.

- (49) a. V, action_N, agent_N, instrument_N
 b. *ramer, —, rameur, rame* 'to row'

To that extent, the existence of a phrasal activity verb with structure (41) is the touchstone of the activity network. Since **faire du sablage* is out, *sable* 'sand' can only occur as a means_N in an action network.

- (50) a. V, action_N, agent_N, instrument_N, means_N
 b. *sabler, sablage, sableur, sableuse, sable* 'to sand'

Activity networks contain no verbal lexeme with a structuring function, since the role of pivot is supported by the activity noun. However, the existence of a correlated verbal phrase appears to be the best criterion to assess whether a derivational paradigm belongs to the activity network type.

A major interest of activity networks lies in the fact that they integrate nouns morphologically marked as agent (cf. (51)), even though the source verb is missing: no inflected form of the verb *hockeyer* was found in Google (June 2018), which precludes us to admit that this verb exists.

- (51) (object); activity_N, human_N, activity_V
crosse; hockey, hockeyeur, jouer au hockey 'hockey'

Activity networks are one of the instances of the numerous noun-based derivational paradigms that exist (Roché, 2017b). Many of them are small, with two nodes only, as the 'monophytic_place network' e.g. *hêtre~hêtraie* 'beech, beechwood' mentioned in §4.

6. Conclusion

What motivated the present study was the issue of the predictive capacity of derivational paradigms in comparison with the corresponding capacity exhibited by inflectional paradigms. Respecting the alignment relation is a key condition for predicting what the form in a given cell can be, knowing the forms instantiating other cells. For this condition to be satisfied, content relations must be properly distinguished. This is why concepts 'instrument' vs. 'means', or 'action' vs. 'activity', or else 'activity' vs. 'place' must be accurately defined and used (§5.1.). In the same vein, it has been shown that it is the verbal lexeme that is relevant when a verb is involved as a base in a paradigm, not the morphological verb (cf. SOUDER₁ vs. SOUDER₂).

But the question of the predictive capacity makes sense only if the issue of the foundation of derivational paradigms themselves has got an answer. What arguments

can we provide to ascertain that a given network of nodes can be said to form a derivational paradigm (Paradigm 1, according to Carstairs (1987))?²⁵ And how can we show that this paradigm should be distinguished from other, sometimes very similar, paradigms? The gist of this article was an attempt to give preliminary answers to these questions. Needless to say, these answers remain very tentative. The main points of this article are the following:

(i) Several types of derivational paradigms exist and are articulated along two main distinctions: first, those that are event-related and those that are not; second, those that are human-centered and those that are not. Paradigms with the higher number of cells / nodes are those involving morphological families centered on human activities. They are also those that exhibit the higher number of members. In comparison, morphological families derived from nouns denoting natural kinds have fewer cells / nodes and the number of their members is (relatively) low. An inquiry into a larger set of data is needed before drawing any firm conclusion. Non-event-related paradigms are illustrated by morphological families that include names of location or of status.

(ii) Content relations may originate in three sources: event-rooted schemes that generally involve an agent, properties associated with the entity denoted by a paradigm's pivot noun, and finally highly available derivational meta-patterns that play a salient role in the grammar of the language in question e.g. adjective / noun of quality.

(iii) The action network and the activity network, introduced by Roché (2007a), indeed seem to correspond to distinct types of human-centered derivational paradigms. While the action network is rooted in the event denoted by a verb, the activity network rests on activity nouns that have properties of uncountable nouns and are used to classify (human) activities. Frequently, lexemes derived from the same origin belong to distinct morphological families and thereby should be attached to either one of these paradigms. At a more general level, however, the predictive value that can be associated with these two networks is weak, because the aligning relations cannot be settled once for all. The number and nature of the nodes slightly vary. Since this situation repeats itself with almost all derivational paradigms, it would be worth to see whether (more) stable networks cannot be established on the basis of activity domains or sub-domains, which amounts to take into account the social anchoring of these networks.

(iv) Derivational paradigms should not be conceived of as mere abstract schemes. To flesh them out, we must take advantage of the information attached to lexemes and give a more precise picture of the concepts constituting the dimensions along which families are aligned. The question of the number of cells / nodes a given type of derivational paradigm should have and of their nature is a very important one. In-depth qualitative and quantitative studies have to be undertaken to see better what the possibilities are.

(v) It is not completely clear whether the notion of paradigm defined as a network of implications can be applied to all types of languages without changing the nature of the entities linked by the Aligning relation.

²⁵ Kos (this volume) suggests that « the pre-existence of cells seems to be clearly manifested » by derivational relations belonging to Dokulil's modificational or transpositional onomasiological categories (Dokulil, 1994). However, the reasons why it is so are not given.

If the goal is to make derivational paradigms more efficient qua descriptive devices, we have to account for their variety in detail in order to see better how the general picture has to be devised. The understanding of the parts depends on the understanding of the whole, but the understanding of the whole cannot be clarified while ignoring the functioning of the parts. This is the dilemma we have to face. This explains why, often enough, we had to investigate deeply into the behavior of the words that constitute derivational paradigms. In a complementary way, an investigation of the types of derivational paradigms existing at the level of languages should be carried out: which types exist in a given language? How stable are they diachronically? How tight are the links between the cells / nodes of the paradigm? Answering these questions is crucial to improve the tools that will allow us to deal with the phenomena in question.

Abbreviations

| | |
|----------|---------------------|
| A | adjective |
| ACC | accusative |
| ADV | adverb |
| AGT, agt | agent |
| ALL | allative |
| ANT | anteriority |
| AUX | auxiliary |
| DA | denominal adjective |
| DAT | dative |
| F.PL | feminine plural |
| GEN | genitive |
| HAB | habitual |
| INS | instrument |
| LOC | locative function |
| MNS | means |
| N | noun |
| NB | number |
| NF | non-feminine |
| nwk | network |
| NOM | nominative |
| NPASS | non-passive |
| PL | plural |
| POSS | possessive |
| PRS | present |
| RSLT | result |
| PST | past |
| SG | singular |
| V | verb |
| Vipf | imperfective verb |
| Vpf | perfective verb |

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References

- ACKERMAN, FARRELL AND MOORE, JOHN. 2001. *Proto-properties and grammatical encoding. A Correspondence Theory of Argument Selection*. Stanford: CSLI.
- BAUER, LAURIE. 1997. Derivational Paradigms. *Yearbook of Morphology*, 243-56.
- . 2001. *Morphological productivity*. Cambridge: Cambridge University Press.
- BEAVERS, JOHN. 2008. Scalar complexity and the structure of events. *Event Structures in Linguistic Form and Interpretation*, ed. by Johannes Dölling, Tatjana Heyndeybatow and Martin Schäfer, 245-65. Berlin / New York: Mouton de Gruyter.
- . 2011. On Affectedness. *Natural Language & Linguistic Theory*, 29.335-70.
- BICKEL, BALTHASAR AND ZUÑIGA, FERNANDO. 2017. The 'word' in polysynthetic languages: phonological and syntactic challenges. *The Oxford Handbook of Polysynthesis*, ed. by Michael Fortescue, Marianne Mithun and Nichols Evans, 158-86. Oxford: Oxford University Press.
- BLEVINS, JAMES P. 2001. Paradigmatic derivation. *Transaction of the Philological Society*, 99.211-22.
- . 2006. Word-Based Morphology. *Journal of Linguistics*, 42.531-73.
- . 2016. *Word and Paradigm Morphology*. Oxford: Oxford University Press.
- BONAMI, OLIVIER AND BENIAMINE, SACHA. 2016. Joint predictiveness in inflectional paradigm. *Word Structure*, 9.156-82.
- BONAMI, OLIVIER AND STRNADOVÁ, JANA. 2018. *Paradigm structure and predicability in derivational morphology*. vol. 10. Morphology
- BONAN GARRIGUES, M. AND ELIE, J. 1971. Essai d'analyse sémique. *Cahiers de lexicologie*. 70-93.
- BOOIJ, GEERT. 1986. Form and meaning in morphology: the case of Dutch 'agent nouns'. *Linguistics*, 24.503-17.
- . 2002. *The Morphology of Dutch*. Oxford: Oxford University Press.
- . 2005. *The Grammar of Words*. Oxford: Oxford University Press.
- BOYÉ, GILLES AND SCHALCHLI, GAUVAIN. 2017. *Realistic Paradigm for Derivational Morphology*. ParadigMo 2017, First Workshop on Paradigmatic Word Formation Modeling, June 19-20 2017. Toulouse: CLLE, CNRS & University Toulouse Jean Jaurès
- BYBEE, JOAN L. 1985. *Morphology. A Study of the Relation between Meaning and Form*. Amsterdam: John Benjamins Publishing Company.
- CARLSON, GREG N. 1998. Thematic roles and the individuation of events. *Events and Grammar*, ed. by Susan Rothstein, 35-51. Dordrecht: Kluwer Academic Publishers.
- CARSTAIRS, ANDREW. 1987. *Allomorphy in Inflexion*. London: Croom Helm.
- CARSTAIRS-MCCARTHY, ANDREW. 2010. *The Evolution of Morphology*. Oxford: Oxford University Press.
- CORBIN, DANIELLE. 1987. *Morphologie dérivationnelle et structuration du lexique*. Lille: Presses Universitaires du Septentrion.
- CROFT, WILLIAM. 1991. *Syntactic Categories and Grammatical Relations: The Cognitive Organization of Information*. Chicago: The University Press of Chicago.
- CRUSE, ALAN D. 1973. Some thoughts on agentivity. *Journal of Linguistics*, 9.11-23.
- DAVIS, ANTHONY R. 2001. *Linking by Types in the Hierarchical Lexicon*. Stanford: CSLI.

- DELANCEY, SCOTT. 1985. Agentivity and Syntax. *Papers from the parasession on Causatives and Agentivity*, ed. by William H. Eilford, Paul D. Kroeber and Karen L. Peterson, 1-12. Chicago: CLS.
- DOKULIL, MILOŠ. 1994. The Prague School's theoretical and methodological contribution to « word formation » (derivology). *Cizojazyčné studie Miloše Dokulila. Obsah Výraz Význam 2*, ed. by Jarmila Panevová and Zdena Skoumalová, 179-210. Praha: Filozofická fakulta UK a Nadace Viléma Mathesia.
- DOWTY, DAVID R. 1991. Thematic proto-roles and argument selection. *Language*, 67.547-619.
- FRADIN, BERNARD. 2005. On a semantically grounded difference between derivation and compounding. *Morphology and its Demarcations*, ed. by Wolfgang U. Dressler, Dieter Kastovsky, Oskar E. Pfeiffer and Franz Rainer, 161-82. Amsterdam / Philadelphia: John Benjamins.
- . 2012. Les nominalisations et la lecture 'moyen'. *Lexique*, 20.129-56.
- . 2017a. The multifaceted nature of Denominal Adjectives. *Word Structure*, 10.27-53.
- . 2017b. *Deverbal nominalizations denoting places*. ISMO. First International Symposium of Morphology. December 13-15th 2017. Villeneuve d'Ascq: University of Lille
- . 2018 (in press). Competition in derivation: what can we learn from French doublets in *-age* and *-ment*? *Competition in Inflection and Word-Formation*, ed. by Franz Rainer, Francesco Gardani, Hans Christian Luschützky and Wolfgang U. Dressler, 67-93. Berlin: Springer.
- FRADIN, BERNARD AND KERLEROUX, FRANÇOISE. 2003. Troubles with lexemes. *Topics in Morphology. Selected papers from the Third Mediterranean Morphology Meeting (Barcelona, September 20-22, 2001)*, ed. by Geert Booij, Janet De Cesaris, Sergio Scalise and Angela Ralli, 177-96. Barcelona: IULA-Universitat Pompeu Fabra.
- FRADIN, BERNARD AND WINTERSTEIN, GRÉGOIRE. 2012. Tuning agentivity and instrumentality: deverbal nouns in *-oir* revisited. Paper presented at Décembrettes 8, Bordeaux.
- GÄRDENFORS, PATER. 2000. *Conceptual Spaces: The Geometry of Thought*. Cambridge, Mass.: The MIT Press.
- . 2014. *The Geometry of Meaning. Semantics Based on Conceptual Spaces*. Cambridge / London: The MIT Press.
- GEUDER, WILHELM. 2003. Agentive Adjectives and Adverbs. *Empirical Issues in Formal Syntax and Semantics 4 / Questions empiriques et formalisation en syntaxe et sémantique 4*, ed. by Claire Beyssade, Olivier Bonami, Patricia Cabredo Hofherr and Francis Corblin, 173-88. Paris: Presses de l'Université de Paris-Sorbonne.
- HASPELMATH, MARTIN. 1996. Word-class-changing inflection and morphological theory. *Yearbook of Morphology*.43-66.
- HATHOUT, NABIL. 2011. Une approche topologique de la construction des mots: propositions théoriques et application à la préfixation en *anti-*. *Des unités morphologiques au lexique*, ed. by Michel Roché, Gilles Boyé, Nabil Hathout, Stéphanie Lignon and Marc Plénat, 251-318. Paris: Hermès / Lavoisier.
- HATHOUT, NABIL AND NAMER, FIAMMETTA. 2014. Démonette, a French derivational morpho-semantic network. *Linguistic Issues in Language Technology*, 11.125—68.
- HUYGHE, RICHARD. 2011. (A)telicity and the mass-count distinction: the case of French activity nominalizations. *Recherches Linguistiques de Vincennes*.101-26.

- JURAFSKY, DANIEL. 1996. Universal tendencies in the semantics of the diminutive. *Language*, 72.533-78.
- KOENIG, JEAN-PIERRE. 1999. *Lexical Relations*. Stanford: CSLI.
- KOENIG, JEAN-PIERRE, MAUNER, GAIL, BIENVENUE, BRETON AND CONKLIN, KATHY. 2008. What with? The Anatomy of a (Proto)-Role [May 1, 2008]. *Journal of Semantics*, 25.175-220.
- KRACHT, MARCUS. 2002. On the Semantics of Locatives. *Linguistics and Philosophy*, 25.157-232.
- LANDMAN, FRED. 2000. *Events and Plurality*.vol. 76: Studies in Linguistics & Philosophy. Dordrecht / Boston / London: Kluwer Academic Publishers.
- LEHRER, ADRIENNE. 1974. *Semantic Fields and Lexical Structure*. Amsterdam: North Holland.
- LEVIN, BETH AND RAPPAPORT HOVAV, MALKA. 2005. *Argument Realization*. Cambridge: Cambridge University Press.
- MATTHEWS, PETER HUGOE. 1974. *Morphology*. Cambridge: Cambridge University Press.
- MEL'CUK, IGOR A. 1993. *Cours de morphologie générale. Première partie: le mot*.vol. 1. Montréal: Presses de l'Université de Montréal - CNRS Editions.
- MEL'CUK, IGOR A. 1994. *Cours de morphologie générale. Deuxième partie: significations morphologiques*.vol. 2. Montréal: Presses de l'Université de Montréal - CNRS Editions.
- MITHUN, MARIANNE. 1991. Active - agentive case marking and its motivations. *Language*, 67.510-46.
- PANFILOV, VALERIJ S., BAUMANN, HOLGER AND HASPELMATH, MARTIN. 2001. Vietnamesisch (Viet-Muong). *Morphologie Morphology. Ein internationales Handbuch zur Flexion und Wortbildung An International Handbook on Inflection and Word-Formation*, ed. by Geert Booij, Christian Lehmann, Joachim Mugdan and Stavros Skopeteas, 1545-54. Berlin / New York: Walter de Gruyter.
- PLAG, INGO. 1998. The polysemy of *-ize* derivatives. *Yearbook of Morphology 1997*, ed. by Geert Booij and Jaap van Marle, 219-42. Dordrecht: Kluwer Academic Publishers.
- PLUNGIAN, VLADIMIR A. 2000. Agentive nouns in Dogon. *Morphological Analysis in Comparison*, ed. by Wolfgang U. Dressler, Oskar E. Pfeiffer, Markus Pöchtrager and John R. Rennison, 179-90. Amsterdam / Philadelphia: John Benjamins.
- . 2001. Agglutination and flection. *Language Typology and Language Universals Sprachtypologie und sprachliche Universalien La typologie des langues et les universaux linguistiques*, ed. by Martin Haspelmath, Ekkehard König, Wulf Oesterreicher and Wolfgang Raible, 669-78. Berlin / New York: Walter de Gruyter.
- POTTIER, BERNARD. 1963. *Systématique des éléments de relation*. Paris: Klincksieck.
- RASTIER, FRANÇOIS. 1987. *Sémantique interprétative*. Paris: PUF.
- ROCHE, MICHEL. 2005. Sur une classe d'adjectifs par conversion. *Questions de classification en linguistique: méthodes et descriptions. Mélanges offerts au Professeur Christian Molinier*, ed. by Injoo Choi-Jonin, Myriam Bras, Anne Dagnac and Magali Rouquier, 319-43. Bern / Berlin: Peter Lang.
- . 2007. Logique lexicale et morphologique: La dérivation en *-isme*. *Selected Proceedings of the 5th Décembrettes. Morphology in Toulouse*, ed. by Fabio Montermini, Gilles Boyé and Nabil Hathout, 45-58. Somerville: Cascadilla Press.

- . 2017a. *Les familles dérivationnelles: comment ça marche?* Toulouse: Université Toulouse 2 Jean Jaurès
- . 2017b. *Un exemple de réseau constructionnel: ethnique, toponymes, gentilés.* Toulouse: Université Toulouse 2 Jean Jaurès
- SAPIR, EDWARD. 1921. *Language*. New York: Harcourt, Brace and Company.
- SCHLESINGER, I. M. 1989. Instruments as Agents: On the Nature of Semantic Relations. *Journal of Linguistics*, 25.189-210.
- SILVA, LEIA DE JESUS. 2011. Morphosyntaxe du rikbaktsa (Amazonie brésilienne), UFRL, Université Paris Diderot-Paris 7: Thèse de doctorat.
- SPENCER, ANDREW. 1999. Transposition and argument structure. *Yearbook of Morphology*.73-101.
- . 2013. *Lexical Relatedness. A Paradigm-based Model*. Oxford: Oxford University Press.
- . 2018. On lexical entries and lexical representations. *The lexeme in descriptive and theoretical morphology*, ed. by Olivier Bonami, Gilles Boyé, Georgette Dal, Hélène Giraudo and Fiammetta Namer, 277-301. Berlin: Language Science Press.
- ŠTEKAUER, PAVOL. 2014. Derivational paradigms. *The Oxford Handbook of Derivational Morphology*, ed. by Rochelle Lieber and Pavol Štekauer, 354-69. Oxford: Oxford University Press.
- TALMY, LEONARD. 2000. *Toward a Cognitive Semantics*.vol. 1. *Concept Structuring Systems*. Cambridge / London: The MIT Press.
- TIXONOV, ALEKSANDR NIKOLAEVIČ. 1985. *Slovoobrazovatel'nyj slovar' russkogo jazyka*. Moskva: Russkij Jazyk.
- VAN DE VELDE, DANIELE. 1997. Un dispositif linguistique propre à faire entrer certaines activités dans des taxinomies: **faire + du + nom d'activité**. *Revue de linguistique romane*, 62.369-95.
- VAN VALIN, ROBERT D. JR. AND LAPOLLA, RANDY J. 1997. *Syntax. Structure, meaning and function*. Cambridge: Cambridge University Press.
- WOLFF, PHILIP. 2003. Direct causation in the linguistic encoding and individuation of causal events. *Cognition*, 88.1-48.
- . 2007. Representing Causation. *Journal of Experimental Psychology: General*, 136.82-111.
- ZWARTS, JOOST AND WINTER, YOAD. 2000. Vector Space Semantics: A Model-Theoretic Analysis of Locative Prepositions [2000/04/01]. *Journal of Logic, Language and Information*, 9.169-211.
- ZWICKY, ARNOLD M. 1990. Inflectional morphology as a (sub)component of grammar. *Contemporary Morphology*, ed. by Wolfgang U. Dressler, Hans C. Luschützky, Oskar E. Pfeiffer and John R. Rennison, 217-36. Berlin / New York: Mouton de Gruyter.

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Figure 1. Inflectional paradigm

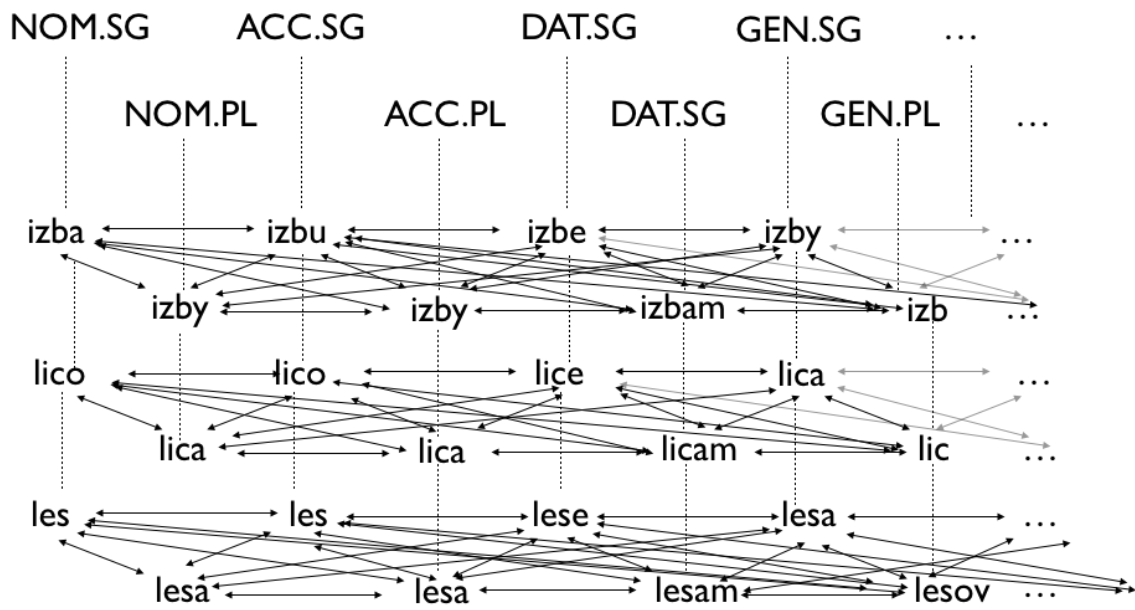


Figure 2. Derivational paradigm

