University of Kentucky
UKnowledge

Linguistics Faculty Publications | Linguistics

2010

Paradigmatic Realignment and Morphological Change: Diachronic Deponency in Network Morphology

Andrew R. Hippisley
University of Kentucky, andrew.hippisley@uky.edu

Follow this and additional works at: https://uknowledge.uky.edu/lin_facpub

Part of the Morphology Commons, and the Syntax Commons

Right click to open a feedback form in a new tab to let us know how this document benefits you.

Repository Citation

Hippisley, Andrew R., "Paradigmatic Realignment and Morphological Change: Diachronic Deponency in Network Morphology" (2010). *Linguistics Faculty Publications*. 67.
https://uknowledge.uky.edu/lin_facpub/67

This Book Chapter is brought to you for free and open access by the Linguistics at UKnowledge. It has been accepted for inclusion in Linguistics Faculty Publications by an authorized administrator of UKnowledge. For more information, please contact UKnowledge@lsv.uky.edu.

Paradigmatic Realignment and Morphological Change: Diachronic Deponency in Network Morphology

Digital Object Identifier (DOI)
https://doi.org/10.1075/cilt.310.06hip

Notes/Citation Information
Published in *Variation and Change in Morphology*. Franz Rainer, Wolfgang U. Dressler, Dieter Kastovsky, & Hans Christian Luschützky, (Eds.). p. 107-128.

© John Benjamins Publishing Company

The copyright holder has granted the permission for posting the book chapter here. The publisher, John Benjamins Publishing Company, should be contacted for permission to re-use or reprint the material in any form.

The document available for download is the authors' post-peer-review final draft of the chapter.

This book chapter is available at UKnowledge: https://uknowledge.uky.edu/lin_facpub/67

Paradigmatic Realignment and Morphological Change

Diachronic Deponency in Network Morphology[1]

ANDREW HIPPISLEY

University of Kentucky

A natural way of formally modeling language change is to adopt a procedural, dynamic approach that gets at the notion of emergence and decay. We argue that in the realm of morphological change, and notably the reorganization of a lexeme's paradigm, a model that at a given synchronic stage holds together both the actual facts about the paradigm as well as the range of potential or virtual facts that are licensed by the morphological machinery more elegantly captures the nature of the changing paradigm. We consider the special case of morphological mismatch where syntactic function is misaligned with morphological expression, Latin deponent verbs representing the classical example. Change in this area is essentially realignment of morphology with syntax. Our analysis of the history of deponent verbs as paradigmatic realignment assumes a separation between syntactic function and its morphological realization and is couched within the computable declarative framework of Network Morphology.

1 Introduction

We typically think of language change as procedural and dynamic: the Great Vowel Shift in English is analyzed as a change in one part of the phonological sub-system leading to another

change, which in turn leads to further changes, and so on. We want to propose that certain lexical changes, specifically changes that result in the reorganization of a lexeme's paradigm are better understood within a declarative framework, such as Network Morphology (NM), where historical facts have static representation. One kind of paradigmatic reorganization is what we term *paradigmatic realignment*, a diachronic situation that is preceded by a historically prior *misalignment.* These are cases where the set of morphosyntactic features furnishing terminal nodes in the syntax are realized by the morphological form not normally associated with that feature set at spell out. The morphological mismatch with syntax has been recently investigated in a range of contexts and languages (Baerman et al. 2007). Latin deponent verbs represent the classical case of mismatch or misalignment: *active* morphosyntax required by a particular syntactic construction gets the form normally associated with *passive* morphosyntax, as seen in (1) for *hortor* 'exhort' (example from Baerman et al. 2007: ix).

(1) me=que hort-antur ut magn-o anim-o sim

me.ACC=and exhort-3PL.PRESENT.**PASSIVE** that great-ABL.SG spirit-ABL.SG be-1SG.SBV

"and they exhort (=**ACTIVE**) me to be of good courage". Cicero *Epist. ad Atticum*, C1 BC

The history of deponents in Latin is regularization, essentially an undoing of the mismatch, or a realignment of the syntax with the morphology, as in (2) from Middle Latin.

(2) Episcop-us horta-batur a su-is

bishop- NOM.SG exhort-3.SG.PAST.**PASSIVE** by pronoun- PL.ABL

"The bishop was exhorted (=**PASSIVE**) by his men". *Henry II Chronicle*, C12 AD

We begin in §2 with the idea of lexical change as paradigmatic reorganization. The reorganization of a deponent's paradigm is special in that it involves a simple realignment of syntactic function with the pattern of exponence that expresses that function. In §3 we introduce

Network Morphology, a computable declarative framework for morphological analysis, together with one of its key assumptions, *separationism*. We show that separationism is crucial for an analysis of morphological mismatch, and in §4 we outline a recent extension of separationism, Stump's theory of paradigm linkage which has been used to capture deponency, showing how it is entailed by NM's partitioning of lexical knowledge into two major hierarchies. This prepares the ground for §5, our NM account of the history of Latin deponents. To demonstrate that change in this area is a genuine chronological development of the Latin language, we go beyond examples such as (2) from Middle Latin, as here we are dealing with a non-native language used for written exchange in Medieval Europe, and therefore subject to first language influence and sociolinguistic pressures.[2] Instead we deliberately restrict ourselves to Flobert's (1975) monumental survey of Latin spoken from the Republican Period (1st century BC), for example Cicero to Late Latin, up to the 8th century, for example the theological writings of Gregory of Tours.[3]

2 Paradigmatic reorganization

There are two ways of thinking about paradigmatic reorganization. First it is the stems of a paradigm which become phonologically uniform where previously there was a distinction. This is analogical leveling. Alternatively in analogical extension, reorganization involves the exponents. (For morphological analogy see for example Hock 1986: 167-279; Anderson 1992: 365-72; McMahon 1994: 70-96.) Phonological changes can cause distinctions to arise in the stem of different word forms in a lexeme's paradigm. To restore transparency between meaning and form one of the stems is taken as the model for all the stems. An example of this is the Russian word for 'eye' in Table 1, based on Chumakina, Hippisley and Corbett (2004). Reorganization is based on the (singular) *glaz-* stem.

@@insert Table 1 here

Equally we could have reorganization that involves the exponent and it is exponent-based reorganization that motivates the diachronic changes of Latin deponent paradigms. Recall that the Latin for 'encourage' is deponent, i.e. the active syntax requiring morphosyntactically active exponence is instead realized by the pattern of passive exponence that is general in the language. From (1) in §1 we see that purely from a syntactic view point *hortor* is unproblematic: it has a valency of two, requiring a subject NP and an object NP, and when in an active construction these grammatical relations requirements are satisfied. The subject NP is a third person plural *pro* which controls *hortor*'s subject agreement, and the object NP is the personal pronoun *me* which is accusative marked as expected (as with all transitives in Latin, *hortor* governs accusative case). The anomalous behavior does not lie in its syntactic configurational properties, but in its pattern of morphological exponence. We can say that whereas the general pattern in the language is $-\alpha$ for ACTIVE, *hortor* uses $-\beta$. We will see that this distinction between *syntactic* regularity and *morphological* irregularity is an important one for our analysis. Moreover, the $-\beta$ pattern which *hortor* uses coincides with the general pattern of passive exponence. Table 2 schematizes *hortor*'s anomalous / disorganized paradigm.

@@insert Table 2 here

Most lexemes have a pattern of exponence such that $-\alpha$ is used for ACTIVE syntax and $-\beta$ for passive syntax. But the lexeme HORTOR upsets the general system by using a different pattern of exponence for ACTIVE syntax. At the same time this is the exact pattern used for PASSIVE syntax for other verbs, namely $-\beta$. It should be noted that *hortor*'s paradigm has the further level of disorganization of lacking morphology for passive syntax, i.e. it is defective. Table 3 shows what it would mean for *hortor* to undergo reorganization.

@@insert Table 3 here

Due to the nature of its disorganization, regularization is simply a question of realignment: passive exponence is 'realigned' to passive contexts, and active with active contexts. An important difference is that passive forms are available to realign with, but active forms are missing from a deponent's paradigm. Realignment presupposes something to realign with. We will argue that active forms are there in a deponent lexeme, but they serve a *virtual* existence, and are made 'real' through realignment. Just as the corollary of deponency is defectiveness, the corollary of realignment is a full paradigm, or 'recovery'. In (3) we see an example from Middle Latin pointing to at least a partially realigned *hortor*.[4]

(3) Petr-us horta-bat e-os de cruc-e

Peter- NOM.SG exhort-3.SG.PAST.ACTIVE pronoun- PL.ACC from cross- SG.ABL

"Peter exhorted them [speaking down] from the cross". *Gregorian chant*, C10 AD.

Here active syntax is no longer being expressed by passive morphology, but by active morphology. A fully realigned *hortor* would be a passive example where *hortor* shows passive exponence, an example of which we gave in (2) above.

The diachronic developments affecting deponent verbs in Latin can therefore be viewed as paradigmatic reorganization, and more specifically paradigmatic realignment. Our analysis will have to account for a number of the characteristics of paradigmatic realignment mentioned above. First, the fact that there is partial and full realignment. Presumably these must be separate diachronic stages which we will need to model. Second, the realignment itself. Our aim is to capture this as a resetting of a default whose overriding yielded deponency in the first place. And finally, and perhaps most importantly, we must somehow account for the fact regularization implies a 'new' active morphology used for active syntax. Where does the active sub-paradigm

come from? Is it a result of analogical extension? If so, what is the model of the analogy? There are a number of patterns of active exponence in Latin according to inflectional class. We need to ask why is precisely the pattern of Conjugation 1 that appears to act as the model for *hortor*. Our key to addressing these issues is to recognize a separation between requirements of syntax and requirements of morphology, in other words we need to place separationism at the centre of our account. This is the theme of the next section.

3 Network Morphology and separationism

Network Morphology situates morphological facts in a network of information sharing nodes; in this way it can capture the generalizations that can be made about morphology, while at the same time characterizing exceptionality. This is because facts are organized hierarchically, where daughter nodes inherit from their mothers. Generalizations are stated at upper nodes, and are inherited by lower nodes; exceptions are expressed as overrides, possible because the inheritance is by default (for a bibliography of work carried out in NM see Hippisley and Corbett 2007). A key element of Network Morphology is the encoding of what is known as separationism, namely the idea that function and form are in principle independent. The Separation Hypothesis (Beard 1995, Beard and Volpe 2005) is behind all approaches to morphology which assume that the information exchanged between morphology and syntax does not lie in the formal constituent structure of a complex word; rather a word's structure is the realization of a morphosyntactic feature set, and it is the word as a set of features which provides the interface between syntax and the lexicon, i.e. realization-inferential approaches (Stump 2001). A word's morphosyntactic representation and not its formal structure is "the only aspect of it that is visible to syntax" (Anderson 1992: 90). This amounts to a separation between a particular feature set σ_1 and its realization such that σ_1 can be realized in more than one way, as

for example in the affix rivalry that embodies inflectional classes. At the same time a single morphological operation can be associated with $\sigma_1, \sigma_2, \sigma_n$. And in fact a one:one mapping of the morphosyntactic feature set and its realization should be thought of as only a special case of the many:many mapping that properly characterizes the relation between syntactic function and morphological form (Spencer 2000: 327). Separationism is built into the architecture of Network Morphology, in the way that it distinguishes a lexemic hierarchy from a morphological hierarchy. Figure 1. is a NM account of Russian nominal morphology to serve as illustration of separationism.

@@insert Figure 1 here

Network Morphology defines a single network of interconnected but nonetheless distinct hierarchies of nodes. From Figure 1 we see that the central hierarchy, the one from which lexical entries inherit, is the Lexemic Hierarchy. To capture morphological realization, we situate a distinct morphological hierarchy orthogonal to the lexemic hierarchy. The two hierarchies express two types of generalization we want to make: morphosyntactic generalizations, captured by the lexemic hierarchy, and strictly morphological / realization generalizations captured by the morphological hierarchy. Gender assignment is a good example of a generalization situated in the lexemic hierarchy. Russian marks gender agreement on adjectives and verbs. The default is that syntactic gender is dependent upon semantic gender, such that male nouns are masculine and female nouns are feminine (see Fraser & Corbett 1995). An example of morphological generalization, on the other hand, is that the locative singular exponent is *–e*. Though there are four (productive) morphological classes for nouns, three of them share the same realization for the feature set {LOC, SG}. The gender assignment fact and the locative realization fact are defaults for two different set of facts, therefore placed at the root (i.e. highest) nodes of two

different hierarchies. One hierarchy captures generalizations about acquiring morphosyntactic features relevant to the syntax, and the other generalizations for the formal realization of feature sets.

4 Deponency and paradigm linkage in Network Morphology

While NM expresses a division between the organization of lexemic facts, such as gender for a lexeme, and the organization of strictly morphological facts, such as how to form a locative singular, it also allows for the two sets of facts to interact. The interaction between the lexemic hierarchy and morphological hierarchy is crucial to a lexeme's inheritance of its full set of grammatical words. In Figure 1 we see links to the Noun node in the lexemic hierarchy from the four inflectional class nodes in the morphological hierarchy. This represents the way in which morphological realization generalizations, such as the locative singular for a sub-class of nouns, are being used to provide facts for the lexemic hierarchy, specifically those facts about the form a lexeme will take in a given (morpho)syntactic context. Keeping facts about realization rules separate from facts about morphosyntax is in the spirit of paradigm linkage, proposed in a number of recent papers by Stump (Stump 2002; 2006; Stewart & Stump 2007). The idea is that a lexeme has two paradigms, only one of which is relevant to syntax. The *syntactic paradigm* contains the set of forms that are licensed by particular syntactic configurations, and which will be inserted into terminal nodes of phrase structure. The syntax is blind to the forms themselves, but sensitive to the morphosyntactic properties which they express. The second paradigm, the *morphological paradigm*, is a repository of the output of standard realization rules operating over the lexeme's stem, or stems, to build up the list of all pairings of morphosyntactic feature set and form for the given lexeme. Although a lexeme has two paradigms, the syntactic paradigm consults the morphological paradigm for all its values, rendering the two paradigms structurally

indistinguishable *in most cases*. The reason why both paradigms are not indistinguishable in *all* cases is that the manner of consultation, i.e. the manner of 'paradigm linkage', may be altered for some sub-class of lexemes, resulting in a separate syntactic and morphological paradigm. The other way of saying this is that the way you link the paradigms is not the same for every lexeme, but the same for very many lexemes so that it can be expressed as a generalization, or a default which can be overridden. The definition of paradigm linkage is given in (4).

(4) *Universal default rule of paradigm linkage*. Stump (2002, 2006).

Where R is L[exeme]'s root in language l, SPF ($<L, \sigma>$) = MPF ($<R, \sigma>$)

The definition is couched within the Paradigm Function Morphology (PFM) framework and basically says that there is a cell in a Lexeme's *syntactic* paradigm specified by a paradigm function (SPF) over the lexeme and a specific morphosyntactic feature set. There is also a cell in the same lexeme's *morphological* paradigm, specified by morphological paradigm functions (MPFs). This is a pairing of the same morphosyntactic property set with the lexeme's root (or stem). And importantly there is a direct link between the two cells belonging to the separate paradigms. It should be noted that in PFM the MPFs are realization rules, so that the cells in the morphological paradigm are outputs of realization rules. Finally, this linkage is described as a *default* rule, such that in theory you could have SPF ($<L, \sigma>$) = MPF($<R, \sigma'>$), where $\sigma \neq \sigma'$, an actual case of which is deponency (Stewart & Stump 2007: 393): active cells in the syntactic paradigm are not linked to active cells in the morphological paradigm, but instead to passive cells. So for Latin deponents the linkage is $<L$, {active...}$>$ = $<R$, {passive..}$>$.

Just as in paradigm linkage the morphological paradigm informs the syntactic paradigm, so in NM a lexeme's set of grammatical words is inherited from the lexemic hierarchy, which accesses spell out generalizations situated at nodes in the morphological hierarchy. The

consequence of all of this is that Network Morphology furnishes a lexeme with two sets of facts, one from the morphological hierarchy, its morphological paradigm equivalent, and one from the lexemic hierarchy, its syntactic paradigm equivalent. By default the two paradigms are the same, but this default can be overridden with interesting consequences. Figure 2 represents both the default situation and the situation where the default link between the two paradigms is overridden.

@@insert Figure 2 here

The figure shows that for most lexemes (Lexeme 1, Lexeme N) the syntactic paradigm containing the lexeme's morphosyntactic word forms is informed by a separate morphological paradigm. Reading from the bottom of the figure, the output of morphological realization rules instantiate a lexeme's morphological paradigm. In this example the active sub-paradigm is expressed by a pattern that modifies the root R with suffixation of -α, and the passive sub-paradigm with suffixation of -β. The values of these cells are passed up to the syntactic paradigm, ready for lexical insertion. Lexeme D represents a deponent lexeme. Looking from the bottom of the figure upwards, this lexeme is similar to other lexemes. Its active and passive morphological sub-paradigms hold the outputs of the same realization rules as for other lexemes, hence it shares the same pattern of exponence. The difference between Lexeme D and the other lexemes only emerges when we move up the system, as it were, where we see the morphological paradigm passing information from it passive sub-paradigm to the 'wrong' place in the syntactic paradigm, i.e. to the active sub-paradigm. At the same time nothing from its passive sub-paradigm is passed. The result is a deponent verb: passive morphology realizing active morphosyntax, and passive morphosyntax rendered defective.

We turn to the NM representation of Figure 2. (5) is a partial DATR representation of the Lexemic Hierarchy, containing the node VERB, inheriting from LEXEME, and daughter lexical entry node for the regular verb AMO 'love'. DATR casts facts as attribute value pairings; the 'value' can be another path, which itself will be evaluated, similar to embedded features in HPSG. DATR is NM's formal language, and is detailed in Evans and Gazdar (1996).

(5) VERB:

```
<> == LEXEME
<syn> == "<mor>"
<mor active> == ACTIVE_FORMS:<>
<mor passive> == PASSIVE_FPRMS:<>
...
Amo:
<> == VERB
...
```

The second line at VERB is key. In DATR a path implies any extension of itself. As any path implies an extension of itself, `<syn> == "<mor>"` is equivalent to (6), and (6) is equivalent to (7).

(6) VERB:

```
<syn active imperfective present indicative sg 2> == "<mor>"
...
```

(7) VERB:

```
<syn active imperfective present indicative sg 2> ==
        "<mor active imperfective present indicative sg 2
...
```

This is how NM expresses that the fully specified cell in the syntactic paradigm, i.e. all extensions of `<syn>`, inherits its value from the equivalent cell in the morphological paradigm,

all extensions of <mor>. Lines 3 and 4 at the node VERB express how <mor active> paths evaluated through a series of nodes negotiated through the node ACTIVE_FORMS, and <mor passive> paths through the node PASSIVE_FORMS (details in Hippisley 2007).

All lexemes will inherit from the network a set of <syn> paths, from the Lexemic Hierarchy, and a set of <mor> paths, from which the <syn> paths take their value. (8) and (9) give the (partial) <syn> path theorem and <mor> path theorem for the lexical entry for AMO. For clarity passive paths are in bold, representing the passive sub-paradigm.

(8)

```
Amo:<gloss> = love.
Amo:<syn active imperfective present indicative sg 2> = am ā s.
Amo:<syn active imperfective past indicative sg 1> = am ā bam.
Amo:<syn active imperfective past indicative sg 2> = am ā bās.
Amo:<syn active imperfective past indicative sg 3> = am ā bat.
Amo:<syn passive imperfective present indicative sg 2> = am ā ris.
Amo:<syn passive imperfective past indicative sg 1> = am ā bār.
Amo:<syn passive imperfective past indicative sg 2> = am ā bāris.
Amo:<syn passive imperfective past indicative sg 3> = am ā bātur.
...
```

(9)

```
Amo:<gloss> = love.
Amo:<mor active imperfective present indicative sg 2> = am ā s.
Amo:<mor active imperfective past indicative sg 1> = am ā bam.
Amo:<mor active imperfective past indicative sg 2> = am ā bās.
Amo:<mor active imperfective past indicative sg 3> = am ā bat.
Amo:<mor passive imperfective present indicative sg 2> = am ā ris.
Amo:<mor passive imperfective past indicative sg 1> = am ā bār.
Amo:<mor passive imperfective past indicative sg 2> = am ā bāris.
Amo:<mor passive imperfective past indicative sg 3> = am ā bātur.
...
```

When we check the paths and their values we see that `<syn>` paths and `<mor>` paths are equivalent, due to `<syn> == "<mor>"` at VERB in (5).

In this analysis deponency is very straightforward. All we need to do is override the `<syn> == "<mor>"` default with something more specific. This is achieved at a special node `DEPONENT` set up to generalize over deponent verbs, given in (10).

(10) `VERB:`

```
    <> == LEXEME
    <syn> == "<mor>"
    <mor active> == ACTIVE_FORMS:<>
    <mor passive> == PASSIVE_FPRMS:<>.
    ...
DEPONENT:
    <> == VERB
    <syn active> == "<mor passive>"
    <syn passive> == undefined
    ...
```

We can see that this node is situated in the Lexemic Hierarchy, and is dominated by VERB. In this hierarchical position it overrides the statement `<syn> == "<mor>"` by pointing all `<syn active>` paths to the set of `<mor passive>` paths for a lexeme, in other words informing active cells in the syntactic paradigm with passive cells in the morphological paradigm. At the same time `<syn passive>` paths are declared as undefined, expressing that they are lacking in a deponent lexeme. An example deponent lexeme is HORTOR 'encourage', and its lexical entry is given in (11), inheriting from the node `DEPONENT`.

(11) `Hortor:`

```
<> == DEPONENT
<gloss> == encourage
<stem> == hort
...
```

A partial theorem of *hortor*'s <syn> paths is given in (12), in other words its syntactic paradigm. The set of active values is comparable to the *passive* values for `Amo` in (8), and there are no values for passive paths, highlighted in bold. In other words it is defective.

(12)

```
Hortor:<gloss> = encourage.
Hortor:<syn active imperfective past indicative sg 1> = hort ā bār.
Hortor:<syn active imperfective past indicative sg 2> = hort ā bāris.
Hortor:<syn active imperfective past indicative sg 3> = hort ā bātur.
Hortor:<syn passive imperfective past indicative sg 1> = undefined.
Hortor:<syn passive imperfective past indicative sg 2> = undefined.
Hortor:<syn passive imperfective past indicative sg 3> = undefined.
...
```

5 *Diachronic deponency in Network Morphology*

Flobert's (1975) survey shows how over time the sub-set of deponents that starts to follow the regular pattern increases in size; by Proto-Romance full regularization of deponents is complete (see Bonnet 1968: 402; Strecker 1929: 61 and Ernout 1945:182-8 amongst others). In this section we give a NM account of this very particular type of morphological change where a lexeme's paradigm of grammatical words changes from what is a morphological mismatch, or misalignment with syntax, to realignment. The regularization of a deponent verb has two aspects, the 'innovation' of an active morphology for active syntax, and the reassignment of its passive morphology for passive syntax. Flobert uses the terms 'activation' and 'passivation' respectively.

5.1 Activation of deponents

In our Network Morphology account deponent *activation* is captured as resetting the default that links the `<syn active>` paths of a deponent lexical entry to its `<mor active>` paths. The deponent verbs ŪTOR 'use' and HORTOR 'encourage' were common deponent verbs in Classical Latin and both 'activated' by C8 AD. Their use in Plautus (C2 BC) is shown in (13) and (14).

(13) At enim nimis long-o sermon-e ut-imur

but for excessively long-ABL.SG talk- ABL.SG use-1PL.PRES.PASS

"But see here, we're going in for too much talk." Plautus *Trinummus*, l.806

(14) sed coqu-os, quasi in mar-i sol-et hortator

but cook-ACC.PL, as at sea-ABL.SG wont-3.SG.PRES.ACT encourager.NOM.SG,

remig-es hort-arier, ita horta-batur

oarsman-ACC.PL encourage-PRES.INF.PASS, thus exhort-3.SG.PAST.PASS

"but he exhorted the cooks, just as the coxswain[5] is wont to exhort the oarsmen". Plautus *Mercator*, ll. 695-97

Lexical entries for these items are expressed as nodes inheriting the path description `<syn active> == "<mor passive>"`, which is itself contained in the special DEPONENT node, as we showed in (10). Regardless of their deponency the lexical entries need to be specified for inflectional class to inherit the right passive morphology from the Morphological Hierarchy. The full description for HORTOR and ŪTOR, including inflectional class information, is given in (15) and (16).

(15) Ūtor:

```
<> == DEPONENT
<gloss> == use
<root> == ūt
<stem> == CONJ_3
...
```

(16) Hortor:

```
<> == DEPONENT
<gloss> == encourage
<root> == hort
<stem> == CONJ_1.
```

A declarative account of the activation of these items amounts to situating an alternate 'activated' lexical entry in the network such that it shares all facts with its deponent counterpart except the path description `<syn active> == "<mor passive>"`. This is shown in (17).

(17) Hortor_ACT:

```
<> == Hortor
<syn active> == <mor active>.
```

As the link between <syn active> and <mor active> is the default, and as such situated at the dominating node VERB (5), we can capture activation as a resetting of the default between the syntactic and morphological paradigms as in (18), the activated lexical entry for ŪTOR.

(18) Ūtor_ACT:

```
<> == Ūtor
<syn active> == VERB.
```

For both lexical entries the primary source of inheritance is the respective deponent counterpart. Historical development is thus expressed as hierarchical arrangement, where the historically earlier item dominates the innovative item. The nature of the innovation is expressed by the override.[6] What this means is that much of the old ŪTOR is preserved in the new ŪTOR: semantics, syntactic category, stem, and crucially inflectional class, in this case Conjugation 3. In our account inflection class represents the set of instructions for forming the morphological paradigm (again, detailed in Hippisley 2007). This means that activation will imply access by the syntactic paradigm of the output of active morphological operations which are specifically associated with Conjugation 3. To demonstrate this point we consider (19), the partial syntactic theorem for the regular Conjugation 3 verb REGO 'rule'.

(19)

```
Rego:<gloss> = rule.
Rego:<syn active imperfective past indicative sg 3> = reg e bat.
Rego:<syn active imperfective past indicative pl 1> = reg e bamus.
Rego:<syn active imperfective past indicative pl 3> = reg e bant.
Rego:<syn passive imperfective past indicative sg 3> = reg e bātur.
Rego:<syn passive imperfective past indicative pl 1> = reg e bāmur.
Rego:<syn passive imperfective past indicative pl 3> = reg e bāntur.
...
```

In (20-22) we give examples of activated ŪTOR.[7] They pattern in the same way as the active equations in REGO's theorem <syn active>.

(20) *utebat*<syn active imperfective past indicative sg 3>

absque taedi-o ute-bat ips-o

without disgust- ABL.SG use-3.SG.IMPF.ACTIVE emphatic.pron-ABL.SG

"[although she considered this vision to be meaningless] she made use of [it] without any actual distaste." *Vita Landiberti* 20; C7-8 AD

(21) *utebant* <syn active imperfective past indicative pl 3>

Arrian-orum sect-a ute-bant

Arrian-GEN.PL mode-ABL.SG use-3.PL.IMPF.ACTIVE

"[Those who had settled in Cisalpine regions] practised the way of life of the Arrians". Fredegarius *Chronicles* III 9; C7-8 AD

(22) *utebamus* <syn active imperfective past indicative pl 1>

qu-am aufer-entes adiutori-o ut-ebamus

wh-ACC.SG raise-PART.PRES.NOM,PL. support-ABL.SG use-1.PL.IMPF.ACTIVE

"which after we had raised we used supporting cable"

Vetus Latina: Acta apostolorum 27, 17; C2-3 AD

Where do these Conjugation 3 active forms come from? We propose that they belong to the virtual morphological paradigm of deponent ŪTOR which houses the output of productive morphological operations, in this case those operations available for regular Conjugation 3 verbs. After realignment these <mor> paths are inherited by activated ŪTOR, where realignment is expressed as <syn active> == VERB. (23) shows the morphological imperfect past sub-paradigm of the lexical entry for deponent ŪTOR.

(23)

```
Uutor:<mor active imperfective past indicative sg 1> = ūt e bam.
Uutor:<mor active imperfective past indicative sg 2> = ūt e bās.
Uutor:<mor active imperfective past indicative sg 3> = ūt e bat.
Uutor:<mor active imperfective past indicative pl 1> = ūt e bamus.
Uutor:<mor active imperfective future indicative pl 2> = ūt e batis.
Uutor:<mor active imperfective past indicative pl 3> = ūt e bant.
...
```

We have a similar account for the activation of HORTOR. For the regularized lexeme, those active forms that surface in syntax will be the forms that are inherited from the (historically prior) deponent lexeme's morphological paradigm. In other words, they are the output of active morphological operations for regular Conjugation 1 verbs, coerced into the syntactic paradigm for lexical insertion, and so pattern like AMO (8). A Middle Latin example was given in (3); an example from Late Latin is given in (24).

(24) *hortabat* `<syn active imperfective past indicative sg 3>`

Horta-bat caeter-os Apostolus: record-amini

encourage-3.PL.IMPF.ACT other-ACC.PL Apostle.NOM.SG: remember-PL.PRES.IMPER.PASS[8]

fratr-um qui erant in Jerusalem

brother-GEN.PL wh.NOM.PL be.3.PL.IMPF in Jerusalem

"The Apostle exhorted the others to remember the brethren who were in Jerusalem."

Luculentius *Commentary on Romans XII 6*; C5-6 AD

5.2 Passivation of deponents

One important property that deponents share is defectiveness: they have no formal means of realizing passive morphosyntax. One aspect of deponency regularization is to redress passive

defectiveness, and this is what Flobert terms 'passivation'. Only transitive deponents are truly defective because they are expected to be able to express passive morphosyntax. The common Latin deponent verb MORIOR 'to die' lacks passive grammatical words. As this lexeme has only the external argument, there is no internal argument to be promoted to subject, and no agent to be demoted. Hence it cannot be associated with a passive construction, hence there is no need for it to have passive grammatical words. On the other hand the agentive HORTOR 'encourage' is defective in the real sense since it has an internal argument which is expressed as a direct object grammatical relation, marked with the accusative case. In (14) *coquos* 'cooks' is the direct object of *hortabatur* and *remiges* 'oarsmen' the direct object of *hortarier*. The personal noun *hortator* is derived from *hortor*, and is the output of a WFR that productively takes transitive agentive verbs as its base (see Aronoff 1994: 37-39 for the *–or* agentive noun derivation built on the 3rd stem). HORTOR's defectiveness can be rectified by realigning its passive morphological paradigm with its passive syntactic paradigm. The result is passivation of the deponent, an example of which we gave in (2), further examples of which we give in (25) and (26).

(25) *hortamur* `<syn passive imperfective present indicative sg 2>`

sic enim a Domin-o sub apostol-orum numer-o hort-amur

thus for by God-ABL.SG under apostle-GEN.PL order-ABL.SG encourage-1.PL.PRES.PASS

"for thus are we encouraged by the Lord under the order of the apostles". Jonas *Vita Columbani* 2, 9; C7-8 AD

(26) (*ex)hortantur* <syn passive imperfective present indicative pl 3>

omn-es consol-antur, aedific-antur, (ex)hort-antur,

all-NOM.PL console-3.PL.PRES.PASS, edify-3.PL.PRES.PASS, exhort-3.PL.PRES.PASS

ut Deum rog-ent

to God- ACC.SG ask-3.PL.PRES.SUBJ.ACT

"All are consoled, edified and exhorted to ask God". Augustine *Epist.* 228,8; C4-5 AD

The agent is demoted to an optional argument in a PP headed by *ab* and the internal theme argument is promoted to subject, overtly shown in (26) *omnes*, which controls the agreement on the head verb. We represent passivation in terms of realignment as in (27).

(27) Hortor_PASS:

<> == Hortor

<syn passive> == VERB.

The (partial) syntactic theorem of the regularized item is given in (28). What is immediately noticeable is that as a consequence of passivation there is homonymy in the active and passive sub-paradigms.

(28)

Hortor_PASS:<gloss> = encourage.

Hortor_PASS:<syn active imperfective present indicative pl 1> = hort ā mur

Hortor_PASS:<syn active imperfective present indicative pl 3> = hort ā ntur

Hortor_PASS:<syn active imperfective present subjunctive sg 3> = hort ētur.

Hortor_PASS:<syn passive imperfective present indicative pl 1> = hort ā mur

Hortor_PASS:<syn passive imperfective present indicative pl 3> = hort ā ntur

Hortor_PASS:<syn passive imperfective present subjunctive sg 3> = hort ētur.

...

In fact it is ambiguity in voice which Flobert argues leads to activation of the paradigm, as a means of disambiguation, and so passivation is 'anterior' to activation (Flobert 1975: 316, 343). For all regularized deponents Flobert is careful to give the diachronic stage at which they are passivized, and when they are activated. In the overwhelming majority of cases passivation is prior. Thus HORTOR has passive forms for passive syntax as early as Cicero (C1 BC), and activation does not occur until C5 AD (Flobert 1975: 64).

5.3 Realignment and virtual paradigms

The notion of a virtual paradigm falls out directly from paradigm linkage, since the link between the syntactic and morphological paradigm of a lexeme is specifically a *default* link, leaving open the possibility that where the default is overridden certain cells in the morphological paradigm are never linked, hence rendered as virtual objects only. Our account of deponent verbs relies heavily on the notion of virtual sub-paradigms: these are the `<mor active>` theorems of a deponent lexical entry that are never used to evaluate syntactic paradigms, i.e. are not shared with `<syn active>` theorems. The actualization of the virtual sub-paradigm is what we have called paradigmatic realignment. In Stump' paradigm linkage terms, this restores "the unmarked pattern of linkage" (Stump 2002: 174). While we have invoked virtual paradigms to account for the historical emergence of active forms of a deponent, Corbett uses the idea of virtual paradigm to account for its passive forms prior to regularization, i.e. while still a deponent. Intransitive lexemes cannot be passive, so the passive looking values in its 'real' active paradigm must come from the passive values of virtual passive cells (Corbett 2007: 29, 33). It is the use of values of virtual cells for 'real' syntactic cells which makes deponency special, and distinguishes it from canonical syncretism. In this section we look at two implications of an analysis that rests on virtual paradigms.

5.3.1 Neo-deponents and virtual paradigms

We have shown historical change as a simple matter of resetting a default that at a prior stage was being overridden. This is made by couching an historical analysis within a declarative framework. A declarative framework would allow for the opposite phenomena as well, where a regular lexeme becomes deponent by overriding the default of a prior stage. In other words, the model predicts both regularization of deponents, as well 'irregularization' of lexemes *into deponents*. And such a class of objects does appear to exist as part of the colorful landscape of the diachronic Latin verb. These are the so-called neo-deponents (Flobert 1975: 410-19; Bonnet 1968: 411; Strecker 1929: 61). An example is the lexeme CONTINERE 'contain, retain' which appears as a regular lexeme in Plautus, but which has been transformed into a deponent in Gregory of Tours. Examples of both uses are given in (29) and (30).

(29) proin se domi contin-eant,

so pron.ACC.SG at home. contain-3.PL.PRES.SUBJ.ACT,

vit-ent infortuni-o

avoid-3.PL.PRES.SUBJ.ACT misfortune-DAT.SG

"So let'em keep themselves at home and avoid danger"[9]. Plautus *Curculio* l.298; C2 BC

(30) capsul-a, qu-ae sanct-orum pignor-a conten-ebatur[10]

box-NOM.SG, wh-NOM.SG saint-GEN.PL pledge-ACC.PL contain-3.SG.IMPF.PASS

"a (little) box which contained the pledges of the saints". Gregory of Tours *In gloria martyrum* 75; C5 AD[11]

The suggestion in Ernout and others that activated, or regularized, deponents were a feature of colloquial Latin, tells only part of story; 'deponentized' verbs were also coined in vulgar varieties, and this a point that Flobert is careful to make.:

> "On ne saurait accepter telle quelle l'explication trop souvent donnée: le déclin des déponents dans la langue parlée; c'est doublement faux: les vulgarismes ne sont pas à sens unique, car il y a des déponents vulgaires…"[12] Flobert (1975: 308)

Of course a development such as this would also entail virtual cells, since an intransitive which becomes a neo-deponent must be equipped with a passive sub-paradigm.

5.3.2 Variation and virtual paradigms

In Flobert's vast survey of the history of deponent verbs he reserves a special place for what he terms 'variants déponents'. For some authors a lexeme is deponent, for other authors of the same period the lexeme is regular. Sometimes there is variation within the same author. Examples of the variant FABRICO / FABRICOR 'carve, manufacture' are given below, both from the same period.

(33) i-i, qui sign-a fabric-antur

PRO-NOM.PL wh.NOM.PL statue -ACC.PL make-3.PL.PRES.PASSIVE

"those who carve statues". Cicero *de Officiis*; C1 BC

(34) hunc crater-a fabric-averat Alcon

this.ACC.SG bowl-ACC.SG make-3.SG.PLUPERFECT.ACT Alcon.NOM.SG

"Alcon made this bowl". Ovid *Metamorphoses*; C1 BC

For us this type of variation is naturally captured as switching from following the default link between the syntactic and morphological paradigms (FABRICO) to overriding it (FABRICOR).

6 Concluding remarks

We have argued that for a specific type of language change, paradigmatic reorganization, and a specific kind of paradigmatic reorganization, *paradigmatic realignment*, a declarative model gives a much more elegant account of the facts than a procedural / dynamic one. By holding together in a network of linguistic facts both actual facts about a language and virtual / potential facts, we can express language change as change in reference between these two sets of facts. Language change is then seen as the virtual becoming the reality. It may well turn out that other types of paradigmatic reorganization could be seen in this way. For example, lexemes that are defective at one stage, and have full paradigms at another. The full paradigm was always there, as the morphological paradigm. Or cases of analogical leveling: the fully transparent paradigm is ever present, waiting its turn to be activated, as in the case of Russian 'eye', in Table 1. The idea of potential forms hiding in the system awaiting activation is close de Saussure's view of analogical leveling, as observed in Anderson (1992: 365-68): "On de Saussure's view, forms that we see as analogically created actually existed all along, as potentialities of the system."

Viewing aspects of morphological change along these lines demands analyses based on a robust model of the synchronic situation that provides for both the actual and virtual morphological facts, and which is furnished with a defaults-based machinery to capture change as default inheritance, default overriding and default resetting. We offer such an analysis of the change in Latin deponent verbs that is modeled in the defaults-based declarative framework of Network Morphology.

References

Anderson, Stephen R. 1992. *A-Morphous morphology*. Cambridge: Cambridge University Press.

Aronoff, Mark. 1994. *Morphology by itself: Stems and inflectional classes*. Cambridge, MA: MIT Press.

Banniard, M. 1992. *Viva Voce: communication écrite et communication orale du IVe au IXe siècle en Occident latin (=Collection des Etudes Augustiniennes, Séries moyen âge et temps modernes, 25).* Institut d'Etudes Augustiniennes: Paris.

Baerman, Matthew, Greville Corbett, Dunstan Brown & Andrew Hippisley, eds. 2007. *Deponency and Morphological Mismatches*. (=Proceedings of the British Academy 145). Oxford: Oxford University Press.

Beard, Robert. 1995. *Lexeme-morpheme base morphology: a general theory of inflection and word formation*. Albany, NY: State University of New York Press.

Beard, Robert & Mark Volpe. 2005. "Lexeme-Morpheme Base Morphology". *Handbook of Wordformation (=Studies in Natural Language and Linguistic Theory 64)* ed. by Pavol Stekauer & Rochelle Lieber, 189-206. Dordrecht: Springer.

Bonnet, Max. 1968. *Le Latin de Grégoire de Tours*. Hildesheim: Georg Olms. [first edition 1890].

Chumakina, Marina, Andrew Hippisley & Greville Corbett. 2004. "Исторические изменения в русской лексике: случай чередующегося супплетивизма (historical changes in the Russian lexicon: alternating suppletion)". *Russian Linguistics* 28.281-315.

Corbett, Greville. 2007. "Deponency, Syncretism and What Lies Between." Baerman et al. 2007.21-44.

Ernout, Alfred. 1945. *Morpholgie Historique du Latin*. Paris: Klincksiek.

Evans, Roger & Gerald Gazdar. 1996. DATR: a language for lexical knowledge representation. *Computational Linguistics* 22.167-216.

Flobert, Pierre.1975. *Les verbes déponents latins des origines à Charlemagne*. Paris: Belles Lettres.

Fraser, Norman & Greville Corbett. 1995. "Gender, Animacy and Declensional Class Assignment: a Unified Account for Russian." *Yearbook of Morphology 1994* ed. by Geert Booij & Jaap van Marle.123-150. Dordrecht: Kluwer.

Hippisley, Andrew; and Gazdar, Gerald. 1999. "Inheritance hierarchies and historical reconstruction: towards a history of Slavonic color terms." *Papers from the 35th Meeting of Chicago Linguistics Society. Vol. 1.* ed. by Sabrina Billings, John Boyle and Aaron Griffith.125-40. Chicago: CLS.

—. 2007. "Declarative Deponency: a Network Morphology Account of Morphological Mismatches." Baerman et al. 2007.145-174.

—, & Greville Corbett. 2007. Network Morphology Bibliography. [Available at http://www.surrey.ac.uk/LIS/SMG/web_resources.htm]

Hock, Hans Henrich. 1986. *Principles of Historical Linguistics*. The Hague: Mouton.

McMahon, April. 1994. *Understanding Language Change*. Cambridge: CUP.

Nixon, Paul. 1988. *Plautus* (5 vols). Cambridge, Mass: Harvard University Press.

Spencer, Andrew. 2000. "Review of Ingo Plag, *Morphological productivity*." *Yearbook of Morphology 2000* ed. by Geert Booij & Jaap van Marle.324-328. Dordrecht: Kluwer.

Stewart, Thomas & Gregory Stump. 2007. "Paradigm Function Morphology and the Morphology-Syntax Interface." *Linguistic Interfaces* ed. by Gillian Ramchand and Charles Reiss.383-421. Oxford: OUP.

Strecker, Karl. 1929. *Einführung in das Mittellatein*. Berlin: Weodmann.

Stump, Gregory. 2001. *Inflectional morphology: a theory of paradigm structure*. Cambridge: Cambridge University Press.

—. 2002. "Morphological and syntactic paradigms: arguments for a theory of paradigm linkage." *Yearbook of Morphology 2001* ed. by Geert Booij & Jaap van Marle.147-180. Dordrecht: Kluwer.

—. 2006. "Heteroclisis and Paradigm Linkage." *Language* 82, 279-322.

Wright, Roger. 2002. *A Sociophilological Study of Late Latin*. Brepols: Turnhout.

Table 1: Russian for eye.

Sg	*Pl*	*Chronology*
ok-o	oč´-i	C10-C16
glaz-Ǿ	oč´-i	C16-C19
glaz-Ǿ	glaz-a	C19- present

Table 2. Exponent-based paradigmatic reorganization

LEXEME 1		*LEXEME N*		*HORTOR*	
ACT	PASS	ACT	PASS	ACT	PASS
X–*α*	X–*β*	Y–*α*	Y–*β*	Z–*β*	- - -

Table 3. Exponent-based paradigmatic reorganization

LEXEME 1		*LEXEME N*		*HORTOR*	
ACT	PASS	ACT	PASS	ACT	PASS
X–*α*	X–*β*	Y–*α*	Y–*β*	Z–*α*	Z–*β*

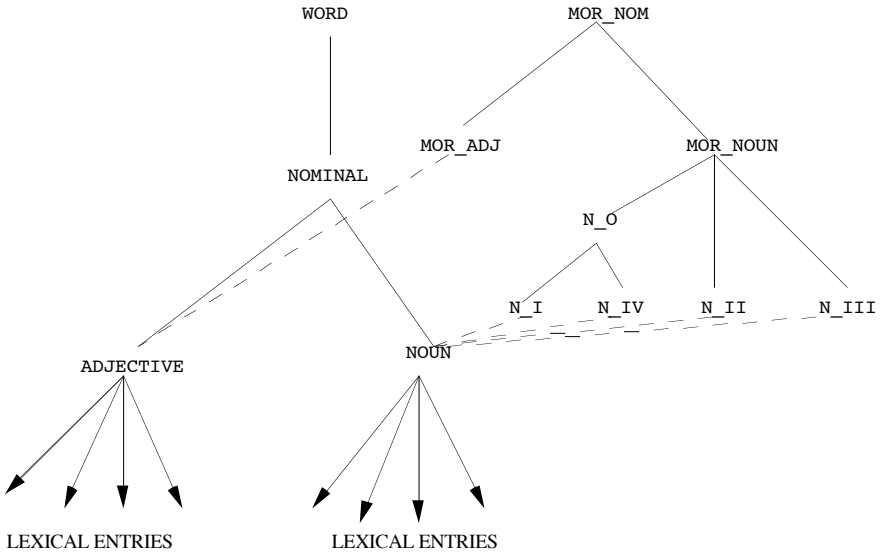

Figure 1. The Lexemic and Morphological hierarchies in Network Morphology

Lexeme 1		. . .	*Lexeme N*			*Lexeme 3*	
syn parad			syn parad			syn parad	
ACT	PASS		ACT	PASS		ACT	PASS
L1-α	L1-β		L-2α	L2-β		L3-β	-------
⇑ ⇑	⇑ ⇑		⇑ ⇑	⇑ ⇑		⇑ ⇐ ⇐	⇐ ⇐ ⇑
mor parad			mor parad			mor parad	
ACT	PASS		ACT	PASS		ACT	PASS
R1-α	R1-β		R2-α	R2-β		R3-α	R3-β

⇑ ⇑ ⇑ ⇑ ⇑ ⇑
Morphological realization rules

Figure 2. Linking the syntactic and morphological paradigms

Notes

---

[1] This research was supported by a University of Kentucky College of Arts & Sciences Research Activity Award and I am grateful for this support. I would also like to acknowledge an anonymous referee for their helpful comments, as well as Greville Corbett, Matthew Baerman and Greg Stump for comments on an earlier draft. I would also like to thank the International Morphology Meeting audience for questions and comments on the presentation version of the paper, especially Wolfgang Dressler, Dalina Kallulli and Michele Loporcaro. All errors are mine.

[2] The distinction between Middle Latin and 'genuine' Latin is an important one to make as I am claiming that paradigmatic realignment is a language change phenomenon and not a consequence of first language interference; I am grateful to an anonymous referee for suggesting clarification of this point.

[3] Though there is evidence that ecclesiastical writings attempted to conserve the phonology of an earlier period of the language, it has been argued that a preacher like Gregory of Tours would still have wanted to be intelligible to his audience, and therefore the morphosyntactic features we find in his writings would have held currency, including the shifts in the morphosyntax of deponent verbs (see Banniard 1992 and discussion in Wright (2002: 10-11, 49-70)).

[44] Of course as an example from Middle Latin we need to be careful about what we are claiming here. In §5.1 we give a parallel example from Late Latin to show that deponents acquiring active morphology to do active morphosyntax is a change taking place in the actual language (example 24).

[5] Nixon (1988) translates *hortator* as 'coxswain'.

[6] See Hippisley and Gazdar (1999) for this approach to Slavonic.

[7] Regularized deponent verbs are taken from Flobert; I have supplied the context and translation unless otherwise stated.

[8] The verb *recordor* 'remember' is a deponent.

[9] Translation by Nixon (1988).

[10] *continebatur* and *continebantur* in some manuscripts

[11] Bonnet (1968: 411)

[12] "One cannot accept at face value the usual explanation that deponents are falling into disuse in the spoken language. This is doubly false: vulgarisms are not a one-way street, for there are vulgar deponents."

Table 1: Russian for eye.

Sg	*Pl*	*Chronology*
ok-o	oč´-i	C10-C16
glaz-Ǿ	oč´-i	C16-C19
glaz-Ǿ	glaz-a	C19- present

Table 2. Exponent-based paradigmatic reorganization

LEXEME 1		*LEXEME N*		*HORTOR*	
ACT	PASS	ACT	PASS	ACT	PASS
X–*α*	X–*β*	Y–*α*	Y–*β*	Z–*β*	- - -

Table 3. Exponent-based paradigmatic reorganization

LEXEME 1		*LEXEME N*		*HORTOR*	
ACT	PASS	ACT	PASS	ACT	PASS
X–*α*	X–*β*	Y–*α*	Y–*β*	Z–*α*	Z–*β*

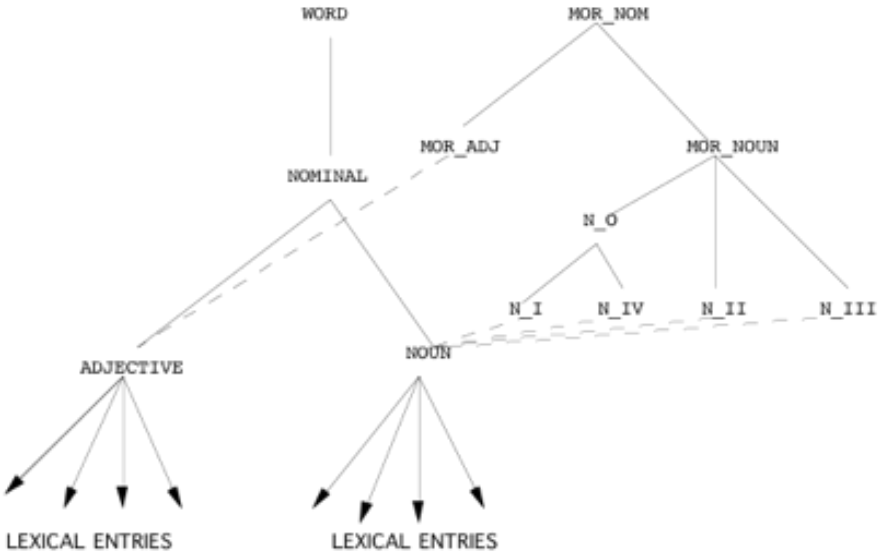

Figure 1. The Lexemic and Morphological hierarchies in Network Morphology

Lexeme 1		. . .	*Lexeme N*			*Lexeme 3*	
syn parad			syn parad			syn parad	
ACT	PASS		ACT	PASS		ACT	PASS
L1-α	L1-β		L-2α	L2-β		L3-β	-------
⇑ ⇑	⇑ ⇑		⇑ ⇑	⇑ ⇑		⇑ ⇐ ⇐	⇐ ⇐ ⇑
mor parad			mor parad			mor parad	
ACT	PASS		ACT	PASS		ACT	PASS
R1-α	R1-β		R2-α	R2-β		R3-α	R3-β

⇑ ⇑ ⇑ ⇑ ⇑ ⇑
Morphological realization rules

Figure 2. Linking the syntactic and morphological paradigms