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TOWARDS A NON-PARADIGMATIC MORPHOLOGY\*  
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Everybody uses the notion of paradigm. In spite of this, it is a somewhat vague notion.

It is generally used to characterize a set of interrelated forms but there are extended usages that go far beyond our present concerns -- such as those of de Saussure (1915) or Hjelmslev (1963), not to speak of Kuhn (1973). There are also restricted uses as well, the subtleties of which are not pertinent to the present discussion. For example, the structure of a paradigm is generally given in terms of the relationships between the forms, most often by defining the members of a paradigm as functions of a given basic form. The formulations in (1) make that clear:

- (1) i) "Each of these groups is called a paradigmatic group, or paradigm and each form of the group is called an inflected form or inflection."  
 (Bloomfield, 1933: 210)
- ii) "For the same reasons, we are often led to construct an artificial base." (Bloomfield: 205)
- iii) For any lexeme  $l$ , the paradigm of  $l$  is the set of all the alphabets  $s$  etc., such that for a given  $w$ ,  $s^*R$ s and  $w^*F$ l (where  $*R =$  "is a realization of" and  $*F =$  "is a form of" in the sense specified in Matthews (1965:272-273) ).

The basic difference lies in the nature of the basic form. For Priscian, for example, the basic form is a member of the paradigm; for Bloomfield and Matthews this is not the case. For them it is an abstraction, though not of the same sort. For Bloomfield, it is a purely formal abstraction, a theme on which the forms of the paradigm are constructed. For Matthews, it is a semantic abstraction; the basic form is the nucleus of meaning which underlies the set of forms of the lexeme. This nucleus is related exponentially to the basic form. These differences, however, are not germane to the argument presented in this paper. It should be obvious that the notion is somewhat vague. There is, for example, no formal criterion that permits us to decide whether we are faced with one, two or three paradigms in any given case. The use of the term reflects this fact. The vagueness also reflects, we shall argue, the fact that the notion of paradigm is a somewhat wavering and incomplete effort to capture lexical relatedness. Although the not infrequent hand-waving is clearly an indication of the fact that there is more to lexical relatedness than paradigms, it is almost never seen as such. We shall attempt to show precisely how incomplete an effort it really is and why the hand-waving should be taken more seriously than it is.

When we refer to the verbal paradigm, we are generally referring to the set of possible forms a given verb can take. We can represent these forms in terms of abstract formulas, such as 3rd person singular present indicative. The set of these forms is what constitutes the verbal paradigm. Thus, in answer to the question of how many verbal paradigms there are, the reply should be one. But generally, we do not answer one, but two, three, five or ten, depending on the language in question. Perhaps in order to avoid this sort of problem certain grammarians have used a different term. To designate this meaning of paradigm, the term conjugation is used. In much the same fashion, the term declension was coined to designate noun case paradigms. In other cases, no special term is in use and the word paradigm must be used. For example, for number (singular, dual, plural), there is no special term, nor is there one for degrees of comparison. In case-languages, we can incorporate these distinctions into the declension and number can also be incorporated into the conjugation in the case of verbs. Aside from these contexts, the term paradigm is used.

Another example of the vague or ambivalent nature of the term paradigm is its use in referring to parts of a paradigm. For example, we have already seen that the term paradigm refers to the set of all forms of a verb, in the case of a verb, that is the set of all forms in a conjugation. But it can also refer to a set of finite verb forms for a given tense or to the set of declined forms for a given number in the case of nouns. In this way we can speak of present, past or passive verb paradigms or the plural paradigm. This use is often conditioned by the actual structure of the paradigm in question. For example, if one recognizes several paradigms within the conjugation of a given verb, it is usually because one recognizes several basic forms. In Latin, for example, we speak of the principal parts of a verb: /ago/ /agere/ /egi/ /aktum/. Any one of these forms constitutes the basic form of a different paradigm:

- (2)     ago     - present  
           agere - future  
           egi    - preterit  
           aktum - passive

There is an asymmetry with respect to the noun declension. There can be two or more principal parts of a noun, such as the nominative and the genitive, for example mos, moris, but never to our knowledge has anyone ever named the set of forms derived from mos and moris, as paradigms.

The foregoing demonstrates the imprecision associated with the term paradigm. However, in our opinion, there are many more drawbacks associated with this term. To make them explicit requires the elucidation of another example. We take the case of Latin declensions under the standard classical analysis, the one we

learned in our school primers and which is based directly on Priscian's grammar. We display it in (3):

(3)	1	2	3	4	5	6
nom	insula	mūrus	bellum	puer	pater	rex
voc	insula	mūre	bellum	puer	pater	rex
acc	insulam	mūrum	bellum	puerum	patrem	rēgem
gen	insulae	mūrī	bellī	puerī	patris	rēgis
dat	insulae	mūrō	bellō	puerō	patrī	rēgī
abl	insulā	mūrō	bellō	puerō	patre	rēge
	7	8	9	10	11	12
nom	cīvis	nōmen	tempus	mare	terror	mōs
voc	cīvis	nōmen	tempus	mare	terror	mōs
acc	cīvem	nōmen	tempus	mare	terrorem	mōrem
gen	cīvis	nōminis	temporis	maris	terrōris	mōris
dat	cīvī	nōminī	temporī	marī	terrorī	mōrī
abl	cīve	nōmine	tempore	marī	terrōre	mōre
	13	14	15	16	17	18
nom	nūbēs	senex	dux	pēs	gens	vectīgal
voc	nūbēs	senex	dux	pēs	gens	vectīgal
acc	nūbem	senem	ducem	pedem	gentem	vectīgal
gen	nūbis	senis	ducis	pedis	gentis	vectīgālis
dat	nūbī	senī	ducī	pedī	gentī	vectīgālī
abl	nūbe	sene	duce	pede	gente	vectīgālī
	19	20	21	22	23	
nom	casus	cornū	domus	diēs	rēs	
voc	casus	cornū	domus	diēs	rēs	
acc	casum	cornū	domum	diem	rem	
gen	casūs	cornūs	domūs	diēī	reī	
dat	casuī	cornuī	domuī	diēī	reī	
abl	casū	cornu	domō	diē	rē	

We use this model, rather than Bloomfield's or Matthews', because there is no analysis of Latin declension in the latter models and we do not want to extrapolate. However it must be clear that what we say concerning paradigms in the Priscian analysis applies equally to the other models. The analysis states, grosso modo, that there are about twenty declensions in Latin. That is to say that if we know a noun in Latin in the nominative, its other case forms would correspond to one of these twenty odd categories.

In general, we can criticize this approach for three reasons:

- i) it prevents generalizations from being formulated
- ii) it does not account for acquisition in a natural fashion
- iii) it does not seem adequate for an account of the language's evolution.

In order to see this, let us take the case of the nouns templum, nomen, tempus, mare, vectigal and cornu. For all these nouns,

the nominative, accusative and vocative forms are identical. Nonetheless, according to the paradigmatic analysis, these belong to six different classes. Even if we divide classes into five principal declensions, with all the defects mentioned, there are three of these declensions included among these words. We actually know that what is at stake is a generalization concerning neuter nouns. If there are no nouns from the first and fifth declensions, it is because these declensions do not contain any neuter nouns. Note that an analysis with paradigms must necessarily have redundancies of this nature.

A list of other generalizations of this type that can and in our opinion must be expressed for Latin are given in (4):

- (4) i) the nom. and acc. are identical for a neuter noun  
 ii) if the nom. ends in -s, the acc. is formed by replacing the -s with -m  
 iii) the nom. and the voc. are identical everywhere except for nouns like murus  
 iv) if the acc. ends in -um, the dative is formed by replacing -um with -o  
 v) if the dative ends in -o, the ablative is identical.

It is evident that if we enlarge the paradigm to plural forms, the generalizations will be all the more striking but we limit ourselves to the singular, for ease of presentation.

As far as acquisition is concerned, the paradigmatic model does not constitute a natural model in the sense that it has never, as far as we know, been demonstrated that during language acquisition paradigms are constructed and actually used. For example, it has been proposed that certain forms are acquired before others, generally according to the order presented by Jakobson's markedness theory. A partial list of some of the oft-cited generalizations from this theory is given in (5):

(5)	Unmarked	Marked
	present	preterit
	3rd pers.	other pers.
	singular	plural
	finite forms	participial forms
	direct case	oblique case
	masculine	feminine

Some of the acquisitional counterparts of the generalizations in (5) are listed in (6):

- (6) (a) The singular is acquired before the plural (cf. Ruke-Dravina: 1973).  
 (b) The present is acquired before the past (cf. Ruke-Dravina, Bates: 1976 and Simoes and Stoel-Gammon: 1979).  
 (c) The indicative is acquired before the subjunctive (cf. Ruke-Dravina and Simoes and Stoel-Gammon).





Note that this analysis: i) permits the clear expression of generalizations blocked by a paradigmatic description, ii) accounts for acquisition facts and diachronic change. If we suppose with Kurylowicz that the two phenomena are linked we make strong predictions on how young Romans expressed themselves and in which direction the language should have changed. In (15) we show several changes that are documented for Vulgar Latin. They are all explainable in terms of the strategies in (12).

(15)	nom.-acc	nom.-gén.
	0-0 3,8,9,10,18,20.	us-î 2
	â-am 1	a-ae 1
	s-m 2,6,13,15,17,19,21	ês-is 13
	is-em 7	is-is 7
	0-um 4	um-î 3
	0-m 5,11.	us-ûs 19,21.
	s-rem 12	0-î 4
	ex-em 14	0-is 5,8,11,18.
	ês-edem 16	s-is 6,15,17.
		us-oris 9
		os-oris 12
		e-is 10
		ex-is 14
		ês-edis 16
		u-ûs 20
		ês-êi 22,23
	acc.-gén.	
	um-î 2,3.	
	am-ae 1	
	em-is 4,5,6,7,11,12,13,14,15,16,17.	
	0-is 8,18.	
	um-ûs 19,21.	
	em-êi 22,23.	
	us-oris 9	
	0-is 10	
	û-ûs 20	

Compare our proposal with the classical versions of the break-up of the case system in Latin in terms of a paradigmatic analysis, of which a sample is given in (16), and you can decide for yourselves which of the two analyses is more revealing.

(16)	nom.	acc.	gén.
	ager > agrus	agrum	agrî
	aedês > aedis	aedem	aedis
	faciês > facia	faciem	faciêi
	bôs > bovis	bovem	bovis
	herês > heredis	heredem	heredis
	honos > honor	honorem	honoris
	cornu	cornu > cornum	cornuî

mare	mare > marem	maris
fructus	fructum	fructûs > fructû
Sabina	Sabinam	Sabinae > Sabinaes

For those who are not familiar with the data we would like to close with an illustration of the efficiency of the model in the solution of another problem. The data is given in (17). It should be noted that with respect to other dialects, Quebec French is characterized by the development of certain new verb forms. At present, the form which interests us is the third person, present indicative plural. Some examples appear in (17):

(17)	sg.	pl. standard	pl. québécois
	ri	ri	riz
	pu	pu	puz
	zu	zu	zuz

It will be seen that a paradigmatic theory will be hard-pressed to account for this type of development. It is not what Bybee has called interparadigmatic because the new plural does not come from the singular. Neither is it extraparadigmatic because the new paradigm formed did not previously exist. The closest one would be a verb like dire or lire but if we say the verb rire has entered the dire paradigm we should have \*nous risons, \*vous rîtes but we have nous rions, vous riez. In the same fashion, if we would like to say that rire has passed over to the lire paradigm, we should have \*nous risons, \*vous risez (cf. lisez, lisons). Thus a new paradigm has been created. The same phenomenon is observed in the case of verbs such as jouer and puer. There is no verb in the standard language that has an infinitive in er which also has a third person plural in -z. Nevertheless, jouer, puer, suere and several other verbs have acquired this property.

Note that in the framework proposed here, we do not need to change paradigms in order for morphological change to occur. We can simply say that these verbs are in conformity with the strategy that says that when a third singular terminates in a vowel, we add -z to make the plural. This strategy is one amongst others that are in competition with the dominant strategy: that the first and third persons singular and plural are identical.

Our main contention is that if word-formation rules are appropriately represented by bidirectional strategies like (14) that capture lexical redundancies in the lexicon and provide, when activated, models for creating or understanding new items, the notion of paradigm is not needed for it is, at best, a partial and somewhat distorted attempt to capture what might be called lexical relatedness. Word-formation processes form a network and the paradigm gives us only a distorted picture of that network. What it really looks like is something we explore in another paper (cf. Ford and Singh: forthcoming).

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