Syntax as an exponent of morphological features

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Abstract

We examine the periphrastic passive construction in Latin, in which a part of the verb paradigm is expressed by an auxiliary/copular verb 'to be' with the perfective passive participle, with the syntax of a predicative adjective construction. Building in part on the treatment sketched by Börjars, Vincent and Chapman (1997) and other recent work in Lexical Functional Grammar (Frank and Zaenen, 1998) and related grammatical formalisms, we show that the interpenetration of syntax and morphology exhibited by the Latin data is more difficult to accommodate within these lexicalist theories than is assumed by Börjars et al. (1997). We find empirical support for a distinction between purely formal or morphological features and contentive syntactic features, a distinction which is missing from the standard model of LFG but which is made (under a variety of different architectural assumptions) in some recent LFG work (including Butt, Niño & Segondo, 1996, Frank and Zaenen, 1998, Sadler 1999). In the present case, the distinction is motivated by the existence of deponent verbs, which are 'passive in form but active in meaning'. The deponents share the periphrastic perfective forms of passive non-deponent verbs, showing that we must separate form from function even for the regular non-deponent verbs. We do not present an LFG analysis as such but rather we give an outline of the kind of morphology component that the theory must accommodate. We adopt the theory of predicates presented by Ackerman and Webelhuth (1998) and within this we provide an analysis based on Stump's (in press) Paradigm Function Morphology. This appeals to a rule of referral within the morphological paradigm, defined over purely morphological features, realizing the perfective passive features as a syntactic construction.

1. Introduction

In this paper we investigate a selection of issues in the morphology-syntax interface. This has been the locus of intense research activity in recent years particularly within lexicalist theories of grammar such as Lexical Functional Grammar (LFG). A central question addressed in LFG is the way that across languages or within a single language a whole host of morphological, lexical and syntactic means can be deployed to express essentially the same set of meanings or functions. One very specific example of this is seen when very similar (or even identical) grammatical meanings/functions are sometimes expressed by inflected morphological word forms and sometimes by means of syntactic constructions, that is, when a single set of grammatical properties receives synthetic and analytic expression within the same language.

Our overall approach to morphology is that of the word-and-paradigm school (cf. Ackerman and Webelhuth 1998), as represented by the model of Paradigm Function Morphology developed in Stump (in press). In such a model, morphemes do not correspond to lexical entries with their own listed properties, but morphological paradigms are generated by realizational rules (or their formal equivalent, such as statements of inheritance). Stump refers to this class of theories as 'inferential-realizational' and argues on a host of empirical and conceptual grounds that this class of theories is superior to alternatives, especially those that appeal to the classical morpheme concept.

A key aspect to realizational approaches to morphology is the doctrine of 'Separationism' (Beard, 1995). In such approaches, the inflected word form realizes a set of morphosyntactic features, but there is no necessary one-to-one mapping between the components of words (roots, stems, affixes and so on) and the feature sets which are realized. This means that we abandon the idea of the morpheme as a sign, a pairing of form and meaning/function. Instead, the way that a word form realizes features is a (possibly rather complex) function of a set of realizational rules (or their formal equivalent).

Morphological theory has devoted very little attention to the way in which a word-and-paradigm morphology might interface with syntactic representations. Similarly, since the morphology is a discrete component responsible for the lexicon (the collection of basic and derived word forms), lexicalist syntactic theories have by and large paid scant attention to it and worked on the simple assumption that it will deliver the appropriate syntactic primitives (Frank and Zaenen, 1998, is an important exception).

In this paper we explore the significance of one distinction which we believe to be of considerable importance for a proper understanding of the morphology-syntax interface, the distinction between morphological features (m-features) and syntactic features (s-features). S-features are the functional features which have to be expressed by well-formed phrases and clauses. A simple example of a purely syntactic functional feature would be definiteness in English, which is realized by the determiner system and not by any form of inflectional morphology. (In practice, the term ‘s-feature’ might refer to some aspect of syntactic structure which is not actually coded in featural terms as such in a given theory, for instance, it might refer to some subpart of an argument structure representation). M-features are those that regulate the morphophonological structure of words. A straightforward example of a pure m-feature would be the inflectional class features of the kind discussed in detail by Aronoff (1994), which are entirely independent of syntax and simply serve to govern the way a word is inflected. Another type of m-feature would be Past (or Perfect or Passive) Participle, which is simply a label for a particular verb form such as written, and which might correspond to a variety of morphosyntactic functions. At the same time, there are features which seem to fulfil both types of function. Thus, in English we seem to need a feature Plural Number to regulate the plural inflections on nouns (m-feature) and to specify the number value of the nominal phrase (s-feature), trigger subject-verb agreement and so on. In the spirit of Separationism we argue that these represent two features, an m-feature ([Number:Plural]) and an s-feature (NUMBER PLURAL), such that the m-feature serves as the (normal) realization of the s-feature.

Finally, we will argue that the Latin perfective passive periphrasis lends support to the concept of 'predicate' developed by Ackerman and Webelhuth (1998). For them, a construction such as the perfect has written constitutes an abstract 'form' of the lexical verb WRITE, even though it is a syntactic construction with its own internal morphosyntactic structure. On such a constructional account both the auxiliary and the participle are pure forms ('morphomes' in Aronoff's, 1994, terminology), devoid of meaning. It is only the combination of auxiliary and participle which conveys the notion ASPECT PERFECT. The separation of form and function is reflected in the polyfunctionality of the auxiliary and of the participle. Thus, with an infinitive, 'have' conveys an entirely different, modal meaning (has to write a letter), while the participle written realizes passive when in construction with a different auxiliary (the letter was/got written). In sum, the analytic construction must be viewed as a kind of morphosyntactic idiom. The idiomatic status of such constructions is particularly apparent when we consider the simple past tense in modern Spoken French: a écrit (une lettre) 'wrote a letter' (the same point can be made for a number of European languages). Here, we have an auxiliary with a Present Tense form serving as part of a construction realizing TENSE PAST.

The distinction between pure form features, or m-features and syntactic or contentful features, or s-features, immediately leads to another distinction. If m-features serve to define a paradigm space for word forms, s-features define a corresponding paradigm space for morphosyntactic constructions. These are not identical paradigms, of course. In English, the s-feature inventory will contain the feature VOICE {ACTIVE, PASSIVE} but there is nothing corresponding to this at the level of m-features (because voice is not realized in a purely inflectional fashion). (Ackerman and Webelhuth's theory of predicates is in part a theory of s-paradigms.)

We consider one system in some detail, the perfective passive subparadigm of Latin verbs, discussed recently within an LFG framework by Börjars, Vincent and Chapman (1997; hence, BVC). In this construction, the perfective aspect of the passive voice is expressed periphrastically, using a passive participle and an auxiliary verb 'to be' (esse), much as in English. However, the nature of the Latin verbal system reveals that important differences between the Latin case and the English construction. The Latin

case is a particularly good example of the need for ‘Separationism’ between morphology and syntax, and as such it joins the case studies presented by Ackerman and Webelhuth (1998).

Where the Latin periphrasis is of particular interest is not merely that a piece of syntax is used to realize some (syntatico-semantic) functional features, but rather that the syntax actually fills cells in the morphological verbal paradigm. In this respect, the Latin periphrastic passive is distinct from, say, the English passive. In English there is no motivation for saying that the passive construction is part of the morphological paradigm of the verb. In other words, we can’t say that the passive (or indeed the perfect, progressive, future or whatever) is in paradigmatic contrast with, say, the past tense. However, in Latin the periphrastic form is part of the verb paradigm, which is to say that it contracts exactly such paradigmatic relations with synthetically inflected forms.

The paper is organized as follows. In section 2 we sketch the essential facts of the Latin system. In section 3 we present an analysis of the Latin periphrastic construction as a piece of pure syntax, arguing that this is the wrong solution. In section 4 we illustrate the LFG notion of f-structure, a level of syntactic projection which permits us a unified statement of grammatical functions independently of their formal realization. We then summarize the analysis of the Latin periphrasis presented in BVC. In section 5 we discuss the separation of m-features and s-features in a little more detail, and suggest a notation for representing default interpretations of m-features. Section 6 presents our own analysis. We first lay out the relevant m- and s-feature inventories. Then we set up a grammatical construction type for predicative adjective + copula. We next define a subtype of this with the participle and a restricted set of copula forms (the Imperfective aspect forms of the verb ‘to be’). We then write a rule under which this subtype of predicate construction serves as the exponent of the m-features of perfective passive. In our Conclusions we provide further comparison between our approach and that of BVC and list a set of more general considerations that require attention.

2. The periphrastic perfective passive in Latin

As discussed in BVC:167f, Latin has two verbal aspects, imperfective and perfective and active and passive voices. In the imperfective aspect forms the passive is expressed synthetically, but in the perfective tense series we find an analytic construction formed from the auxiliary/copular verb sum 'to be' and the perfective passive participle (PPP) formed in -t-. This is illustrated in (1):

(1) Latin verb forms

laudo 'I praise'

IMPERFECTIVE	Active	Passive
Present	laudat	laudatur
Past	laudabat	laudabatur
Future	laudabit	laudabitur

PERFECTIVE	Active	Passive
Present	laudavit	laudatus/a/um est
Past	laudaverat	laudatus/a/um erat
Future	laudaverit	laudatus/a/um erit

The participle is morphosyntactically an adjective. Thus, while finite verbs agree with the subject in Person/Number features, the analytic perfective passive forms agree in Number/Gender (but not person), exactly as predicative (and attributive) adjectives do. This is illustrated in (2), where we see 3rd sg. forms:

(2) Agreement in perfective forms

	Pf. Act.	Pf. Pass. (Fem. subj.)
1sg	laudavi	laudata sum
3sg	laudavit	laudata est
3pl	laudaverunt	laudatae sunt

In (3--5) we illustrate the morphosyntax of the participial constructions in comparison to normal adjectives:

(3) adjective agreement (all in the Nominative case):

roman-us sum	roman-a es	roman-ae sunt
roman-MASC.SG am	roman-FEM.SG art	roman-FEM.PL are
'I (masc.) am Roman'	'thou (fem.) art Roman'	'they (fem.) are Roman'

(4) adjective construction:
Clodia romana est
C. Roman.FEM.NOM.SG is
'Clodia is Roman'

(5) participial passive construction
Clodia laudata est
C. praised.FEM.NOM.SG is
'Clodia was/has been praised'

Both adjectives and participles can be used attributively: mulier bona 'a good woman' mulier laudata 'a woman who has been praised'.

One further important feature of Latin inflection is the existence of deponent and semi-deponent verbs. Deponents are verbs with active syntax and active 'meaning' but which have the form of passive verbs. The semi-deponents are active in form in the imperfective tense series but take the deponent, passive, form in the perfective

aspect. In (6) we see a sample partial paradigm for a deponent verb and in (7) we see a semi-deponent:

(6) Deponent verb: loquor ‘I speak’

	IMPERFECTIVE	PERFECTIVE
Present	loquitur	locutus/a est
Past	loquebatur	locutus/a erat
Future	loquar	locutus/a erit

(7) Semi-deponent verbs: gaudeo ‘I rejoice’

	IMPERFECTIVE	PERFECTIVE
Present	gaudet	gavisus/a est
Past	gaudebat	gavisus/a erat
Future	gaudebit	gavisus/a erit

Deponent and semi-deponent verbs are largely intransitive. Some, however, take oblique case-marked complements such as gratulor ‘congratulate + Dative’, utor ‘use + Ablative’, while others are genuinely transitive (sequor ‘follow’) and at least one is a verb of functional control (conor ‘try’) (BVC:172). Very occasionally a deponent can be used with the function and interpretation of a genuine passive (!), a fact which, while interesting, will not concern us.

3. Latin periphrasis as pure syntax.

The Latin perfective passive is puzzling from the typological point of view because it goes counter to a very general principle of markedness, often referred to as Blocking (see Andrews 1990): when morphology and syntax are in competition it’s morphology which has precedence. Other things being equal we would expect the verb morphology of Latin to be able to churn out synthetic perfective passive forms. For instance, ‘she was praised’ might be expressed by the non-existent form *laudavitur. But if such virtual forms do exist they are pre-empted by the periphrastic forms.

The obvious answer to this question is to say that there are no morphological forms for the perfective passive section of the paradigm in the first place, and thus the

periphrastic construction is not pre-empting the morphology, rather it is filling in a gap left by the morphology. Thus, we might suppose that the paradigm for the Latin verb is not 'square' as in (1) above but rather 'L-shaped' as shown in (8):

(8) 'L-shaped' interpretation of Latin verbal paradigm

laudo 'I praise'

IMPERFECTIVE	Active	Passive
Present	laudat	laudatur
Past	laudabat	laudabatur
Future	laudabit	laudabitur

PERFECTIVE	Active
Present	laudavit
Past	laudaverat
Future	laudaverit

How exactly the morphology should be rigged so as to ensure that there are no perfective passive forms in the paradigm is immaterial. Once we have this paradigm structure, however, we can then note that there is an independently motivated perfective passive participle with all the features required for filling in the hole in the paradigm, save for finiteness (tense and agreement) features. However, participles, being categorially adjectives, form predicates with the copula and this can provide the requisite features. Thus, we have a situation in which the morphological verb paradigm fails to realize certain theoretically possible feature combinations (the missing bottom right hand corner of (8). However, there is a periphrastic (syntactic) construction which conveys the same sorts of meanings as that bit which is missing from the morphological paradigm. That is, the grammar offers both morphological and syntactic means of expression, but for the expression of complementary sets of (contentful) distinctions: syntax stands in where morphology fails to produce. This seems largely to capture our intuitions about the periphrasis (use of an analytic construction) in this case.

Note however, that although syntactic resources are harnessed as part of a kind of a paradigm completion strategy, the syntactic construction itself does not actually serve as exponent of cells in the morphological paradigm on this view. Rather, the syntactic construction expresses a particular set of contentful (f-structure) features, so in some sense could be seen as filling in the gap in the "content" or f-structure paradigm space.

There are a number of immediate advantages to this type of approach. For example, we can postulate a single meaning for the perfective passive participle and this will be largely unchanged whether the participle is used as an attributive modifier, in an absolute construction as part of an adverbial construction, or in the periphrastic construction. (The participle had an eventive and not just stative semantics, at least in absolute constructions, so there will be no semantic mismatch here.) Moreover the argument structure properties seem to be constant across all uses of the participle. Another important advantage is that we would immediately explain why the perfective passive has the same agreement and other morphosyntactic properties as a predicative adjective construction. This would come about because it actually is a predicative adjective construction.

For all its seductiveness the view just sketched cannot be correct. BVC:168--169 point out some of the crucial difficulties. The (functional) values of the periphrases and the missing cells are absolutely identical (that is, they are in a relation of absolute synonymy rather than loose correspondence) and there is no possibility of parallel forms. These are important points, which we agree with. There are further problems with this 'independent syntax' view, both of them illuminating for our understanding of the morphology-syntax interface.

The first problem is that that the periphrasis is not itself a simple compositional structure. This means that at the very least we have to recognise special, constructional meaning. There is a clear distinction between the periphrastic perfective passive and true, 'normal' syntactic constructions such as the combination of present active participle with a copula verb.

Latin had a present active participle in -ens which could (occasionally) be used predicatively:

(9) uidetis ut senectus sit operosa et semper agens aliquid et moliens
you.see how old.age is busy and always aiming something and trying
'You see how busy old age is, always aiming and trying at something'
(Cat. M. 26, cited in Allen and Greenhough, p. 311)

Here the participles agens 'doing, aiming' and moliens 'trying' are conjoined with the true adjective operosa 'busy' to form a predicative complement to sit (present subjunctive form of esse). Now, in a true syntactic construction we find the full paradigm of the copular verb, just as we would find with a predicative adjective. However, in the case of the perfective passive periphrasis we see a rather different pattern. The periphrastic passive doesn't have this freedom. Instead, the imperfective form of the copula is used even though the construction itself expresses perfective aspect. Thus, to express the perfective past passive 'I had been praised' Latin used the construction laudatus eram, not laudatus fui. If the analogy with the true periphrastic constructions had held then laudatus eram would have meant 'I was being/used to be praised' or 'I had been being praised', contrasting with laudatus fui which would have meant 'I was/had been praised (once)'[1]. Presumably, the fact that the imperfective meaning of the copula is neutralized in the analytic passive is connected with the fact that perfectivity is already signalled in the participle. Nonetheless, if the construction really were a syntactic construction, then it is somewhat suspicious that the full set of oppositions implied by the copula is not found. Indeed, it is unclear why there are any synthetic passive forms at all in Latin. A more 'logical' periphrastic construction would treat the participle as solely an exponent of passive voice and would then express all the finiteness features of tense, aspect, mood and agreement through the copula (auxiliary), much as in the participial passive of modern Romance languages. Thus, in much the same way that sono lodato, fui lodato, sarò lodato in Italian mean 'I am praised', 'I was praised', 'I shall be praised', so we might expect the whole of the Latin passive to be expressed by the participial construction: laudatus sum/fui/ero. This latter point doesn't actually refute the syntactic analysis of the perfective passive

construction, but it does raise a question mark over the assumption that the construction is no more than a piece of compositional syntax.

However, there is a second problem with this analysis, and that is the problem of the (semi-)deponents (BVC:172, a point made independently by Stump, in press, Ch. 1.4,). Recall from section 2 that deponents are verbs which are passive in form but active in meaning. The semi-deponents are active in form in the imperfective aspect and take passive morphology only in the perfective aspect. The problem which the (semi-) deponents pose for the syntactic analysis of the passive periphrasis is now evident. These verbs are active in meaning. Therefore, their form cannot possibly be derived from a syntactic construction which realizes passive content. Therefore, the periphrastic construction must form part of the (morphological) paradigm of the verb because it expresses an opposition of form which is not necessarily an opposition of content. In other words, the verb paradigm is ‘square’ and not ‘L-shaped’.

BVC:169 note that such a situation poses serious problems of description for most current theories of morphosyntax. They claim that Lexical Functional Grammar (Bresnan, in press) provides the sort of grammatical architecture to express the idea that a periphrastic form can realize feature values in a morphological paradigm. Their idea involves viewing the paradigm as the space generated by the product of the f-structure features. We will show below that this conceptualisation is incorrect. We agree with their view that lexicalist frameworks are appropriate but we argue that the phenomenon at hand presents more evidence for a more careful typing of features to projections within that theory (in this sense, our approach is along the lines of Frank and Zaenen, 1998).

To see the problem we first provide a brief review of the architectural assumptions of classical LFG.

4. Morphological features and Classical LFG

4.1 F-structures in classical LFG

Lexical Functional Grammar (Bresnan, in press) posits two levels of surface syntactic representation, c-structure which expresses information about constituent structure

and syntactic word class, and f-structure which expresses information about grammatical relations and such semantically interpretable functional features as definiteness, tense and so on. The articulation of these levels of representation together capture the observed wide variability of external surface form (exponence) together with the largely invariant or universal aspects of syntactic structure. It is an important aspect of LFG that it represents grammatical functions in a fashion completely independent of exponence. Thus, whether the subjects and objects of a clause are expressed by word order, agreement, case marking, clitics or whatever (or any combination of these) the f-structure will remain relatively constant across languages and across constructions. This level of representation makes it possible to state generalizations about functional organization which cut across morphosyntactic realization. For instance, the f-structure shown in (10) will be applicable to any language that makes a tense distinction and which has pronominals, whether full pronouns, clitics or affixal (incorporated) pronominals, which distinguish person and number:

(10) f-structure for ‘I saw them’

$$\begin{bmatrix} \text{PRED} & \text{'see} < (\text{SUBJ}), (\text{OBJ}) > \text{'} \\ \text{TENSE} & \text{PAST} \\ \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{'PRO'} \\ \text{PERS} & 1 \\ \text{NUM} & \text{SG} \end{bmatrix} \\ \text{OBJ} & \begin{bmatrix} \text{PRED} & \text{'PRO'} \\ \text{PERS} & 3 \\ \text{NUM} & \text{PL} \end{bmatrix} \end{bmatrix}$$

Although f-structure in the classical model (Kaplan and Bresnan 1982) largely abstracted away from information proper to c-structure, such as categorial features ([±N,±V] or their equivalent), it did contain a significant residue of morphosyntactic ‘contamination’ (see Frank and Zaenen, 1998 for further discussion of this point). Consider, for instance, the analysis of was persuaded (to go) and the lexical information given in (11) (Kaplan and Bresnan 1982:224):

(11) persuaded: V, (↑PARTICIPLE) = PASSIVE
(↑PRED) = ‘PERSUADE<(↑BY OBJ) (↑SUBJ) (↑VCOMP)
(↑VCOMP TO) $=_c$ +

The f-structure denoted by ↑ in (11) is that corresponding to the predicate ‘persuade’ and it contains the attribute—value pair (PARTICIPLE :PASSIVE). This f-structure contains a subsidiary f-structure (the value of the attribute VCOMP –corresponding to the VP complement ‘to go’) which is constrained to contain the attribute-value pair (TO: +). Features such as PARTICIPLE, FIN, VFORM, etc. were regularly used to ensure that morphosyntactic dependencies of this sort were respected. Although syntactic well-formedness may well depend on them, these features have little to do with content and much to do with form. They seem ultimately to be properties of the morphology, that is, m-features or form-features in our terms, and it would be somewhat surprising if they obeyed the same principles as those governing the distribution of subjects and objects or the semantic interpretation of definiteness or tense. In more recent formal work on the architecture of LFG it is often assumed that the f-structure contains precisely those functional elements which contribute to semantic interpretation (Dalrymple, Lamping, and Saraswat, 1993) but this would exclude purely morphological features such as those governing choice of non-finite verb form in a given construction.

In similar fashion, in recent work Bresnan (in press) treats functional categories as contributing grammatical features to the f-structures mapped by the main verb (or noun, adjective, etc), but not themselves having a lexical meaning (in LFG terms, not bearing a PRED attribute). Andrews and Manning (1999) discuss the analysis of Romance causative complex predicates by Alsina (1997), in which two predicates, the causative and the lexical verb, are fused to provide a composite representation with the phrase structure [$_{VP}$ Cause [$_{VP}$ Verb …]]. The composite structure is then said to give rise to a single f-structure representation, and this means that the higher and lower VP must share a good deal of grammatical information. However, it is precisely the morphological form information (m-feature information in our terms) that such VPs cannot share (Andrews and Manning, 1999:40). The direction of much recent

work, then, is to recognise the anomalous nature of such morphologically-motivated features in f-structure and move then into a different projection or dimension of linguistic representation. Andrews and Manning, 1999 and Frank and Zaenen, 1998 propose interesting architectural innovations within LFG, but our analysis is essentially independent of the precise choice of architecture.

4.2 The analysis of BVC

In their LFG analysis of the Latin periphrases BVC (correctly) posit a single f-structure for both the synthetic (single word) forms and the periphrastic forms. For the periphrasis, their idea is that both the auxiliary and the participle independently introduce (attribute value) constraints: in the normal way, the f-structure corresponding to the syntactic (periphrastic) construction will be the minimal model jointly satisfying these constraints. The description language for LFG f-descriptions is a first order logic with equality: unification is a convenient tool for checking consistency of constraints and building the minimal model.

The participle provides the semantic value of the verb itself (the LFG ‘PRED’ value), the perfective aspect feature and the passive voice feature, while the auxiliary provides all the finiteness features (i.e. agreement in person/number with the subject, and tense). This can be seen by comparing (12), the f-structure which they propose for <u>laudatur</u> ‘(she) is (being) praised’, with (14), the f-structure which they propose for <u>laudata est</u> ‘she was/has been praised’, and the representations for <u>laudata</u> and <u>est</u> which they give, shown here in (13):

(12) laudatur

$$\begin{bmatrix} \text{PRED} & \text{'lauda < (SUBJ) (OBJ) >'} \\ \text{SUBJ} & \begin{bmatrix} \text{NUM} & \text{SG} \\ \text{PER} & 3 \\ \text{GEND} & \end{bmatrix} \\ \text{VFORM} & \text{FIN} \\ \text{TENSE} & \text{PRES} \\ \text{ASP} & \text{IMPERF} \\ \text{VOICE} & \text{PASS} \\ \text{MOOD} & \text{INDIC} \end{bmatrix}$$

(13)a. laudata

$$\begin{bmatrix} \text{PRED} & \text{'lauda} < (\text{SUBJ})\,(\text{OBJ}) > \text{'} \\ \text{SUBJ} & \begin{bmatrix} \text{NUM} & \text{SG} \\ \text{PER} & 3 \\ \text{GEND} & \text{FEM} \end{bmatrix} \\ \text{VFORM} & \text{PART} \\ \text{ASP} & \text{PERF} \\ \text{VOICE} & \text{PASS} \end{bmatrix}$$

b. est

$$\begin{bmatrix} \text{SUBJ} & \begin{bmatrix} \text{NUM} & \text{SG} \\ \text{PER} & 3 \\ \text{GEND} & \end{bmatrix} \\ \text{VFORM} & \text{FIN} \\ \text{ASP} & \\ \text{VOICE} & \\ \text{MOOD} & \text{INDIC} \\ \text{TENSE} & \text{PRES} \end{bmatrix}$$

(14) laudata est

$$\begin{bmatrix} \text{PRED} & \text{'lauda} < (\text{SUBJ})\,(\text{OBJ}) > \text{'} \\ \text{SUBJ} & \begin{bmatrix} \text{NUM} & \text{SG} \\ \text{PER} & 3 \\ \text{GEND} & \text{FEM} \end{bmatrix} \\ \text{VFORM} & \text{FIN} \\ \text{TENSE} & \text{PRES} \\ \text{ASP} & \text{PERF} \\ \text{VOICE} & \text{PASS} \\ \text{MOOD} & \text{INDIC} \\ & \end{bmatrix}$$

(14) is intended to satisfy the constraints in (13a) and (13b). Unfortunately, however, (13a) and (13b) cannot be partial descriptions of the same f-structure. Any attempt to unify these representations will fail because of a clash in the feature specifications PART and FIN in [VFORM PART] and [VFORM FIN].

Note that in the intended analysis the participle defines the aspect (perfective) and voice (passive) features of the associated f-structure. Since the auxiliary and the participle map to one and the same f-structure, the information associated with the auxiliary esse must be consistent with these equations. But the auxiliary forms which are actually found in this construction would appear, in fact, to be morphologically imperfective in aspect (est, erit, erat), while the perfective forms (fuit, fuerit, fuerat) are not permitted. What BVC appear to have in mind is an additional set of (lexical) entries for the auxiliaries est, erit, erat which, distinct from their counterparts in non-periphrastic usages, are unmarked for aspect. Furthermore, some additional mechanism (which they do not discuss) must be specified to ensure that the participle combines only with these wordforms, and not with the perfective forms fuit, fuerit, fuerat, which themselves bear an ASP value consistent with that of the participle.

These problems seem to follow from the same source. Despite acknowledging that the analytic construction fills a slot in the morphological paradigm, BVC propose an analysis which treats the parts entirely as separate syntactic units independently contributing information to the same f-structure. But these elements have incompatible morphological, formal features. The formalism could, of course, be extended to permit priority union so that, for example, the specification VFORM:FIN might ‘over-ride’ the specification VFORM: PART associated with the participle, and the specification ASP: PERF associated with the participle might ‘over-ride’ the specification ASP:IMPERF associated with the tensed auxiliary. But even if we were to permit this, it would not capture the facts adequately. The participle remains a participle whatever the meaning or grammatical function of the periphrasis. Indeed, this is why it agrees with the subject in the manner of a predicative adjective rather than a finite verb. The standard model of LFG presupposed by BVC is unable to capture the fact that the participle and auxiliary word forms in the periphrastic construction still bear the same morphological description they always have even though the construction they form now conjointly realizes an entirely different set of features, namely the perfective passive.

Ackerman and Webelhuth (1998:142--3 fn 4) discuss in passing the Latin periphrasis from precisely this point of view. They point out that earlier descriptions of such phenomena fail because they fail to "separate morphosyntactic information such as being a participle of the perfect from predicate information such as having a passive function structure." They claim "The confusion dissipates immediately once we recognize the following important distinction: morphosyntax is a way of categorizing word-sized units of form, but meanings, voice, and function inventories are ways of specifying predicates whose content is realized by one or more word-sized units identified by their morphosyntactic profiles." [emphasis original]. By 'predicate', Ackerman and Webelhuth here essentially mean either single word verbs or periphrastic constructions which realize some language specific set of morphosyntactic features (such as perfective passive).

In sum, the analysis of the Latin periphrasis offered by BVC is valuable for two reasons: first it correctly signals the importance of recognising that the periphrastic construction does indeed complete/enter the paradigm space, and second, it illustrates the problems engendered by conflating form (morphological) features with the sorts of contentful features appropriately represented in LFG f-structures (this problem is recognised explicitly in Ackerman and Webelhuth, 1998, Andrews and Manning, 1999, and Frank and Zaenen, 1998). The problems that the BVC analysis encounters all centre around one set of phenomena, namely, morphosyntactic constructions that are used to realize syntactic features other than those they would normally be associated with. The Latin data, just like the past tense in Spoken French or the periphrastic constructions discussed at length in Ackerman and Webelhuth, demand that we separate form from function, and equally demand that we treat entire constructions as conjoint exponents of features, possibly in a non-compositional manner. The Latin data show in addition that purely morphological features, and not just s-features, can be spelled out by multi-word constructions.

We will offer a re-analysis of the construction which unites the architecture of LFG with the realizational word-and-paradigm approach (as instantiated in the work of Stump) essentially following Ackerman and Webelhuth (1998).

5. M-features and s-features in Frank and Zaenen (1998)

5.1 Analysis

We have stressed the need to distinguish two kinds of morphosyntactic features, and dwelt at some length on the problems which arise when form or exponence related features are encoded in LFG f-structures. A particular source of confusion is that the domains of these features are not totally disjoint: there is both an m-tense and an s-tense feature. Thus the French analytic past tense est venu will have the m- and s-featural descriptions as in (15):

(15) m-features: [m-Tense:Pres] + [m-Participle:Perfect]
s-features: [s-TENSE Past]

Although there is an obvious need to keep m-features and s-features separate, it is equally true that in languages with rich morphology, especially, there is frequently an (apparently) trivial mapping between the two sets of features. We assume that there is need in such systems to acknowledge the existence of both sets of features, for the m-features define the morphological paradigm space. In such cases, there is a trivial mapping between morphological and contentful features, for example:

(16) Tense ⇔ TENSE
Aspect ⇔ ASPECT
Voice ⇔ VOICE
Person ⇔ PERSON
Number ⇔ NUMBER
Gender ⇔ GENDER

Of course, the features ‘Tense’ and TENSE are completely different formal objects on such a view (as can be seen by replacing all the feature names with completely arbitrary integers).

Only s-features may appear in f-structure (and on the most restrictive versions of LFG, arguably only semantically interpretable s-features). The m-features can be represented on a special m-structure projection (as in Butt et al., 1996, Frank and Zaenen, 1998) or can be regarded as part of a global set of features but typed, so as to distinguish them from s-features (members of an m-restriction class in the sense of Andrews and Manning). For our purposes it doesn't greatly matter how this is implemented, provided the type differences m- vs. s-feature are observed. In the rest of this section we illustrate how the Latin periphrasis problem can be recast in a version of LFG which respects a distinction between morphological and contentful (f-structure) features, the projection structure architecture of Frank and Zaenen 1998. Frank and Zaenen (building on earlier work by Butt et al., 1996) propose the following projection architecture for LFG:

(17)

	$\underline{\phi}$		$\underline{\mu}$	
c-structure	→	f-structure	→	m-structure

In LFG, passive is conceived of as a morpholexical rule applying to argument structures of predicates and defining a mapping of arguments to surface grammatical functions such that the highest argument maps to an OBL function (or ADJUNCT) and a lower argument to the SUBJ function. For expository purposes we will substitute an f-structure feature VOICE to stand in for this operation over PRED values. Since voice has to be reflected somehow in f-structure representations, whether as a feature, or as a predicate, or as a choice of derivational verb form, the exact choice of notation is immaterial to our concerns.

Our reanalysis using the Frank and Zaenen system makes use of the following features: at f-structure we distinguish ASPECT, VOICE and TENSE and at m-structure we distinguish the features PER, NUM, GEN, VFORM, AUX, FIN, ASPECT, TENSE and VOICE. We abstract away from other f-structure features which would be required in a full account.

We illustrate with <u>laudata</u> <u>est</u>. The word forms are associated with the lexical descriptions given in (18) and (19), with irrelevant features omitted. The c-structure

nodes V (which dominates est) and A (which dominates laudata) are both associated with the annotation (↑ = ↓) which specifies that they map to the same f-structure. An equation associated with the A node specifies that it corresponds to the DEP (dependent) in the m-structure associated with the mother's f-structure. These are shown in the tree (20)(we show informal diagrammatic representations of the collections of constraints in (18) and (19) to aid the reader unfamiliar with LFG notation: the subscript to the attribute names in the informal diagrams is intended to indicate a strict constraint over the value)[2]:

(18) est: V:

(↑μ AUX) = +

(↑μ FIN) = +

(↑μ ASPECT) = IMPERF

(↑μ TENSE) = PRES

(↑μ DEP VFORM) =$_c$ PART

(↑μ DEP VOICE) =$_c$ PASSIVE

(↑μ DEP AUX-SEL) =$_c$ ESSE

(↑ ASPECT) =$_c$ PERF

(↑ TENSE) = PRES

$$\mu: \begin{bmatrix} \text{AUX} & + \\ \text{FIN} & + \\ \text{ASP} & \text{IMPERF} \\ \text{TENSE} & \text{PRES} \\ \text{DEP} & \begin{bmatrix} \text{VFORM}_C \\ \text{VOICE}_C \\ \text{AUX-SEL}_C \end{bmatrix} \end{bmatrix}$$

$$\varphi: \begin{bmatrix} \text{ASP}_C & \\ \text{TNS} & \text{PRES} \end{bmatrix}$$

(19) laudata: A:

(↑μ DEP VFORM) = PART

(↑μ DEP VOICE) = PASSIVE

(↑μ DEP AUX-SEL) = ESSE

(↑μ ASPECT) =c IMPERF

(↑ ASPECT) = PERF

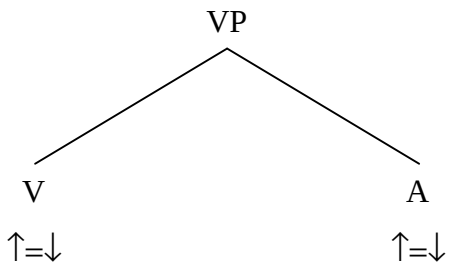
(↑ VOICE) = PASSIVE

((↑ SUBJ) μ GEND) = FEM

$$\mu: \begin{bmatrix} \text{DEP} & \begin{bmatrix} \text{VFORM} & \text{PART} \\ \text{VOICE} & \text{PASS} \\ \text{AUX-SEL} & \text{ESSE} \end{bmatrix} \\ \text{ASP}_C & \end{bmatrix}$$

$$\varphi: \begin{bmatrix} \text{ASP} & \text{PERF} \\ \text{VOICE} & \text{PASS} \end{bmatrix}$$

(20)



(other nodes may be interspersed between these)

The equations in (18) and (19), together with those on the c-structure nodes in (20), define the following f-structure and m-structures.

(21) m-structure:

$$\begin{bmatrix} \text{aux} & + \\ \text{fin} & + \\ \text{tense} & \text{pres} \\ \text{aspect} & \text{imperf} \\ \text{dep} & \begin{bmatrix} \text{vform} & \text{part} \\ \text{aux-sel} & \text{esse} \\ \text{voice} & \text{passive} \\ \text{aspect} & \text{perf} \end{bmatrix} \\ \text{gend} & \text{fem} \end{bmatrix}$$

(22) f-structure:

$$\begin{bmatrix} \text{ASP} & \text{PERF} \\ \text{VOICE} & \text{PASSIVE} \\ \text{TENSE} & \text{PRES} \end{bmatrix}$$

The form laudata is lexically associated with passive voice at f-structure and is a morphologically passive form. Deponent and semi-deponent verbs differ only in that these participles are morphologically passive but not associated with passive voice at f-structure. The auxiliary selects a morphologically (not f-structure) passive form.

5.2 Evaluation

Turning to the problems which we outlined earlier, we might now pause to consider whether they are solved. Technically, there seems to be no problem with this solution although the expression is somewhat cumbersome. However the lexical entry for est is novel and additional (this may not be a problem if all the other uses of est are copula rather than auxiliary). Because of the use of the projection architecture we do not have to maintain (counterfactually) that est is devoid of morphological Tense features.

However recall that our original premise, in which we agreed with BVC, was that the Latin morphological paradigm is indeed square, and not L-shaped. Given the terminology that we have now introduced, the premise is that the analytic forms laudatus est, laudatus erat and laudatus erit provide values for the combination of features m-Voice (passive), m-Aspect (perfective) and m-Tense (pres, past, fut). The approach outlined in the section above does not quite achieve this. Inspection of the m-structure associated with the f-structure and thus the lexical nodes in (18) and (19) and the tree in (20) shows that the m-structures corresponding to the parts of the construction contain different (and therefore incompatible) values for m-Aspect. But by our own argument it would be incorrect to eliminate the m-Aspect feature on the auxiliary est since this is clearly morphologically an imperfective form, whereas what we need as the m-Aspect feature of the whole is that of the dependent laudata. Moreover we also want the m-Voice feature, [m-Voice:Passive] of the dependent laudata to be associated with the structure as a whole. That is, the m-features that we want to associate with the syntactic construction are as in (23), and our complex m-structure does not correspond to this.

(23) [Tense = pres, Voice = passive, Aspect = perf]

The most important point is that this solution actually reintroduces the L-shaped morphological paradigm that we sought to avoid. The syntactic structures are fine but what is to stop the morphology producing the non-existent forms? It must be explicitly stated in the morphological component that there are no (synthetic) finite perfective passive forms, and for deponent verbs it must be stated that there are no active forms, and for semi-deponent verbs, that there are no perfective active forms. But this is tantamount to saying that the morphological paradigm is L-shaped. Though the approach allows us technically to generate appropriate syntactic forms, and associate appropriate m-structures with the separate syntactic atoms, the problem is that the notion that the syntactic construction itself plays a role in the morphological paradigm is missed.

The problem is that syntactic constructions, or multiword predicates, have no ontological status in the theory. Our reanalysis in terms of the Frank/Zaenen proposals

ultimately fares no better than that of BVC, and for the same reason. In the following section, we return to our original morphological perspective on these matters and then sketch out how the competing demands can be achieved within the theory of predicates of Ackerman and Webelhuth (1998).

6. Rule of referral to a syntactic construction

Recall that the periphrastic construction plays the role of the missing affixal inflection by realizing the morphological features of [m-Voice:Passive, m-Aspect:Perfective] (as opposed to the syntactic, f-structure, features of [s-VOICE PASSIVE], [s-ASPECT PERFECTIVE]). This distinguishes the Latin construction from, say, the English participial passive, which realizes the s-feature [s-VOICE PASSIVE], but doesn't serve to realize any m-features at all.

From the point of view of morphological theory, the situation in Latin is one in which a subspace of a morphological, synthetic paradigm is realized by an independently available multiword morphosyntactic construction. This is effectively a rule of referral in the sense of Stump (1993), in that the syntax independently generates a form (copula/auxiliary + participle) and the morphology then 'refers' us to this form as the exponent of part of the morphological paradigm. Such situations are not unheard of. Stump (in press, ch7, section 5) explicitly proposes such an analysis for the Sanskrit periphrastic future, arguing that it is a part of the verb paradigm. In the theory of Paradigm Function Morphology (Stump, in press) we might propose a special type of morphological rule for Latin which realizes the relevant feature set (cells in the paradigm) by means of a syntactic construction which would normally be associated with entirely different m-features.

We first outline our syntactic assumptions. One of the keystones of our argument is the fact that the participle + auxiliary construction exhibits a strong syntactic similarity to the predicative adjective + copula construction – that is, a 'bleached' form of this construction serves as exponent of a set of paradigm cells in the verbal paradigm. The theory of predicates advocated by Ackerman and Webelhuth (1998) provides a helpful way of capturing this constructional overlap. They define

inheritance networks for morphosyntactic constructions, based on a universal set of archetypes. We propose that Latin includes in its declaration of constructional types a subtype of the generalized predicate type which we label the 'predicative adjective construction' or pac . The presentation of these constructions is informal – they can be translated into the typed feature structure formalism of Ackerman and Webelhuth[3]:

(24) pac =
Complement:[$_{AP}$…A[Subj Agr:[…]…]] + Head:[$_{V}$ Type:Copula]

This states that one of the predicate types consists of an adjective (agreeing with the subject) in construction with a copula verb. The canonical copula verb is, of course, 'to be' (in Latin, esse), though others are also found (e.g. English become, Latin fieri). The copula verb serves as the syntactic head of the construction, though semantically it is the adjective which is the head.

In Ackerman and Webelhuth's terminology, the copula verb here is a kind of auxiliary so that (24) is therefore an instantiation of their Auxiliary Schema (p. 102). The perfective passive construction is a subtype of (24), the predicative adjective construction, and hence bears the agreement features appropriate for adjectives in this language, including Gender. The constructional subtype realizing the perfective passive is informally described by (25):

(25) predicative-participle construction (ppc) =
Complement:[$_{AP}$…A[m-Vform:PassPart,]] + Head:[$_{V}$ Type:Esse, m-Aspect:Imperfective]

In the ppc subtype, the adjectival semantic head has to be specified as the passive participle (recall that this label is purely formal, we could equally have labelled it 'Form57'). Moreover, we must specify the copula as the verb esse and restricted it to (morphologically) imperfective aspect forms. This restriction reflects the fact that the grammaticalization process has selected esse as the sole exponent of the passive construction. Things could have been different. In principle Latin could have used any (copular) verb as its passive auxiliary, for instance, it could have used the verb 'become' (fieri), just as is done in German and Polish, or it could have used more than

one to give subtly different passive types (such as the German werden/bekommen passives or the English be/get passives). That it used 'be' is an accident of linguistic history. Also part of the grammaticalization process is the aspectual restriction. It is possible that this restriction can be made to fall out of other systemic features of Latin conjugation, but failing such a generalization we simply have to stipulate this as part of the construction.

Turning now to the morphology, which we express in terms of Stump's paradigm functions, we specify that the passive participle belongs to Declension Class1/2 (as opposed to present active participles which belong to Class3):

(26) [Vform:PassPart] ⇒ [m-Class:1/2]

All that remains is to add a rule to the morphology of Latin specifying that the ppc (that is, the construction, or, in Ackerman and Webelhuth's terminology, the multi-word predicate) is the exponent of the morphological features Perfective Passive:

(27) Given a verbal lexeme, m-feature set σ (excluding [m-Voice:Passive, m-Asp:Perfective]), then

[m-Voice:Passive, m-Asp:Perfective, σ](X) $=_{def}$ ppc

Inspection of the Latin verb paradigms reveals that there are no other dependencies between aspect and voice. In other words, the realizations of aspect elsewhere in the paradigm appeal to just the aspect feature and realizations of voice appeal to just the voice feature. This means that the rule in (27) which appeals to both feature sets conjointly will always be more specific than any other realization rule for aspect or voice, and will hence override all other realization rules for aspect or voice[4].

One important aspect to our analysis is that it severs the link between the predicative use of the participle in the ppc and attributive uses. This is not a criticism that can be levelled at BVC, for their passive participle is effectively a kind of sign, bearing the features of 'passive' and 'perfective' as a lexical property. Indeed, on our approach it

is actually an historical accident that the perfective passive construction makes use of the perfective passive participle. This is an automatic consequence of our theoretical architecture. We have adopted the Separationist axiom of word-and-paradigm realizational morphology. We have also argued that the Latin paradigm is 'square' rather than 'L-shaped'. From the latter premise, it follows that the periphrasis is an exponent of cells in the morphological paradigm, realizing morphological features. Coupled with Separationism this means that the individual word forms and morphemes which make up those words are pure forms, and not form-meaning pairs (signs). Nonetheless, it's clear that the default interpretation of the inflected participle is that which associates it with perfective semantics and passive diathesis. This, in fact, is a consequence of assuming a default m-/s-feature mapping which would give (28) when applied to a passive participle form, other things being equal (though how exactly the features of voice and aspect interact with the semantics of attributive modification is a question we cannot pursue here):

(28) [m-Voice:Passive, m-Aspect:Perfective] ⇒
VOICE PASSIVE, ASPECT PERFECTIVE

For the periphrastic construction, however, the default is overridden, albeit by a feature specification which provides the construction as a whole with the feature values which would normally be associated with the participle in isolation. Far from seeing this as a failing, we regard it as an initial step towards the coding the notion of grammaticalization.

Finally, we must account for the deponents. Here we need a special rule of referral which tells us that the voice feature in the morphology is realized by the passive value for a lexically specified subset of verbs[7]. We assume a lexical feature [Class:Deponent] with subfeatures [Class:Deponent:{Full, Semi}]. We can then state the rule for deponents informally as (29): [5]

(29) If lexeme L is marked [Class:Deponent], then for all feature sets σ, if ([Class:Deponent:Semi] & [Asp:Perf]) or [Class:Deponent:Full] ⊂ σ then:

[m-Voice:Active] ⇒ [m-Voice:Passive]

In Stump's Paradigm Function theory, rules of referral are not overwriting rules which destroy feature specifications. Rather, they are instructions for constructing word forms. This is important in that it means that we start with a set of feature values which include [m-Voice:Active] and which therefore corresponds, by default, with the f-structure AVM [s-VOICE ACTIVE]. Thus, despite the fact that the referral in (29) applies, the syntax will treat a deponent verb as an active voice form. Given (29), rule (27) will be triggered when we come to construct perfective forms for the deponents and we will obtain the desired form. The syntax itself is (almost) entirely ignorant of the fact that deponents are passive in form. The only way in which this morphological fact intrudes into the syntax is in the perfective paradigm where rule (27) ensures that the features are realized periphrastically. But even then the construction serves to realize [s-VOICE ACTIVE].

The interplay of s- and m-features with deponents can be illustrated in (30):

(30)

[s-VOICE ACTIVE]	⇔	[m-Voice:Active]
		⇓
		[m-Voice:Passive]

The active voice characterization at f-structure (syntax) corresponds by default to the m-feature characterization [m-Voice:Active]. However, in the morphology, the rule of referral (28) intervenes and refers all forms (or all perfective forms in the case of semi-deponents) to a passive paradigm. By separating s-features and m-features we thus have a straightforward way of capturing the intuition that deponents are passive in form (morphology) but active in 'meaning' (i.e. in their syntax)[6].

7. Conclusions

We have applied the logical of realizational theories of morphology to the Latin verb paradigm and especially the periphrastic passive forms. The existence of deponent

verbs has confirmed the traditional view that the periphrasis is an exponent of cells in the morphological paradigm of the verb. This means that the passive interpretation is not the only interpretation for passive verb forms, but only the default interpretation. But from these assumptions it follows that the components of the periphrasis are pure forms: the periphrasis has to be regarded as a kind of constructional idiom.

By way of conclusion, some characterisation of the difference between the account which uses a conspiracy of separate word forms and our account.

Our analysis distinguishes between form features, internal to the morphology, which we refer to as m-features, and content features, of the type which are appropriate for the f-structure projection in LFG, which we call s-features. The participle_predicate_construction is defined in terms of syntactic words with m-feature specifications. The perfective passive rule in the morphology tells us that this construction realizes the m-features [Voice:Passive, Aspect:Perfective]. This construction is available in various (m-feature) Tense/Mood forms, inherited from the corresponding forms of the auxiliary. All we need to do to complete the analysis is to invoke the default s-feature interpretations of m-feature specifications: [Voice:Passive, Aspect:Perfective] will normally correspond to VOICE PASSIVE, ASPECT PERFECTIVE. The exception is, of course, the (semi-)deponents, which are handled by our (more specific) deponent rule of referral, overriding the defaults. Tense/Mood m-features will default to corresponding TENSE/MOOD s-feature values[7].

In the analysis of BVC there is no distinction drawn between m- and s-features. Every feature specification of the perfective passive has to be attributed to one or other constituent of the periphrasis. Thus, while for us the specifications [m-Voice:Passive, m-Aspect:Perfective] are taken to be properties of the entire construction, a possibility made available under the assumption of Separationism, for BVC these feature values have to come from the participle itself. Therefore, the feature specifications for the f-structure of the entire clause are almost entirely partitioned amongst the pieces of the construction (except for the value of the subject's Number feature, which is specified on both the auxiliary and the participle). In a sense, therefore, the BVC doesn't really capture the idea that the periphrasis realizes cells in the morphological paradigm. This

is because there is no scope in their account for distinguishing between a morphological paradigm and a syntactic paradigm. Recall that the s(yntactic)-paradigm is the declaration of those grammaticalized constructions that the language must realize, whether synthetically, periphrastically, by means of indeclinable particles, word order or whatever. In our approach the s-features defining s-paradigms are largely equated with LFG f-structure features. In BVC's analysis f-structure features have to cover for both m-features and s-features. But this, together with their treatment of the periphrasis in terms of unification, means that they are actually treating the periphrasis as an essentially syntactic phenomenon. Similarly, the rule of referral over m-features that we define for deponent verbs is handled in BVC:172 as an interpretive rule mapping the f-structure VOICE feature (for us s-feature) to a level of argument structure representation. But that rule is independent in kind of morphological paradigms, and one could easily imagine a similar rule being invoked for a language in which voice was mediated entirely in syntactic terms. In effect, then, the notion of morphological paradigm doesn't actually play any role in the BVC analysis. Rather, what BVC are really proposing can perhaps best be viewed as a variant of the straw man we discussed in Section 3, which presupposes an "L-shaped" morphological paradigm.

However, the distinction between m-features and s-features is not in itself sufficient to handle the Latin facts. The architecture proposed by Frank and Zaenen (1998) draws just this distinction, yet the way they deploy their features would lead us into essentially the same problems that are encountered on the BVC analysis. The moral of the Latin data is that grammatical theory must recognize the two types of feature and must also permit syntactic constructions to realize morphological features.

A number of important questions remain unanswered, including myriad details of the Latin system. We make no apologies for the incompleteness of our account. In part this is because a full account would be impossibly unwieldy. However, a major reason is that linguistic theory has yet to provide an acceptable framework for handling a good many of the phenomena which are implicated in the Latin periphrastic construction. These include the nature of agreement (whether attributive or predicative), the nature of 'mixed' categories such as participles, the relationship

between auxiliary verbs and homophonous lexical verbs (such as ‘be’ in Latin), as well as the precise details of the relationship between m-features and s-features.

First and foremost, it is still unclear how best to incorporate constructions such as participle + auxiliary into general linguistic theory, whether in LFG or any other architecture. Thus, while it is very important to study cases like the Latin perfective passive, in order to clarify the relationship between morphology and syntax, it is still important to have a general theory which will allow us to understand how analytic constructions in general can simultaneously function as exponents of morphosyntactic features and also have a syntactic structure of their own. We have provided an analysis broadly in the spirit of Ackerman and Webelhuth’s (1998) theory of predicates, which in our view provides a good basis for examining these questions.

Second, it is unclear precisely how the Latin periphrasis relates to other auxiliary constructions. For instance, how exactly should we relate periphrastic constructions which realize m-features to periphrastic constructions (in Latin or in other languages) which directly realize s-features without filling in cells in a morphological paradigm?

A full solution to these problems will require clarification of a great deal that is at present very murky. Some of the questions include the following:

- what is the relationship between interpreted and uninterpreted features (such as agreement) and at what levels of representation are they recorded?
- to the extent that periphrastic constructions show the properties of fully compositional syntactic structures, how can they be integrated into those structures?
- to the extent that periphrastic constructions show syntactic properties distinct from those of corresponding compositional syntactic structures how can the grammar treat them separately from those structures?
- to what extent do the components of periphrastic constructions have lexical properties of their own (including PRED values) and how does this affect their morphosyntactic behaviour? What model of the lexicon do such structures presuppose?

- how in general can a separate morphology (particularly one conceived of in realizational terms, rather than in terms of morphemes) be made to articulate with syntax?

We regard these questions, together with the more general question about how a realization morphology articulates with syntactic theory, as some of the most pressing questions in morphosyntactic theory, and indeed, in linguistic theory generally. Our investigation of a small ‘corner’ of the Latin verb paradigm has thrown some light on some of these questions, but more importantly has served to highlight some of the issues that must be addressed in order to advance our understanding of the morphology-syntax interface.

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NOTES

[1] Allen and Greenhough (p. 94, 312) note that occasionally the perfective auxiliary was found, possibly arising from "an intensified expression" for the perfective forms. The crucial point is that there is never (as far as we are aware) a period in which the aspectual contrast of the verb 'to be' is inherited by the periphrastic construction.

[2] We abstract away from several aspects of the syntax of auxiliary – adjective constructions in Latin, but nothing hangs on this.

[3] In point of fact, the pac will be a subtype of a more general predicate + copula construction which includes PPs and NPs.

[4] Strictly speaking, of course, we should demonstrate this by providing a full suite of realization rules accounting for the complete Latin verb system and then showing how our rule (27) interacts with those other rules in the way we claim.

[5] We ignore a number of subtleties to do with deponents. A complete account of the matter would take cognizance of the fact that deponents can occasionally be used with passive meaning, but we omit that refinement. All that matters to our argument is that there exist intransitive deponents. Interestingly, even full deponents have active present and future participles: sequens and secuturus from sequor 'follow'. Moreover, the periphrastic future construction in -urus is always active in form: secuturus esse 'to be about to follow', not passive: *secutum iri. This is compatible with our account under which those participles do not form part of the finite paradigm as such, and in which the periphrastic future is simply the future active participle used with the copular verb. These minor idiosyncrasies in the deponent paradigm underline one again that we are dealing with the exponence of m-features and not with anything which f-structure representations need to be concerned with.

[6]Embick (2000) has recently offered an analysis of the Latin periphrasis within a Minimalist/Distributed Morphology framework. This framework is too different from our own to allow comparison and we will just note here that Embick's treatment (contrary to the claims of the paper) relies crucially on a set of stipulations. For

example, he distinguishes deponents from passivized transitives by claiming that the deponents, uniquely, are subject to a special process of ‘Early Insertion’. However, no mechanism is provided for achieving this and it is not clear how such a thing can come about given his general architectural assumptions. Presumably on that account deponents must be marked with a special lexical feature [+early], yet nothing is said about whether or how this feature is “checked” or otherwise disposed of. Likewise, the periphrasis itself comes about by virtue of a failure of verb movement in the syntax, but what actually prevents the verb movement, and what guarantees the correct spell-out forms of the participle and auxiliary is entirely mysterious.

[7] As is well-known, Latin had defective verbs which lacked [Tense:Present] forms and instead used forms of the perfect: odi ‘I hate (not ‘I have hated’)’, oderam ‘I hated (not ‘I had hated’)’, odero ‘I shall hate (not ‘I shall have hated’)’. For these verbs, then, the default mapping m-Tense:Perfect ⇒ s-TENSE PERFECT has to be overridden.