

Inflectional Classes in Lexical Functional Morphology:
Latin -sk- and its Evolution

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0. The aims of this paper

In this paper* I will address two questions: How can inflectional classes be represented? And why do inflectional classes exist?

I will propose an answer to the first question within the theoretical framework of Lexical Functional Morphology, which is an application of Lexical Functional Grammar (LFG) to morphology, inflectional as well as lexical. I will argue that inflectional class membership is a property of morphological segments and that it is lexically encoded by features which are not passed on to syntax.

Regarding the second question, I will assume that an answer can be found when processes of morphological change are regarded with respect to certain assumptions about the structure of the lexicon. In order to show this, I will propose a case study on the rise of a relatively recent inflectional class of the Italo-Romance and Gallo-Romance verb.

1. What is Lexical Functional Morphology?

Lexical Functional Morphology (LFM) was outlined by Börjars et al. (1996) and Schwarze (1999). It assumes that morphology, like syntax, can adequately be accounted for by a distinction between two levels of representation, c-structure and f-structure, which are systematically related to each other by mapping relationships. At the functional level, the morphology of a language is a set of operations on feature structures. LFM needs no zero segments and no transformations. It can dispense with the notion of morpheme. It only identifies and characterizes morphological segments¹. It is basically a lexicalist theory, but also provides means to account for those phenomena which are not affix-driven².

At the c-structure level, a distinction is made between lexical and syntactic words (Schwarze 1999). Lexical words are not fully specified regarding inflection and, accordingly, are not accepted by syntax. Syntactic words are accepted by syntax. Inflectional morphology then turns lexical words into syntactic words, whereas lexical morphology (or word formation) generates derived lexical words.

2. What are inflectional classes?

A language has inflectional classes if its inflectional paradigms show systematic allomorphy. An inflectional class, then, is made up of a set of lexical items which show identical stem alternations or take the same set of inflectional suffixes. As an example, consider Exese, a hypothetical language which has the following four noun stems: *abab*, *ekek*, *imim*, and *utut*. These stems inflect for number, using suffixes, namely *-e* and *-i* for the singular, and *-o* and *-u* for the plural, with the following distribution:

(1)	<i>Singular</i>	<i>Plural</i>
	abab-e	abab-o
	ekek-e	ekek-o
	imim-i	imim-u

*I want to thank Andrew Spencer for valuable comments on the original version of this paper.

¹ LFM is similar, in some important points, to the theory proposed by Wunderlich (1995). But it does not postulate mental "construction of paradigms" (Wunderlich 1995:98ff), since the paradigms of a language are implied in the system of functional features by which affixes are characterized. Wunderlich needs paradigms to "instantiate unspecified features" (Wunderlich 1995:102). In LFM, no such device is needed. "Unspecified features" are equations of attributes and values, where the value is a variable. They are instantiated when that value is retrieved from some context. Furthermore, in languages which have compound tenses and aspectual periphrases, the functional systems of tense and aspect do not only correspond to morphological, but also to syntactic structures. Therefore paradigms are not specific to morphology. It follows that, when the terms "paradigm" and "cell" are used in the present paper, they are not to be understood as terms of the theory.

² The most important of these means are the functions, written as arrows, which organize the flow of features. They can do what zero affixes do in other theories, and they make "morphemes" unnecessary. Thus, at least one of the criticisms Stump (1998:35) formulates against lexicalist approaches to inflection does not apply to LFM.

utut-i utut-u

Provided that this variation is not phonological, Exese has two inflectional noun classes.

The differences between the inflectional classes of a language do not necessarily comprise all cells of a paradigm. Furthermore, inflectional classes are unstable, i.e. the class membership of lexical items may easily change, such that the classes may be blurred, and eventually disappear.

Inflectional classes may be associated with other lexically encoded classes, grammatical, or conceptual. As an example of association of an inflectional class and another grammatical feature, consider Italian, where two of the large noun classes are associated with gender, whereas the third is not, and is not productive; cf.

- (2) -o / -i nouns are mostly masculine (e.g. *tavolo* / *tavoli* 'table')
 -a / -e nouns are mostly feminine (e.g. *sedia* / *sedie* 'seat')
 -e / -i nouns are indifferently masculine (e.g. *rene* / *reni* 'kidney') or feminine (e.g. *torre* / *torri* 'tower')

An example of association of inflectional with conceptual class is given by those nouns of Italian which are masculine and have *-o* in the singular and those which are feminine and have *-a* in the plural. They show the peculiarity that their plurals are collective; cf.

- (3) *un osso* 'a bone' - *le ossa* 'the bones of the body', *un muro* 'a wall' - *le mura* 'the walls (around a medieval town)'

Associations like these may be considered to make inflectional classes more learnable and thus help them to survive.

2.1 How can inflectional classes be represented?

Authors of dictionaries and reference grammars, generally represent inflectional classes by a system of examples and pointers. They select a set of model words, each of which belongs to a different inflectional class, then give the full paradigm for each of these words, and specify the inflectional properties of the remaining words by pointers in their respective lexical entries.

An example of how inflectional classes can be represented in a more analytical approach is given by Halle & Marantz (1993). These authors define, for a given language, a system of inflectional features, such as number, person and tense, and specify, for each configuration of features, the phonological form to which it corresponds. Thus the plural of the English noun, e.g., corresponds to the segments /s/, /en/, and /ø/. Inflectional class membership, then, is expressed by a list of words which is attached to each of the correspondences. In other words, there is no putting together of stems and affixes, but direct mapping from morphological features to phonological shape.

Both kinds of representation express the idea that the existence of inflectional classes is a property of the lexicon. But they do not make explicit the fact that inflected words often have internal constituency, in such a way that they are made up of morphological segments which are stored in the lexicon. Halle and Marantz' approach, in particular, elegantly accounts for those cases in which morphology is not of the item-and-arrangement type. But it has two drawbacks: it postulates zero affixes (cf. Stump 1998:41), and it does not seem to provide a unified account of lexical and inflectional morphology.

I will assume that morphological segments are largely encoded in the lexicon, at least in some languages, e.g. Italian, and I will propose to account for the inflectional classes of the Italian verb in terms of a unification-based item-and-process morphology.

2.1.1 The data

The Italian verb has six inflectional classes, which partially overlap in such a way that their mutual relationship can be represented by fig. 1 (Vincent 1988:295):

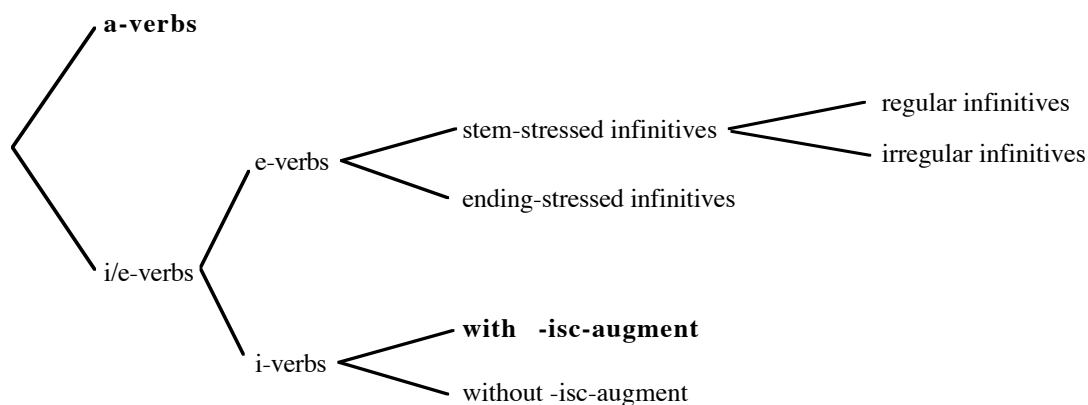


Figure 1: Inflectional classes of the Italian verb

Among these classes, only the "a-verbs" and the "i-verbs with -isc-augment" (*are*-verbs and *ire*-verbs with -sk- stem extension in my terminology) are productive in Italian. The class of *are*-verbs is the default; the productivity of *ire*-verbs with -sk- is limited to deadjectival and denominal verbs³: like the ones in (4):

- (4) *ingiallire* 'to become yellow' from *giallo* 'yellow' - *ingiallisco* 'I become yellow'
dimagrire 'to slim' from *magro* 'thin' - *dimagrisco* 'I slim'
inacetire 'to become vinegar' from *aceto* 'vinegar', - *inacetisco* 'I become vinegar'
invelenire 'to become poisonous', from *veleno* 'poison' - *invelenisco* 'I become poisonous'

In order to show how inflectional classes can be represented in lexical-functional morphology, it may suffice to discuss these two productive classes, which I will exemplify with two verbs, *cantare* 'to sing' and *finire* 'to finish'. The two classes differ with respect to three properties: thematic vowels, the stem extension, and inflectional suffixes. Here are the details:

Thematic vowels. Thematic vowels are semantically empty conjugation markers appearing in parts of the paradigm (Savoia 1997:75). Italian *are*- and *ire*-verbs have different thematic vowels, -a- and -i-, respectively, which appear in most parts of the paradigm; a choice of such forms is given in table 1.

	<i>are-verbs</i>	<i>ire-verbs</i>
infinitive	cantare	finire
past participle mas. sg	cantato	finito
2nd pers. ind. present	cantate	finite
1st pers. sg. imperfect	cantavo	finivo
1st pers. sg. ind. perfect	cantai	finii
1st pers. sg. subj. perf.	cantassi	finissi

Table 1: Some forms with thematic vowels -a- and -i-

These thematic vowels have a certain amount of regular allomorphy. *Are*-verbs have -e- instead of -a- in the future and conditional forms, *ire*-verbs have -e- instead

³ Virtually exhaustive lists of these verbs are given in DiFabio 1990:203f and in Vegnaduzzo 1999:19ff.

of -i- in the gerund, and both classes have -ia- in two forms of the present tense, as shown in table 2.

	<i>are-verbs</i>	<i>ire-verbs</i>
1st pers. sg. future	canterò	finirò
gerund	cantando	finendo
1st pers. pl. present	cantiamo	finiamo
2nd pers. pl. subj. pres.	cantiate	finiate

Table 2: The allomorphy of thematic vowels -a- and -i-

And, finally, the thematic vowel of the *are-verbs* disappears, in the present tense, when followed by a suffix with an initial vowel: *cant-o*, *cant-i*, *cant-ino*, whereas it is protected by the -sk- suffix: *fin-i-sc-o*, *fin-i-sc-i*, *fin-i-sc-e*.

Although the thematic vowel, as such, is meaningless, it carries a certain amount of inflectional information. This is in conformity with the fact that, loosely speaking, even the most regular verbs of Italian have stem inflection⁴.

The stem extension. The second difference between the *are-verbs* and the *ire-verbs* is that only the latter have a stem extension in the present tense.

A stem extension is a morphological segment of the verb, which precedes the person-and-number suffix and may be associated with various kinds of functional information. This information mostly, but not always (cf. section 3.1), concerns inflectional attributes, such as tense, person and number.

The stem extension characteristic for Italian "*ire-verbs* with -sk-" is expressed, in writing, by the letters *sc*; phonologically, it is /SS/ when followed by a front vowel, and /sk/ elsewhere⁵. For convenience, I will call this stem extension "ISK"⁶. The forms which contain ISK are exhaustively shown in table 3.

	indicative	subjunctive
1st pers. sg.	finisco	finisca
2nd pers. sg.	finisci	finisca
3rd pers. sg.	finisce	finisca
3rd pers. pl.	finiscono	finiscano

Table 3: The forms of the *ire-verbs* which contain ISK

Inflectional suffixes. The third difference between *are-verbs* and *ire-verbs* is that, in some cells of the paradigm, identical values are not expressed by the same suffixes, as can be seen in table 4.

⁴ Irregular verbs, then, differ from regular verbs inasmuch as they have inflectional information encoded in their roots.

⁵ This alternation is a morphological, not a phonological one, since, in modern Italian, there is no phonological constraint excluding /k/ before front vowels.

⁶ In Schwarze (1999) tense-and-mode suffixes (imperfect -v- and future or conditional -r-) are also treated as stem extensions. - In the literature, ISK is also regarded as an "infix" (DiFabio 1990) or an "augment" (Vogel 1993:223ff).

	<i>are-verbs</i>	<i>ire-verbs</i>
3d pers. sg. ind. pres.	canta	finisce
3d pers. pl. ind. pres.	cantano	finiscono
sg. subj. pres.	canti	finisca
3d pers. pl. subj. pres.	cantino	finiscano
3d pers. sg. ind. perf.	cantò	finì

Table 4: Allomorphy of inflectional suffixes

In LFM, inflectional classes can be represented by features⁷ which are lexically assigned to lexical words (5) - (6), thematic vowels (7) - (8), stem extensions (9) - (10), and inflectional suffixes (11) - (12)⁸. The stem extension segment is represented by two entries in order to account for its distribution in the paradigm.

- (5) *cant*, *v*, (↑ PRED) = 'CANTARE (SUBJ), (↑ CLASS) = ARE
(6) *fin*, *v*, (↑ PRED) = 'FINIRE (SUBJ), (↑ CLASS) = IRE
(7) *a*, *them_vowel*, (↑ CLASS) = ARE⁹
(8) *i*, *them_vowel*, (↑ CLASS) = IRE
(9) *sc*, *stem_ext*, (↑ CLASS) = IRE, (↑ TENSE) = PRES, (↑ PERS) = 3
(10) *sc*, *stem_ext*, (↑ CLASS) = IRE, (↑ TENSE) = PRES, (↑ PERS) = {1, 2}, (↑ NUM) = PL
(11) *a*, *Vinfl*, (↑ PERS) = 3, (↑ NUM) = SG, (↑ TENSE) = PRES, (↑ MODE) = IND, (↑ CLASS) = ARE
(12) *e*, *Vinfl*, (↑ PERS) = 3, (↑ NUM) = SG, (↑ TENSE) = PRES, (↑ MODE) = IND, (↑ CLASS) = IRE

The following c-structure rules turn lexical verbs (*v*) into syntactic verbs (*V*). Rule (13) generates forms with, and rule (14) without a stem extension.

- (13) $V \rightarrow v \quad \text{them_vowel} \quad \text{stem_ext} \quad \text{Vinfl}^{10 \ 11}$

⁷ Unlike Wunderlich (1995:94, 104ff), who claims that productive inflectional classes can always be derived from other features, I assume that there are arbitrary inflectional class features. Wunderlich's claim may be considered as a violable principle. In a language like Pomo (cf. Catherine O'Connor's talk at the 1999 LFG Conference) that principle is not violated, whereas it is in Italian.

⁸ It follows from this that, in LFM, inflectional affixes are not just "exponents" of morphosyntactic properties (Stump 1998:31). Instead, they are pairs of a segment (c-structure) and a configuration of features (f-structure). One argument in favor of this conception is that, as the evolution of Latin -sk shows, a segment may persist, whereas its features change.

⁹ The choice of the thematic vowel is also sensitive to tense (cf. Table 2), a fact which I am ignoring here.

¹⁰ The reader may be surprised by the extremely flat structures which are generated by these rules. One might argue, in fact, that the sequence *v* - *them_vowel* - *stem_ext* - *Vinfl* is a syntactic word which contains three lexical words; and that therefore the bracketing should be [V[v[v[v *them_vowel*] *stem_ext*]] *Vinfl*]. But such a treatment would raise problems of recursivity, and, which is more important regarding descriptive adequacy, it would not reflect the twofold nature of the stem extension, which may convey inflectional information, but does not create syntactic words. A different treatment has been proposed by Vogel 1993:223. She considers ISK as a part of the stem, present in all underlying forms of the verb and deleted when it is not stressed. She proposes this treatment because she wants to say that ISK-verbs do not have two stems. But postulating that morphological segments are deleted is not compatible with the theory I advocate here. Notice that in LFM, ISK-verbs do not have two stems either.

¹¹ The attribute CLASS and its values are subject to agreement within the word. But since they only support morphological wellformedness, they should not be passed on to the syntactic word. In their present formulation, however, rules (13) and (14) do not meet this requirement. Schwarze (1999:85) contains a proposal about how to treat the derivation of It. future and conditional forms from the infinitive. In the relevant c-structure rule, the functional information (↑ NON_FINITE = INFINITIVE) must be looked for, but, once it has been found, must remain, so to speak, encapsulated. The proposal exploits the possibilities of the "down arrow" function. But this solution does not work in the present case, where the inflectional class features of morphological segments must unify. When rules (13) and (14) are applied, the inflectional class feature will necessarily appear in the functional description of the verb. This can possibly be avoided by filtering out the class feature when lexical insertion takes place (Miriam Butt, p.c.).

- ↑ = ↓ ↑ = ↓ ↑ = ↓ ↑ = ↓
- (14) V → v them_vowel Vinfl
- ↑ = ↓ ↑ = ↓ ↑ = ↓
- (↑ CLASS) ≠ IRE

3. Why do inflectional classes exist?

Since inflectional classes are functionally vacuous, one may wonder why they exist at all. A first answer is that inflectional classes originate from morphological structures which are *not* functionally vacuous. They come about when morphological segments lose their function, but survive as phonological shapes, which are subsequently reanalyzed. The distinction between c-structure and f-structure makes it possible to explicitly represent such changes.

A new inflectional class may spread in the lexicon far beyond the set of words in which the reanalyzed segment originally was present. Eventually, the new inflectional class may be associated with some conceptual class; a process which may restore a shade of functionality to the reanalyzed suffix. I will try to illustrate this type of morphological change with respect to the Italo-Romance and Gallo-Romance ISK-verbs.

3.1 The starting point of the process: -sk- in Latin word formation

In Latin, the morphological segment -sk- was a suffix of word formation¹², by which inceptive verbs were derived; cf. e.g.:

- (15) *flore-sc-ère* 'to begin to bloom'
albe-sc-ère 'to become white'

These verbs belonged to the so-called 3rd or consonantal conjugation, i.e. an inflectional class characterized by the lack of thematic vowel in some forms and a thematic -è- in others.

The bases to which -sk- typically applied were essive verbs, cf.

- (16) *augére* 'to grow' - *auge-sc-ère* 'to begin to grow'
patére 'to stand open' - *pate-sc-ère* 'to be laid open'

It is interesting to notice that the segment -sk- could not be added to the perfect stems of the basic verbs. Therefore, the basic essive verb and the derived inceptive verb have the same perfect forms: *auxi* and *pâtùi* each are the 1st singular indicative perfect of two verbs, *augére* as well as *augescère* and *patére* as well as *patescère* respectively.

This is quite surprising. One would expect, in fact, that word formation suffixes are not sensible to inflection. DiFabio 1999:157 provides a key for understanding this unusual situation. In order to explain the lack of -sk- in the perfect forms, she postulates a morphological principle, the "infix condition", according to which "... only one infix is possible in a single form of the paradigm". In fact, /s/- in *auxi* and /ù/ in *pâtùi* are stem extensions ("infixes"); they derive the perfect stem from the stem of the present tense. If -sk- is an "infix", then perfect forms like **augescùi* or **patescùi* violate the "infix condition".

But the notion of "infix", on which this explanation depends, raises a problem. Although Latin -sk- and -ù- (or -s-) both are extensions of the verb stem, they differ in

¹² As we will see later, -sk- belongs to the category "stem extension". DiFabio calls it an "infix". It is not clear whether this is only a matter of terminology or if she actually thinks the segment is added to the syntactic word, i.e. when there already is an inflectional ending. The way she formulates the rule of -sk-formation suggests that she actually does: "-V_i-re + /-sk-/ >>> -V_isc-ere" (DiFabio 1990:170). If this notation is taken literally, it means that -sk- must be infixed to each single inflected form in which it appears.

an important point: *-sk-* belongs to the system of word formation, whereas *-ù-* and *-s-* belong to the inflectional system. In a model of morphology where morphemes are defined with respect to both, form and function, *-sk-* and the segments which derive perfect tense stems cannot belong to the same category. In lexical functional morphology, however, DiFabio's idea can easily be restated in the following way: At the c-structure level, Latin *-sk-* and *-ù-* (or *-s-*) both are of the category "stem extension" (*stem_ext*), and the functional difference which holds between them can be expressed at the f-structure level. The c-structure rules must then be formulated in such a way that there is only one slot for a stem extension. This is what rule (18) below actually does. Latin *-sk-* can then be represented by the following lexical entry:

- (17) *-sk-*, *stem_ext*
 (↑ DPRED)¹³ = 'SK (ARG)'
 (↑ CLASS) = CONS

And the c-structure rule which derives inceptive verbs is:

- (18) $v \rightarrow v^{14} \quad \text{stem_ext}^{15}$
 $\uparrow / \text{CLASS} = \downarrow / \text{CLASS}^{16} \quad \uparrow = \downarrow$
 $(\downarrow \text{CLASS}) = \text{ERE}$

The semantics of (↑ DPRED) = 'SK (ARG)' is the following: ARG is the predicate of the derivational base, which must refer to a state. SK creates a predicate which refers to the event of beginning to be in that state¹⁷. In Prolog notation, the semantics of DPRED = 'SK (ARG)' can be formulated as follows:

- (19) `pred (<p2,e,x>, event(e), begin <p1,x>) ->`
`dpred (sk)`
`dpred_arg <p1,x>`
`state <p1,x> ;`

The first line of (19) is the definition of the new predicate created by DPRED. *p2* is a variable for this predicate, *event(e)* categorizes *p2* as an event predicate, and *begin <p1,x>* is a decomposition of *p2*. The lines which follow the arrow state the conditions which must be met for *p2* to come about: the *dpred* must be *sk*; there must be a predicate *<p1,x>*, which must be the argument of *dpred* and have the property of specifying a *state*.

Essive verbs could in turn be derived from nouns or adjectives. They belonged to what is traditionally called the 2nd conjugation, i.e. an inflectional class characterized by the thematic vowel *-é-*; cf.

- (20) *flor-* 'flower' - *flor-ére* 'to bloom'
alb- 'white' - *alb-ére* 'to be white'

The intermediate *ére*-verb is not always attested. Thus Lewis and Short 1962 have *siccesco* (*sicce-sc-ère*) 'to become dry', cf. *siccus* 'dry', but not *siccèò* (*sicc-ére*) 'to be dry'. In other cases, where both derived verbs are attested, the essive verb is more marginally attested than the inceptive one; an example is inceptive *duresco* (*dure-sc-*

¹³ DPRED is a function which creates a new predicate when applied to its argument, which is the PRED of the base; cf. Mayo et al. 1995:932f.

¹⁴ The symbol *v* is meant to represent the stem of the input verb, including the thematic vowel. In fact, the vowel which precedes the stem extension "reflects the thematic vowel of the underlying primary verb" (DiFabio 1990:169).

¹⁵ The rule, as it stands, is recursive, which, of course, is undesirable. It is an open question to what extent recursiveness occurs in lexical morphology.

¹⁶ This annotation may be read as: "up equals down except for the class feature". It is meant to express that there is no unification requirement for the class feature of the verb stem and the class feature of the suffix. In fact, the derived verb receives its inflectional class feature exclusively from the suffix.

¹⁷ According to DiFabio (1990:186), Latin *-sk-*verbs also developed a causative meaning: "... the change-of-state semantics were initially ergative, *to become X*. However, the change-of-state verb in later texts is attested as having a causative meaning as well, that is, *to cause to become X*."

ère) 'to become hard', cf. *durus* 'hard', as opposed to *durèò* (*dur-ère*) 'to be hard'. These facts do not prove, of course, that there was a direct derivation from adjective to verb, but they suggest that inceptive verbs had greater importance, in whatever sense, than essive verbs.

It is noteworthy, in this context, that there were two other closely related rules of word formation. They applied directly to adjectives and turned them into verbs either of the so-called 4th conjugation, i.e. an inflectional class characterized by the thematic vowel *-î-* (21), or of the 1st conjugation, with *-á-* as thematic vowel (22); cf.

(21) *grand-* 'large' - *grand-îre* 'to increase', 'to become larger'
moll- 'soft' - *moll-îre* 'to make soft'

(22) *sicc-* 'dry' - *sicc-áre* 'to make dry', 'to become dry'
dur- 'hard' - *dur-áre* 'to make hard'¹⁸

Since their derivation takes place by conversion, i.e. the rule does not use a suffix, the DPRED, which I dub ZERO, is introduced as an annotation to the rule. The rule can then be formulated as:

(23) v → a
 ↑ / CLASS = ↓ / CLASS
 (↑ DPRED) = ZERO
 (↑ CLASS) = {IRE, ARE}

Semantically, this rule generated inceptive or causative¹⁹ verbs. Their meaning may be formulated by (24) if they were inceptive, and by (25) if they were causative²⁰:

(24) pred (<p2, e, x>, event(e), become <p1,x>) ->
 dpred (zero)
 dpred_arg <p1,x>
 property <p1,x> ;

(25) pred (<p2, e, x, y>, event(e), cause(x, become <p1,y>)) ->
 dpred (zero)
 dpred_arg <p1,y>
 property <p1,y> ;

The semantics of *-sk-*verbs (19) and deadjectival *are-* and *-ire* verbs (24), (25), is similar: both imply that a change takes place; the change concerns a state in (19) and a property in (24). The term “inceptive” is meant to cover both types of verbs of change.

To sum up: in Latin word formation there were three rules which derived inceptive verbs:

- i. deverbal verbs, derived by affixation of *-sk-*, mostly belonging to the consonantal class

¹⁸ The other attested meanings, 'to be hard', and 'to last' may be thought to have developed from the causative reading.

¹⁹ Both readings are attested for *grandire* and *durare*. But there seemed to be a preference for the causative variant: according to Lewis and Short, the inceptive variant of *siccare* is "very rare", and no inceptive reading of *mollire* is attested. According to DiFabio, who reports Mignot 1969:279ff, "... the *-are* denominative <verbs> most often only had a causative meaning ..., e.g., *celebrare* 'to make well-known', *maturare* 'to make ripe'". But in Lewis & Short 1962, s.v. *celebro*, one reads that the basic meaning of *celebrare* is 'to go to a place or person in great number or often, to frequent, to fill', of which the meaning 'to make something known, to publish abroad, to proclaim' is derived by metonymy. This is consistent with DiFabio's claim that *celebrare* has a causative, and no inceptive meaning; but the causative meaning is not the central one. And, in the same dictionary (s.v. *maturo*, *maturesco*), one does find that the basic meaning of *maturare* is causative ('to make ripe, to ripen, to bring to maturity', as opposed to *maturescere* 'to become ripe, ripen, to come to maturity'), but that in post-classical Latin, *maturare* also means 'to grow ripe, ripen'. This point seems to need further investigation.

²⁰ It is well known that deadjectival verbs of the kind discussed here have meaning variation if the base adjective is gradable. Thus It. *ingrandire* means 'to become large' or 'to become larger'. This fact, which is a consequence of the semantics of adjectives, is not expressed in (23) and (24).

- ii. deadjectival verbs, derived by conversion, which could also be causative, belonging to the *ire*-class.
- iii. deadjectival verbs, derived by conversion, which can also be causative, belonging to the *are*-class.

This state of affairs is the starting point of the evolution which led to Italo- and Gallo-Romance ISK. In the following sections I will assume a number of processes by which this evolution can be reconstructed. Their order is not necessarily chronological, i.e. they may be coextensive in time.

3.2 The loss of Latin -sk- derivation

The first of the processes which gave rise to the Romance ISK-verbs was the loss of suffixal inceptive derivation²¹. This process can be described by saying that Latin morphology lost the entry for -sk-, as given above in (17) and the c-structure rule given in (18), which I reproduce here for convenience:

(17) -sk-, stem_ext, (\uparrow DPRED) = 'BEGIN (ARG)', (\uparrow CLASS) = CONS

(18) $v \rightarrow v \quad \text{stem_ext}$
 $\uparrow / \text{CLASS} = \downarrow / \text{CLASS} \quad \uparrow = \downarrow$
 $(\downarrow \text{CLASS}) = \text{ERE}$

Regarding the derivational system as a whole, the loss of -sk-formation is a reduction of competing derivational devices. What is relevant for the further evolution is the state of the *lexicon* after the loss of -sk- word formation. It is important, indeed, to be aware of the fact that the loss of a rule of word formation does not imply the loss of the words which were derived by it. In fact, we must assume that a certain number of derived ISK-verbs were stored in the lexicon as syntactic words, i.e., with an inflectional ending. This assumption implies that only a selection among the syntactic words contained in the full paradigm was lexically stored. In fact, it is reasonable to believe that only frequently used forms can be accessed, not only via the morphological system, but directly, as ready-made lexical elements. So the lexicon of speakers of Proto-Romance may have contained -sk- verbs in the present tense, but not in the imperfect or the infinitive.

The loss of inceptive formation with -sk- concerns Italo- and Gallo-Romance; it did not extend to Spanish²². That language has inceptive or causative verbs derived from Romance nouns and adjectives by suffixation with -ec-, the successor of -sk-, and prefixation:

(26) *anochece* 'to become night', from *noche* 'night'
enriquece 'to make rich', from *rico* 'rich'

But -ec- was also affixed to verbs, and when it was, the derived verb did not get an inceptive or causative meaning; cf.

(27) Lat. *parere* - Span. *parecer* 'to appear'
 Lat. *oboedire* - Span. *obedecer* 'to obey'

In Spanish the consonantal verb inflection disappeared entirely; the verbs belonging to it joined the inherited *er*- and *ir*-verbs. Derived and opaque -sk-verbs homogeneously joined the *er*-verbs, and in some cells of the paradigm preserved -sk- as ζ (/Tk/ in Castilian, /sk/ in the *seseo* varieties of Spanish); cf.

(28) *anochezca* 'the night falls-SUBJUNCTIVE'
conozco 'I know'

²¹ DiFabio 1990:167 proposes the following explanation: All Latin -sk-verbs were derived from essive ("stative") verbs. These verbs "have been lost"; then, "the second process, forming +SK verbs, broke down: the source forms, namely stative verbs, disappeared".

²² For a phonological explanation of the Spanish facts, cf. DiFabio 1990:112ff.

This variation was then generalized to other verbs with stems ending in *c* or *z* preceded by a vowel (Green 1988: 101):

- (29) *traducir* 'to translate' - *traduzco* 'I translate'
luzir 'to shine' - *luzco* 'I shine'

Thus Spanish has undergone a contradictory evolution. Latin inceptive formation did not completely disappear. But, on the other hand, -sk- was added to some stems without changing their meaning. Additionally, phonological variation of -sk- was lexicalized, causing irregular stem alternation. Finally this alternation spread to some other verbs. So the evolution of Latin -sk- had no bearing on the inflectional class system of Spanish.

3.3 The reanalysis of lexicalized syntactic words

The second process is reanalysis of the lexicalized output of the former -sk- derivation rule. If, as I assumed above, this lexicalized output is made up of a selection from the paradigm, then the stems of the -sk-verbs had the -sk- suffix in the lexicalized forms, but not necessarily in the others. So these verbs now had a mixed paradigm: with -sk- in some cells, without -sk- in others. At that stage it was plausible for the speakers to reanalyze this variation of verb stems not within derivational, but inflectional morphology. In fact, derivational affixes typically are not sensible to inflection, they are virtually identical throughout the paradigm, whereas inflectional affixes, by definition, are restricted within the paradigm. Furthermore, a reinterpretation in terms of inflection must have been available already at the previous state, when -sk- still was a suffix of word formation: as we have seen in section 3.1, -sk- did not combine with perfect stems. This had the consequence that the presence of -sk- implied the information that the tense could not be the perfect.

So the general pattern of a scattered distribution of ISK in standard Italian verb inflection, as shown in Table 3 above, can be regarded as the immediate result of reanalysis.

The details of this distribution, however, need more specific explanation. DiFabio 1990 argues quite convincingly that phonology of stress assignment played an important role²³.

3.4 The merger of *ire-* and *-sk-* verbs

As has been said before, the Latin inceptive and causative derivation could take place on the basis of three competing rules. Now, when the consonantal verb class, to which the -sk- verbs belonged, became unproductive, and when -sk- derivation had been abandoned, there was good reason to merge the lexicalized and reanalyzed -sk-verbs with one of the remaining inceptive or causative classes. In the Italo-Romance and the Gallo-Romance domain, the choice fell on the *ire*-verbs, which were semantically more closely related to the former -sk-class (DiFabio 1990:188, Vegnaduzzo 1999:5). So most Italian and French *ire*-verbs accepted ISK as a stem extension in some forms of their paradigms, presumably first in the present tense.

3.5 The spreading of -sk- in the paradigm

As has been shown above (table 3), the stem extension ISK, in standard Italian, only appears in the present tense, and, even there, lacks in the 1st and 2nd person plural. In other Romance varieties²⁴, it spreads farther into the paradigm of *ire*-verbs. In French, it appeared in all forms of the present²⁵ and of the imperfect and in the so-called *participe présent*, which is a continuation of the Latin gerund. And, which is more,

²³ She argues that the lack of ISK (an "infix", in her terminology) in the 1st and 2nd plural of the present tense is due to the resolution of a stress conflict: "In the case of the inflectional paradigm, a stress conflict arises when the infix, which requires stress, is added to a form which has a stressed desinence, and the infix is deleted" (DiFabio 1990:33).

²⁴ For a detailed review of the facts cf. DiFabio 1990:59ff.

²⁵ The lack of -ss- in the indicative singular (*je finis, tu finis, il finit*, as opposed to *nous finissons, vous finissez, ils finissent*) is due to sound change.

morphological nominalization takes extended verb stems as a base (Vegnaduzzo 1999:6):

(30) Fr. *finissage* 'finishing', *investissement* 'investment'

In certain dialects of Northern Italy ISK extends to all forms of the present tense, and some central and southern dialects have generalized it "to all persons, and into other tenses" (Savoia 1997:83). In Friulano it even appears in the future and the conditional (DiFabio 1990:209, Vegnaduzzo 1999:7); cf.:

(31) Friul. *partissarai* 'I will leave', *partissares* 'I would leave'

It seems, in fact, that there are topological relationships among the parts of the paradigmatic system of the language. If the present tense is the point where innovation first appears, and the innovation subsequently spreads into the paradigm, the imperfect and the present participle are reached before the future or the conditional, and the infinitive, as well as the past participle are most remote. It would be tempting to investigate whether the existence of such relations is confirmed with respect to the spreading of analogy in general, especially when analogy reduces stem alternations.

3.6 The spreading of ISK in the lexicon, the split of the *ire*-class, and blocking

In parallel to spreading in the paradigm, ISK also spreads in the lexicon. When, after the loss of *-sk-* word formation, reanalyzed ISK appeared in verb forms of the *ire*-class, some *ire*-verbs resisted that innovation. In standard Italian, as well as in French, verbs such as *dormire* 'to sleep', *sentire* 'to feel', *partire* 'to leave', *mentire* 'to lie', have no ISK stem extension, thus giving rise to the inflectional class distinction among *ire*-verbs shown at the bottom of Fig. 1.

Why did this happen? Again, the assumption that the lexicon, along with lexical words, also contains syntactic words, yields an explanation: if forms like (32) were permanently stored in the lexicon, then the new forms with ISK, like (33), were blocked.

(32) Lat. *dormio* (or **dormo*) 'I sleep', *dormis* 'you sleep', etc.

(33) Lat. **dormisco* 'I sleep', **dormiscis* 'you sleep', etc.

But blocking may suffer erosion, and that is actually what happened in dialectal Italian. Savoia 1997:83 reports the following forms of *addormirsi* 'to fall asleep' (derived from *dormire* 'to sleep') from the Southern dialect of Caloveto, Italy:

	present	imperf. indicative	imperf. subjunctive
1st sg.	m addOr"miSSu	m addOrmiS"SiE	m addOrmiS"SissE
1st pl.	n addOrmiS"Simu		
2nd pl.	v addOrmiS"Siti		

Table 4: The erosion of ISK-blocking

3.7 Conceptual homogeneity as a factor of stabilization

We have seen up to now how inflectional classes originated from a change in the system of word formation. But the Calaveto example also shows that inflectional class systems may again be simplified, and Hastings 1997:327 mentions a dialect in which the imperfect shows "complete neutralization of conjugation distinctions". So why did an inflectional system like the one shown in table 3, or similar systems, survive? A general answer may be that human memory is so powerful that there is no need to immediately clear information when it has become functionless. And cultural factors, such as being a language of literature, or the official language of a nation, certainly make this natural inertia still stronger.

But the story of ISK suggests a complementary hypothesis, namely, that an inflectional class may be made learnable, and therefore become more stable, by a

certain amount of conceptual homogeneity of its members²⁶. Let us consider the following facts:

- a. As was said in the beginning, deadjectival *ire*-verbs constitute the only case in which the Italian *ire*-class still is productive.
- b. These verbs have a homogeneous semantics, the same as described in section 3.1 above for Latin *grandire* and similar.
- c. In addition to deadjectival *ire*-verbs, Italian also has deadjectival *are*-verbs; they are far less numerous and, according to Vegnaduzzo (1999:12ff), are systematically different from the *ire*-group²⁷.

This means that the productive nucleus of the *ire*-class is conceptually homogeneous. This may plausibly be thought to support the learnability and maintenance of the *ire*-group as a whole.

4. Conclusion

After having proposed a way in which inflectional classes can be represented, I have tried to answer the question of why such classes exist. I have proposed an answer by examining a specific case, the Italian *ire*-class with its ISK stem extension, which originated from a change in the system of word formation.

Doing so, I tried to explicitly define the morphological and semantic structures which are involved in this process, and I emphasized the role which the lexicon (lexicalization of inflected verb forms, blocking) can play in such a process.

Returning to the system of Italian inflectional verb classes given in fig. 1, we can now conclude that these inflectional classes, although they are semantically empty, are not fully arbitrary: From the two productive classes, the *are*-class is default, and the *ire*-class is supported by a productive and semantically homogeneous subgroup of its members.

The question to what extent this analysis can be generalized is an object for further research.

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²⁶ Vegnaduzzo 1999:8ff makes an interesting attempt to describe the ISK-verbs of Italian as a conceptually homogeneous group, taking into particular consideration deadjectival *ire*- and *are*-verbs. Her observations show that the inflectional class distinction actually is associated with systematic semantic differences.

²⁷ "I verbi denominativi in *-are* possono avere forma transitiva (con valore trasformativo) e intransitiva (con valore causativo), ma mai solo intransitiva; mentre i verbi in *-ire* possono prestare tutte e tre queste possibilità" (Vegnaduzzo 1999:12).

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