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## Analogical Change

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# 9 Analogical Change

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## Chapter Overview

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### 1. Analogy as a Linguistic Concept

Analogy has a long history as a concept inside and outside linguistics (cf. Best 1973, Anttila 1977, Itkonen 2005, Blevins and Blevins 2009). In historical linguistics the concepts of analogy and analogical change have traditionally been used in connection with the so-called Sturtevant's paradox (Sturtevant 1947: 109): 'Phonetic laws are regular, but produce irregularities. Analogic creation is irregular but produces regularity.'

Indeed, the paradox focuses on only one aspect of phonological change, namely its 'blind' effect on morphological paradigms. For instance, if we consider the phonological change which affected all intervocalic Latin sibilants: /s/ → [r] / V \_ V, we obtain an increase in irregularity in several nominal paradigms: \**honōs* 'honor' / \**honōsis*, etc. > *honōs* / *honōris*, etc.<sup>1</sup> This is due to the limited role played by morphological paradigms in constraining the effect of phonological change. The term 'blind' refers exactly to this property of phonological change of applying across the board, regardless of any morphological context.<sup>2</sup>

Because of the effect of an analogical change morphological irregularity was eliminated by extending the stem form *honōr-* to the nominative as well: \**honōs* > *honor*. However, this change did not affect all final sibilants, but only those

which displayed a paradigmatic, i.e. morphologically conditioned, alternation with rhotics. This reveals one main property of analogical change which has been repeatedly emphasized: its sensitivity to morphemes, i.e. to meaning and semantic content. Furthermore, analogical change did not take place in all possible target cases at once, but affected nouns in a word-by-word fashion. Put differently, analogical change does not display the rush expansive character which is typical of phonological change, but proceeds in a much slower way. In fact, not all possible targets have been affected by analogical change in Latin, as documented by words like *flōs* ‘flower’ / *flōris*, etc.

In this light, the opposition regular / irregular which is at the heart of Sturtevant’s paradox amounts to mirroring the basic difference between phonology (and phonological change) and morphology (and morphological change, see Chapter 8 in this volume). This has been termed ‘Hermann Paul’s dualism’ (cf. Wurzel 1988). We will come back to this point later.

On the other hand, analogical change has also been assumed in cases where no meaning is involved. A clear case again involves rhotics. In several varieties of English, both in Great Britain and in the United States, rhotics are commonly deleted word-finally—or better: in syllable-coda position—after certain vowels (cf. Paul [1880] 1995: 119, McMahon 1994: 39, Gaeta 2001):

- (1) a. /P/ → Ø / [ə, ɔ:, ɑ:, ɪə, εə, υə, ɜ:] \_ C<sub>0</sub> ]<sub>#</sub>  
 b. *Hom*[ə] *bores me*      *algebr*[ə] *bores me*  
 c. *Home*[r] *is difficult*      *algebra*[r] *is difficult*

However, deletion was blocked by a resyllabification process occurring in external sandhi, which caused the final rhotic to be parsed as the onset of the following syllable. Nonetheless, because of the neutralization caused by the deletion the speaker reinterprets every final vowel in (1b) as having an underlying rhotic. Subsequently, in the resyllabification context (1c) a rhotic may be erroneously introduced also when it did not originally occur. Such cases have been treated as instances of rule inversion, in which on the base of the surface data the speaker reinterprets the structural change in inverse terms with regard to the original change (cf. Vennemann 1972b):

- (2) Ø → [P] / [ə, ɔ:, ɑ:, ɪə, εə, υə, ɜ:] ]<sub>#</sub> [ \_ V

Finally, analogy has also been invoked for explaining syntactic changes. For instance, Harris and Campbell (1995) assume extension to be one of the three basic types of syntactic change. Since ‘extension might be seen as part of analogy as traditionally defined in the linguistic literature’ (Harris and Campbell 1995: 51), they assume *de facto* analogy to be one of the basic mechanisms of syntactic change.

In more general terms, analogy can be taken to be a general cognitive mechanism underlying grammar and language as well as other human faculties. From this viewpoint, it is not difficult to treat analogy as a general structuring principle of phonology, as for instance suggested by Anttila (1989: 88): ‘the regularity of sound change [and we can add: of any sound alternation, LG] is also analogical: when a sound  $x$  changes under conditions  $y$  in a word  $A$ , it also changes in word  $B$  under the same conditions.’ Similar assumptions have been made for syntax as well.

With the background of such a far-reaching perspective involving analogy, to which we will come back at the end of the chapter, let us briefly review the types of analogical changes discussed in the literature, by focusing on cases which have especially attracted the interest of historical linguists, namely those concerning morphology. In fact, this interest does not reflect an arbitrary choice, because ‘[t]here is evidence of word-based analogy in every language where analogical patterns have been investigated’ (Blevins and Blevins 2009: 5).

## 2. Types of Analogy

Several types of analogical change are traditionally distinguished in the literature, although the differences are not always clear, and much depends on our success in constructing the so-called four-part proportion. The latter is always present when an analogical extension is observed as in cases like the following one:

- (3) a. German *brauch-t* ‘needs’ > Colloquial German *brauch*  
 b. *sollen* : *soll* ‘must’ = *brauchen* :  $X$      $X = \textit{brauch}$   
    *wollen* : *woll* ‘want’  
 ...

A certain pattern, the inflectional behavior of modal verbs in German, is extended to another verb, which originally followed a different pattern. What forces the analogical extension is a matter of discussion to which we will return in the following section, as well as the set of words which constitutes a possible target for the extension. Notice that this analogical extension has been invoked for any case of inflectional class change like for instance Old English *bōc* / *bēc* > MnE *book* / *books*, *sunne* / *sunnan* > *son* / *sons*, etc. on the basis of the very frequent pattern of OE *stān* / *stānas* ‘stone,’ or Classical Latin *senātus* ‘senate’ / *senātūs* > Late Latin *senātus* / *senātī*, *pondus* ‘weight’ / *ponderis* > *pondus* / *pondī* on the basis of the frequent *lupus* ‘wolf’ / *lupī*, etc. Moreover, all cases of extension of a pattern to encompass (or produce) a new item have been considered cases of analogical extension, for instance in word formation: *sentencehood* is coined on the

basis of the pattern instantiated by *nation / nationhood*, *syllabification* on the basis of *verify / verification*, etc. (cf. Hock 1991: 176).

A second type of analogical change is represented by leveling, which consists in the complete or partial elimination of morphophonemic alternations within paradigms like the one discussed above for Latin *honor*. Although this example may seem quite unproblematic, it has raised questions about the directionality of change. In fact, in this example we observe the extension of the stem form from the oblique cases to the nominative, in spite of the fact that the latter is generally taken to be the unmarked form which *ceteris paribus* should prevail over the others (cf. Wetzels 1986). In this case, however, it may be reasonable to solve the question of directionality by simply observing that the stem form *honōr-* occurs in the whole inflectional paradigm except for the nominative singular. So it is no surprise that the extension eliminated the less frequent (although unmarked) form. Furthermore, it is not difficult to reduce this leveling to a four-part analogy, as in (4):

$$(4) \text{ soror} : \text{sorōris} = X : \text{honōr-is} \quad X = \text{honor}$$

The influence of the *soror* pattern may also be helpful in explaining why the leveling did not spread to nouns like *flōs / flōris*, because the analogical pattern is based on polysyllabic non-neuter nouns like *soror*, while no monosyllabic models can be invoked for *flōs* (cf. Hock 1991: 180).

A much more difficult case for settling the question of directionality is provided by the singular and plural preterite forms of the following German verbs, in which allomorphy has been leveled out in two opposite directions, as in (5):

$$(5) \text{ a. sang / sungen 'sang'} > \text{ sang / sangen} \\ \text{ b. greif / griffen 'grasped'} > \text{ griff / griffen}$$

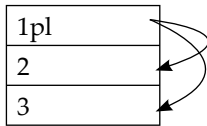
Apparently, the different directionality of leveling can be explained by the mechanism of homonymy avoidance, because in the case of *greifen* the leveling after the singular would have led to homonymy with the present forms (cf. Becker 1993: 13). However, similar cases of opposite directionality can be mentioned for Old English verbs like the following ones, in which no homonymic clash with the present occurred (Anttila 1989: 95), as in (6):

$$(6) \text{ a. rīte / rād / ridon} > \text{ ride / rode} \\ \text{ b. bīte / bāt / biton} > \text{ bite / bit}$$

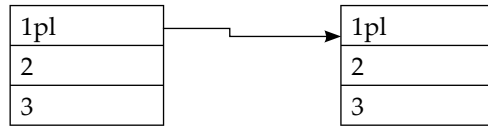
Leveling may also relate to the suffix rather than to the stem. In this case we observe two different possibilities, again according to the directionality of leveling, which have to do with how words are organized in paradigms. In fact, one

of the major factors playing a role in analogical changes is paradigmatic strength, as Blevins and Blevins (2009: 3) generally observe: ‘paradigms are a central locus of analogy in grammar.’ In this light, a paradigm can be viewed in a vertical as well as in a horizontal dimension (cf. Gaeta 2007):

(7) Vertical leveling



Horizontal leveling



In the first type, a form is extended to other slots within the vertical dimension of the paradigm, as in the Upper Rhineland German, in which the ending *-ən* was generalized to the whole plural as shown below (cf. Schirmunski 1962: 523):

(8)

	OHG Present Indicative	Upper Rhineland German
1pl	<i>giloub-em(ēs)</i> ‘we believe’ >	[‘glaw-ən]
2	<i>giloub-et</i> ‘you believe’	[‘glaw-ən]
3	<i>giloub-ent</i> ‘they believe’	[‘glaw-ən]

Leveling was probably favored in this case by a syncretism due to the parallel reduction of the 1<sup>st</sup> and 3<sup>rd</sup> ps.pl., cf. respectively *-em* > *-ən* and *-ent* > *-ən*.

A case of horizontal leveling matching the schema in (7) is provided by the Italian suffix *-iamo* of the 1<sup>st</sup> ps.pl.pres.ind. of all inflectional classes, which results from the extension of the original endings of the Latin subjunctives in *-eāmus* and *-iāmus* (second and fourth conjugation) first to the subjunctive and then to the indicative of all classes:

(9)

	Present Subjunctive	Present Indicative
1pl	( <i>-eāmus</i> >) <i>amiamo</i> ‘let us love’ →	<i>amiamo</i> (older <i>amamo</i> < <i>amāmus</i> )
2	<i>amate</i>	<i>amate</i>
3	<i>amino</i>	<i>amano</i>

Horizontal leveling seems to be more frequent, as it is easy to multiply the examples and to reduce them to a proportional analogy. For instance, in Ancient

Greek the 3<sup>rd</sup> sg present form *phérei* 's/he brings' presents a zero marker instead of the expected *\*\*phéresi* (from Indo-European *\*bhereti*) on the basis of the imperfect *éphere*. The extension is supposed to have been triggered by the similar endings of the 2<sup>nd</sup> Sg of the present and of the imperfect indicative on the basis of the proportion: *épheres* : *éphere* = *phéreis* : X (*phérei*, cf. Lehmann 1992: 220). However, such a formula is not available for the Italian case, whose explanation is still 'obscure' (cf. Maiden 1995: 128). Furthermore, both the Ancient Greek and the Italian leveling present a similar difficulty, because leveling goes from what is usually held to be a marked category to an unmarked one.

Other types of analogical changes are generally taken to be less systematic than these first two. A first example is given by contaminations. Although the latter are often referred to as sporadic or unsystematic analogy in the literature, they actually share a lot of systematicity with four-part analogy and leveling. Moreover, far from being rare, such cases 'are quite common . . . [b]ut their effect usually is much more "helter-skelter" than that of four-part analogy and leveling' (Hock and Joseph 2009: 161). On the other hand, leveling and analogical extension can also be sporadic, in the sense that they may affect a single word on the basis of a unique model. An example of such an extreme case is provided by the Elean Greek word *meú-s* 'moon' / *mēn-ós*, etc., whose nominative singular has been reshaped with respect to the expected *\*\*meí-s* on the basis of the unique model provided by the word *Zeú-s* 'Zeus' / *Zēn-ós*, etc. (cf. Anttila 1989: 89).

A contamination can be found in the Middle Greek suffix for the 3<sup>rd</sup> pl. non-active past *-ondustan*, which goes back to an earlier form *-ondusan* reshaped under the influence of the 1<sup>st</sup> and 2<sup>nd</sup> pl. suffixes *-mastan* and *-sastan* (cf. Joseph 2005). Similarly, in Ancient Greek the nominative plural of the feminine *ā*-stems was reshaped on the basis of the nominative plural of the masculine *o*-stems *\*hoi lukoi* 'the wolf.NOM.PL' giving rise to *\*hai korwai* 'the maiden.NOM.PL' instead of the expected *\*\*hās korwās* on the basis of the parallel forms attested for the respective accusative plurals, cf. resp. *tans korwans* 'the maiden.ACC.PL' and *tons lukons* 'the wolf.ACC.PL' (cf. Hock 1991: 199). Accordingly, a new morpheme *-ai* was recreated on the basis of its masculine counterpart instead of the expected *\*\*-ās*. Notice that this contamination parallels a four-part analogy: *tans korwans* = *hoi lukoi* : X (*hai korwai*).

These two cases can be couched fairly well within the schemas seen above for leveling in (7) appropriately modified. In fact, a vertical contamination took place in the case of the Middle Greek suffix *-ondustan*, whereas the reshaping of the nominative suffix *-ai* in Ancient Greek can be considered a case of horizontal contamination. The difference between contamination and extension or leveling may sometimes be subtle, as shown by the two cases discussed above of the Elean Greek nominative *meús* and of the Ancient Greek feminine suffix *-ai*, assigned respectively to extension and contamination. To keep them distinct,

much depends on how far the extension either of a morpheme or of a part of it is likely to be assumed. Thus, in the case of Elean Greek we can see a leveling if we assume the extension of the stem-ending diphthong of *Zeús*. Accordingly, a morphological type was extended. On the other hand, we might also consider that the nominative *meús* was simply reshaped on the basis of (or contaminated by) the rhyming companion *Zeús*.

Contamination may also result in a purely phonological reshaping of a word on the basis of a close model. A classical example is provided by the word *father*, which is expected to have a voiced plosive *\*\*fa[d]er* resulting from the phonological change of Proto-Germanic *\*ð* > OE *d*. The observed *fa[ð]er* is likely due to the influence of the semantically close word *brother*.

At any rate, even in such cases of lexeme-by-lexeme contamination we may observe horizontal influence, as for instance in pairs of antonyms like the Latin adjective *gravis* 'heavy' reshaped as *grevis* after *levis* 'light,' or vertical influence, as for instance in the case of numerals: cf. the dialectal Greek form *hoktō* 'eight' instead of the expected *\*\*oktō* because of the influence of *heptá* 'seven' (cf. Hock 1991: 197).

Two other types of sporadic analogical change are backformation and folk etymology. In the first case, an analogy is established which allows the speaker to reconstruct a pseudo-derivational relation and to create a nonexistent derivational base, as in *to edit* < *editor*, *to burgle* < *burglar*, in which a verbal base form is extracted by dropping an alleged agentive suffix *-ar* which normally occurs in *driver*, *speaker*, etc. from the two loans respectively from Latin and French. Backformation can become quite productive, as shown by German reverbalsizations like *notlanden* 'to make an emergency landing' < *Notlandung* 'emergency landing,' *ehebrechen* 'to commit adultery' < *Ehebruch* 'adultery,' etc. Clearly, this depends on the analyzability of the alleged affixation and on the productivity of the noun > verb conversion which lies behind it. A by far more restricted, sporadic, case is illustrated by those examples in which backformation leads to the secretion of an alleged suffix, like in *pea* and *cherry* from the French loans *pease* and *cherries* (OF *peis* and *cerise*) where an alleged plural suffix has been stripped away.

A similar process of reanalysis also lurks in folk etymology, which leads to the remotivation of a word in more transparent parts, as shown by *sandblind* which goes back to OE *sām-blind* 'half-blind.' The semantic remotivation does not necessarily amount to providing a new transparent meaning to the word as speakers simply seek to replace elements of unfamiliar words with more familiar ones independently of the final outcome (see Chapter 17 in this volume). However, we also find cases in which a true remotivation has taken place as a consequence of folk etymology, as in German *hantieren* 'to handle,' which is a loan from Old French *hanter* 'to stroll about' and has been remotivated on the basis of the word *Hand* 'hand.' In some cases, a pattern can also become



productive and analogically extended, as in *Hamburger (Wurst)* 'sausage from Hamburg' > *ham+burger* by folk etymology and subsequently *cheese+burger*, *fish+burger*, etc.

### 3. Laws of Analogy?

So far we have been discussing several types of analogical change without raising the general question which lurks behind it, namely: which factors allow us to establish the attractor pattern? This also entails a subordinate question regarding the directionality of the analogical change.

Several attempts have been made to discover general principles or laws which would enable us to make predictions (of course, always relating to the how or why of a change, never to the when!) on possible analogical changes. Classical reference works are Kuryłowicz (1947) and Mańczak (1958), who carefully investigated a considerable number of cases of analogical changes in several (mainly European) languages. Thus, even if we cannot attribute a statistical significance to their results, their findings are largely supported empirically. Kuryłowicz's six 'laws' and Mańczak's nine 'tendencies' mainly deal with the question of directionality leaving in the background the question of the attractor pattern. Notice that the label 'law' adopted by Kuryłowicz is inadequate not only because exceptions against the alleged laws are easy to find, but also because we have already seen that analogical change, compared to sound change, usually takes place in a word-by-word fashion, thus intrinsically displaying the character of a tendency rather than the mechanism of a law.

We can summarize Kuryłowicz's and Mańczak's contributions by pointing out three main tendencies which are still valid after analytic discussion (cf. Hock 1991, Chapter 10; McMahon 1994: 80). First, there seems to be a tendency for some categories (i.e. morphological contents) to be more basic (or less marked) than others. This explains the preference for a certain directionality in analogical change. For instance, we have seen in (5) above that in German preterites leveling normally goes from the singular to the plural. Another similar example can be taken from Provençal, in which the inflectional endings of the preterite *cantém* 'we sang' > *cantétem*, *cantétz* 'you sang' > *cantétei*, *cantéren* 'they sang' > *cantéten* have been reshaped on the basis of the 3<sup>rd</sup> person singular *cantét* 's/he sang,' generally taken to be the unmarked form (cf. Bybee 1985: 39). However, exceptions to this tendency can be mentioned, as is the case of the verb *greifen* in German and the English preterites seen in (5–6) above.

Second, there is a general preference for more explicit marking over less explicit marking as in the English -s plural in *books* with respect to OE *bēc*, in which the additive marking may be seen as more explicit than the stem vowel alternation. The extension of the stem vowel alternation in German plurals like

*Baum* 'tree' / *Baum-e* > *Bäume* after the model of *Gast* 'guest' / *Gäste* can also be considered a case of more explicit marking, because the vowel alternation reinforces an already present additive marking.

Finally, there seems to be a tendency to reduce multiple expression (including allomorphy) of the same morphological content inside and outside paradigms. This seems to hold true both for analogical extension (cf. again the case of the extension of the English *-s* plural) and for leveling (cf. the case of Latin *honor*).

All these preferences can be captured by the same principle, called the 'principle of constructional iconicity' or 'Humboldt's universal.' Indeed, the two names highlight two different aspects of the question. To put it in a nutshell, the principle of constructional iconicity claims that more form should correspond to more meaning, while Humboldt's universal claims that one form should correspond to one meaning.

In general, these claims have to be treated in the broader frame of markedness, as understood by scholars like Nikolaj S. Trubetzkoy and Roman Jakobson (cf. Andersen 1989 for a survey). In particular, Jakobson has elaborated further on Trubetzkoy's comprehension of markedness by adopting the semiotic reference frame of Charles S. Peirce (cf. Jakobson 1965). In Peirce's view, iconicity means that the signs are motivated in that their formal structure mirrors or makes reference to their referential content: a clear case is provided by onomatopoeic forms, which partially mimic some vocal aspect of the referent. A more subtle (or abstract) case of iconicity is provided by the so-called diagrams, in which the referential content is hinted at by the makeup of the sign. Iconicity in morphology refers to this latter definition, and implies additive (i.e., affixation) marking to be preferred over non-additive marking (such as zero-affixation, inner root alternations like apophony, and subtraction). In other words, a semantic 'more' must correspond to a formal 'more,' which lies at the heart of the principle of constructional iconicity.

Clearly, in order to assess the semantic 'more,' it is necessary to have an idea of what is semantically more basic or unmarked. Although the latter is not always as clear-cut as one would like to have it,<sup>3</sup> we can at least agree upon singularity being more basic than plurality. Accordingly, singulars are expected to be less marked than plurals. Notice that the apparent paradox given by the fact that for instance the plural of a word like *sheep* / *sheep* has to be treated as more marked than the plural of *boy* / *boys* disappears if the original German terms suggested by Jakobson are considered. In this regard, he carefully distinguishes between 'markiert / unmarkiert' as corresponding to basic / complex and 'merkmalhaft / merkmallos' as corresponding to feature-bearing / feature-lacking. Thus, in the ideal case we should expect that what is 'markiert' should also be 'merkmalhaft,' namely an isomorphism between the formal and the content level. Violations of this principle may occur, as shown by *sheep* / *sheep*, but

are predicted to be unproductive, and/or to presuppose iconic morphological marking in the rest of the inflectional system.

The other principle refers to an iconic isomorphism according to which uniform coding is preferred over non-uniform coding; this is captured by the formula one form—one meaning. Such isomorphism is maintained as far as possible, and it is reestablished after its disruption by sound change with the help of Humboldt's universal. Accordingly, '[s]uppletion is undesirable, uniformity of linguistic symbolization is desirable: Both roots and grammatical markers should be unique and constant' (Vennemann 1972a: 184). Notice that this principle in a way updates Sturtevant's paradox by promoting it to an 'innate principle of linguistic change,' very much in Paul's sense of a general striving towards the symmetry of the system: 'Der Symmetrie des Formensystems ist also im Lautwandel ein unaufhaltsam arbeitender Feind und Zerstörer gegenüber gestellt . . . Wo durch den Lautwandel eine unnötige und un Zweckmäßige Differenz entstanden ist, da kann dieselbe mit Hilfe der Analogie beseitigt werden' (Paul [1880] 1995: 198).<sup>4</sup>

Even though this view is attractive, it is not entirely clear what the symmetry of the system should mean. In fact, iconic isomorphism (spelled out along both dimensions of constructional iconicity and Humboldt's universal) does not seem to be sufficient to account for a number of analogical changes. For instance, we have seen in (3) above that non-iconic marking is introduced as a consequence of analogical change: *braucht* > *brauch*. For this reason, in a theoretical framework which makes crucial reference to iconicity as a basic ingredient, such as Natural Morphology, it is customary to distinguish between a universal, system-independent naturalness and a specific system-dependent one (cf. Dressler 2003). In this framework, naturalness is equated with constructional iconicity in the sense defined above. Accordingly, the strong prediction is made that language change should run towards more naturalness, i.e. more iconicity.

However, such a general statement must be adapted to the specificity of a given linguistic system. In particular, the tendency towards universal naturalness seems to weigh very differently for derivational and for inflectional morphology. For the latter, the paradigmatic strength seems to be more enhanced, as for instance suggested by Plank (1981: 31) by means of the following implication: If a certain stem alternation is leveled in a derivational paradigm, then it is also leveled in the corresponding inflectional paradigm but not vice versa. Thus, the outcomes of Proto-Germanic \**h* were different depending on the preceding (palatal or velar) vowel. The alternations still occurring in Middle High German only survive in derivation (10c), but have been leveled out in inflection (10a):

- (10) a. *sihe* 'I see' / *sach* 'he saw' > *sehe* / *sah*  
b. *nah* 'near' / *näher* / *nächst*, *hoch* 'high' / *höher* / *höchst*  
c. *sehen* 'to see' / *Sicht* 'sight', *hoch* 'high' / *erhöhen* 'to heighten'

Relics of this alternation can only be observed in the case of adjective gradation (10b), which clearly shows the intermediate status, between inflection and derivation, of this inflectional category.

In general, system-dependent naturalness is defined in terms of system adequacy which accounts for a particular morphological system on the basis of its own structural properties (cf. Wurzel 1989). System adequacy is spelled out by means of specific system-defining properties which express the normalcy of the system. A stable morphological system tends to have inflectional paradigms anchored by well-defined extra-morphological (i.e., phonological, semantic, syntactic) properties, which make the morphological relations between (nets of) words easily accessible and learnable. Thus, the extension of the inflectional class of *lupus* / *lupī* to *senatus* / *senatūs* > *senatī*, etc. simplifies the inflectional system, in that inflectional pattern is strictly associated with the extra-morphological property given by the ending *-us*.

Analogy has a basic economic effect on a morphological system in that it generally extends the domain of application of extra-morphological properties (cf. Gaeta 2006). By spelling out the conditions for system adequacy, we are able to predict the conditions for analogical changes to take place. In this light, the role played by analogy is a central one in favoring the organization of paradigms. Thus, the German verb *brauchen* can be said to have acquired the extra-morphological property of being modal. As a consequence, it has also acquired the properties of the other modals. This is confirmed by the acquisition of a further property specific of modals, namely the government of a bare infinitive: *Karl brauch nicht kommen* 'Karl need not come.' The high specificity of the extra-morphological property justifies the anti-iconic effect of the analogical change.

However, given the very specific nature of system-dependent naturalness, it is unclear to what extent it is harmonic with the general principles of iconicity. It may also be the case that an analogical change systematically runs against iconicity, as for instance in Milanese where feminine nouns ending in *-a* display a subtractive plural marking like *la scarpa* 'the shoe' / *i scarp* (cf. Salvioni 1975). This is due to a phonological change which deleted all final /e/. In spite of its anti-iconic nature, the subtractive plural is extended to other feminines as well like *\*vest* 'cloth' / *vest* > *vesta* / *vest*, *\*carn* 'meat' / *carn* > *carna* / *carn*, etc. In this case too, a more systematic distribution (i.e., all feminines explicitly marked by means of the ending *-a*) is reached at the cost of reducing iconicity.<sup>5</sup> Therefore, iconic marking is subordinated to the system adequacy of a certain morphological coding, which emphasizes the priority of system-dependent naturalness over the universal dimension of naturalness.

One corollary of this conclusion is that very specific information may be of relevance for determining the directionality of analogical extensions. In this connection, Wurzel (1989: 70) explains the extension of the stem vowel

alternation typical of words like *Gast* 'guest' / *Gäste* to words like *Baum* 'tree' / *Baume* > *Bäume* by simply considering the larger type frequency of the lexical set of *Gast*. No appeal to any extended iconic marking seems to be necessary. The opposite direction might also have been possible if the frequency relations were inverse.

#### 4. Analogy as an Emergent Force

To summarize, analogical change seems to favor paradigmatic systematicity in that idiosyncratic patterning is eliminated in favor of more general (and frequent) patterns. Extending Paul's dualistic view of a local improvement of opaque outcomes of phonological change with the help of a sense for systemic symmetry, language can be viewed as resulting from the analogical generalization of salient and/or frequent patterns. In other words, analogy can be considered to be an emergent force: language (and the process of language acquisition) can be seen as resulting from output-oriented generalizations on the basis of an entrenched model (cf. Blevins and Blevins 2009).

This view of analogy as a cognitive ability underlying the faculty of language has given rise to a long-lasting debate concerning the nature of productivity and of rules. In fact, as pointed out among others by Becker (1990), rules and analogy are not conceptually different in the sense that a rule can be translated into a four-part analogy and vice versa. Thus, one may wonder whether two different concepts must be assumed or whether we can reduce the inventory and simply adopt analogy for any kind of regular, in the sense of rule-governed, pattern. Furthermore, we have seen that analogical extension has been also invoked for cases like *nationhood*, *verification*, etc., which are also considered typical examples of productive word formation rules. Should we really put the case of Latin *honor* and of *nationhood*, *verification*, etc., into the same basket of analogy? Or should we rather keep the latter case aside?

Plag (2003: 38) argues radically against merging the two concepts together by observing first that the concept of analogy is incapable of accounting for 'the systematic structural restrictions . . . that are characteristic of derivational processes, and which in a rule-based framework are an integral part of the rule.' Second, 'it is unclear why certain analogies are often made while others are never made' while in a rule-based system 'this follows from the rule itself.' Thus, he maintains that analogy is found in cases like folk etymology and back-formation, while core examples of word formation are kept under the domain of rules.

Although this distinction may have some usefulness, in that it aims at keeping the highly productive application of a pattern distinct from more sporadic and unsystematic manifestations, it is unclear how far the theoretical

distinction can really be maintained given that '[t]he arguments for and against analogy seem to cancel each other out to a large extent' (Bauer 2001: 96). In fact, we have seen that some analogical changes emerge in the context of very frequent patterns like the inflectional class changes of *boc / bēc > books*, etc., or of *senatus / senatūs > senatī*, etc., while others only affect single words on the basis of a single pattern like in the Elean Greek *meūs*. Thus, any analogy seems to be possible provided that an improvement in terms of the systematicity of a certain paradigm is aimed at. Notice that paradigmatic strength is not only limited to inflectional morphology but may be of relevance for analogical changes in derivational morphology as well. For instance, the French word *amour* 'love' has been leveled after the derivatives *amoureux* 'in love,' *amourette* 'affaire,' etc., instead of the expected *\*\*ameur* resulting from the fronting of the original Latin /o(:)/ in open stressed syllables: *sōlus > seul* 'lonely,' etc. (cf. Plank 1981: 34). Furthermore, we have seen that systematic structural properties may be at the heart of analogical changes, as in the case of the German modal *brauchen* discussed above.

Finally, the difference between analogy and rules may simply be seen in terms of different connotations resulting from a shift of interest from the observation of patterns to the generative capacity of producing them as programmatically endorsed by Chomsky's view of a rule-governed creativity, even though 'the original substance is very much the same' (cf. Anttila 1989: 106). Indeed, 'it could be that speakers work with analogy, but that linguists' descriptions of the output of this behavior are in terms of rules . . . It may also be that rule systems presuppose analogy: they must start somewhere!' (Bauer 2001: 97).

At any rate, a quality which analogy does not share with rules is that it can refer to local relations among forms, for instance of a 'vertical' or of a 'horizontal' type. In this light, we have seen that aiming at a better organization of paradigms, analogy introduces local optimization, which has the effect of increasing the local similarity of two items. This holds true for proportional (extension, leveling) as well as for non-proportional (contamination, folk etymology) changes. They all basically follow the same strategy of saving energy costs of lexical storage by generalizing morphological (or sub-morphological) types. Accordingly, their aim is not to increase unsystematicity, i.e. to make the system more chaotic: recall Paul's systemic symmetry, but rather to reduce formal differentiation. This quality, which more generally consists in identifying and expanding similar recurrent patterns, seems to characterize our cognitive capacity in very general terms (cf. Jackendoff 2007: 17). Along these lines, it might be suggested that analogy also underlies the general property which Hauser et al. (2002) claim to be at the heart of the faculty of language in the narrow sense, namely recursiveness. In this sense, analogical models of language offer a better chance to grasp the forces which underly our cognitive abilities, and among them language.

## Notes

1. However, the reader may ask why we still have cases of intervocalic sibilants in Latin as in words like *rosa* 'rose' and others (see Anttila 1989: 59–60 for a general picture). Following the logic of sound laws, we may only explain this irregularity away, if for instance we assume this word to have entered the Latin lexicon after the end of the effect of the phonological change. This assumption is borne out by the historical evidence: *rosa* is a loanword probably of a Greek origin.
2. On the other hand, we know that phonological rules may be sensitive to morphological information, although of a very specific kind, namely morphological boundaries. To make just one example, in Northern Italian a voicing rule affects all intervocalic sibilants: *co[z]a* 'thing,' *ca[z]a* 'house,' etc. (cf. Standard Italian *co[s]a*, *ca[s]a*). However, a morphological boundary has the effect of blocking the voicing rule, as in the prefixed words *a[s]ociale* / *\*\*a[z]ociale* 'asocial,' *a[s]immetrico* / *\*\*a[z]immetrico* 'asymmetric,' etc.
3. In this regard, cf. Andersen (2001b: 36) who assumes and empirically justifies in each speaker's competence 'a comprehensive network of association that readily relates unmarked terms with unmarked, and marked with marked terms across categories, in part without regard to the substantive character of the categories, in part, apparently, constrained by reference to the substantive content of some categories.'
4. [Thus, sound change struggles against the symmetry of the form system as an inexorably acting enemy and destroyer . . . Where a gratuitous and inappropriate difference arises through sound change, it can be eliminated with the help of analogy] (my translation).
5. It must be added that this state of affairs is not tolerated in other close dialectal varieties like Bergamasco where a plural suffix *-i* is extended from the masculine nouns: *dona* 'woman' / *doni*, *scarsela* 'pocket' / *scarseli* (cf. Lurati 1988: 498).