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Editors' introduction

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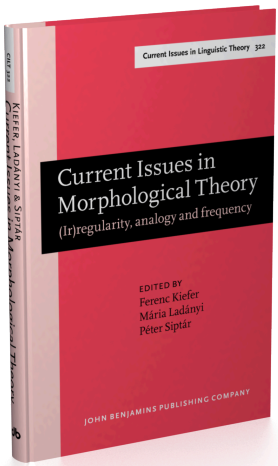

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Current Issues in Morphological Theory. Selected papers from the 14th International Morphology Meeting, Budapest, 13–16 May 2010 : (Ir)regularity, analogy and frequency
Edited by Ferenc Kiefer †, Mária Ladányi and Péter Siptár
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Editors' introduction

1. General introduction

The topics discussed in the present volume clearly reflect the shift in interest from formal approaches toward more functional ones. Aspects of language use did not play a decisive role in linguistic theorizing until the advent of cognitive and functional theories in the 1980es. But according to these theories language cannot be separated from the linguistic experiences of the speakers, production and understanding are part of the linguistic system (Givón 2001; Bybee 2006). From a cognitive-functional perspective, abstract structures cannot be adequately described without taking into account the linguistic and extralinguistic context in which they occur. The abstract linguistic structures are schematic patterns (schemas), which categorize types and tokens (see Bybee 1988, for details). The meaning of complex forms (constructions) is never completely compositional because the constructional schemas arrived at by means of generalizations, too, have their proper meaning (Goldberg 1995; Langacker 2009; Croft & Cruse 2004; Booij 2010). Morphology does not constitute an autonomous system; it can only be constructed on the basis of the facts of language use (Barlow & Kemmer 2000; Taylor 2002). Frequency plays an important role on the individual level, in which case it has to do with the level of linguistic knowledge, but it also determines the conventionalization of linguistic expressions in the linguistic community (Bybee 2006, 2007; Langacker 2000, 2009).

Rule-based morphology concentrates on regular cases and considers irregular ones to be exceptions (Plag 1999; Bauer 2001). Functional morphology – in addition to paying due attention to regular morphology – addresses the problems raised by irregular morphology as well (Taylor 2002; Tuggy 2005). Irregular forms play an important role in language change, which is often conditioned by analogy. Consequently, quite a few explanations in functional morphology are analogy-based.

The papers selected for the present volume are all related to the problem of (ir)regularity, frequency and language use. However, they differ with respect to the extent in which these aspects are taken into consideration.

2. Overview

The papers in this volume can be divided into two groups: the papers in the first group deal with various aspects of morphological regularity versus irregularity as well as with the role of analogy.

2.1 Regularity, irregularity, and analogy

András M. **Baló** argues for an analogy-based explanation of various seemingly irregular forms in the verbal paradigm in Lovari. In particular, he argues that it does not make sense to strictly distinguish between diachronic and synchronic aspects in the description of Lovari morphology. The changes that occurred in the Lovari verbal paradigm can be explained by analogical leveling. The relations between the particular forms are 'holistic' and are independent of the morphological make-up of the morphological word. The paper is a theoretical contribution to analogy-based morphology and at the same time it represents the first detailed account of the variants of the Romani verbal paradigm.

László **Kálmán**, Péter **Rebrus** & Miklós **Törkenczy** argue for an analogy-based approach to linguistic variation. This approach conceives of variation as the competition of two analogical sources of equal strength. It is claimed that such an approach is able to explain where variation is expected and where it is not. The approach is illustrated using the distribution of linking vowels in Hungarian. The authors demonstrate that both in the case where variation is motivated by phonotactics and where variation is motivated by lexical class and category membership, the analogical approach is able to predict whether variation is possible or not.

Péter **Rácz** & Péter **Rebrus** investigate the possible sources of variation in the possessive allomorphy of Hungarian. The authors argue that the morphemes in question are formally underdetermined and can thus be affected by the behavior of similar forms in the speaker's language use. The paper provides several arguments against a generative account of possessive allomorphy and for an analogy-based account. It is shown that analogical pressure can counter-balance any bias based on phonological markedness. Free variation is not a viable notion in the cases discussed.

Angela **Ralli** & Mario **Andreou** propose a revision of the criteria for distinguishing endocentric and exocentric compounds. The authors argue that the distinction is structural rather than semantic. In particular, it is proposed that in the case of exocentric compounds compounding precedes derivation, while the inverse order is valid for endocentric compounds. It is also shown on the basis of Greek and Cypriot examples that exocentric compounds, too, may belong to the productive and regular word-formation mechanisms.

Alan K. **Scott** provides a constructionist account of the adnominal genitive in Dutch. The author argues that though Dutch lost its case system in the 15th century, a fragment of the adnominal genitive is still used productively and preserves agreement morphology that is otherwise absent from the language. This may be a problem for traditional (including generative) accounts of Dutch morphosyntax but can be explained by means of a usage-based, constructionist account. A usage-based analysis, in which regularity plays a decisive role, is also posited for the diachronic development of the genitive fragment.

2.2 The role of frequency in morphological complexity, morphological change and language acquisition

The second group of papers involves the problem of frequency in morphology. Anna Maria **Di Sciullo's** contribution deals with the problem of morphological complexity. She makes a distinction between language external complexity and language internal complexity. The latter can be measured on the basis of the number of operations applying in the derivation of morphological forms. The former has to do with frequency, i.e. with the statistical occurrences of affixes and their combinations with roots. The author compares results from studies classifying languages based on their external complexity to results showing similarities between languages with respect to internal complexity. The comparison reveals that languages with different external complexity may have similar internal complexity.

Dunstan **Brown** & Roger **Evans** address the question of whether it is possible to use machine learning techniques on linguistic data to validate linguistic theory. The paper shows that inflectional classes recognized by linguists can be inferred by an unsupervised learning method when it is presented with the paradigms of a small number of high frequency lexemes. The authors conclude that there is good empirical support for the paradigm classes established on theoretical grounds.

Gabriella **Caballero** & Alice C. **Harris** present the results of a preliminary investigation of the range of cross-linguistic variation of multiple exponence. The survey reveals, among other things, that multiple exponence involving stem alternation is quite common, the occurrence of two markers is quite frequent, and there do not seem to be many constraints on the types of multiple exponence attested in either formal or semantic terms. The survey covers 95 languages belonging to 25 language families.

Anna **Anastassiadis-Symeonidis** & Maria **Mitsiaki** report on gender change in Greek. Gender-related variation is interpreted in terms of cognitive and usage patterns, i.e. prototypicality and frequency. The data suggest that gender change is motivated by prototypicality, strengthened by phonetic similarity, and

consolidated by high frequency of use. The frequency distribution is determined by a web-based research.

Sabine **Laaha** & Wolfgang U. **Dressler** examine the impact of suffix and stem properties on children's acquisition of German noun plural morphology. The relevance of suffix predictability and stem transparency is tested in 140 German-speaking children by using a plural elicitation task. The results show that both variables have an impact on the correct production of plural forms. The findings support a probabilistic view and are incompatible with the traditional dual-route view, which is insensitive to frequency and phonological similarity effects. The paper discusses the differences and similarities between the acquisition of regular and that of irregular forms.

Wolfgang U. **Dressler**, Laura E. **Lettner** & Katharina **Korecky-Kröll** address the early acquisition of German diminutive formation and compounding. The authors argue that first language acquisition can be taken as external evidence for or against a theoretical position. The gist of the paper is about the impact of linguistic typology and frequency in language use on the order of the emergence of morphological patterns in early child language. It is shown that diminutives and compounds emerge as early as inflection patterns do and the paper offers an explanation for this simultaneity in terms of various factors including frequency.

3. (Ir)regularity and analogy

Most broadly conceived, *regular* means 'conforming to the rule(s) of grammar' and *irregular* means 'in violation of the rule(s) of grammar'. In the first case both the inputs and the outputs of a rule must be regular (Dressler 1985: 65–68). The input to a rule is regular if it can be characterized as a (natural) class. For example, there is a rule in English that makes tense vowels lax in the syllable before the suffix *-ity* (provided that there is an intervening consonant). This rule is one of the rules that are responsible for the vowel alternations in *obscene–obscenity, divine–divinity, vain–vanity.* The regular input to the laxing rule comprises the class of Latinate adjectives.

A morphological process may be more or less regular, that is, the shape and, more especially, the meaning of its products may be more or less predictable on the basis of the shape and the meaning of the bases to which it applies. Regularity thus has not only to do with form but also with meaning. If meaning is predictable it is also compositional. In this sense regularity is related to compositionality. Consequently, "regular output" means both 'regular shape' and 'compositional meaning' (Kiefer 2000).

Any theory of language should provide a way for grammars defined by the theory to distinguish irregular cases from regular ones. Different grammars, however, can draw the line between exceptions and regular cases differently. The relationship can even be reversed: what counts as irregular according to one grammar may count as fully regular according to another grammar. Some irregular forms are not only tolerated but also desired in a language. This must be the case, for example, with suppletive forms, which never get regularized.

Regularity/irregularity is not a dichotomy but rather a scalar phenomenon. One way to show this is to describe the typical properties of regular forms and those of irregular forms and then examine whether there are forms that share some, but not all, of the properties of these forms.

In compounding, endocentricity and exocentricity are traditionally related to the presence or absence of a lexical head. In a number of works (see, for example, Dressler 2006; Bauer 2010) exocentricity is treated as a cross-linguistically marked phenomenon in compounding, compared to endocentricity, and not widely attested. On the other hand, on the basis of an extensive corpus of compounds from several languages, Scalise et al. (2009) have shown that exocentricity is not a marginal phenomenon. This is also argued for in Angela Ralli and Marios Andreou's paper in which it is shown that in Cypriot Greek the formation of exocentric compounds exhibits a high rate of productivity. These observations have an important consequence for the theory of compounding: contrary to the received view, exocentric compounds may belong to the productive word-formation mechanisms. The authors point out that exocentric compounds are in no way irregular in Cypriot Greek but they have a structure that is different from most Greek compounds.

Regularity can also be conceived of as a kind of productivity. More specifically, the concept of productivity may also be interpreted as regular performance which is defined by Barðdal (2008: 30) with reference to morphology in the following way: "the application of a morphological pattern to create new word forms of already existing words". Regularity therefore relates to language users' knowledge of the constructions and lexemes of their language, and their ability to combine constructions into meaningful utterances. Alan K. Scott's paper shows that a constructional approach can satisfactorily explain the preservation in productive use of a single section of a morphological case system even as the system as a whole starts to decline and eventually dies out, leaving the preserved fragment isolated in a caseless language. The example of the Modern Dutch adnominal genitive shows that synchronic productivity and morphological regularity can be effectively explained within a construction grammatical framework, along the lines of Booij (2010).

As far as *analogy* is concerned, it is taken for granted that several types of analogy exist. In the case of surface analogy a neologism is formed in exact

imitation of one specific existing form. The neologism may be regular, as in the case of German *Stichwort* 'prompt (in theatre)' giving rise by analogical formation to *Stichnote* 'cue note (in chamber music)', which is a regular compound. In contrast, the English word *illfare,* which was formed surface-analogically after *welfare* is irregular (Dressler & Laaha 2012). The problem of variation is closely linked to the problem of analogy. In contrast to mainstream generative theories, which explain variation in terms of underlying representations and rules or constraints that determine their surface forms, an analogy-based approach – argued for in considerable detail by Kálmán, Rebrus & Törkenczy – takes surface similarities and differences as the basic facts about language. It is assumed that an analogy-based theory incorporates the following principles: (i) a considerable portion of language is memorized, (ii) linguistic experience leads to generalizations, (iii) depending on the strength of a generalization, analogy may be pervasive and may lead to rule-like behavior. Such rule-like behavior can be observed in the case of certain word endings in Hungarian such as *-or* (*doktor, professzor, terminátor,* etc.), which never take the possessive form with *j,* though no phonological constraint would prevent it from taking such a form. The analogy-based theory is used to explain the variation of linking vowels in Hungarian, which is shown to be superior to the rule-based approach used in earlier accounts. In spirit the Kálmán, Rebrus & Törkenczy theory comes very close to Albright & Hayes' (2003) discussion of the English past tenses, which, too, advocates an analogy-based account. Péter Rácz & Péter Rebrus tackle a different aspect of Hungarian morphology. Possessive allomorphy, and, in particular, the third person singular possessive shows a complex pattern influenced by phonological, morphological and lexical factors. It is assumed that the particular function is formally underdetermined and can therefore be affected, among other things, by the behavior of similar items in the language user's lexicon. In the paper analogy is interpreted as a pressure on morpheme selection based on the most salient pattern(s) of the language. It is claimed that the analogical pressure of a strong pattern can override any bias based on phonological markedness.

Paradigms play an important role in theories of analogy, which does not come as a surprise since similarity is a significant characteristic of paradigms and analogy maintains paradigmatic uniformity (Eddington 2006). Recently, analogical modeling has also been used to make certain predictions about possible forms and paradigms (Skousen 2009). Baló investigates the Lovari verbal paradigms in considerable detail and in doing so he makes use of arguments based on analogy. The lack of adequate descriptive grammars of Lovari makes it extremely difficult to establish the number of verbal paradigms; the same goes for the individual forms occurring in these paradigms. Some non-attested forms are postulated on the basis of analogy, which is methodologically fully justified. In the second part of the

paper the analogy-based analysis is extended to verbal derivational morphology as well. The last section deals with the problem of loan-verb adaptation. It can be shown that the variation encountered is a result of analogical change. Baló's study is an important contribution to the grammar of Lovari as well as to the theory of analogical change.

4. Frequency

One of the key notions of usage-based accounts in morphology is frequency. Frequency may refer to type frequency or to token frequency. Word token frequency counts have very little to say concerning regularity. But even type frequency is not an appropriate measure of regularity. It is impossible to extract information concerning the number of possible items of a morphological class from the observed number of types. Moreover, two word formation rules may yield approximately the same number of types in a corpus while differing significantly with respect to their degree of regularity (Baayen 2008). On the other hand, there seems to be a close correlation between high frequency and irregularity and this is considered to be one of the reasons why suppletion is maintained.

Statistical aspects may also play a role in measuring morphological complexity. The complexity issue has a relatively long history in linguistics and has remained a hot topic in more recent linguistic research as well (cf. Culy 1985; Juola 1998; Dahl 2004 and, more recently, Bane 2008). Anna Maria Di Sciullo proposes a sophisticated account of morphological complexity that goes much beyond earlier research. She distinguishes between language external complexity (E-complexity) and language internal complexity (I-complexity). While E-complexity is measurable on the basis of statistical occurrences of affixes and their combinations with roots, I-complexity can be measured on the basis of the number of operations in the derivation of morphological forms. E-complexity was also discussed in Bane (2008), who, however, did not measure I-complexity. This may have been due to the fact that I-complexity is not corpus-based and cannot be calculated on the basis of the occurrences of affixes and roots. I-complexity can be assessed by psycholinguistic experiments, as well as by experiments using brain-imaging techniques. (For the theoretical basis of computing I-complexity see Di Sciullo 2005.) It can be shown that languages that are dissimilar with respect to corpus-based E-complexity may have similar I-complexity in the processing of morphological forms, which is taken as evidence for supporting the Split Complexity Hypothesis.

In recent times frequency data have widely been used in theoretical work on morphology. Frequency data can be used, among other things, to validate theoretically established classification. Exactly this is the objective of Dunstan

Brown and Roger Evans who investigate the extent to which generalizations represented in theoretical accounts of Russian nominal morphology correspond to observable structure in empirical linguistic data, as captured by a general-purpose machine learning system with no linguistic knowledge. Machine learning methods can be applied to linguistic data with a number of objectives (Corbett et al. 2001; Goldsmith 2001). The objective set by the authors is to assess a theory of linguistic structure by analyzing empirical language data in a theoretically neutral way and comparing the result with the predictions of the theory. A good correspondence indicates that the theory is successfully modeling some substantive property of the data, and hence constitutes an empirical validation of the theory. The work is based on Network Morphology as elaborated in Corbett & Fraser (1993). Using this technology the authors could successfully validate, among other things, the theoretical claim about the existence of four paradigm classes in Russian.

In view of the fact that multiple exponence has implications for different morphological theories (it challenges, for example, the widely held principles of economy and structural complexity, see Anderson 1992) and that multiple exponence is not at all infrequent, a thorough typological investigation of multiple exponence may have important consequences for morphological theory. Multiple exponence was originally defined as the association between one meaning and many forms (Matthews 1974). *Wurm* 'worm-SG' – *Würmer* 'worm-PL' would be a German example for multiple exponence (Matthews 1974:149). It would not be difficult to cite further examples from the literature. However, so far nothing has been known about the possible range of variation in multiple exponence patterns cross-linguistically. In their article Gabriela Caballero & Alice C. Harris present the results of a preliminary investigation of multiple exponence patterns documented in 95 language varieties belonging to 25 language families. A major result of this research is that multiple exponence is far more common and less constrained than commonly believed. Furthermore, while occurrence of three or more markers seems to be uncommon, occurrence of two is quite frequent. Finally, no formal or semantic constraints on the types of multiple exponence have been attested. This result has important implications for morphological theory (see, for example, Harris 2009 for a discussion of this problem).

The relationship between grammatical change and frequency is addressed in the paper by Anna Anastassiadis-Symeonidis & Maria Mitsiaki. They report on a case of morphological change in progress that falls within the scope of Greek grammatical gender. Gender-related variation of Modern Greek feminine nouns is explained in terms of prototypicality and frequency. The investigation of grammatical gender change over time gives insights into the way in which the entire gender system works, as pointed out in Corbett (1991:97). This change is based on certain analogical processes: semantic and formal similarities may give rise

to the change of a particular noun from one inflectional class to another. The investigation shows that membership in the masculine *-(o)s* gender class is considered to be more prototypical than membership in the feminine *-(o)s* gender class. Masculine gender spread across feminine nouns shows that the linguistic system tends to get adjusted to regularities imposed by analogy and economy as well as usage patterns (salience, frequency). The change is initiated by masculine prototypicality, reinforced by phonetic similarity, and enhanced by high token frequency. Divergent grammatical gender occurrences are highly frequent in electronic texts of informal register and [– learned] style. The paper explains the grammatical change in terms of "self-regulation". According to Altmann (2005), language systems possess self-regulating and self-organizing control mechanisms that change languages towards an optimal steady state and an optimal adaptation to their environment – in analogy to biological evolution. Self-regulation is oriented to the emergence of unmarked, economic and frequent linguistic structures.

Sabine Laaha & Wolfgang U. Dressler investigate the impact of suffix and stem properties on children's acquisition of German noun plural morphology. One of the central issues of the paper is the problem of predictability, i.e. the question is raised as to what extent plural forms can be predicted. The paper examines the various factors that may influence predictability. At the same time the paper is an important contribution to the controversy between what has become known as dual-route models (for example, Clahsen 1999) and single-route models (for example, McClelland & Patterson 2002). Under the dual-route view, regular forms are computed by symbolic rules and irregular forms are stored in the lexicon. Under the second view, both regular and irregular forms are acquired in the same way: the network is presented a singular stem and its plural form and encodes them. Schema-based models, too, belong to the single-route models: it is assumed that speakers store a large number of exemplars of complex units and that similar exemplars have partially overlapping representations. Generalizations emerge as similarities inherent in exemplars are reinforced through repeated use. The findings of the paper are incompatible with dual-route models; they can, however, be accommodated within a schema-based model. The results corroborate two central claims of schema-based models, namely that speakers prefer local generalizations, and that type frequency plays an important role in generalization (Bybee 1995). In addition, more predictable suffixes occur more often than less predictable ones. What seems to matter for the child is the number of plural nouns belonging to a specific sonority/gender context, e.g. high type frequency of feminine nouns ending in a reduced vowel which take the plural suffix *-(e)n* as in *Katze/Katze-n* 'cat/cats'.

It is commonplace that the acquisition of morphology cannot be independent of morphological typology as well as of the regularity, transparency and frequency

of the individual forms. Dressler, Lettner & Korecky-Kröll investigate the impact of linguistic typology and frequency in language use on the order of emergence of morphological patterns in early child language. The theoretical framework of the investigation is that of natural morphology (Dressler et al. 1987). Morphological typology enters into play insofar as has been shown that greater morphological richness stimulates the child to focus on the acquisition of morphology (Austin 2010). It is also well known that transparent morphological patterns are easier to acquire than corresponding opaque ones. The fact that the agglutinating language type is more transparent than the inflecting-fusional type, too, has consequences for the acquisition of morphology. As for frequency, the authors show that there is a clear correlation between children's inputs and outputs, whereas the impact of input frequency on age of acquisition is weak. On the other hand, productivity and transparency are better predictors of early emergence than input frequency. This casts doubts on the overestimation of frequency as an overall explanatory factor in morphology as proposed, for example, by Haspelmath (2006). It is stressed that type and token frequency in the child's input (i.e. in child-directed speech) is a good predictor of frequency distributions in the child's output.

5. Concluding remarks

The papers of the present volume are primarily dedicated to (i) analogy-based explanations of morphological irregularity and to (ii) the role of frequency in morphological change as well as in the acquisition of morphology by children. Both topics belong to, or are related to, usage-based accounts in morphology (Barlow & Kemmer 2000). The notion of analogy has been known in linguistics for some time and analogical explanations were sometimes considered to be an alternative to rule-governed explanations. The novelty of the papers in the present volume is that they show why an analogy-based account is superior to rule-governed accounts. Unlike mainstream, modular models of language, it affords a uniform treatment of the interplay of disparate factors. In discussing new data and in offering new explanations they go much beyond the current state of the art.

Some papers address the problem of frequency and stress its role in linguistic change in general, and in the emergence of linguistic structures in particular. It is shown that frequency and probability play a role at the interface between the language faculty and the cognitive systems sub-serving mathematical computations. Frequency analysis may also provide us with cues and markers through which a certain type of grammatical change is manifested and diffused. The case studies presented in these papers corroborate not only the close correlation of frequency with emergence and change but they also abound in methodological innovations.

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