

Suppletion: Typology, markedness, complexity¹

Greville G. Corbett

1. Introduction

Suppletion can be seen as an outer limit of inflection, the extreme of markedness and complexity. It is therefore of particular interest within the research programme of Wolfgang Ullrich Wurzel (see, for instance, Wurzel (1989, 1990)). Given the potential interest of suppletion, my colleagues Dunstan Brown, Marina Chumakina, Andrew Hippisley and I, with Peter Lutzeier as a consultant, have undertaken a project on the typology of suppletion, which will give rise to a database and an annotated bibliography. Naturally we hope that this typological database will prove a useful resource to linguists approaching suppletion from various perspectives. It will be a cross-linguistic database, with detailed information on thirty genetically unrelated languages. It will be made generally available, together with the bibliography, with our other databases at <http://www.smg.surrey.ac.uk/>.

A good definition of suppletion is provided by Igor Mel'čuk:

‘For the signs X and Y to be suppletive their semantic correlation should be maximally regular, while their formal correlation is maximally irregular.’

(Mel'čuk 1994: 358)

The formal definition of suppletion is the point of Mel'čuk's (1994) fine work, and while we do not fully agree with him, it is of great benefit to be investigating a linguistic phenomenon where issues of definition have been seriously addressed. We restrict suppletion to inflectional morphology; in particular, that means that for instance ‘verbal number’ lies outside the phenomenon to be investigated (Corbett 2000a: 243-264). We distinguish ‘full’ suppletion as in Russian *rebenok* ‘child’ ~ *det-i* ‘children’ from partial suppletion, as in the English glosses *child* ~ *children*, and concentrate on full suppletion (see Nübling 1998, 2000: 228-230 for discussion of degrees of suppletion).

Gustav Wurzel (1990) suggested two sides to the problem: the morphological and the functional (communicative-pragmatic). We will consider each of these.

2. Morphology

Einerseits ist Suppletion vom Standpunkt der Morphologie (oder auch der gesamten Grammatik) aus betrachtet faktisch Irregularität par excellence ...

(Wurzel 1990: 87)

Approaches to suppletion within Natural Morphology have also been discussed by Dressler (1985b) and Bittner (1988) among others; see Fertig (1998) and Nübling (2000: 249-277) for discussion and further references. It seems timely to widen the debate by gathering data from a broader range of languages. We will explore the typological space of suppletion by examining five questions outlined in turn below.

2.1. Which features are involved?

At least the following are known to be involved:

number: Russian *čelovek* ‘person’ ~ *ljud-i* ‘people’.

case: Latin *Iuppiter* as in Table 1.

Table 1. The Latin noun *Iuppiter* (Rhodes 1987: 230)

| | |
|-----|----------|
| NOM | Iuppiter |
| ACC | Iov-em |
| GEN | Iov-is |
| DAT | Iov-ī |
| ABL | Iov-e |

Such suppletion is more common in pronouns. Thus in the Nakh-Daghestanian language Tsakhur, the second singular pronoun has absolutive and ergative *Ru*, but dative *wa-s* (Kibrik 1999: 130).

tense: Russian *id-ti* ‘go’ with past tense *še-l*, French *all-er* ‘go’ with future *ir-ai*.

mood: Lezgian (Nakh-Daghestanian family) has *altu-n* ‘come’ with imperative *ša*, and *fī-n* ‘go’ with imperative *alad*, and other examples (Haspelmath 1993: 129). There are other instances of the imperative having a separate form, as in Macedonian. It will be interesting to investigate whether other moods are marked by a suppletive stem.

person: German *bin* ‘am’ (1ST), versus *ist* ‘is’ (3RD).

degree: English *good*, with comparative *better*.

gender: examples are very rare in inflectional morphology. Mel’nik (1994: 390) suggests Ancient Greek: *heī(+s)* ‘one (MASC)’ and *mi(+a)* ‘one (FEM)’. This suppletion survives in Modern Greek.

definiteness: Hans-Olav Enger has provided the following interesting data on his East Norwegian dialect (and a comparable situation is found in some other dialects). The adjective ‘small’ has different stems as follows:

Norwegian (East Norwegian dialect, Hans-Olav Enger p.c.)

- (1) *en* *lit-en* *gutt*
 ART.MASC.SG.INDEF little-MASC.SG.INDEF boy.MASC.SG.INDEF
 ‘a little boy’
- (2) *den* *vesle* dialect *gutt-en*
 ART.MASC.SG.DEF little.DEF boy.MASC-SG.DEF
 ‘the little boy’
- (3) *ei* *lit-a* *jent-e*
 ART.FEM.SG.INDEF little-FEM.SG.INDEF girl.FEM-SG.INDEF
 ‘a little girl’
- (4) *den* *vesle* *jent-a*
 ART.FEM.SG.DEF little.DEF girl.FEM-SG.DEF
 ‘the little girl’
- (5) *et* *lit-e* *barn*
 ART.NEUT.SG.INDEF little-NEUT.SG.INDEF child.NEUT-SG.INDEF
 ‘a little child’
- (6) *det* *vesle* *barn-et*
 ART.NEUT.SG.DEF little.DEF child.NEUT-SG.DEF
 ‘the little child’

The form *vesle* is only found in the singular definite. In the plural, irrespective of definiteness, and irrespective of gender another suppletive form namely *små* is used (compare the Danish examples (9)-(10) below).

long form/short form: some Russian adjectives distinguish, in some cases, short form (for predicative use) from long form (attributive or predicative use). One adjective is suppletive in this regard:

Russian

- (7) *bol'shie brjuki*
 large.PL trousers.PL
 ‘large trousers’
- (8) *èt-i brjuki mne velik-i*
 this.PL trousers.PL 1.SG.DAT large.SHORT.FORM-PL
 ‘these trousers are (too) large for me’

Isačenko (1962: 146) calls them ‘ein eigenartiges suppletives Formenpaar’.

Let us also consider the **type** of feature involved, bearing in mind that we are concerned only with inflection. We might have expected suppletion to be restricted to inherent features (Booij 1996), but number agreement shows that suppletion extends to contextual features too. This is found in Danish.²

Danish (Maja Drejsig Petersen, p. c.)

(9) *en lille øl*
 one small.SG beer
 ‘one small beer’

(10) *to små øl*
 two small.PL beer
 ‘two small beers’

Here number agreement is expressed through suppletion; for the majority of adjectives, of course, it is expressed regularly.

This same item is also suppletive for degree:

(11) *en mindre øl*
 a small.COMP beer
 ‘a smaller beer’

(12) *den mindste øl*
 the small.SUPER beer
 ‘the smallest beer’

2.2. How do these features interact?

The simplest instances can be defined by a single feature: for instance, the suppletion of *go ~ went* in English is determined by tense. There are more complex instances, however. Consider the present tense of French *aller* ‘go’.

Table 2. Present tense of French *aller* ‘go’

| | singular | plural |
|----------|----------|--------|
| 1 person | vais | allons |
| 2 person | vas | allez |
| 3 person | va | vont |

In order to define this suppletion we need reference to both dimensions of the paradigm, person and number.

We envisage four lines of enquiry here, and have some preliminary results:

- first, how complex can the specification be? In other words, how many features may be required to define the usage of each of the suppletive stems. The example in Table 2 suggests that the specification, if expressed in features, can require all the available features. Thus to define a cell in the French verbal paradigm required person and number, but to define this sub-paradigm within the verbal system requires also tense and mood. All these are required to specify the suppletion in Table 2, in featural terms (but see also the fourth point below).

- second, which features may be sufficient to define a suppletive pair, and which occur only as part of a more complex specification? For example, in Russian, number is sufficient to define the suppletive relation between *rebenok* ‘child’ and *det-i* ‘children’; all cases in the singular take the first stem, and all in the plural take the second. Within the verbal paradigm, we might not expect person to behave in this way, with suppletive stems being distributed by person. Yet this is what we find in Papantla Totonac (I am grateful to Paulette Levy for these data).

Table 3. ‘go’ (incomplete) in Papantla Totonac (Paulette Levy, p.c.)

| | SG | PL | |
|---|--------------|------------------|-----------|
| | | exclusive | inclusive |
| 1 | k-an | (k)-aná: | aná:-(w) |
| 2 | pín-a | piná:-tit | |
| 3 | an | t-a':n | |

Here we see that the suppletive relation can be specified by person (without reference to number), and that second person contrasts with the remaining persons. This same suppletion is found in the other paradigms, the completive and the perfective (which appears to make it a counter-example to Rudes’ claim about verbal suppletion, namely that it will be according to tense/aspect/mode or by person and number ‘inevitably in the present conjugations’, 1980: 658). Note too that it is in the second person that non-phonologically conditioned allomorphy is found (Paulette Levy, p.c.), which is relevant to the fourth point below. We find a similar picture to that of Table 3 in Misantla Totonac (MacKay 1991: 226-232).

- third, what can the possible patterns tell us about the interrelation of features? This brings us into the whole area of relative markedness. We shall investigate which regularities hold cross-linguistically. To take one example, in a paradigm determined by case and number, we expect suppletive stems to be distributed according to number rather than case, as discussed above with relation to Russian *rebenok* ~ *det-i* ‘child(ren)’. And yet there is a counter-example even within Russian. The third person pronoun has one stem for the nominative, as opposed to all the other case form, singular and plural (there are further complications within the oblique cases).
- fourth, can the patterns of suppletion be defined in other terms? We have been discussing them in a neutral way using feature specifications. It is claimed that there are instances where the pattern is definable in phonological terms (Carstairs-McCarthy 1994: 4410) or in terms of morphological patterns or templates (Matthews 1981, Vincent 1988: 297-298, Maiden 1992: 306-307 and Aski 1995). In some instances, as in Table 2, the same pattern can be defined in

phonological or morphological terms (or, of course, more redundantly in terms of feature specifications). We shall investigate which types of definition are required (that is, those which do not reduce to another) and their distribution across a range of languages.

2.3. What is the role played by alternating suppletion?

In the familiar cases, suppletion is a relation between obligatory forms. However, there are complex instances, where the suppletive stem may alternate with the regular one. Russian presents interesting examples: *god* ‘year’ has a suppletive genitive plural *let*. This item was discussed briefly by Gustav Wurzel (1970: 19).

Russian

(13) *god*
year.SG.NOM
‘(one) year’

(14) *pjat’ let*
five.NOM year.PL.GEN
‘five years’

However, regular *god-ov* is also possible in certain contexts (Bortnik 1978, Comrie 1998).

(15) *s dvadcatyx god-ov*
from twenty.ORD-PL.GEN year-PL.GEN
‘from the twenties’

In ‘alternating suppletion’ of this kind, we will examine the factors determining or favouring the different stems. Here quantifiers favour the suppletive alternate *let*, but given an ordinal denoting a period of time, *god-ov* will be used, e.g. *s dvadcatyx godov* ‘from the twenties’. Another example is the genitive plural of *čelovek* ‘person’. We saw that it has the suppletive plural *ljud-i*, and therefore genitive plural *ljud-ej*; however genitive plural *čelovek* is also possible, typically in quantified expressions (unless the quantifier is a collective numeral, when *ljud-ej* is favoured). We will establish how the alternates are used by examining the contexts of each example in the Uppsala corpus, an established one-million word corpus of Russian, and consider the implications for diachrony.

2.4. Which items can be suppletive?

This question links to section 3 below. At its simplest, however, we wish to map the lexical items which are fully suppletive in a wide range of languages. We shall do this iteratively, drawing up a list of items found in each language investigated but also using the current state of that list to

check relevant items in each new language. This will lead to an interesting ‘map’ of the suppletive items in a range of languages.

For instance, when looking at a new language it is no surprise to find that the translation equivalents of ‘man’ or ‘go’ are suppletive. There are some less expected examples. For instance in the Nakh-Daghestanian language Archi, we find the following nouns showing number suppletion (Marina Chumakina, p.c., Kibrik, Kodzasov, Olovjannikova and Samedov 1977).

Table 4. Suppletive plurals in Archi (Marina Tchoumakina, p.c.)

| singular | plural | gloss |
|----------|--------|------------------|
| bošor | Lele | ‘man’ |
| ʃɛnnol | xom | ‘woman’ |
| uʃdu | ʃɛWat | ‘shepherd’ |
| xlon | bucɛ·i | ‘cow’ |
| bič’ni | boždo | ‘corner of sack’ |

Compare regular *adam* ‘person’, plural *adamtil*.

We hypothesize that suppletion must always be lexically specified, that is, it cannot be predicted from other information independently required in a lexical entry.

Note that we include suppletion of pronouns in the survey, including suppletion for number. Linguists have been inconsistent towards pronouns: in grammars we typically find singular-plural paradigms of pronouns, just like nouns, but when discussed it is often presented as self-evident that *we* is not the plural of *I*. The point is argued at length in (Corbett 2000b). Briefly, number does not have fully homogeneous semantics and the fact that *I* ~ *we* is not quite the same as *book* ~ *books* is not conclusive. On the other hand there are several instances of fully regular pronouns. Mandarin Chinese is a good example of regularity (Chappell 1996: 470-471); the pronouns include the following:

Table 5. Personal pronouns of Mandarin Chinese (Chappell 1996: 471)

| | singular | plural |
|------------|-----------------|---------------------|
| 1st person | w/ | w/men (exclusive) |
| 2nd person | n— | n—men |
| 3rd person | t TM | t TM men |

Chappell points out that *-men* is spreading to nouns, those for occupations and professions, not for inanimates: *xuésheng* ‘student’, *xuéshengmen* ‘students’, *lǎoshī* ‘teacher’ *lǎoshīmen* ‘teachers’. Other languages with pronouns with regular plurals include Kannada, Kayardild, Ket and Yup’ik (Marina Chumakina, p.c.).

2.5. How does suppletion interact with other morphological phenomena?

Syncretism

This issue has been discussed by Plank (1994), Corbett and Fraser (1997), Evans, Brown and Corbett (2001).

Table 6. Slovene *človek* ‘man, person’ (Priestly 1993: 401)

| | SINGULAR | DUAL | PLURAL |
|------|------------|-------------|----------|
| NOM | človek | člove5!ka | ljude5^ |
| ACC | člove5!ka | člove5!ka | ljudi |
| GEN | člove5!ka | ljudi | ljudi |
| DAT | člove5!ku | člove5!koma | ljude5^m |
| INST | člove5!kom | člove5!koma | ljudmi |
| LOC | člove5!ku | ljude5!h | ljude5!h |

The point is that there is a pattern of syncretism, general throughout the noun system, according to which genitive dual is as the genitive plural, and locative dual is as the locative plural. This particular item has a suppletive stem for the plural. The interaction of these two phenomena gives the surprising pattern in Table 6.

Periphrasis

The interaction of suppletion with periphrasis is demonstrated in Vincent and Börjars (1996).

Deponency

We wish to find instances of interaction with deponency in particular. That is, we might expect to find examples where a suppletive stem is deponent (e.g. a verbal stem having passive form with active meaning) while another stem is not.

We have outlined the components of a typology. We shall investigate a range of genetically unrelated languages, and present the results in a relational database, so that other researchers can continue investigating the complexity of suppletion.

3. Function

Man muß sich allerdings klar machen, daß diese Funktionalität der Suppletion nicht eigentlich grammatisch ist, sondern kommunikativ-pragmatischen Charakter hat.
(Wurzel 1990: 88-9)

Suppletion is too prevalent to be the ‘mere irregularity’ that some linguists believe. An alternative view (Werner 1987 and others) is that it serves for

efficient storage and processing of highly frequent items. This question of the function of suppletion will inform our investigation of the Russian corpus.

The distribution of the regular and irregular expression of number in Russian texts has been investigated in detail (Corbett, Hippisley, Brown and Marriott 2001), and we report here the main results of that paper insofar as they are relevant to suppletion. There are various analytical choices to be made; here we shall take them as given, together with the statistical method.

We set up a scale of irregularity, devised without reference to frequency, and treated suppletion as the limiting case of irregularity. This scale has similarities with those developed for a different purpose within Natural Morphology (see Dressler 1985a: 59, 316, Wurzel 1984; 1987: 65-66, 76-77).

(16) Irregularity Scale

suppletion (8)>
pluralia tantum >
 stem augments (5-7)>
 segmental stem irregularity (4)>
 stress stem irregularity (3)>
 segmental inflectional irregularity >
 stress inflectional irregularity (1-2)>
 full regularity (0)

The numbers in parentheses indicate the parts of the scale addressed as groups in Table 7 below.³

Frequency can be viewed in two ways. Given a noun whose plural is irregular, with what precisely do we expect to find a relationship? We might compare lexemes one with another or we could compare regular and irregular forms within lexemes. For the first approach, we could count up how many times each lexeme occurs in the plural. We call this the *absolute frequency* of a lexeme's plural. We can then compare the absolute frequency of plural of different lexemes, regular and irregular, to see if there is a relationship between irregular plurals and their absolute frequency. Alternatively we could analyse the plural by comparing it, within the lexeme, with the other available forms. For a given lexeme, we can count how often it occurs in the plural as compared with the number of times in the singular. This is the *relative frequency* of the plural. We can then compare the relative frequency of the plural in lexemes where it is irregular with that in lexemes where it is regular.

We examined the nouns in the Uppsala corpus of Russian (see Lönngren 1993 for details).⁴ Recording all those lexemes which occur at least five times. Our dataset contains around 5440 lexemes, accounting for some 243 000 word forms from the entire one million word corpus. Each noun in our dataset was assessed according to the irregularity scale. We found relations between frequency and irregularity and a certain degree of correspondence with the Irregularity Scale. In Table 7 we give eight groups of nouns from the corpus divided up to match sections of our Irregularity Scale.

Table 7. Absolute Plural Anomaly in eight groups of Russian nouns

| Group | Type of irregularity | Median plural count | Observed number of types | p-value |
|-------|--------------------------|---------------------|--------------------------|---------|
| 1 | end stress plural | 9 | 64 | < 0.001 |
| 2 | end stress singular | 5 | 80 | < 0.05 |
| 3 | stem stress alternation | 22 | 2 | 0.25 |
| 4 | stem alternation | 96 | 3 | < 0.001 |
| 5 | stem augment in plural | 10 | 24 | < 0.001 |
| 6 | stem augment in singular | 15 | 10 | < 0.05 |
| 7 | stem augment in both | 14 | 14 | < 0.05 |
| 8 | suppletion | 935.5 | 3 | < 0.001 |

For each of the irregularity groups in Table 7 the median value for plural occurrences was significantly higher, as the p-values show, than for the corpus as a whole, with the single exception of Group 3. (The p-value represents the probability that a median value more extreme than that observed could have occurred purely by chance. A value < 0.05 is reasonable evidence that there is a relationship between anomaly and irregularity. A value < 0.01 is strong evidence that there is a relationship.) Thus seven out of eight groups confirm our hypothesis. For comparison, the median plural count for nouns in our dataset as a whole is 3 (and 10 for the singular). A clear result is that the three nouns showing suppletion stand out dramatically in that the plural is very frequent.

We found some evidence that the frequency of occurrence of the irregular forms, and not just frequency of occurrence of the lexeme as a whole, does relate to irregularity of the forms in question. As far as suppletion is concerned, though the median plural proportion is high, the result is not statistically significant. The difficulty is that there are so few nouns with suppletive stems.

The outcome from this part of the project will be an analysis of a corpus of one language (the Uppsala corpus of Russian, investigating the frequency with which suppletion occurs in texts). A recurring problem is the small number of suppletive items, frequent though they are.

4. Conclusion

This paper represents a revised plan for an ongoing project. We intend to investigate suppletion from the point of view of morphological structure and textual/statistical structure, in ways which we think Gustav Wurzel would have found interesting. Suppletion is on the one hand an obvious problem and on the other a deep one. It goes to the heart of what it means to be a word.

Notes

1. The support of the AHRB under grant B/RG/AN4375/APN10609 ‘The Notion “Possible word” and its Limits: a typology of suppletion’, and of the ESRC under grant R00027135, is gratefully acknowledged. I wish to thank Matthew Baerman, Dunstan Brown, Andrew Carstairs-McCarthy, Marina Chumakina, Andrew Hippisley and Paul Marriott and for discussion of some of the issues raised. The paper was presented at the conference ‘Wolfgang Ullrich Wurzel in memoriam - Typological aspects of markedness and complexity’, as a plan for a research project, leading to a database which should be of use to those who share Wolfgang Wurzel’s passion for morphology. My sincere thanks go to the participants at the conference, for positive discussion and helpful suggestions, which have led to improvements in the programme presented here, and will lead to a more useful database when it is completed.
2. Thanks to Nigel Vincent for alerting me to this.
3. We distinguish segmental irregularities from prosodic ones (related to stress). A ‘stress stem irregularity’ involves movement of stress within the stem while ‘stress inflectional irregularity’ implies movement of stress on to or from the stem. Naturally we could not investigate *pluralia tantum* nouns in terms of relative plural anomaly.
4. The basic dataset created can be found at: <http://surrey.ac.uk/LIS/SMG> (see ‘outputs’), along with a readme file.

References

- Aski, Janice
 1995. Verbal suppletion: an analysis of Italian, French and Spanish *to go*. *Linguistics* 33.403-432.
- Bittner, Andreas
 1988. Reguläre Irregularitäten: Zur Suppletion im Konzept der natürlichen Morphologie. *Zeitschrift für Phonetik, Sprachwissenschaft und Kommunikationsforschung* 41.416-425.
- Booij, Geert
 1996. Inherent versus contextual inflection and the split morphology hypothesis. In: Geert Booij and Jaap van Marle (eds) *Yearbook of Morphology 1995*, 1-15. Dordrecht: Kluwer.
- Bortnik, Ninel'
 1978. Nekotorye osobennosti osnov, obrazujuščix dvojnye formy množestvennogo čisla. *Russian Language Journal* 32 (part 112). 43-58.
- Carstairs-McCarthy, Andrew
 1994. Suppletion. In: R. E. Asher (ed.) 1994. *Encyclopedia of Language and Linguistics*: 8, 4410-4411. Oxford: Pergamon.
- Chappell, Hilary
 1996. Inalienability and the personal domain in Mandarin Chinese discourse. In: Hilary Chappell and William McGregor (eds) *The Grammar of Inalienability: A Typological Perspective on Body Parts and the Part-Whole Relation* (Empirical Approaches to Language Typology 14), 465-527. Berlin: Mouton de Gruyter.
- Comrie, Bernard
 1998. Review of: Christian Lehmann 'Thoughts on Grammaticalization'. *Diachronica* 15.171-174.
- Corbett, Greville G.
 2000a. *Number*. Cambridge: Cambridge University Press.
 2000b. Are personal pronouns suppletive? Paper read at: Suppletion 2000: International Workshop on Suppletion. Department of Linguistics, Stockholm University, 26-27 May 2000.
- Corbett, Greville G. and Fraser, Norman
 1997. Vyzislitel'naja lingvistika i tipologija. *Vestnik MGU: Serija 9: Filologija* no. 2.122-140.
- Corbett, Greville G.; Hippisley, Andrew; Brown, Dunstan and Marriott, Paul
 2001. Frequency, regularity and the paradigm: a perspective from Russian on a complex relation. In Joan Bybee and Paul Hopper (eds)

- Frequency and the Emergence of Linguistic Structure*, 201-226.
Amsterdam: John Benjamins.
- Dressler, Wolfgang.
1985a. *Morphology*. Ann Arbor: Karoma.
1985b. On the predictiveness of Natural Morphology. *Journal of Linguistics* 21.321-337.
- Evans, Nicholas; Brown, Dunstan and Corbett, Greville G.
2001. Dalabon pronominal prefixes and the typology of syncretism: a Network Morphology analysis. In: Geert Booij and Jaap van Marle (eds) *Yearbook of Morphology 2000*, pp. 187-231.
- Fertig, David
1998. Suppletion, natural morphology, and diagrammicity. *Linguistics* 36. 1065-1091.
- Haspelmath, Martin
1993. *A Grammar of Lezgian* (Mouton Grammar Library 9). Berlin: Mouton de Gruyter.
- Isačenko, Aleksandr V.
1962. *Die russische Sprache der Gegenwart: I: Formenlehre*. Halle (Saale): Max Niemeyer.
- Kibrik, Aleksandr E. (ed.)
1999. *Èlementy grammatiki caxurskogo jazyka v tipologičeskom osveščenií*. Moscow: Nasledie Press.
- Kibrik, A. E., Kodzasov, S. V., Olovjannikova, I. P. and Samedov, D. S.
1977. *Opyt strukturnogo opisanija arpińskogo jazyka: I: Leksika, fonetika* (Publikacii otdelenija strukturnoj i prikladnoj lingvistiki 11). Moscow: Izdatel'stvo Moskovskogo universiteta.
- Lönngren, Lennart
1993. *áastotnyj slovar' sovremennogo russkogo jazyka*. (=Acta Universitatis Upsaliensis, Studia Slavica Upsaliensis 33). Uppsala.
- Mackay, Carolyn J.
1991. *A Grammar of Misantla Totonac*. PhD dissertation, University of Texas at Austin.
- Maiden, Martin.
1992. Irregularity as a determinant of linguistic change. *Journal of Linguistics* 28.285-312.
- Matthews, Peter
1981. Present stem alternations in Italian. In: Christian Rohrer (ed.), *Logos semantikos: Studia linguistica in honorem Eugenio Coseriu*, 1921-1981, vol. IV, 57-65. Berlin: de Gruyter.
- Mel'πuk, Igor
1994. Suppletion: toward a logical analysis of the concept. *Studies in Language* 18.339-410.

- Nübling, Damaris.
 1998. Zur Funktionalität von Suppletion. *Germanistische Linguistik* 141-142.77-101.
 2000. *Prinzipien der Irregularisierung: Eine kontrastive Analyse von zehn Verben in zehn germanischen Sprachen* (Linguistische Arbeiten 415). Tübingen: Niemeyer.
- Plank, Frans
 1994. Homonymy vs. suppletion: A riddle (and how it happens to be solved in ...) *Agreement gender number genitive and* (EUROTYP Working Papers VII/23) 81-86. Konstanz: University of Konstanz.
- Priestly, T. M. S.
 1993. Slovene. In: Bernard Comrie and Greville G. Corbett (eds), *The Slavonic Languages*, 388-451. London: Routledge.
- Rhodes, Richard
 1987. Paradigms large and small. In: Jon Aske, Natasha Beery, Laura Michaelis and Hana Filip (eds), *Proceedings of the 13th Annual Meeting of the Berkeley Linguistics Society*, 223-34. Berkeley, California: B. L. S., University of California.
- Rudes, Blair A.
 1980. On the nature of verbal suppletion. *Linguistics* 18.655-676.
- Vincent, Nigel
 1988. Italian. In: Martin Harris and Nigel Vincent (eds) *The Romance Languages*, 279-313. London: Croom Helm/Routledge.
- Vincent, Nigel and Börjars, Kersti
 1996. Suppletion and syntactic theory. Miriam Butt and Tracy Holloway King (eds) *Papers from the 1st LFG Colloquium, Grenoble, August 1996*, pp. 448-462.
- Werner, Otmar 1987. The aim of morphological change is a good mixture - not a uniform language type. In: Anna Giacalone Ramat, Onofrio Carruba and Giuliano Bernini (eds) *Papers from the 7th International Conference on Historical Linguistics*, 591-606. Amsterdam: Benjamins.
- Wurzel, Wolfgang Ullrich
 1970. *Studien zur deutschen Lautstruktur* (Studia grammatica VIII). Berlin: Akademie-Verlag.
 1984. *Flexionsmorphologie und Natürlichkeit: ein Beitrag zur morphologischen Theoriebildung* (Studia grammatica 21). Berlin: Akademie-Verlag.
 1987. System-dependent morphological naturalness in inflection. In: Wolfgang Dressler (ed.) *Leitmotifs in Natural Morphology*, 59-96. Amsterdam: John Benjamins.

1989. *Inflectional morphology and naturalness*. Dordrecht: Kluwer.
1990. Gedanken zu Suppletion und Natürlichkeit. *Zeitschrift für Phonetik, Sprachwissenschaft und Kommunikationsforschung* 43.86-91.