



Language complexity: Typological perspectives

Matti Miestamo, Stockholm University
Guest lecture, ZefiS Kolloquium
Wuppertal, Jan 30, 2013

Plan of the talk

- The equicomplexity hypothesis
- On the notion of complexity
- Testing the equicomplexity hypothesis
- Criteria for measuring complexity
- Case study: Implicational hierarchies and complexity.
- Some further large-scale typological studies of complexity
- Complexity, contact and change
- Complexity and cross-linguistic rarity

The equicomplexity hypothesis

All languages are equally complex overall. Complexity in one grammatical domain is compensated by simplicity in another.

56

tur herrscht, im Allgemeinen den Vorzug haben, wird man nach reifer Untersuchung wohl zugeben; wie sehr aber auch die schönste Sprache entarten könne, das erfahren wir an unser eignen von Natur gemäß edlen Sprache in vernachlässigten Mundarten oder bei schlechten Schriftstellern zur Genüge, ohne daß wir uns auf ähnliche Beispiele bei Griechen und Römern zu beziehen brauchen.

Der Gang der bloß grammatischen Kunst und Auszubildung ist in den beiden Hauptgattungen grade umgekehrt. Die Sprache durch Afrika ist im Anfang ganz kunstlos, wird aber immer künstlicher, je mehr die Affra mit dem Hauptwort zusammenschmelzen; in den Sprachen durch Asien hingegen geht die Schönheit und Kunst der Struktur, durch den Gang sich zu erleichtern, allmählig mehr und mehr verloren, wie wir es sehen, wenn wir manche deutsche, romanische und jetzige indische Mundarten mit der ältern Form, aus der sie abstammen, vergleichen.

Daß die amerikanischen Sprachen im Ganzen auf einer niedern Stufe stehen, wird man nicht läugnen. Dahin gehört der auffallende

19th
Century
Linguistic
Imperialism.

Friedrich von Schlegel. 1808. *Über die Sprache und die Weisheit der Indier: ein Beitrag zur Begründung der Altertumskunde*. Heidelberg: Mohr & Zimmer. [reprint, Amsterdam: Benjamins]

Sapir's view

- "... all attempts to connect particular types of linguistic morphology with certain correlated stages of cultural development are vain. Rightly understood, such correlations are rubbish. Both simple and complex types of language of an indefinite number of varieties may be found spoken at any desired level of cultural advance. When it comes to linguistic form, Plato walks with the Macedonian swineherd, Confucius with the head-hunting savage of Assam."

(Sapir 1921: 219)

The equicomplexity hypothesis

- "Objective measurement is difficult, but impressionistically it would seem that the total grammatical complexity of any language, counting both morphology and syntax, is about the same as that of any other. This is not surprising, since all languages have about equally complex jobs to do, and what is not done morphologically has to be done syntactically. Fox, with a more complex morphology than English, thus ought to have a somewhat simpler syntax; and this is the case. English, thus ought to have a somewhat simpler syntax; and this is the case.

Thus one scale for the comparison of the grammatical systems of different languages is that of average degree of morphological complexity – carrying with it an inverse implication as to degree of syntactical complexity." (Hockett 1958: 180–181)

The equicomplexity hypothesis

- “There is no evidence that normal human languages differ greatly in the complexity of their rules, or that there are any languages that are “primitive” in the size of their vocabulary, (or any other part of their language), however “primitive” their speakers may be from a cultural point of view. (The term “normal human language” is meant to exclude on the one hand artificial languages such as Esperanto or computer languages, and on the other hand languages which are not used as the primary means of communication within any community, notably pidgin languages. Such languages may be simpler than normal human languages, though this is not necessarily so.)” (Hudson 1981: “83 things linguists can agree about”)

The equicomplexity hypothesis

- “[M]odern languages, attested extinct ones, and even reconstructed ones are all at much the same level of structural complexity or communicative efficiency.” (McMahon 1994: 324)
- “All languages have a complex grammar: there may be relative simplicity in one respect (e.g., no word-endings), but there seems always to be relative complexity in another (e.g., word-position).” Crystal (1997: 6)

The equicomplexity hypothesis

- Received view at the end of the twentieth century.
 - But what is it based on? Empirically tested?
- Recently several linguists have started to question this:
 - McWhorter (2001, 2002, 2007)
 - Kusters (2003)
 - Dahl (2004, 2009)
 - Deutscher (2000)
 - Everett (2005)
 - Gil (2005, 2008)
 - Nichols (2009)
 - Miestamo & al (eds. 2008)
 - Sampson & al (eds. 2009)

On the notion of complexity

Two approaches

- In everyday language, complexity has two principal meanings
 - Oxford advanced learner’s dictionary of current English (1989)
 - *complex* =
 1. “made up of (usu[ally] several) closely connected parts”
 2. “difficult to understand or explain because there are many different parts”
- These two meanings are also reflected in the definitions of complexity used in linguistics.
 - absolute (theory-oriented, objective)
 - relative (user-oriented, subjective)

Absolute complexity

- The number of parts in a system. The number of connections between the parts.
 - A simple example: the number of phonemes; Kwazá has 34 phonemes, Tauya has 18. The phoneme inventory of Kwazá is more complex than that of Tauya.
- Algorithmic Information Content (AIC); Kolmogorov-complexity
 - The complexity of a system/phenomenon is equal to its shortest possible description.
 - Information packaging.

hahaha	hahhah	hrampf
3×ha	2×hah	hrampf
 - The description of the phoneme inventory is shorter in Tauya than in Kwazá.
- The length of description is naturally dependent on metalanguage.

Relative complexity 13

- Relative to language users.
- Complex = difficult/costly to process or learn.
- But complex to whom?
 - E.g. fission (one meaning – many forms syntagmatically) eases the listener's task, but is costly for other classes of language users.
 - Definiteness in Swedish: *det röda rummet*
- Kusters (2003) defines complexity as difficulty of L2 learning.
- The relative approach does not allow for a general definition of complexity independent of a particular class of language users.
- Furthermore, on most aspects of language structure and use, there is not enough psycholinguistic research.

Complexity vs. cost/difficulty 14

- The terms cost and difficulty should be used when these concepts are meant.
- The term complexity should be reserved for absolute complexity.
- To what extent complexity and cost/difficulty correlate with each other is an interesting question.

Chaos and effective complexity 15

- Total chaos cannot be compressed and is therefore maximally long to describe.
 - There are no regularities on which information packaging could be based.
- Chaos is not complexity in an interesting or intuitive sense.
- Effective complexity (Gell-Mann 1994) pays attention to the regularities in a system.
 - The length of description of the regularities.

System vs. product 16

- Complexity of the system:
 - number of grammatical/lexical distinctions, allomorphy, number of rules etc.
 - Dahl (2004): System complexity
- Complexity of the product:
 - length, number of structural elements, hierarchical structure of sentences/utterances/texts.
 - Dahl (2004): Structural complexity

Testing the equicomplexity hypothesis

McWhorter (2001) 18

- A metric for measuring the overall grammatical complexity of languages, paying attention to overt signalling of phonetic, morphological, syntactic and semantic distinctions beyond communicative necessity.
- A grammar is more complex than another to the extent that
 1. its phonemic inventory has more marked members
 2. its syntax requires the processing of more rules
 3. it gives overt and grammaticalized expression to more fine-grained semantic and/or pragmatic distinctions
 4. it uses inflectional morphology.

Nichols (2009)

- Phonology:
 - number of contrastive manners of articulation
 - number of vowel quality distinctions
 - tone system
 - syllable structure
- Synthesis
 - inflectional synthesis of the verb
 - polyagreement
 - noun plural marking
 - noun dual marking
- Classification
 - numeral classifiers
 - overt possessive classes
 - agreement gender
 - overt inherent gender
- Syntax
 - number of different alignments between noun arguments, pronoun arguments, and verb
 - number of different basic word orders
- Lexicon
 - inclusive/exclusive opposition in independent personal pronouns
 - number of distinct roots in plain and semantically causative verbs
 - number of different overt derivations in these verb pairs

Problem: Representativity

- Ideal: all aspects of grammar should be taken into account as exhaustively and in as much detail as possible.
- In practice this is difficult in a study of overall complexity, and especially when studying a larger number of languages.
- How close to this ideal should one get to be able to say something about overall complexity?
- One may arrive at a level of representativity sufficient to reveal clear complexity differences between grammars. The more fine-grained distinctions one is dealing with, the more problematic the issue of representativity becomes.

Problem: Comparability

- How to compare the criteria, e.g., McWhorter's, with each other?
- How much does the complexity of each area contribute to overall complexity?
- The different domains and subdomains of grammar are incommensurable and their contributions to overall complexity cannot be quantified.
- The problem can be avoided when one language is more/less complex than the other(s) according to each criterion used, and thus overall clearly more/less complex according to the metric.
- But the problem cannot be escaped when the complexity differences between the languages are smaller and when the different criteria give conflicting results.

Consequences for the typological study of complexity

- Because of the problem of comparability, comparison must focus on specific domains of grammar, e.g.:
 - phoneme inventories, phonological processes, syllable structure, tone systems etc.
 - degree of synthesis, morphological processes, allomorphy
 - word order variations, clausal embedding etc.
 - semantic/pragmatic distinctions encoded in functional domains: marking of semantic roles, negation, expression of time, coding of information structure.
- Differences in overall complexity can only be identified if they are clear enough, i.e. if all criteria point to the same direction and the problem of comparability is thus avoided.

Criteria for measuring complexity

Criteria (McWhorter 2001, 2007)

- McWhorter (2001)
 1. Size of the phoneme inventory
 2. Number of syntactic rules
 3. Number of semantic/pragmatic distinctions
 4. Amount of inflectional morphology
 - "beyond communicative necessity".
- McWhorter (2007)
 1. Overspecification (marking of semantic categories left to context in many or most languages, such as evidential marking)
 2. Structural elaboration (number of rules mediating underlying forms and surface forms, such as morphophonemics)
 3. Irregularity

Criteria (Kusters 2003)

25

- Three principles
 1. Economy: restriction of the number of explicitly marked categories.
 2. Transparency: clarity of the relationship between meaning and form.
 3. Isomorphy: similarity of order in different domains.
- Violations of these principles may increase complexity.
- Those violations that cause difficulties to L2 learners increase complexity. (Relative approach to complexity)

Kusters (2003): Economy

26

- Restriction of the number of explicitly marked categories.
 - agreement
 - expression of TAM-categories, voice etc.

Kusters (2003): Transparency

27

- Clarity of the relationship between meaning and form.
 - morphological allomorphy
Finnish *helmi*: *helmen* pearl.NOM / *pearl*.GEN (Cf. *Helmi*: *Helmin*)
 - accidental homonymy
Finnish: *voin* can.1SG.PRES/PRET
 - fission
Swedish *det röd-a rumm-et* DEF red-DEF room-DEF
 - fusion (=cumulation)
Latin *ama-ba-t* love-IND.IMPF-ACT.3.SG
 - phonological allomorphy
Finnish vowel harmony, e.g. inessive -*ssa*: *halussa* vs. *hälyssä*
 - structural homonymy
German feminine dative/genitive: *der Frau*

Kusters (2003): Isomorphy

28

- Similarity of order in different domains.
 - marked affix order
cf. Bybee (1985):
root-voice-aspect-tense-mood-person/number (suffixes)
person/number-mood-tense-aspect-voice-root (prefixes)
 - inconsistent affix order
- Karok (Bright 1957: 67, 138)
 - a. *kun-iykár-at*
3PL/3SG-kill-PST
'They killed [him/her].'
 - b. *pu-?iykar-áp-at*
NEG-kill-3PL/3SG-PST
'They did not kill [him/her].'
- Complexity?

Difficulty of morphological features for different classes of language users Kusters (2003: 60)

29

Table 2.5 Preferences for inflectional phenomena in various processing dimensions
+ = preference, 0 = neutral and -, --, and --- = degrees of difficulty.

	Speaker	L1 learner	Symbolic use	Hearer	L2 learner
Redundant agreement	--	+	0	+	--
Non-redundant agreement	--	+	+	-	--
Aspect/Tense/Mood	-	+	+	0	-
Voice	0	+	+	+	-
Morphological allomorphy	-	--	+	-	---
Accidental homonymy	0	--	0	--	---
Fission	-	-	+	+	--
Fusion	+	0	0	0	-
Phonological allomorphy	+	-	+	0	--
Structural homonymy	+	+	0	0	+
Isomorphy	+	0	0	+	+
Marked affix order	0	0	0	0	0
Inconsistent affix order	-	0	0	-	-

Two general criteria

30

- The principle of Fewer Distinctions
 - The fewer semantic/pragmatic distinctions a language makes in a functional domain (e.g., tense, aspect, distance contrasts in demonstratives etc.), the less complex it is in that respect.
- The principle of One Meaning – One Form
 - The better the formal coding of meaning adheres to the principle of One Meaning – One Form, the less complex it is.

(Miestamo 2006, 2008)

Deviations from the principle of One Meaning – One Form

- Many meanings – one form
 - syntagmatic: Latin *ama-ba-t* love-IND.IMPF-ACT.3.SG
 - paradigmatic: Finnish *-n* GEN/ACC
- One meaning – many forms
 - syntagmatic: Swedish *det röda rummet*
 - paradigmatic: Finnish GEN.PL: *omenoiden, omenoitten, omenien, omenojen, omenain*

NB! Implicit expression vs. vagueness

- Riau Indonesian (Gil 2008: 114)
Ayam makan
chicken eat
– The Association Operator
– IMA language
- Do we expect a language to make a distinction implicitly every time another language makes the distinction explicitly?
– Does, e.g., German or English make all the possible distinctions of metrical tense found in the world's languages?
- Different languages cut semantic space in different ways. A language may leave vague what another language codes explicitly.

Case study: Implicational hierarchies and language complexity (Miestamo 2009)

Implicational hierarchies as cross-linguistic complexity measures

- Agreement and case hierarchies:

	1	2	3
Agr:	SUBJ/ABS <	DO/ERG <	OBL
	3	2	1
Case:	SUBJ/ABS >	DO/ERG >	OBL
- Verbalization and copula hierarchies:

	3	2	1
Vblz:	LOCATION >	OBJECT >	PROPERTY
	1	2	3
Cop:	LOCATION <	OBJECT <	PROPERTY

Agreement and case

Basque (Hualde and Ortiz de Urbina, ed. 2003: 209, 411, 413)

- dakar-ki-zu-t*
bring.3.ABS-PRES-2SG.DAT-1SG.ERG
'I bring it to you.'
- jon-ek miren-i ardoa ekarri dio*
Jon-ERG Miren-DAT wine[ABS] bring AUX.3.ABS-3.ERG.3.DAT
'Jon brought wine for Miren.'
- autobus-era bultzatu gaituzte*
bus-ALL push AUX.1PL.ABS.3PL.ERG
'They pushed us into the bus.'

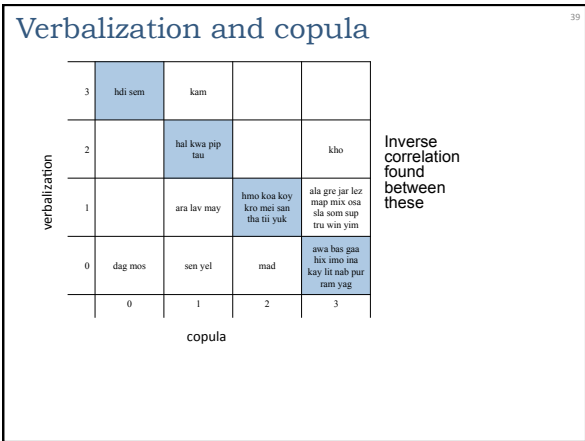
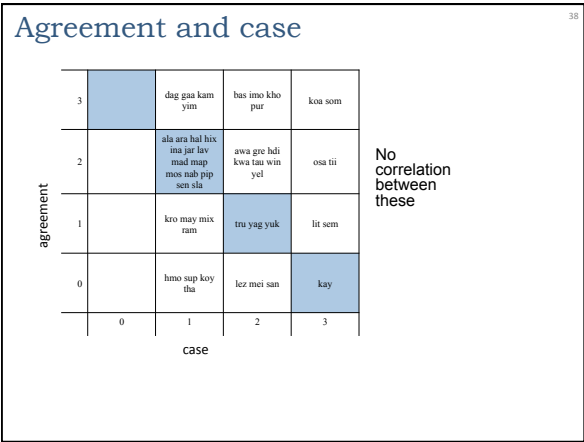
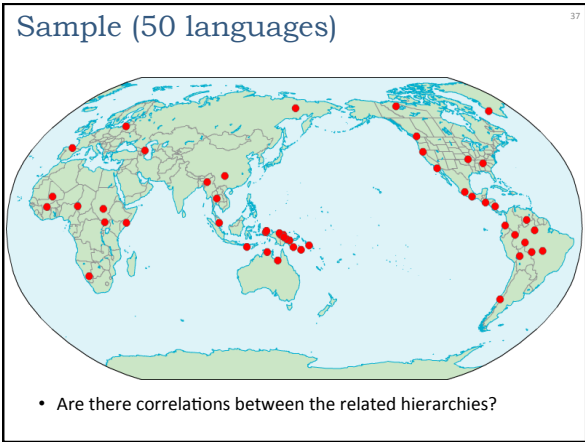
Abbreviations: 1/2/3 = 1st/2nd/3rd person, ABS = absolutive, AUX = auxiliary, DAT = dative, ERG = ergative, PL = plural, PRES = present, SG = singular

Verbalization and copula

Kamera (Klamer 1998: 49, 107, 123, 166)

- mbe-ni-ya-ka nu*
be.angry-3SG.ACC-PFV DEI
'People are angry.'
- tau mayila-mbu-kai nyimi na*
person poor-also-2PL.ACC you DEI
'Moreover, you are also poor people.'
- la 'uma-ya*
LOC house-3SG.ACC
'(S)he is at home.'
- ni-nya la uma*
be-3SG.DAT LOC home
'(S)he is at home.'

Abbreviations: 2/3 = 2nd/3rd person, ACC = accusative, DAT = dative, DEI = deictic, LOC = locative, PL = plural, PFV = perfective, SG = singular



Discussion

- Ease of processing/storage/learning, plays a role in what is (dis)preferred cross-linguistically, cf. Hawkins' (2004) Performance-Grammar Correspondence Hypothesis.
- Implicational hierarchies are built on data on cross-linguistic preferences. On any hierarchy the feature at the least marked end is the most frequent one cross-linguistically and the feature at the marked end is the least frequent one.
- In that sense, implicational hierarchies can be interpreted as measuring cost/difficulty of processing/storage/learning from a cross-linguistic point of view.
- Linguistic phenomena that are cross-linguistically frequent are relatively easy for all types of language user (speakers, hearers, learners).
- Cross-linguistic preferences can be interpreted as reflecting, to some extent, cost/difficulty shared by all user types.
- A way of seeing connections between complexity and cost/difficulty.

Some further large-scale typological studies of complexity

Sinnemäki (2008, 2009, 2010, 2011)

- Complexity in core argument marking
 1. Complexity trade-off between dependent marking and rigid word order.
 2. Head marking shows no correlation with either dependent marking or rigid word order.
 3. Negative correlation between complexity in core argument marking and population size.
 4. Zero-marking of core arguments correlates with SVO word order.
 5. Areal diffusion has a greater impact than word order on the distribution of zero marking.

Shosted (2006)

- The relationship between phonological and morphological complexity (number of possible syllables vs. degree of inflectional synthesis).
- No (inverse) correlation in a sample of 32 languages.

Perkins 1992

- Inverse correlation between the complexity of culture and the complexity of the deictic system.
- The complexity of culture following Murdock (1967)
- Explanation: in a less complex culture, communication is more about the concrete environment.

Complexity, contact and change

Complexification and simplification

- Maturation (Dahl 2004)
 - Gradual growth of complexity
 - Grammaticalization
 - Mature features include complex word structure (inflection, derivation, incorporation), lexical idiosyncracies (grammatical gender, inflectional classes), agreement, Germanic V2 rules etc.
- Language contact
 - long term contact involving bilingual L1 learning may lead to growth of complexity (Nichols 1992, Trudgill 2009)
 - contact involving (imperfect) L2 learning may lead to simplification (Trudgill 2009, Kusters 2003, McWhorter 2001, 2007).

Kusters (2003): two opposite idealized types of speech community

- Type I
 - Speaker oriented, speakers' needs override hearers' needs
 - A lot of shared background knowledge
 - L1 learners outnumber L2 learners
 - The language has a important symbolic identity function.
- Type II
 - Hearer-oriented, hearers' needs override speakers' needs
 - The members of the community differ as to their command of the language.
 - L2 learners outnumber L1 learners
 - Main function of language is communicative (other languages may serve identity purposes)
- Cf. Trudgill (1992, 2009): tightly-knit vs. loosely-knit societies
- Hypothesis: Type I communities foster complexity, Type II communities favour simplification.
- Cf. also Nichols (1992): residual zones vs. spread zones.
- Cf. Sinnemäki (2009).

Creoles

- McWhorter (2001): The world's simplest grammars are creole grammars.
 - The metric of overall complexity points to that direction
 - see debate in *Linguistic Typology* 5 (2/3).
- Parkvall (2008)
 - Tests the claim with WALS.
 - 53 features interpretable as complexity points, quantified on a scale from 0 to 1.
 - 155 languages for which data found for at least 30 features.
 - The two creoles in the sample are located at the simple end.
 - Similar result when 30 more creoles added, average complexity figures: non-creoles: 0.41, creoles 0.24 (pidgins: 0.14).
 - NB! Even if the set of criteria used was not considered a valid measure of overall complexity, creoles clearly form a typological group a part.

Simplification of high-contact non-creole languages (McWhorter 2002, 2007)

- English has simplified with respect to its Germanic sisters.
- A set of features missing in English but present in other Germanic languages: e.g., external possession, gender distinctions in articles, prefixal verb derivation, directional adverbials, be-perfect, become-passive, V2-rules, 2. singular pronouns, man-passive.
- According to McWhorter, this is due to language contact: imperfect L2 learning by Scandinavian settlers from the 9th century on.
- McWhorter (2007, 2008): only large scale L2 learning may cause the grammar of a language to simplify to a significant extent.
- Similar cases: Mandarin Chinese, Persian, Regional variants of Arabic, Standard Indonesian.
- Cf. also Szmrecsanyi & Kortmann's (2009) work on varieties of English, as well as Trudgill (2009)

Complexity and cross-linguistic rarity

Complexity and cross-linguistic rarity

- Complexity need not directly correlate with rarity.
- Cost and difficulty, by contrast, would be expected show a positive correlation with rarity.
 - The performance grammar correspondence hypothesis (Hawkins 2004)
- Thus, complexity would be expected to correlate with rarity indirectly, via its relation to cost and difficulty.

Bibliography

- Bright, William. 1957. *The Karok Language*. Berkeley: University of California Press.
- Bybee, Joan. 1985. *Morphology: A study of the relation between meaning and form*. Amsterdam: Benjamins.
- Crystal, David. 1997. *The Cambridge encyclopedia of language*. Cambridge: Cambridge University Press.
- Dahl, Östen. 2004. *The growth and maintenance of linguistic complexity*. Amsterdam: Benjamins.
- Dahl, Östen. 2009. Testing the case of complexity invariance: The case of Eifalian and Swedish. In Geoffrey Sampson, David Gil & Peter Trudgill (eds.), *Language complexity as an evolving variable*, 50-63. Oxford: Oxford University Press.
- Deutscher, Guy. 2000. *Syntactic change in Akkadian. The evolution of sentential complementation*. Oxford: Oxford University Press.
- Everett, Daniel L. 2005. Cultural constraints on grammar and cognition in Pirahã. *Current Anthropology* 46 (4), 621-634.
- Gell-Mann, Murray. 1994. *The quark and the jaguar, adventures in the simple and the complex*. New York: Freeman & Co.
- Gil, David. 2005. Isolating-Monocategorial-Associational Language. In Henri Cohen and Claire Lefebvre (eds.), *Handbook of categorization in cognitive science*, 347-379. Amsterdam: Elsevier.
- Gil, David. 2008. How complex are isolating languages? In Matti Miestamo, Kaius Sinnemäki & Fred Karlsson (eds.), *Language complexity: Typology, contact, change*, 109-131. Amsterdam: Benjamins.
- Hawkins, John A. 2004. *Efficiency and complexity in grammars*. Oxford: Oxford University Press.
- Hockett, Charles F. 1958. *A Course in Modern Linguistics*. New York: The Macmillan Company.
- Hualde, José Ignacio & Jon Ortiz de Urbina. 2003. *A grammar of Basque*. Berlin: Mouton de Gruyter.
- Hudson, Richard. 1981. 83 things linguists can agree about. *Journal of Linguistics* 17. Available online at <http://www.llas.ac.uk/resources/gpp/135>.
- Klamer, Marian. 1998. *A grammar of Kambera*. Berlin: Mouton de Gruyter.
- Kusters, Wouter. 2003. *Linguistic complexity, the influence of social change on verbal inflection*. Utrecht: LOT.

Bibliography

- McMahon, April M. S. 1994. *Understanding language change*. Cambridge: Cambridge University Press.
- McWhorter, John H. 2001. The world's simplest grammars are creole grammars. *Linguistic Typology* 5 (2/3), 125-166.
- McWhorter, John H. 2002. What happened to English? *Diachronica* 19, 217-273.
- McWhorter, John H. 2007. *Language interrupted: Signs of non-native acquisition in standard language grammars*. Oxford: Oxford University Press.
- McWhorter, John H. 2008. Why does a language undress? In Matti Miestamo, Kaius Sinnemäki & Fred Karlsson (eds.), *Language complexity: Typology, contact, change*, 167-190. Amsterdam: Benjamins.
- Miestamo, Matti. 2006. On the feasibility of complexity metrics. In Krista Kerge & Maria-Maren Sepper (eds.), *Finest linguistics. Proceedings of the Annual Finnish and Estonian Conference of Linguistics, Tallinn, May 6-7, 2004*, 11-26. Tallinn: Tallinn University Press.
- Miestamo, Matti. 2008. Grammatical complexity in a cross-linguistic perspective. In Matti Miestamo, Kaius Sinnemäki & Fred Karlsson (eds.), *Language complexity: Typology, contact, change*, 23-41. Amsterdam: Benjamins.
- Miestamo, Matti. 2009. Implicational hierarchies and grammatical complexity. In Geoffrey Sampson, David Gil & Peter Trudgill (eds.), *Language complexity as an evolving variable*, 80-97. Oxford: Oxford University Press.
- Miestamo, Matti, Kaius Sinnemäki & Fred Karlsson (eds.). 2008. *Language complexity: Typology, contact, change*. Amsterdam: Benjamins.
- Sampson, Geoffrey, David Gil & Peter Trudgill (eds.). 2009. *Language complexity as an evolving variable*. Oxford: Oxford University Press.
- Murdock, George Peter. 1967. *Ethnographic atlas*. Pittsburgh: University of Pittsburgh.
- Nichols, Johanna. 1992. *Linguistic diversity in space and time*. Chicago: The University of Chicago Press.
- Nichols, Johanna. 2009. Linguistic complexity: A comprehensive definition and survey. In Geoffrey Sampson, David Gil & Peter Trudgill (eds.), *Language complexity as an evolving variable*, 110-125. Oxford: Oxford University Press.

Bibliography

- Parkvall, Mikael. 2008. The simplicity of creoles in a cross-linguistic perspective. In Matti Miestamo, Kaius Sinnemäki & Fred Karlsson (eds.), *Language complexity: Typology, contact, change*, 265-285. Amsterdam: Benjamins.
- Perkins, Revere D. 1992. *Deixis, grammar, and culture*. Amsterdam: Benjamins.
- Sapir, Edward. 1921. *Language: An introduction to the study of speech*. San Diego: Harcourt Brace & Co.
- Schlegel, Friedrich von. 1808. *Über die Sprache und die Weisheit der Indier: ein Beitrag zur Begründung der Altertumskunde*. Heidelberg: Mohr & Zimmer. [reprint, Amsterdam: Benjamins]
- Shosted, Ryan. 2006. Correlating complexity: A typological approach. *Linguistic Typology* 10, 1-40.
- Sinnemäki, Kaius. 2008. Complexity trade-offs in core argument marking. In Matti Miestamo, Kaius Sinnemäki & Fred Karlsson (eds.), *Language complexity: Typology, contact, change*, 67-88. Amsterdam: Benjamins.
- Sinnemäki, Kaius. 2009. Complexity in core argument marking and population size. In Geoffrey Sampson, David Gil & Peter Trudgill (eds.), *Language complexity as an evolving variable*, 126-140. Oxford: Oxford University Press.
- Sinnemäki, Kaius. 2010. Word order in zero-marking languages. *Studies in Language* 34(4): 869-912.
- Sinnemäki, Kaius. 2011. Language universals and linguistic complexity: Three case studies in core argument marking. University of Helsinki PhD dissertation.
- Szmrecsanyi, Benedikt & Bernd Kortmann. 2009. Between simplification and complexification: Non-standard varieties of English around the world. In Geoffrey Sampson, David Gil & Peter Trudgill (eds.), *Language complexity as an evolving variable*, 64-79. Oxford: Oxford University Press.
- Trudgill, Peter. 1992. Dialect typology and social structure. In E.H. Jahr (ed.), *Language contact, theoretical and empirical studies*, 195-211. Berlin: Mouton de Gruyter.
- Trudgill, Peter. 2009. Sociolinguistic typology and complexification. In Geoffrey Sampson, David Gil & Peter Trudgill (eds.), *Language complexity as an evolving variable*, 98-109. Oxford: Oxford University Press.