

Diachronic aspects of blocking

Economy, analogy, and the emergence of paradigm structure

WOTM 2007, Universität Leipzig
Eric Fuß, Universität Frankfurt
fuss@lingua.uni-frankfurt.de

“Nun bewegt sich die Geschichte der Sprachen in der Diagonale zweier Kräfte: des Bequemlichkeitstriebes, der zur Abnutzung der Laute führt, und des Deutlichkeitstriebes, der jene Abnutzung nicht zur Zerstörung der Sprache ausarten lässt.” (Gabelentz ²1901: 256)

1. Introduction

- Traditional observation: Cyclic nature of morphological change – reduction of forms via phonological erosion and analogical leveling is compensated for by grammaticalization processes that provide new exponents of inflectional categories that replace old, worn out forms (cf. e.g. Paul 1880, Gabelentz 1891).¹
- This paper examines the interplay between these complementary forces in language change, focusing on the tension between (i) analogical leveling of paradigms and (ii) compensating changes that provide new, more distinctive forms via grammaticalization processes.
- Basic claims: (i) and (ii) are linked to two different learning strategies that impose apparently conflicting requirements on the acquisition of morphology:
 - (a) A strategy that aims at minimizing the number of features (and Vocabulary items) mentioned in the lexicon (⇒ analogical leveling).
 - (b) A strategy that favors the acquisition of the most specified exponent in cases where the input contains more than a single potential realization of a given inflectional morpheme (⇒ grammaticalization).
- (b) is reminiscent of synchronic blocking effects where the availability of a more specified inflectional formative prevents the use of another form that would otherwise be expected to occur, cf. e.g. Halle’s (1997) *Subset Principle* (relevant passage marked by underlining):²

(1) *The Subset Principle* (Halle 1997)

The phonological exponent of a Vocabulary item is inserted into a morpheme in the terminal string if the item matches all of a subset of the grammatical features specified in the terminal morpheme. Insertion does not take place if the Vocabulary item contains features not present in the morpheme. Where several Vocabulary items meet the conditions for insertion, the item matching the greatest number of features specified in the terminal morpheme must be chosen.

¹ The idea that grammaticalization processes are motivated by the need to compensate for the loss of distinctions due to phonological erosion is widely held in typological approaches to grammaticalization, cf. Lüdtkke (1980), Hopper & Traugott (1993), Siewierska (1999), (2004), Ariel (2000), and Lehmann (2002), among others.

² For a general discussion of blocking effects cf. e.g. Kiparsky (1973), (1982); Aronoff (1976); Anderson (1986), (1992); Halle (1997); Noyer (1997); Giegerich (2001); Embick & Marantz (2006).

- Well-known example from English: Although the completely underspecified null suffix /-∅/ would be compatible with the insertion context [3sg.pres.indic.], its use is blocked by the existence of a more distinctive verbal inflection (/ -z/):
- (2) he/she/it run-s vs. *he/she/it run-∅

2. Blocking effects in language acquisition and change

- Observation: The grammaticalization of inflectional markers does not replace existing formatives in a random fashion. For example, it appears that across languages, the creation of new inflectional material complies with the following generalization:
- (3) New verbal agreement morphology arises historically only for those slots of the agreement paradigm where the existing verbal inflection is non-distinctive.
- Relevant examples include: various Italian and Rhaeto-Romance dialects (cf. e.g. Spiess 1956, Kuen 1957, Renzi & Vanelli 1983, Linder 1987, Haiman & Benincà 1992, Poletto 1997, Gerlach 2002), Non-Standard French (Wartburg 1970, Ashby 1977, Harris 1978, Auger 1993, Gerlach 2002), a number of German varieties (Wiesinger 1989, Dal Negro 2004, Fuß 2005, Kolmer 2005), Khinalug (North-East Caucasian, Corbett 1991: 123), Kisar (Austronesian, Blood 1992, Siewierska 1999, 2004), Maricopa (Yuman, Siewierska 1999, 2004), and the Papuan language Skou (Donohue 2002).
 - Formal account of this observation: The rise of (new) exponents of functional/inflectional heads is shaped by blocking effects that operate during language acquisition and favor the use of more specified Vocabulary items over less specified Vocabulary items (cf. Fuß 2005, 2006):³
- (4) *Blocking Principle (BP)*⁴
If several appropriate PF-realizations of a given morpheme are attested in the Primary Linguistic Data (PLD), the form matching the greatest subset of the morphosyntactic features included in the morpheme must be chosen for storage in the lexicon.
- In other words, child learners scan the input they receive for the most specific phonological realization of a given underlying functional/inflectional morpheme.
 - The BP ensures that the development of new inflections can affect only underspecified slots of the paradigm, replacing non-distinctive Vocabulary items.
 - Similar to structural economy principles (cf. e.g. Clark & Roberts 1993, Roberts & Roussou 2003), the BP is called into service only if the cues provided by the input data are for some reason ambiguous and not sufficient for identifying the exponent of an underlying morpheme on independent grounds.

³ Note that grammaticalization processes not only provide new exponents of previously existing functional categories; they may also alter the feature content of these categories (cf. van Fintel 1995, Roberts & Roussou 2003). Thus, the reanalysis of a given element as the spell-out of a functional head may (i) add feature specifications (e.g., C[+declarative] in the case of complementizers, D[+φ] in the case of determiners etc.) and (ii) simultaneously provide the most specific spell-out for the relevant feature combination (one may even entertain the notion that grammaticalization leads to the development of new functional categories that represent options provided by UG, but were previously not existent in the grammar at hand, cf. e.g. van Gelderen 2004).

⁴ Possibly, the generalization in (4) can be reduced to general principles governing the procedure of Vocabulary Insertion such as the Subset Principle (Halle 1997).

2.1 A case study: The rise of new agreement suffixes in German/Bavarian

- Background: In Bavarian (and a number of other Germanic varieties), new agreement suffixes developed via a reanalysis of subject enclitics that attach to the right of finite verbs in inversion contexts (cf. e.g. Fuß 2005 for details):

(5) XP V_{fin}+subj. clit. ... >>> XP V_{fin}+AGR ...

- In most cases, this change led to an enlargement of the existing inherited agreement endings (e.g., 2sg *-s* + *t(hu)* 'CLIT.-2sg' >>> 2sg *-st*).
- This grammaticalization process did not take place in a wholesale fashion, enlarging/replacing all existing agreement endings. Rather, the change is confined to the following contexts:

- (6) a. 2sg *-s* >>> *-st* (early OHG; *-st* in most mod. varieties of German)
 b. 2pl *-t* >>> *-ts* (13th century Bavarian; attested in all mod. varieties)
 c. 1pl *-an* >>> *-ma* (18th century; extension to verbs in clause-final position in e.g. some Lower Bavarian dialects)⁵

- Why?

2.2 Bavarian 2pl *-ts*, 1pl *-ma*

- Observation: The development of the new endings 2pl *-ts*, 1pl *-ma* eliminated syncretism in the verbal agreement paradigm.
- The development of 2pl *-ts* (< clit. *-(ē)s*) began in the 13th century (in Northern and Middle Bavarian, cf. Wiesinger 1989:72f.), resolving homophony of 3sg, 2pl forms:

	Old paradigm	New paradigm
1sg	-∅	-∅
2sg	-st	-st
3sg	-t	-t
1pl	-an	-an
2pl	-t	-ts
3pl	-ant	-ant

Table 1: Verbal agreement paradigms (pres. indic.), 13th century Bavarian

- In the 18th century, erosion of final *-t* in 3pl forms led to homophony of 3pl and 1pl forms in most Bavarian dialects. In some dialects, this was compensated for by the development of 1pl *-ma* as a new agreement ending:

⁵ These dialects are spoken in the Bavarian Forest, in an area the boundaries of which are (roughly) marked by Cham in the west, Lam in the east, Furth i.W. in the north and Kötzing in the south (cf. Pfalz 1918, Kollmer 1987; Wiesinger 1989, Weiß 1998, 2002).

	Old paradigm	New paradigm
1sg	-∅	-∅
2sg	-st	-st
3sg	-t	-t
1pl	-an	-ma
2pl	-ts	-ts
3pl	-an(t)	-an(t)

Table 2: Verbal agreement paradigms (pres. indic.), late 18th century Bavarian

- It appears that the reanalysis of clitics as agreement markers is triggered if the change leads to the elimination of syncretism in the paradigm.

2.3 Analysis: Change driven by blocking effects

- The new agreement suffixes 2pl *-ts*, 1pl *-ma* satisfy the Blocking Principle due to the fact that they are more specified than their respective predecessors.
- 2sg *-t* >>> *-ts*: The fact that the formative /-t/ occurs in 3sg and 2pl contexts can be taken to indicate that the relevant Vocabulary item is underspecified for [person] as well as [number]. In other words, it represents the elsewhere case that is inserted as the default agreement ending:

(7) elsewhere ↔ /-t/

- Accordingly, the introduction of 2pl /-ts/ is licensed by the BP since the new form is specified for [person] and [number], eliminating homophony of 3sg and 2pl:

(8) [2, pl] ↔ /-ts/

- 1pl *-an* >>> *-ma*: In 18th century Bavarian, there are only two different plural forms in the agreement paradigm: /-ts/ is inserted in the context [2, pl], whereas /-an/ is used for 1pl and 3pl. Thus, the lexical entry for /-an/ must be underspecified for the feature [person].⁶ In other words, /-an/ is simply the elsewhere case among the plural forms, cf. the following insertion rules:

(9) [2, pl] ↔ /-ts/
[pl] ↔ /-an/

- Again, the potential new realization of 1pl (*-ma*) is more specified than the existing Vocabulary item /-an/, since it is in addition specified for [person]. This state of affairs facilitates the grammaticalization process in question, leading to a fully distinctive set of plural agreement markers:

(10) [1, pl] ↔ /-ma/
[2, pl] ↔ /-ts/
[pl] ↔ /-an/

⁶ If person features are decomposed by making use of binary feature specifications such as [±speaker] and [±hearer], then it appears that the form /-an/ may in fact be specified for [-hearer], which characterizes both first and third person forms. In a similar vein, /-t/ (here analyzed as the elsewhere marker) might be taken to realize [-speaker]. However, even under this analysis, the new formatives are clearly more specified than the existing forms: /-ts/ is more distinctive than /-t/, since it is in addition specified for [+pl]. /-ma/ is more specific than /-an/, since it is in addition specified for [+speaker], unambiguously identifying 1st person.

- The BP makes available an explanation of why the changes in question affected only a subset of the agreement markers in the history of Bavarian: The relevant grammaticalization took place only in contexts where the potential new agreement markers were more specified than the existing markers (i.e., the new formatives realized a greater subset of the morphosyntactic features included in the relevant agreement morpheme).

2.4 2sg -s >>> -st: an apparent problem

- It seems that the development of 2sg /-s/ presents a problem for an account in terms of blocking. Consider the forms listed in Table 3:⁷

	Old paradigm	New paradigm
1sg	nim-u	nim-u
2sg	nim-is	nim-ist
3sg	nim-it	nim-it
1pl	nēm-emēs (-ēm, -ēn)	nēm-emēs (-ēm, -ēn)
2pl	nēm-et	nēm-et
3pl	nēm-ant	nēm-ant

Table 3: Agreement paradigms (pres. indic.) for *nēmen* 'take', early OHG

- Apparently, the change from 2sg /-s/ to /-st/ did not involve the creation of an inflectional formative that is more specific than its predecessor. Both items seem to realize the same set of morphosyntactic features:

- (11) a. [2, sg, pres.] ↔ /-s/
 b. [2, sg, pres.] ↔ /-st/

- Problem: It appears that the creation of the new ending /-st/ conflicts with the BP, since it apparently does not lead to a more specified form.
- Possible answer: In early OHG, the 2sg endings of many verbs were identical in the pres. indic. and the pres. subjunc., i.e., the 2sg forms were underspecified for verbal mood. In contrast, verbal mood was clearly distinguished in other person/number combinations (apart from 2pl), cf. the paradigms for the verbs *salbōn* 'anoint' (class 2) and *habēn* 'have' (class 3):⁸

⁷ Note that the initial vowel in formatives such as *-emēs* is actually not part of the agreement suffix, but rather a theme vowel that originally served to derive verb stems from roots.

⁸ Strong verbs and the weak verbs of conjugation class 1 exhibit *-is* and *-ēs* for 2sg present indicative and 2sg present subjunctive, respectively. Here, the difference in vowel quality was perhaps not salient enough to differentiate the forms. Furthermore, the difference was presumably further weakened by phonological erosion that affected non-stressed final syllables. Alternatively, one might assume that the change first affected the weak verbs of the conjugation classes 2 and 3 and spread later to other verb classes by analogy.

	Present indicative	Present subjunctive
1sg	salbōm	salbo
2sg	salbōs	salbōs
3sg	salbōt	salbo
1pl	salbōmēs	salbōm
2pl	salbōt	salbōt
3pl	salbōnt	salbōn

Table 4: Conjugation of *salbōn* 'anoint' (class 2, present tense), early OHG

	Present indicative	Present subjunctive
1sg	habēm	habe
2sg	habēs	habēs
3sg	habēt	habe
1pl	habēmēs	habēm
2pl	habēt	habēt
3pl	habēnt	habēn

Table 5: Conjugation of *haben* 'have' (class 3, present tense), early OHG

- The development of the new formative /-st/ began in the present indicative (cf. Brinkmann 1931, Braune & Reiffentstein ¹⁵2004: 261).⁹ This suggests that the development in question was licensed by the fact that the new ending was unambiguously specified for verbal mood (i.e., indicative) in contrast to the earlier formative /-s/:

- (12) a. [2, sg, pres.] ↔ /-s/
 b. [2, sg, pres., **indic.**] ↔ /-st/

- Accordingly, the change leading to 2sg /-st/ does not represent a counterexample to the BP. Rather, it proceeded in accordance with the requirement that new inflectional formatives realize a greater subset of morphosyntactic features than their predecessors.
- In a later development, the new ending spread to all verb classes, tenses and verbal moods including the pres. subjunctive. This subsequent development blurred the original motivation for the change in question.

3. Analogical change

- Well-known fact: Analogical change may create regular variants of originally irregular forms, as illustrated in (13) and (14) with irregular and regular variants of past tense and participle forms in German:

⁹ The first instances of 2sg *-st* appear in Franconian and spread later to other OHG varieties. The early OHG manuscripts written in the monastery of Fulda show this change in the process of its development, cf. the *Hildebrandslied* (preserved in an early 9th century copy of the original text dating from the late 8th century), the *Basel Recipes* (around 800), or the *Tatian* (translated around 830-840. This translation was then copied in the second half of the 9th century). Furthermore, it can be shown that the change affected first the present indicative: in the OHG texts of Otfrid von Weißenburg, for example, 2sg *-st* appears frequently with present indicative verb forms, while past tense and subjunctive forms still exhibit the non-enlarged ending 2sg *-s*. See Brinkmann (1931), Moulton (1944), Sievers (1961), Sommer (1994) for details.

- (13) a. *buk* (irreg.) vs. *backte* (regular) ‘I/he/she/it baked’
 b. *glomm* (irreg.) vs. *glimmte* (regular) ‘I/he/she/it glowed’
- (14) a. *gegoren* (irreg.) vs. *gegärt* (regular) ‘fermented (participle)’
 b. *geblichen* (irreg.) vs. *gebleicht* (regular) ‘bleached (participle)’

- Traditional, it is often assumed that the drift towards more uniformity is a natural development towards a one-to-one correspondence between form and meaning/function (cf. e.g. Mayerthaler 1980).
- **Problem:** Contrary to what is expected from the perspective of blocking, it is usual the regular form that wins out over the irregular form, and not vice versa.
- **Paradigm leveling:** unmarked (i.e., underspecified) inflectional formatives gain a wider distribution in a paradigm, replacing forms that are apparently more distinctive.
- Again, this phenomenon conflicts with the idea that the acquisition of inflectional paradigms is governed by a principle that favors more specified over less specified exponents.¹⁰
- In this section I try to reconcile the phenomenon of analogical leveling with the claim that the acquisition of inflectional formatives is guided by blocking effects.

3.1 Analogical leveling I: Expanding the domain of unmarked exponents

- **“Einheitsplural”** (‘common plural’) in Alemannic: The majority of the Alemannic dialects spoken in Switzerland and Southwest Germany exhibit only a single plural agreement ending for all persons, *-ət*.¹¹

	Present indicative
1sg	-ə
2sg	-ʃ
3sg	-t
1pl	-ət
2pl	-ət
3pl	-ət

Table 6: *Einheitsplural* in Alemannic

- In Alemannic, the ‘common plural’ *-ət* originated from the original 3pl *-ent* (via vowel reduction and elision of /n/).

¹⁰ Note that leveling via phonological erosion is presumably no real issue here: When phonological processes lead to the erosion of inflectional distinctions, the relevant forms simply disappear from the PLD and fail to be acquired.

¹¹ Note that the phenomenon of “common plural” is also a characteristic of Low German dialects: Western Low German dialects exhibit the form *-(ə)t*, while *-ən* is the typical ending found in Eastern Low German dialects (cf. Schirmunski 1962: 543f. for details). Interestingly, many of these dialects also exhibit loss of final /-t/ in 2sg forms, similar to Alemannic (Schirmunski 1962: 544).

- The development of common plural proceeded via two stages:¹²
 - (i) The 3pl *-ent* replaced the former 2pl *-et* (2pl *-ent* first attested in the work of Notker, 950-1022).
 - (ii) In a later development, *-ent* spread to 1pl (formerly *-ēn*).
- Development from early OHG to a paradigm with general plural marker *-ent* (including the early innovation 1pl *-mēs* → *-ēn*):

	Original paradigm (Early OHG, ca. 800)	1pl <i>-mēs</i> → <i>-en</i> (Otfrid, ca. 865)	2pl <i>-et</i> → <i>-ent</i> (Notker, OHG/ Alem., ca. 1000)	1pl <i>-et</i> → <i>-ent</i> (MHG/Alem., 13th- 15th cent.)
1sg	-u	-u	-o	-e(n)
2sg	-is	-ist	-est	-es(t)
3sg	-it	-it (→ -et)	-et	-(e)t
1pl	-mēs	-ēn ¹³	-ēn	-ent
2pl	-et	-et	-ent	-ent
3pl	-ent	-ent	-ent	-ent

Table 7: The development of *Einheitsplural* in Alemannic, present indicative (inflections of strong verbs & weak verbs of class I, including theme vowels)

- Bavarian and Alemannic started from the same set of distinctions (compare the plural forms of Otfrid). However, the developments that took place in Alemannic are apparently the opposite of what happened in Bavarian (see above).
- After 3sg (originally *-it*) and 2pl (originally *-et*) had fallen together in *-et*,¹⁴ Alemannic did not innovate a new, more specified 2pl. Instead, it extended the 3pl form *-ent* to 2pl, which eventually evolved into the general plural marker *-ent*.
- Conjecture: The fact that Alemannic did not innovate a more specific 2pl form was due to the lack of an appropriate source: the 2pl pronoun *ēs* is confined to Bavarian, while Alemannic exhibits 2pl *ir* (clit. *er* identical to 3sg.masc, and therefore not distinctive).
- Unclear: Why did Alemannic choose to innovate 2pl on the model of 3pl?
- Claim: The development of a common plural resulted from two major reanalyses that affected the feature specifications of the relevant Vocabulary items.
- First reanalysis: The early transition of 3pl *-ent* to 2pl resulted from a reanalysis in which /n/ was associated with the feature [+pl], while /t/ was linked to the person feature [-speaker].
- Details:
 - (i) The early innovation of 2sg *-st* (see above) opened up the possibility to analyze /t/ as the realization of [-speaker] (final /t/ appears in all 2nd and 3rd person forms).
 - (ii) The 3pl *-ent* could be decomposed into a person marker /-t/, realizing [-speaker], and a plural marker /-n/, which also shows up in the 1pl *-en* (note that /e/ is merely a theme vowel and presumably not part of the actual agreement ending).¹⁵

¹² Cf. Braune & Reiffenstein (152004: 263), Paul (241998: 240), Paul (1952: 194), and in particular Schirmunski (1962: 521ff.), Besch (1967: 310ff.).

¹³ It is commonly assumed that the 1pl *-en*, which replaced *-mēs*, originated in the subjunctive 1pl *-(e)m*.

¹⁴ This change was due to a general reduction of vowels in non-stressed (final) syllables. Note that the difference in theme vowels (3pl /i/ vs. 2pl /e/ in strong verbs and weak verbs of class I) originally contributed to signaling person distinctions.

¹⁵ The absence of /-t/ in 3sg person preterite forms can be attributed to an Impoverishment rule that deletes the feature [-speaker] in the relevant context ([-hearer, -pl, +past]), giving rise to identical 1sg

- (iii) As a result, the plural marker /n/ was generalized to the remaining plural context 2pl.

	Paradigm after conflation of 3sg, 2pl	Paradigm after reanalysis
1sg	-o	-o
2sg	-est	-est
3sg	-et	-et
1pl	-en	-en
2pl	-et	-ent
3pl	-ent	-ent

Table 8: Reanalysis of conjugation system in OHG/Early Alemannic (Notker)¹⁶

- Insertion rules after 3sg and 2pl had fallen together (present indicative, without theme vowel):¹⁷

- (15) a. [+speaker, -pl] ↔ /-o/¹⁸
 b. [+hearer, -pl] ↔ /-s/
 c. [-hearer, +pl] ↔ /-n/
 d. [-speaker] ↔ /-t/

- Insertion rules after the reanalysis (present indicative):

- (16) a. [+speaker, -pl] ↔ /-o/
 b. [+hearer, -pl] ↔ /-s/
 c. [+pl] ↔ /-n/
 d. [-speaker] ↔ /-t/

- This change led to a more transparent relation between meaning/function and form and therefore clearly satisfies conditions of analogical change proposed in frameworks such as Natural Morphology (cf. e.g. Mayerthaler 1980).
- Under the assumption (cf. e.g. Halle 1997) that child learners acquire the most economical lexical inventory compatible with the input they are exposed to, the relevant changes can also be accounted for in a more formal way:¹⁹

and 3sg preterite forms in these dialects (cf. Müller 2006: 104 for a related analysis of the conflation of 1st and 3rd person preterite forms in Standard German). Note that the present-day Alemannic dialects generally lack preterite forms (preterite forms began to disappear in the 16th century).

¹⁶ Note that at this stage, the theme vowel still served to distinguish conjugation classes (cf. class II: 3pl -ont, class III: 3pl -ent).

¹⁷ Note that a decomposition of the relevant agreement markers requires that the relevant Agr-morpheme is subject to Fission, cf. e.g. Noyer (1997). See Müller (2006) for a related analysis of the verbal inflection of Standard German.

¹⁸ Or /-∅/, if /-o/ is analyzed as theme vowel.

¹⁹ Further questions concern the driving factor behind analogical change. First, one might assume that analogical changes originally take place in the language of adults, which mistakenly take /-n/ to be a general plural marker, yielding 2pl forms that vary between /-t/ and /-nt/. The new forms will then be part of the PLD children are exposed to, eventually triggering a grammar change. Alternatively, analogical changes can be taken to originate directly in the language acquisition process (via misparses etc.). If the relevant changes fail to be corrected, the child will continue to produce the innovated forms, providing relevant input for her peers (and subsequent generations).

(17) “Minimize Feature Content” (Halle 1997)

The number of features mentioned in the Vocabulary must be minimized.

- (17) can be taken to require that each Vocabulary item is associated with the most economical feature specifications compatible with the input data.
- The development of a general plural marker that is not linked to [person] – compare (15c) with (16c) – clearly satisfies this condition.
- The change at hand did not violate the BP:
 - (i) The BP does not require the learner to store lexical items with redundant feature specifications (this would conflict with (17)).²⁰
 - (ii) While the former 2pl *-(e)t* merely realized [–speaker], the new (combined) 2pl formative *-(e)nt* is actually more specified, realizing both [–speaker] and [+pl].
- Second reanalysis: In the MHG period, *-(e)nt* evolved into the general plural marker for all persons, replacing 1pl *-(e)n* (cf. Schirmunski 1962: 521ff., Besch 1967: 310ff., Paul ²⁴1998: 240).

	“Old” paradigm	“New” paradigm
1sg	-e(n)	-en
2sg	-s(t)	-s
3sg	-et	-et
1pl	-en	-ent
2pl	-ent	-ent
3pl	-ent	-ent

Table 9: Second reanalysis of conjugation system in MHG/Alemannic (~13th-15th century)

- Observations: The extension of *-ent* to 1pl contexts was accompanied by two further changes in the MHG period.
 - (i) Many Alemannic dialects lost final */-t/* in 2sg contexts, giving rise to a new 2sg ending */-s/* (later turning into */-ʃ/*, via reg. sound change [-s] >>> [-ʃ]), cf. Schirmunski (1962: 520f.), Weber (1987: 174).
 - (ii) In addition, the development of a common plural *-ent* seems to be linked to the presence of a new 1sg form *-en*.²¹
- Due to the loss of final */-t/* in 2sg contexts, */-t/* could no longer be analyzed as a marker realizing [–speaker].²²
- Due to the innovation of */-n/* as a marker of 1sg, */-n/*²³ could no longer be analyzed as the realization of [+pl].
- As a result, the complex */-nt/* was reanalyzed as a pure plural marker, and */-t/* turned into the elsewhere marker (again abstracting away from the theme vowel):

²⁰ For example, if a feature specification [+speaker] is sufficient to guarantee that a 1sg exponent is inserted in the contexts where it appears in the input, the child will not acquire a redundant feature specification [+speaker, –hearer] for this exponent.

²¹ See Besch (1967: 301) for the observation that there is (geographic) connection between the extension of the *Einheitsplural* to 1pl and the presence of the 1sg form */(e)n/*.

²² The possible connection between the loss of 2sg */-t/* and the rise of the common plural */-nt/* was pointed out to me by Helmut Weiß.

²³ Apparently an extension of the relevant 1sg ending of the weak verbs of classes II & III, cf. Schirmunski (1962: 519).

- (18) a. [+speaker, -pl] ↔ /-n/
 b. [+hearer, -pl] ↔ /-s/
 c. [+pl] ↔ /-nt/
 d. elsewhere ↔ /-t/

- It appears that the relevant change again proceeded in line with (17), since it led to a reduction of feature content in the Vocabulary, with /-t/ being converted into the elsewhere marker.²⁴
- Later changes that led to the present-day paradigm (cf. Table 6):
 - (i) Cluster reduction of /nt/ via elision of /n/ (cross-linguistically a common change, which is usually attributed to a tendency to preserve the least sonorous element of the target cluster, cf. Ohala 1996, 1999, Pater & Barlow 2003).
 - (ii) Loss of final /-n/ in 1sg forms (in most dialects).
- Both changes are most probably due to purely phonological factors.

3.2 Analogical leveling II: Loss of stem alternations

- Typical example: Loss of stem vowel alternations in Yiddish present tense forms.
- Extension of the stem found in the 1sg to other contexts: Relevant examples come from the 2sg and 3sg forms of 'to dig' and the plural forms of 'to know' (see Albright 2002 for detailed discussion).

	Present tense of <i>grɔbn</i> 'to dig'	Present tense of <i>visn</i> 'to know'
1sg	grɔb	veys
2sg	grebst → grɔbst	Veyst
3sg	grebt → grɔbt	veys(t)
1pl	grɔbn	visn → veysn
2pl	grɔbt	vist → veyst
3pl	grɔbn	visn → veysn

Table 10: Analogical leveling of stem vowel alternations in Yiddish

- Analogical leveling led to the loss of agreement distinctions: In the case of *grɔbn* 'to dig', the change conflated the forms for 3sg and 2pl, which were formerly distinguished by stem vowel alternation. Similarly, analogical leveling led to homophonous forms for 2sg and 2pl of *visn* 'to know'.
- Albright (2002): Analogical leveling as an effect of the way learners acquire the base form of the verb in a given paradigm.
- Idea: Learners scan the input for a base form of the verb which allows to generate unknown forms as accurately as possible:

“The way that they do this [...] is by seeking a base form within the paradigm that is “maximally informative” – that is, that suffers the least serious

²⁴ Note that this analysis raises a number of questions, for example concerning (i) the status of the elsewhere marker /-t/ if Agr is still subject to Fission at this stage, and (ii) the status of Impoverishment in the relevant preterite forms (but note that the preterite began to diminish shortly after the rise of the common plural).

phonological and morphological neutralizations — and then deriving the remaining forms in the paradigm from the base form.” (p. 7)

- “Neutralization”: disappearance of (morpho-) phonemic contrasts in a certain stem form due to the affixation of inflectional material.
- Example: In Yiddish (similar to German or English), the affixation of a suffix consisting of voiceless obstruents requires that a stem-final obstruent become voiceless as well.
- Result: Neutralization of morphophonemic contrasts in the 2sg, 3sg and 2pl, where it is no longer clear whether the base form ends in a voiced (as in *libən*) or voiceless obstruent (as in *zipən*).

	<i>libən</i> ‘to love’	<i>zipən</i> ‘to sift’
1sg	lib	zip
2sg	lipst	zipst
3sg	lipt	zipt
1pl	libən	zipən
2pl	lipt	zipt
3pl	libən	zipən

Table 11: Neutralization due to voicing assimilation in Yiddish (present tense)

- According to Albright, the 1sg forms have a unique status in Yiddish since they are much less affected by phonological neutralization than all other base forms.
- Thus, the 1sg form can be considered the *maximally informative* form with respect to the manifestation of phonemic distinctions. Accordingly, it is stored as the base form in the lexicon.
- The learner may be later compelled to store additional forms with stem vowel alternations if they are robustly attested in the relevant input data.
- Analogical leveling: If learners fail to pay attention to the relevant data they will go on to use the maximally informative base form as the sole stem form.
- The more speakers adopt the change, the less robust will be the evidence for the irregular forms in the PLD, and the base form will eventually replace the old irregular forms if the change gains a wider distribution in the speaker community.
- Proposal: Loss of stem vowel alternations can be analyzed in terms of blocking effects, if it is assumed that the learner selects the stem alternant which is most informative / specified with respect to phonemic distinctions as the base form of a given lexical root:

(19) *Blocking Principle – phonemic distinctions*

If several realizations of a given lexical root are attested in the Primary Linguistic Data, the form manifesting unambiguously the greatest number of phonemic distinctions is stored as the base form.

- Problem: This approach is primarily concerned with the question of which forms are in principle available as potential regularizations (and which ones are not). It does not say much about the reasons that might lead learners to ignore the presence of stem alternations (contra the effects of inflectional blocking).
- Tentative solution: If stem alternations are to be analyzed as lexical exceptions that must be stored separately for each individual stem, the tendency to eliminate

stem alternations can perhaps be attributed to a general preference for reducing idiosyncratic (phonological) features in the Vocabulary if the relevant forms are not robustly attested in the PLD (cf. Kiparsky 2003 for related considerations with respect to sound change).²⁵

- Presumably, this preference can be subsumed under the principle “Minimize Feature Content” discussed above.

(20) *Analogical leveling/stem alternations*

- (i) Phonemic blocking selects the most informative base form.
- (ii) General preference for reducing lexical exceptions in the Vocabulary promotes loss of stem alternations (if not robustly attested).

4. Conclusion

- Principles governing acquisition and change of inflectional formatives:
 - (i) Minimize Feature Content: If the input does not provide sufficient clues, economy principles such as (17), which aim at minimizing the number of features (or, Vocabulary items) mentioned in the lexicon, may promote an expansion of the domain of unmarked exponents. ⇒ Analogical leveling
 - (ii) Blocking: The learner scans the input for the most marked (and therefore salient) realization of a given underlying morpheme. In cases where there is more than a single potential candidate robustly attested in the PLD, the more specified form is stored in the lexicon. ⇒ Grammaticalization processes
- In this way, the two principles actually work hand in hand during acquisition, warranting that the acquisition process leads to an optimal paradigm and lexicon structure.
- In addition, the division of labor between blocking effects and “Minimize feature content” accounts for the cyclic nature of language change, where erosion and analogical change lead to a loss of distinctions, which is compensated for by grammaticalization processes which provide new exponents of inflectional heads, replacing worn out and non-distinctive formatives.

References

- Anderson, Stephen R. 1986. “Disjunctive ordering in inflectional morphology.” *Natural Language and Linguistic Theory* 4, 1-31.
- Anderson, Stephen R. 1992. *A-morphous Morphology*. Cambridge: Cambridge University Press.
- Ariel, Mira. 2000. “The development of person agreement markers: from pronoun to higher accessibility markers.” In *Usage-based Models of Language*, S. Kemmer and M. Barlow (eds.), 197-261. Stanford: CSLI.
- Aronoff, Mark. 1976. *Word Formation in Generative Grammar*. Cambridge, Mass.: The MIT Press.
- Ashby, William. 1977. *Clitic Inflection in French. An Historical Perspective*. Amsterdam: Rodopi.
- Auger, Julie. 1993. “More evidence for verbal agreement marking in Colloquial French.” In *Linguistic Perspectives on the Romance Languages*, W. J. Ashby, M. Mithun, G. Perissinotto, and E. Raposo (eds.), 177-98. Amsterdam: John Benjamins.
- Besch, Werner. 1967. *Sprachlandschaften und Sprachausgleich im 15. Jahrhundert*. München: Francke Verlag.
- Blood, Cindy. 1992. “Subject-verb agreement in Kisar.” *NUSA. Linguistics Studies of Indonesia and Other Languages in Indonesia*, vol. 34, 1-21. Jakarta: Badan Penyelenggara NUSA.
- Braune, Wilhelm & Ingo Reiffenstein. ¹⁵2004. *Althochdeutsche Grammatik I*. Tübingen: Niemeyer.
- Brinkmann, Hennig. 1931. *Sprachwandel und Sprachbewegung in althochdeutscher Zeit*. Jena.

²⁵ This is in line with the observation that analogical leveling first targets less frequent verbs, while stem alternations are more likely to be preserved in frequently used verbs.

- Clark, Robert and Ian Roberts. 1993. "A computational model of language learnability and language change." *Linguistic Inquiry* 24: 299-345.
- Corbett, Greville. 1991. *Gender*. Cambridge: Cambridge University Press.
- Dal Negro, Silvia. 2004. *The Decay of a Language. The Case of a German Dialect in the Italian Alps*. Frankfurt: Peter Lang.
- Donohue, Mark. 2002. "A most agreeable language." Ms., University of Sydney.
- Embick, David & Alec Marantz. 2006. "Architecture and blocking." Ms., University of Pennsylvania and MIT.
- Fintel, Kai von. 1995. "The formal semantics of grammaticalization." *Proceedings of NELS 25: Workshop on Language Change*, 175-189, Amherst, Mass.: GLSA.
- Fuß, Eric. 2005. *The Rise of Agreement*. Amsterdam: John Benjamins.
- Fuß, Eric. 2006. "Morphological blocking and the rise of agreement." Paper presented at the annual GGS meeting, University of Stuttgart.
- Gabelentz, Georg von der. 1891^[21901]. *Die Sprachwissenschaft. Ihre Aufgaben, Methoden, und bisherigen Ergebnisse*. Leipzig: Weigel
- Gerlach, Birgit. 2001. "Optimality aspects of clitic doubling in Romance." In *Clitics et cliticisation*, P. de Carvalho, L. Labrune, F. Lambert, CL. Muller and K. Ploog (eds.), 343-363. Paris: Champion.
- Gerlach, Birgit. 2002. *Clitics Between Syntax and Lexicon*. Amsterdam: John Benjamins.
- Giegerich, Heinz. 2001. "Synonymy blocking and the elsewhere condition: Lexical morphology and the speaker." *Transactions of the Philological Society*, 99(1), 65-98.
- Haiman, John and Paola Benincà. 1992. *The Rhaeto-Romance Languages*. London and New York: Routledge.
- Halle, Morris. 1997. "Distributed Morphology: Impoverishment and Fission." In *MIT Working Papers in Linguistics 30: PF: Papers At the Interface*, B. Bruening, Y. Kang, and M. McGinnis (eds.), 425-450. Cambridge, Mass.: Department of Linguistics and Philosophy, MIT.
- Harris, Martin. 1978. *The Evolution of French Syntax. A Comparative Approach*. London: Longman.
- Kiparsky, Paul. 1973. "'Elsewhere' in phonology." In *A Festschrift for Morris Halle*, S. Anderson and P. Kiparsky (eds.), 93-106. New York: Holt, Rinehart and Winston.
- Kiparsky, Paul. 1982. "Word-formation and the lexicon." In *Proceedings of the 1982 Mid-America Linguistics Conference*, F. Ingemann (ed.), University of Kansas.
- Kiparsky, Paul. 2003. "The phonological basis of sound change." In: Joseph, Brian D. & Richard D. Janda (eds.), *The Handbook of Historical Linguistics*, 313-342. Oxford: Blackwell.
- Kollmer, Michael. 1987. *Die schöne Waldlersprach*. Bd. I-III. Prackebach: Kollmer (Eigenverlag).
- Kolmer, Agnes. 2005. "Subjektklitika als Kongruenzmarkierer: Ein Vergleich zwischen bairischen und alemannischen Sprachinseldialekten in Norditalien (Zimbrisch und Walsersdeutsch)." In: Bidese, Ermenegildo /Dow, James R. /Stolz, Thomas (eds.), *Das Zimbrische zwischen Germanisch und Romanisch. (Diversitas Linguarum 9)*, 164-189. Bochum: Brockmeyer.
- Kuen, Heinrich. 1957. "Die Gewohnheit der mehrfachen Bezeichnung des Subjekts in der Romania und die Gründe ihres Aufkommens." In *Syntactica und Stilistica. Festschrift für Ernst Gamillscheg zum 70. Geburtstag*, G. Reichenkron (ed.), 293-326. Tübingen: Niemeyer.
- Lehmann, Christian. 1988. "On the function of agreement." In *Agreement in Natural Language*, M. Barlow and Charles A. Ferguson (eds.), 55-65. Stanford: CSLI.
- Lehmann, Christian. 2002. *Thoughts on Grammaticalization*. Second edition. Arbeitspapiere des Seminars für Sprachwissenschaft der Universität Erfurt.
- Linder, Karl Peter. 1987. *Grammatische Untersuchungen zur Charakteristik des Rätoromanischen in Graubünden*. Tübingen: Gunter Narr.
- Lüdtke, Helmut. 1980. "Auf dem Weg zu einer Theorie des Sprachwandels." In *Kommunikationstheoretische Grundlagen des Sprachwandels*, H. Lüdtke (ed.), 182-252. Berlin: de Gruyter.
- Mayerthaler, Willi. 1980. "Aspekte der Analogietheorie." In *Kommunikationstheoretische Grundlagen des Sprachwandels*, H. Lüdtke (ed.), 80-130. Berlin: de Gruyter.
- Moulton, William. 1944. "Scribe γ of the Old High German Tatian translation." *PMLA* 59:2, 307-334.
- Müller, Gereon. 2006. "Pro-drop and Impoverishment." In: Patrick Brandt & Eric Fuß (eds.), *Form, Structure, and Grammar. A Festschrift Presented to Günther Grewendorf on Occasion of His 60th Birthday*, 93-115. Berlin: Akademie Verlag.
- Nordlinger, Rachel. 1998. *A Grammar of Wambaya, Northern Territory (Australia)*. (Pacific Linguistics C-140). Canberra: ANU.
- Noyer, Rolf. 1997. *Features, Positions, and Affixes in Autonomous Morphological Structure*. New York: Garland.
- Ohala, Diane. 1996. Cluster reduction and constraints in acquisition. Doctoral dissertation, University of Arizona.
- Ohala, Diane. 1999. "The influence of sonority on children's cluster reductions." *Journal of Communication Disorders* 32, 397-422.

- Pater, Joe & Jessica Barlow. 2003. "Constraint conflict in cluster reduction." *Journal of Child Language* 30, 487-526.
- Paul, Hermann. 1880. *Prinzipien der Sprachgeschichte*. Halle: Max Niemeyer.
- Paul, Hermann. 1952. *Deutsche Grammatik II.3: Flexionslehre*. Halle: Max Niemeyer.
- Paul, Hermann. ²⁴1998. *Mittelhochdeutsche Grammatik*. Tübingen: Niemeyer.
- Pfalz, Anton. 1918. "Suffigierung der Personalpronomina im Donaubairischen." Republished 1983 in *Die Wiener dialektologische Schule. Grundsätzliche Studien aus 70 Jahren Forschung. (Wiener Arbeiten zur germanischen Altertumskunde und Philologie 23)*, P. Wiesinger (ed.), 217-235. Wien: Peter Lang.
- Poletto, Cecilia. 1997. "Pronominal syntax." In *The Dialects of Italy*, M. Maiden and M. Parry (eds.), 137-145. Cambridge: Cambridge University Press.
- Renzi, Lenordo and Laura Vanelli. 1983. "I pronomi soggetto in alcune varietà romanze (Subject pronouns in some Romance varieties)." In *Scritti linguistici in onore die Giovan Battista Pellegrini (Linguistic Papers in Honor of G. B. Pellegrini)*, P. Benincà et al. (eds.), 121-145. Pisa: Pancini.
- Roberts, Ian and Anna Roussou. 2003. *Syntactic Change. A Minimalist Approach to Grammaticalization*. Cambridge: Cambridge University Press.
- Schirmunski, V.M. 1962. *Deutsche Mundartkunde*. Berlin: Akademie Verlag.
- Sievers, Eduard (ed.). 1961. *Tatian*. Darmstadt: Wissenschaftliche Buchgesellschaft.
- Siewierska, Anna. 1999. "From anaphoric pronoun to grammatical marker: why objects don't make it." *Folia Linguistica* 33.2, 225-251.
- Siewierska, Anna. 2004. *Person*. Cambridge: Cambridge University Press.
- Sommer, Thomas. 1994. *Flexionsmorphologie des Verbs im althochdeutschen Tatian*. München: Tuduv.
- Spiess, Federico. 1956. *Die Verwendung des Subjektpersonalpronomens in den lombardischen Mundarten. (Romanica Helvetica 59)*. Bern: A. Francke.
- Traugott, Elizabeth and Bernd Heine (eds.). 1991. *Approaches to Grammaticalization*. Amsterdam: Benjamins.
- Wartburg, Walther von. 1970. *Einführung in die Problematik und Methodik der Sprachwissenschaft* (3rd edition). Tübingen: Niemeyer.
- Weber, Albert. 1987. *Zürichdeutsche Grammatik. Ein Wegweiser zur guten Mundart*. Zürich: Hans Rohr.
- Weiß, Helmut. 1998. *Die Syntax des Bairischen. Studien zur Grammatik einer natürlichen Sprache*. Tübingen: Niemeyer.
- Weiß, Helmut. 2002. "Agr-in Comp and partial pro-drop." Ms., Universität Regensburg.
- Wiesinger, Peter. 1989. *Die Flexionsmorphologie des Verbums im Bairischen*. Wien, Verlag der Österreichischen Akademie der Wissenschaften.