

BROKEN FORMS IN MORPHOLOGY

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1. Introduction

A curious paradox is provided by incomplete or “broken” morphological structures in surface syntactic strings: bound forms, thus forms illegitimate at word-level, have full status as syntactic atoms and participate in syntax as if they were complete. This paper explores how morphological brachylogy or ellipsis ought best to be understood and what the phenomenon reveals about the relations between morphology and other components of grammar. It will be shown that morphological brachylogy can be applied to a wide range of structural types: inflection and word-formation, including the processes of compounding, prefixation, and suffixation, whereby modificational processes such as vowel alternations may also participate.

In (1a), a Turkish sentence fragment consists of three conjoined verbs. Each inflected verb form consists of a root, a suffix indicating aorist, a null copula clitic, and a suffix indicating subject agreement (Kabak, to appear). In the optional variant (1b), however, the first two verbs in the series are provided only with the aorist suffix, while the subject agreement marking occurs once, on the verb in the final conjunct. This is a model case of morphological brachylogy in inflection. We can consider that the agreement suffix in the final conjunct “has scope” over the verbs in the preceding conjuncts, that is, that the values ‘1st person’, ‘plural’ hold for these verbs; the non-occurrence of the first agreement affixes is legitimized through the presence of the final one. Note here also that phonological, although not phonetic, identity obtains.

(1) a. gid-er- -iz, gör-ür- -üz ve al-2r- -2z
 go-AOR-COP-1P see-AOR-COP-1P and buy-AOR-COP-1P
 ‘We go (there), see (it), and buy (it).’

 b. gid-er-, gör-ür- ve al-2r--2z
 go-AOR- see-AOR and buy-AOR-COP-1P
 ‘We go (there), see (it), and buy (it).’

In the Turkish sentence-fragment (2a) similarly, the number and case affixes are attached to both nouns, but in optional variant (2b), it only occurs on the noun in the second conjunct. The values ‘plural’ and ‘locative’ of the suffixes on the final conjunct “hold” for the noun in the first conjunct as well. As in (1), the two expressions are synonymous and are typical of Turkish writing and speech.

- (2) a. ev-ler-de ve dükkan-lar-da
house-PL-LOC and shop-PL-LOC
‘in houses and shops’
- b. ev- ve dükkan-lar-da
house-and shop-PL-LOC
‘in houses and shops’ (based on Kabak to appear)

The Japanese coordinate structure in (3a) contains a verb inflected for Tense in each conjunct; in (3b), however, the Tense suffix is found only on the verb in the final conjunct, while the verb in the first conjunct bears a “continuative” suffix, signalling only that the morphological information is yet to come, in other words, that the verb is semantically and formally incomplete.

- (3) a. Taroo-ga uta-ta sosite Hanako-ga odot-ta
T.-NOM sing-PAST and H.-NOM dance-PAST
‘Taroo sang and Hanako danced’
- b. Taroo-ga uta-i (sosite) Hanako-ga odot-ta
T.-NOM sing-CONJ and H.-NOM dance-PAST
‘Taroo sang and Hanako danced’ (based on Fukushima 1999)

Note that the two events referred to may be quite independent of each other; they need not be chronologically related, for example (Fukushima 1999:298).

(4a) shows an example from Modern German word-formation, in which a prefix without its base appears in the first conjunct, while the verb participle in the second conjunct is intact, consisting of prefix, complex base, and participle suffix, whereby the base is identical to that required in the first conjunct. (4b) shows a synonymous sentence with intact morphological structures for comparison. In order to interpret the incomplete *pref-* in (4a), the hearer/reader must wait until the matching verb in the second conjunct appears, analyze that verb (here the structure of the complex base has not been shown), extract its base, combine with the first prefix, determine the semantic interpretation of the whole, which as we shall see later, may require consultation of a lexical entry where lexicalization and lack of transparency are present.

- (4) a. werde... nicht re-, sondern ent-sozialisier-t
be... not PREF-, but rather PREF-socialize-PART
‘be... not resocialized but rather desocialized’
(1980 *Spiegel* 15:80, from Müller 1990:348)
- b. nicht re-sozialisiert sondern ent-sozialisiert
not PREF-socialized but PREF-socialize-PART
‘not resocialisiert but rather desocialized’

Examples (1)-(4) do not by any means exhaust the possibilities existing in any one language or across languages for executing morphological brachylogy, but they illustrate some common patterns. For one thing, we observe that there is morphological material that is present in the final conjunct in a coordinate construction only, while earlier conjuncts contain incomplete or “broken” forms whose completion is based on the structure of the final conjunct. In these cases, the complete form is final in the conjunct. Data presented for German in Section 2 will reveal further possibilities and point out some language-specific constraints.

Before proceeding further, let us now give names to the phenomenon itself and the morphological structures involved. We have called the phenomenon morphological ellipsis or brachylogy; the latter term is less familiar, but is preferable due to the wide range of phenomena to which “ellipsis” is applied in modern linguistics and to their original meanings in Greek rhetoric, whereby “ellipsis” is used where the missing material is recovered pragmatically and “brachylogy” where it is recovered structurally, i.e. on the basis of material elsewhere in the sentence. Let us use the term “fragment” to refer to the incomplete morphological structure in the surface syntactic string; in (2b), for example, the fragment is *ev-* and in (4a) it is *re-*. The term “recuperand” will be used to refer to the morphological material which would be reconstructed to complete the fragment, thus in the case of (2b) the recuperand is *-ler-de*, in (4a) it is *-sozialisiert*. Finally, the term “target” will refer to the morphological material in the complete word-form on the basis of which the recuperand will be reconstructed: in (2b), for example, the target is *-lar-da*, while in (4a) it is *-sozialisiert*.

In the rest of this paper, we will attempt answers to the following questions: 1) how is morphological ellipsis or brachylogy best analyzed? 2) to what extent does this phenomenon depend on the syntactic context, namely coordination? Are conditions for syntactic and morphological ellipsis the same? That is, is ellipsis a unified phenomenon at all structural levels? 3) What does morphological ellipsis tell us about grammatical organization and processing in production and comprehension?

Theoretical assumptions in the following discussion will be kept minimal in order not to restrict compatibility with any given framework, an important consideration when working with interface phenomena. Underlying the approach to morphology is a process model that recognizes morphological autonomy, so that syntax is not held responsible for structure of complex words either in inflection or in word-formation, and it is assumed that syntax cannot manipulate subword-structures. Note that this does not mean that the grammar is compartmentalized such that interaction between structural components is excluded, nor that processing is sequential as in the simplistic model in (6) with no feedback allowed:

- (6) Lexicon (including derivational morphology)
 9
 Syntax
 9
 Inflectional Morphology
 9
 Phonology

The paper will conclude that structure-sharing analyses of ellipsis may be preferable to deletion analyses. It will indicate that coordination provides the most common, although not the only, structural context for morphological ellipsis, as it easily provides the necessary conditions of parallelism which allowing reconstruction in processing. The claim will be made that syntactic and morphological ellipsis are manifestations of one basic phenomenon, but that the conditions under which each occurs differ, the latter being more highly constrained. Finally, the paper will claim that interaction between syntactic and semantic aspects of coordination, on the one hand, and morphological ellipsis, on the other hand, strongly suggest that processing involves feedback between components of the grammar, rather than sequential responsibility for structure.

2. Data: Modern and Earlier Modern German

In this section, we will consider morphological ellipsis or brachylogy in contemporary and older Modern German. Morphological brachylogy is common in contemporary Modern German word-formation, compounding, prefixation, and suffixation with some restrictions. The standard language admits the following types (7-10), with additional variations also possible. Various conjunctions are used in order to show that there is no restriction with regard to choice of conjunction (unlike Japanese, where morphological brachylogy is only possible with ‘and’/’and not’ (M. Shimada, p.c.)). In (7), we see two examples of compounding. In these examples, the target is underlined and the exposed hyphen, as before, indicates the morphological boundary where the form is “broken”. (7a) is comparable to the Turkish examples in (1) in that the fragment occurs in the first conjunct and the full form in the second; it is unlike the Turkish examples in that the fragment is not a legitimate object at word-level, as it is terminated by a juncture morph (note also that the fragment does not correspond to any form in the inflectional paradigm of the lexeme base). (7b) illustrates a less frequently-occurring type in which it is the second conjunct which contains the fragment, the first conjunct containing the full form and thus the target. In this particular example, the fragment does correspond to a homophonous free-standing word-form, although as we have seen in (7a), this is not necessary.

- (7) a. Universität-s- oder Schul-verwaltung
 university-JUNCT- or school-administration.SG
 ‘university or school administration’

- b. Dam-en-mäntel¹ und- schuh-e
 lady-JUNCT-coat.PL.NOM and - shoe-PL.NOM
 ‘ladies’ coats and shoes’

(8) shows examples of prefixation, where again, the fragment, namely a bound prefix, is found in the first conjunct. It is not possible to have the reverse situation, where the fragment is found in the second conjunct, as indicated by (8c). (8a) also illustrates a requirement on the phonological structure of the fragment: it must correspond to a phonological word (Smith 2000). This is met here by stressing the normally unstressed prefix and giving it a full vowel as opposed to the schwa that normally appears there.

- (8) a. den Zeugen weder be- noch ent-last-en
 the witness neither PREF- nor PREF-burden-INF
 ‘neither incriminate the witness nor free him of suspicion’
- b. ob man sich ver-, sondern ob man sich
 if one REFL PREF-, but rather if one REFL
 ‘whether people can get along, but rather whether people can stand
 er-träg-t.
 PREF-bear-IND.PRES.3.SG
 each other’ (Schlink 2000:243)
- c. *den Zeugen weder be-last-en noch ent-
 the witness neither PREF-burden-INF nor PREF-
 ‘neither incriminate the witness nor free him of suspicion’

In (8a), the semantic contribution of the prefixes and the semantic combination with the base are quite transparent. However, this is not the case in (8b), where the semantic contribution of the prefix is not readily identifiable; the difference in prefix mainly serves to indicate that one lexeme is distinct from the other to which it is semantically closely related. This shows that brachylogy can occur even when the morphological structures are highly lexicalized; semantic transparency is not a prerequisite. Finally, (9) shows some examples of brachylogy in suffixation, whereby the recuperand consists of word-formation suffixes followed by inflectional suffixes. (9a) parallels the Turkish examples (7a) and (8a,b) in that the fragment occurs in the first conjunct. (9b) shows that the reverse situation, with the fragment in the second conjunct, is not possible. In (9a), the fragment is the base and is homophonous with a free-standing word-form of the lexeme. (9c) is a more complex example in which the recuperand consists of two word-formation suffixes as well as inflectional material.

¹ The segmentation here and thus the base (*Dam-* vs. *Dame*) are controversial (cf. Pounder 1996); the choice is, however, not relevant here.

- (9) a. Freund- oder Feind-schaft
 friend- or enemy-SUFF
 ‘friendship or enmity’
- b. * Freund-schaft oder Feind-
 friend-SUFF or enemy-
 ‘friendship or enmity’
- c. freund- oder feind-schaft-lich-e Beziehungen
 friend- or enemy-SUFF-SUFF-PL relations
 ‘with relations of friendship or enmity’
- d. * die Provenz-al- und Romant-isch-en Dichter
 the.PL Provence-SUFF- and romance-SUFF-PL poets
 ‘the Provençal and Romantic poets’

(9d), finally, shows that there is a phonological restriction on morphological brachylogy in current Modern Standard German: a vowel-initial suffix may not be involved, as this structure involves a mismatch between syllable and morphological boundaries (the segmentation being e.g. *ro.man.tisch*) (cf. discussion in e.g. Booij 1985).²

Let us turn now to Earlier Modern German, that is, the language of the 17th to early 19th centuries. It is during this time that the language underwent standardization, a process which occurred somewhat later than in English. In its essential characteristics, morphological brachylogy is operative in a similar fashion to what we observe in the current standard. There are some differences, however. For one thing, the phonological restriction on fragments just noted for the current modern stage does not seem to hold at this time, as shown in (10). (10a) is the original model for (9d), while (10b) shows a similar example with the vowel-initial suffix *-ung*.

- (10) a. die Provenz-al- und Romant-isch-en Dichter
 the.PL Provence-SUFF- and romance-SUFF-PL poets
 ‘the Provençal and Romantic poets’ (Herder, from Paul 1920:362)
- b. Veränder- oder Verfälsch-ung
 alter- or falsify.SUFF
 ‘alteration or falsification’ (Grimmelshausen, *Vogelnest*:88.18)

Of particular interest is the occurrence of morphological brachylogy in German inflection until 18th-19th century. It is certainly more limited compared to word-formation with regard to frequency of occurrence and is subject to more constraints restricting its occurrence, but it does occur, unlike the case of the current modern standard. (11) shows some examples of brachylogy in noun

² Ongoing research shows that this restriction is occasionally violated, even though this is not admitted in the codified standard.

In (13), we see that, again, the fragment occurs in the first conjunct; here again, phonological as well as semantic identity obtain.

Based on the above data and observations in other work, we can summarize by saying that in morphological brachylogy in Modern German, phonological identity of recuperand and target is usual, but not always found. Identity of semantic relations is likewise the norm, but may be violated in word-formation. There seem to be few if any morphological restrictions on the fragment; it must, at least in current Modern German, correspond to a Phonological Word (Smith 2000). According to Booij (1985), the phonological conditions on the recuperand in the current standard are such that it, too, must correspond to a phonological word and adjustment of syllable boundaries must not be required. Where the fragment is found in an initial conjunct, it must be the final syntactic element in that conjunct. Finally, the fragment is marked prosodically by focus stress and pitch, sometimes by a pause (Kleinhenz 1998). In text, the fragment is usually indicated by an exposed hyphen. The following section will discuss how morphological brachylogy in general and the data presented in this section in particular are best to be analyzed.

3. Theoretical Background: Ellipsis and Coordination

In this section, we will examine the relationship between ellipsis and coordination. It will be shown that they are independent of each other, but that ellipsis is facilitated by coordination. We will then attempt to establish a useful understanding of coordination against which ellipsis can be analyzed. Coordination is the context in which ellipsis is most often studied, and it is the context that will be focused on in this paper. However, ellipsis can occur in absence of coordination, as shown in the German compounding example in (14).

- (14) Ich hatte die Mokka- mit den Rhum-~~tort-en~~verwechself.
 I had the mocha- with the rum-cake-PL confused.
 ‘I had confused the mocha- with the rumcakes.’

In this example, the preposition *mit* has a value close to that of a coordinating conjunction; it could, indeed be replaced by it (with appropriate adjustments for case). At any rate, coordination is clearly not a syntactic prerequisite to ellipsis. It is certain likewise that coordination does not require ellipsis either, as shown in (15), a syntactic example in which there are elements common to both clauses.

- (15) Max washed the plates and Max washed the cutlery.

However, at the same time, coordination provides a typical context for ellipsis; given (15), we can attribute this to an at least partial parallelism of structure and partial parallelism of meaning in the conjuncts, which then allows reconstruction of non-expressed material. Coordination naturally implies contrast as well as association: even in a list, each item contrasts as distinct from each other item.

Therefore, coordination provides a structural context for semantic contrast (e.g. in (15): contrast of *the plates* and *the cutlery*) (Lang 1984): this suggests one of the functions of brachylogy/ellipsis, indeed, in that by reducing the number of elements common to each conjunct, heightened focus is placed on the contrasting elements. Note also that the contrastiveness of elements across conjuncts is supported by the intonation contour, which places prominence on just the contrasting elements. Let us introduce at this point two additional terms, borrowed from Wesche (1995): the “contrast set” will refer to the material not common to both conjuncts, thus contrasting (in (15): *the plates, the cutlery*).³

In this paper, we shall focus on the issue of whether coordination involves complete or incomplete structures in syntax, as it is relevant for both syntactic and morphological brachylogy. That syntactic coordination involves the conjunction of complete structures is perhaps the majority view; here, a common subproposal is that all coordination is clausal (cf. e.g. Johannessen 1998, Wilder 1997), some researchers making an exception for NP-coordination (e.g. Hartmann 2000). Advantages to the “complete structures” hypothesis include the fact that no special provisions are necessary for the licensing of incomplete structures. However, it appears that this hypothesis leads to the postulation of structures (b) which although not ungrammatical are clearly not the semantic parents of the brachylogized (a) sentences, as illustrated in (16) and (17).

- (16) a. I borrowed, and my sister stole, a total of \$3000 from the bank.
 b. * <I borrowed a total of \$3000 from the bank and my sister stole a total of \$3000 from the bank. (Abbott 1976:642, in Wesche 1995:53)
- (17) a. Yesterday the same man attacked three old ladies and robbed a bank.
 b. * <Yesterday the same man attacked three old ladies and yesterday the same man robbed a bank. (Wesche 1995:51)

Sentences like (16a) and (17a) make the hypothesis of initially incomplete structures (usually XPs) more compelling: cf. e.g. Klein (1985). Other theoretical alternatives produce the same result, namely structure-sharing as in Lexical Functional Grammar, e.g. Sadler (in press), Dalrymple (2001), as well

³ It may of course be that a conjunct contains extraneous material that does not contrast, as in:

Max washed the plates and I washed the cutlery after lunch.

Here, under one possible interpretation, Max’s action is not associated with any time, while mine is. It seems reasonable to assume that *after lunch* need not form or be part of a contrast set, while the “factor” will be the material common to both conjuncts (in (15): *Max washed*).

as in Wesche (1995), Kathol (1999), and the incremental syntax framework of Phillips (2003). In addition to their ability to handle sentences like (16) and (17), these approaches also present the advantage of economy: structure is not created just to be deleted in ellipsis. Of course, the incomplete structure hypothesis does have its drawbacks as well, the principal one being that it may require special structures or mechanisms for coordination only (Phillips 2003 claims that this is not the case under his incremental model, however).

Now that we have reintroduced the phenomenon of ellipsis or brachylogy, let us consider whether it should be analyzed as a deletion process or as a participant in a structure-sharing relation. Deletion is naturally associated with the Complete Structure hypothesis of coordination: under this hypothesis, ellipsis must involve the (optional) deletion of one or more factors from one or more conjuncts. In English, for example, we observe both ellipsis with the direction of recuperand to target from right to left, as in (18), where lexical but not morphological identity is required (as before, the targets are underlined) and with the reverse direction, as in (19).

(18) Max reads the paper before dinner and we ~~read~~ the cartoons ~~before dinner~~.

(19) Max reads ~~the newspaper~~ but Moritz usually ignores the newspaper.

Various mechanisms have been proposed to account for this deletion process, e.g. as a post-syntactic, phonological rule (e.g. Hartmann 2000); under such an account, it is assumed that the LF-representation is intact, which allows for the correct semantic interpretation. An alternative analysis involves the non-insertion or non-pronunciation at PF of the factor (Bartos 2001, Bánrėti 2001), which is technically not a deletion. Note that in a deletion analysis, there is an emphasis on the factor - we ask what common material may be deleted under what circumstances? - rather than on the contrast set. We will return to this point below. Advantages of a deletion analysis at the level of form and not semantics include the ability to account for the intact semantic interpretation, but the drawbacks noted for the Complete Structure hypothesis are not eliminated.

Under the structure-sharing account of coordination likewise, a number of mechanisms have been proposed. One such is the superposition of XPs, a three-dimensional model, with linearization at the surface (e.g. Moltmann 1992, Wesche 1995); another involves the filling of a “place-holder” in the incomplete structure when the target is encountered (in RL ellipsis) (e.g. Cann et al. 2005). In Lexical Functional Grammar, “resource-sharing” obtains at f-structure within a complex of rules constructing and constraining syntactic coordination (cf. e.g. Dalrymple 2001). Advantages of these approaches are that they allow the accounting for non-identity on both formal and semantic levels and that unlike deletion analyses, they focus on the contrast sets as well as the factors. The principal disadvantage, depending on the approach, is the necessity of expanding the set of basic structural tools in the framework to accommodate the sharing mechanism. In other words, the advantages and disadvantages of deletion and

structure-sharing analyses respectively can be identified with the respective advantages and disadvantages of the Complete Structure and Incomplete Structure hypotheses. If we accept that the difficulties presented by such data as (16) and (17) are insurmountable, then we are led tentatively to conclude that in principle, structure-sharing analyses are superior to deletion analyses.

4. Morphological Ellipsis: Deletion or Structure-Sharing?

We will now turn to the question of whether morphological ellipsis or brachylogy can be understood in the same terms as ellipsis in syntax - as this latter is a highly controversial domain, this is not a straightforward undertaking. Morphological brachylogy most commonly receives a deletion analysis (e.g. Booij 1985, Kleinhenz 1998, Smith 2000), namely an automatic deletion mechanism under phonological identity. The particular advantage of a deletion analysis in the domain of morphology is that it allows the maintenance of some form of the Lexical Integrity Hypothesis, under which syntax is not responsible for word-level structure. With automatic deletion in post-syntactic and post-morphological phonology, complex words are intact in syntax. This allows us to account for ellipsis with lexicalized items as in (8b): non-compositional semantics are irrelevant. Further, the fact that in some cases, the recuperand contains both word-formational and inflectional material as in (9c) is unproblematic: even if we assume that this material is added at different points in sentence production, it can be eliminated all at once in the post-syntactic and post-morphological phonology. Against this we must set the conundrum that according to this analysis, brachylogy involves a phonological process but affects morphological units only (affixes, stems...). One might expect that an automatic phonological deletion process would eliminate any sequence of common material independently of higher-level structure, as in the German example (20), in which an attempt to brachylogize an identical phonological sequence (syllable boundaries marked) that does not match morphological boundaries is represented:

(20) *die Beispiele a.na.ly.- oder kri.ti.s-ie.r-en?
 the examples analy- or criticize?
 ‘analyze or criticize the examples?’

If a deletion analysis is to be preserved, at the very least, morphological units must be present in structure and the deletion process must be constrained to target these only - not quite as automatic after all. Further, just as in syntax, deletion analyses are difficult to sustain in cases in which semantic or morphological identity does not obtain, as in (21), based on Artstein (2005), and (11c).

- (21) a. Max and Mary are perio- and orthodontists.
 b. = Max and Mary are periodontists and orthodontists OR

c. =*Max and Mary are period~~ontist~~ and orthodontists

(21a) can be an automatic phonological reduction from (21b) unproblematically: Max and Mary are each both a periodontist and an orthodontist. However, (21a) can also mean that Max is a periodontist (only) and Mary is an orthodontist (only); however, the sentence which would correspond to this and allow the reduction, (21c), is ungrammatical and anomalous. This fact suggests a structure in which the brachylogical structure is preplanned: structure sharing rather than deletion. In (11c), as discussed in Section 2, the recuperand and the target are not formally identical. An automatic phonological deletion process could not be held responsible for data of this sort.

In languages with “connective” or “suspensory” affixes such as Japanese (3b), a deletion analysis is awkward: one would be required to assume deletion of some morphological material and then replacement by a new affix (Fukushima 1999). While this is not impossible, it does seem simpler for the speaker simply not to construct the complex form to begin with. Further, if an automatic phonological deletion process were in effect, we would not expect the (universally) strong preference for LR brachylogy in the morphological domain; would expect the distributions of LR and RL types to be approximately equal and arbitrary. Finally, if we conclude that a structure-sharing analysis is preferable for syntactic ellipsis, it would be preferable, all other things being equal, to have the same or similar mechanism for morphological ellipsis. As all other things do not appear to be equal, but rather leading towards a structure-sharing analysis, this admittedly weak consideration can be added.

Let us now think of morphological brachylogy in relation to the syntactic structure in which it is typically found, coordination. Coordination provides factors and contrast sets, as stated in Section 3. While syntactic brachylogy allows the non-realization of factors in a conjunct, morphological brachylogy allows further the non-realization of factors, this time, however, from the contrast set identified at the syntactic level. In (23), the syntactic factor is *die Container*, indicated with a double underline; the contrast set consists of the verbs *entladen* and *beladen*, whereby the factor within this contrast set is the stem and infinitive suffix, *-laden*.

(23)	dass	Max	<u>die Container</u>	ent-	und	be-lad-en	muss
	that	Max	the containers	PREF-	and	PREF.-load-INF	must
		‘that	Max must unload and load the containers’				

We thus see that morphological and syntactic brachylogy target different components of the coordinated conjuncts: while the mechanism has essentially the same function in each case, it does not operate on the same domain. While the specific formal analysis of morphological brachylogy will depend on both the syntactic framework and the morphological model assumed, we can make an informal sketch here of an analysis in the multidimensional approach of Wesche (1995) by way of example. Consider (24), which shows the morphologically

full form corresponding to Earlier Modern German (14):

- (24) Was warten und zweifeln wir?
 What wait-IND.PRES.1.PL and doubt-IND.PRES.1.PL we
 ‘What are we doubting and waiting for?’

In this example, the syntactic factors are *was* and *wir*, underlined. The contrast set consists of *warten* and *zweifeln*. In Wesche’s system, the terminals in the syntactic tree will give the linear sequence shown in (25):

- WARTEN
- (25) [UND] | was | ZWEIFELN |IND.PRES.1.PL| | wir |

According to her linearization rule (Wesche 1995:119), the “list” or contrast items will be linearized one by one in order, connected by the given conjunction according to its specific conditions; the factors are realized in place as indicated above. This gives us (24). For the further factorization at the morphological level of the verbs in the contrast set, we can consider that this may apply to the morphosemantic information given in (25) between the factor lines [...], or more concretely, to its formal realization as *-n*, giving (26), whereby the morphological factor is not realized in the first conjunct.

- (26) was wart- und zweiffeln wir?

The possibility of applying brachylogy to the morphosemantic information rather than the suffix itself allows for ellipsis under non-identity, as in (11b,c). We can suppose that as reconstruction of the recuperand involves an extra step or more, it would not be the preferred option. An approach like that sketched here is advantageous as it can be integrated into coordination structure required for syntax anyway, as shown. However, it is apparent that it will result in more complexity than a deletion analysis for complex cases (combinations of word-formational and inflectional affixes), as in (9c). We will not attempt to analyze such a case here, but will discuss the issues in section 5 to follow.

5. Consequences for Processing

Let us now consider what the implications of morphological ellipsis or brachylogy for processing in production and interpretation might be. Morphological brachylogy takes place within a syntactic context and is subject to syntactic, morphological, lexical, semantic, phonological, including prosodic, constraints. Due to these constraints, it involves reference to the syntactic context and to the lexicon, as well as a look-ahead to phonology for syllabification, prosody etc. Beginning with syntax, the morphology needs to ensure that the syntactic conditions are given: there must be a syntactic context of parallelism, as in coordination, to begin with, and the syntactic position of the item potentially undergoing brachylogy must be assured, namely final in the

conjunct in the case of LR brachylogy. With respect to word-formation, if the framework used assumes that word-formation is presyntactic and that the syntax works with both complex and simplex lexemes as atoms - and this is assumed in any framework for lexicalized items - then morphological brachylogy is a puzzle under the structure-sharing model. Here, a decision whether or not to create morphological structure needs to refer to surface syntax. If it is desirable to maintain a structure-sharing approach, then we will have to suppose that there is a certain amount of feedback between formation of structure at different levels; perhaps final decisions of lexical choice and execution of word-formation morphology are delayed until surface syntax is (tentatively) in place, so that a more abstract lexeme representation appears in syntax. In a model in which inflectional morphology is added post-syntactically, morphological brachylogy does not appear to pose any problems. However, reference will need to be made to the lexicon in case of non-default inflectional morphology. A model in which forms are inserted fully inflected into syntax will encounter the same problems as with word-formation.

Production of fragments in brachylogy also requires lookahead or evaluation of a form in another, usually following, conjunct. A decision in LR brachylogy means establishing that language-specific conditions for identity are met. An incremental framework will require the incorporation of some preplanning process. With regard to phonology, if we assume that phonology “follows” morphology in the production process, depending on the language, lookahead may be necessary not only to the next conjunct, but to the outcome of phonological processes to apply to the item containing the target, in order to establish legitimacy of a potential brachylogy.

Deletion and structure-sharing analyses appear to be equivalent in terms of comprehension processes: in both cases, interpretation by the hearer involves reconstitution of the fragment, signalled by prosodic or other cues, based on evaluating the full conjunct for possible completive cues. In some sense, this is the inverse of agreement morphology, where syntactic mates must be located in a sentence based on morphology.

It is clear from the data that under both deletion and structure-sharing analyses complex items, in both inflection and word-formation, must appear at all levels with morphological structure (formal, if not semantic): it is uniquely morphological units that are targeted, so morphological boundaries must be maintained throughout. This provides unshakeable evidence that hypotheses of loss of formal structure in cycles of derivation and under lexicalization must be considered non-tenable.

With regard to the brachylogy process itself, it seems that it may be incremental, in the sense that the “cutoff” point of the fragment may be variable. This would indicate that decisions as to whether to “brachylogize” may be made morphological unit by unit, to some extent at least. In the German example (9c), here repeated as (27a), we saw that all derivational suffixes in the first conjunct went unrealized; in (27b), we see a synonymous sentence fragment in which the first derivational suffix appears in both conjuncts.

- (27) a. freund- oder feind-schaft-lich-en Beziehungen
 friend- or enemy-SUFF-SUFF-PL relations
 ‘relations of friendship or enmity’
- b. freund-schaft- oder feind-schaft-lich-en Beziehungen
 friend-SUFF- or enemy-SUFF-SUFF-PL relations
 ‘relations of friendship or enmity’

(In fact, (27a) is ambiguous; another possible recuperand is -lich-en, giving the interpretation ‘friendly ... relations’). Naturally, one cannot “skip” structure and add later structure, say inflection, to the fragment at the cutoff point.

Many questions concerning processing are left open here; this would be a rich area for psycholinguistic research.

6. Conclusions

Based on the considerations in this paper, it seems that at least as far as cognitive strategy is concerned, the same ellipsis mechanism is operative in syntax and morphology. Language-specific constraints will differ between the two components, as will the portion of the coordinate structure in which each operates: syntactic ellipsis operates on the “common material” or factor, while morphological ellipsis factors out morphological material from the “contrast set”. LR ellipsis is apparently strongly preferred cross-linguistically in morphology, which is not necessarily the case in syntax. Morphological brachylogy presupposes syntactic coordination (with some well-defined exceptions), and should be explained with reference to it. Structure-sharing may end up being a preferable approach to analysis to deletion for a variety of reasons.

It is possible to maintain “lexical integrity” as a principle constraining the role of syntax. This must be reconciled within individual frameworks. Both with a phonological deletion analysis and a structure-sharing analysis, this can be achieved with the help of the assumption that fragments represent complete words (word-forms or lexemes) in syntactic structure and thus have the syntactic value of words. While one need not conclude that syntax can manipulate subword elements, it is clear that morphological structure must remain least formally transparent and that morphology refers to syntactic structure. Look-ahead from morphology to phonology appears to be a necessary assumption (in some cases, look-ahead from syntax to morphology and phonology is likewise necessary).

References

- a Sancta Clara, Abraham. 1709. (facsimile edition 1978). *Centi-Folium Stultorum In Quarto. Oder Hundert Ausbündige Narren in Folio...*Dortmund: Harenberg.
- Artstein, Ronald. 2005. Coordination of parts of words. *Lingua*:115:359-393.

- Bánréti, Zoltán. 2001. Multiple lexical selection and parallelism in Hungarian VP ellipsis. *Acta Linguistica Hungarica* 48:25-58.
- Bartos, Huba. 2001. Sound-form non-insertion and the direction of ellipsis. *Acta Linguistica Hungarica* 48:3-24.
- Booij, Geert. 1985. Coordination reduction in complex words: A case for prosodic phonology. In *Advances in nonlinear phonology*, eds. Harry van der Hulst and Norval Smith, 143-160. Dordrecht: Foris.
- Borsley, Robert. 1994. In defense of coordinate structures. *Linguistic Analysis* 24:218-246.
- Borsley, Robert. 2005. Against ConjP. *Lingua* 115:461-482.
- Cann, Ronnie et al. 2005. Right-Node Raising, coordination, and the dynamics of language processing. *Lingua* 115:503-525.
- Dalrymple, Mary. 2001. *Lexical Functional Grammar*. San Diego: Academic Press
- Fukushima, Kazuhiko. 1999. Bound morphemes, coordination, and Bracketing Paradox. *Journal of Linguistics* 35:297-320.
- Grimmelshausen, Hans J. (1672): Scholte, J. (ed.). 1931. *Grimmelshausens Wunderbarliches Vogelneest. Erster Teil*. Halle: Niemeyer.
- Haller, A.: Hintsche, E. (ed.) 1948. *Albrecht Hallers Tagebücher seiner Reisen nach Deutschland, Holland und England (1723-1727)*. St. Gallen: Hausmann
- Hartmann, Katharina. 2000. *Right Node Raising and Gapping: Interface conditions on prosodic deletion*. Amsterdam: Benjamins.
- Johannessen, Janne. 1998. *Coordination*. Oxford: OUP.
- Kabak, Baris. (to appear) Turkish suspended affixation. *Linguistics*.
- Kathol, Andreas. 1999. Linearization vs. phrase structure in German coordination constructions. *Cognitive Linguistics* 10: 303-342.
- Klein, Wolfgang. 1985. Ellipse, Fokusgliederung und thematischer Stand. In *Ellipsen und fragmentarische Ausdrücke*, Vol. I, eds. Reinhard Meyer-Hermann and Hannes Rieser, 1-24. Tübingen: Niemeyer.
- Kleinhenz, Ursula. 1998. *On words and phrases in phonology*. ZAS Papers in Linguistics 12. Berlin: ZAS.
- Lang, Ewald. 1984. *The semantics of coordination*. Amsterdam: Benjamins.
- Moltmann, Friederike. 1992. Coordination and comparatives. Doctoral Dissertation, MIT.
- Paul, Hermann. 1920. *Deutsche Grammatik*. Vol. IV. Halle: Niemeyer.
- Phillips, Colin. 2003. Linear order and constituency. *Linguistic Inquiry* 34:37-90.
- Pounder, Amanda. 1996. Inflection and Paradigm in German Nouns. *American Journal of Germanic Linguistics and Literatures*. 8:219-263.
- Sadler, Louisa. (in press) Function spreading in coordinate structures. *Lingua*.
- Schlink, Bernhard. 2000. *Liebesfluchten*. Zürich: Diogenes.
- Smith, George. 2000. Word remnants and coordination. In *Deutsche Grammatik in Theorie und Praxis*, eds. Rolf Thieroff et al, 57-67. Tübingen: Niemeyer.
- Steglich, Wilhelm. 1902. Über die Ersparung von Flexions- und Bildungssilben bei copulativen Verbindungen. *Zeitschrift für deutsche Wortforschung* 3:1-52.
- Wesche, Birgit. 1995. *Symmetric coordination. An alternative theory of phrase structure*. Tübingen: Niemeyer.
- Wilder, Chris. 1997. Some properties of ellipsis in coordination. In *Studies of Universal Grammar and typological variation*, eds. Artemis Alexiadou and Tracy A. Hall, 59-107. Amsterdam: Benjamins.