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Stress and loan words in German

Livio Gaeta

"It is simply not true, as has been suggested in recent works, that English accent is borrowed from Romance, or that the morphophonemics borrowed in Romance words constitutes the "sound pattern" of English. After half a millennium, these borrowed alternations still are restricted to precisely the vocabulary they are borrowed in, and not one operates in native words. Language is no melting pot".
Donegan & Stampe (1983:351)

Modern Standard German (= MSG) has recently been portrayed as dominated by a fixed word stress rule, which is either restricted to the non-native lexicon or to the whole set of simplex words. This proposal is very innovative with respect to the traditional approach, for it assumes that MSG has completely given up the feature of initial-stress (the so-called *Stammakzent*), characteristic of all Germanic languages. In this paper, an attempt is made to establish the properties of MSG word stress rule from a functional perspective. In particular, the factors shaping the preferred MSG (morpho-)prosodic pattern will be investigated. This pattern is also assumed to be the target of the (only partially prosodic) integration processes of loanwords. In this light, the typological inclinations of the MSG accentuation system will be considered, underlining the crucial interplay of phonological, morphological and lexical factors. The behaviour of loanwords in German will be evaluated on the basis of the different functions fulfilled by MSG prosody.*

1. Introduction

Under the influence of similar studies conducted on English, Modern Standard German (= MSG) has been recently portrayed as dominated by a fixed word stress rule, which is either restricted to the non-native lexicon (cf. Giegerich 1985, Féry 1986) or to the whole amount of simplex words (cf. Vennemann 1990, 1995, Gamon 1996, Wiese 1996). In particular, the latter proposal is very innovative with respect to the traditional approach, since it assumes that MSG has completely given up the initial stress characteristic of Germanic languages (the so-called *Stammakzent*). According to this approach (cf. Vennemann 1995, *in press*), the loss of the *Stammakzent* happened

under the strong influence that Latin and Romance languages exerted upon German since the Middle Ages. As a consequence, a new prosodic model has come about in MSG. Basically, the word edge, to which stress refers, has turned upside down; while in older stages of German, as well as in the Germanic languages, the word stress marked the left edge of the words, the right edge has only become relevant in MSG. In this respect, MSG is supposed to have become similar to Latin with respect to word stress.

In this paper, I will try to establish the characteristics of MSG word stress from a functional perspective (cf. Wurzel 1980); the focus will be put on the factors shaping the preferred MSG (morpho-)prosodic pattern, which is also the target of (only partially prosodic) integration processes for loan words. I will first discuss approaches that take as a basic assumption the essentially phonological nature of MSG word stress. Then I will deal with the typological characteristics of MSG stress, taking into consideration the functional load and the role of the (phonological, morphological, lexical) factors involved in the shaping of the dominant MSG prosodic patterns. Finally, I will evaluate the place occupied by the loan words in German: Do they really give insights into the presumed MSG word stress rules, or do they simply make clear the different functions fulfilled by MSG prosody?

2. Word stress and phonological perspectives

The debate about MSG word stress has received a strong impulse since Giegerich's (1985) book, in which a complete theory of MSG word stress is developed. Giegerich maintains that a difference between the native and the non-native vocabulary must be made; however, since the native vocabulary is either monosyllabic (like *Haus*) or bisyllabic with only one vowel in its underlying representation (like *Vogel*), the same stress rule makes the correct predictions for both the native and the non-native vocabulary (cf. Giegerich 1985: 111).

The basic assumption that permeates Giegerich's theory is the role played by the syllable weight for the correct assignment of stress, according to the following rule (cf. Giegerich 1985:31):

- (1)
$$\begin{array}{c} S \\ | \\ \text{syllable} \rightarrow \text{syllable} / _ \text{ (light syllable) light syllable) } \end{array}$$

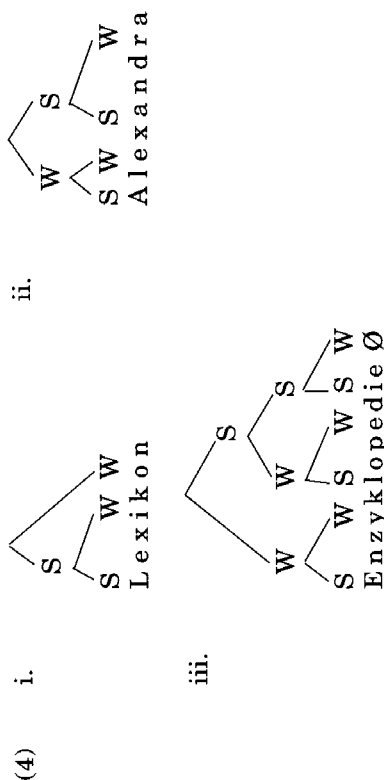
This rule is similar to the Latin word stress rule, since the stress can be predicted on the basis of the prosodic structure of the word. As in the Latin stress rule, there is the so-called *Dreisilbengesetz*, according to which the word stress cannot pass over the antepenultimate syllable. However, the final syllable can also bear stress in MSG in contrast with Latin, where final stress is rather marginal and exceptional (cf. "truncated" words like *Arpi'nās*, etc.). The analogies with the Latin stress rule are even more evident when the syllable weight is taken into consideration. The syllable weight is determined in MSG, as well as in Latin, on the basis of the length of the nuclear vowel and/or of the syllable structure. A syllable is heavy if the right node S is branching, i.e. if it contains a long vowel or a diphthong or if it ends with a consonant, i.e. if the coda is not empty (cf. Giegerich 1985:47):

- (2)
$$\begin{array}{cc} \text{heavy syllable} & \text{light syllable} \\ \begin{array}{c} \diagup \quad \diagdown \\ W \quad S \\ \diagup \quad \diagdown \\ (W S) \quad S W \\ ((C) C) \quad V C \\ ((C) C) \quad V V \\ ((C) C) \quad V: \end{array} & \begin{array}{c} \diagup \quad \diagdown \\ W \\ \diagup \quad \diagdown \\ (W S) \quad S \\ ((C) C) \quad V \end{array} \end{array}$$

A syllable containing a reduced schwa vowel is not stressable; in a certain sense it is extrametrical (cf. Giegerich 1985:25). To complete the picture, one must add that a consonant in the coda of a final syllable must be considered extrametrical, i.e. it does not count for establishing the syllable weight (cf. Giegerich 1985:49):

- (3)
$$\begin{array}{ll} \text{i. light final syllables} & \begin{array}{c} \diagup \quad \diagdown \\ W S \quad W S \\ \diagup \quad \diagdown \\ C V \# \dots \quad C V C \# \dots \end{array} \\ \text{ii. heavy final syllables} & \begin{array}{c} \diagup \quad \diagdown \\ S \quad S \\ \diagup \quad \diagdown \\ W S W \quad W S W \\ \diagup \quad \diagdown \\ C V V \# \quad C V C \# \dots \end{array} \end{array}$$

Once the syllable that bears the main stress (the so-called *designated terminal element*, which is marked as *strong*), has been established on the basis of (1), it is possible to build up the metrical tree. Starting with the stressed syllable, a left-branched left-headed foot is erected (cf. (4i-ii)). In a similar way, the syllables to the left of the stressed one build up left-headed feet (cf. (4ii-iii)). The latter are then grouped into right-headed trees (cf. Giegerich 1985:35ff.):



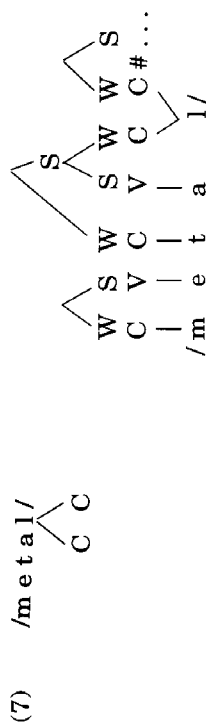
The rule in (1) accounts for a number of foreign words, as in the following examples:

- (5)
- | | | |
|------------------------------|------------------------|----------------------------------|
| a. <i>Penultimate stress</i> | b. <i>Final stress</i> | c. <i>Antepenultimate stress</i> |
| 'Gummi | Etu'i | 'Mimikri |
| 'Konto | Bü'ro | 'Risiko |
| 'Akku | Ta'bu | 'Kakadu |
| 'Kaffee | Ca'fé | 'Kanapee |
| 'Sofa | Ta'ra | 'Mafia |

However, (1) is not able to make the correct prediction for a large set of words:

- (6)
- Me'tall, kom'plett, Re'bell, Kon'sum, Kame'rad, Kon'greß
 - 'Leutnant, 'Napalm, 'Nekt[a:]r, 'Ballast, 'Billard, 'Leopard
 - 'Arbeit, 'Andacht, 'Heir[a:]t, 'Mon[a:]t, 'Klein[o:]d, 'Dem[u:]t

As for the words in (6i), Giegerich is forced to arbitrarily assume that the last consonant is phonemically specified as long so as to render the last syllable heavy. In other words, the condition on extrametricality seen above in (3) does not apply to these words, since the final consonant is underlyingly specified as long:



According to Giegerich, a phonological proof of the underlying length of the final consonant in *Metall* is given by its being ambisyllabic in certain contexts, as in the plural *Metalle* [me'taɪə]. However, he is forced to admit elsewhere that making this assumption "would imply rather heavy redundancy on the contrastive level: German doesn't have contrastive length for both vowels and consonants" (cf. Giegerich 1985:79). The best solution seems then to mark such words as exceptions to the main stress rule.

The words in (6ii-iii) are treated *ad hoc* as if they contained a fictional stem boundary so as to receive the normal stressing of suffixed forms like *Freiheit* (cf. Giegerich 1985:117). In this way, a word like *Arbeit* should be analysed as composed by the bound morphemes *ar-* and *-beit*. One must add that the words in (6ii) are particularly undesirable for Giegerich's approach, because, as Hayes (1986) notes, they belong to the category that borrowings drift into as they are nativized. In particular, notice the shift in *Leut(e)'nant* to *'Leutnant*, where the loan word, getting nativized, becomes an exception to the word stress rule, since it no longer bears stress on the last heavy syllable. This point is very important, and I will come back to it later. Moreover, the words in (6iii) belong to the native vocabulary, yet, strangely enough, a particular word stress must be assumed for these native words.

In light of that, Giegerich's stress rule seems inadequate to describe the word stress in MSG. Besides the fact that the rule cannot account for a number of words, it brings about the very unpleasant result of treating as exceptional the behaviour of native words and of nativized loan words.

In a different framework, Gamon (1996) is able to account for the word stress in (6ii-iii) by making a different use of the notion of extrametricality and of cyclicity, based on Hayes (1995). In his view, the last consonant of *Heirat*, for example, undergoes extrametricality (EM) and then the word receives an extra gridmark on the first syllable (provided by the End-Rule Left, ERL) as every native word does at the first cycle. Only at the second cycle does the word stress rule

(= WSR) build a trochaic foot on the last heavy syllable. It goes without saying that Gamon's notion of heaviness is similar to Giegerich's. Finally, the reapplication of the rule assigning an extra gridmark to the leftmost available syllable (ERL) gives the correct form:

(8)	<i>Heirat</i>
level I	
EM	/haɐ ra: <t>/
ERL	X
	/haɐ ra: <t>/
level II	X (X)
WSR	/haɐ ra: <t>/
ERL	X
	X (X)
	/haɐ ra: <t>/

The distinction between the two levels is crucial in his model, where only native words undergo ERL at the first level. A word like *Leutnant* can in this framework be explained away by considering it a native word:

(9)	<i>Leutnant</i>
level I:	
EM	/lɔʏt nan <t>/
ERL	X
	/lɔʏt nan <t>/
level II:	X (X)
WSR	/lɔʏt nan <t>/
ERL	X
	X (X)
	/lɔʏt nan <t>/

Notice, however, that in Gamon's view every tense vowel is

underlyingly specified as long, whereas tenseness results redundantly from a tensing rule that looks at the length of the vowel on the skeletal tier (cf. Hall 1992). Short tense vowels as in the last syllable of *Mutti* [muti] are derived by a shortening rule affecting unstressed tense vowels (cf. Gamon 1996:113). In this way, it is impossible to predict the correct stress for words like *Kino* [ki:no] in comparison with words like *Trikot* [tri:ko]. Since the vowel shortening takes place after the application of the word stress rule at the second level, the word stress must be phonemically specified for the large set of words like *Kino*, *Mutti*, etc.

Moreover, phonemic length of the last consonant must be assumed just as with Giegerich in order to provide the correct stress for the words in (6i), for the last consonant would otherwise be considered extrametrical. The crucial problem with these stress rules is that they are completely unable to account for the stress differences in the following words (cf. Wiese 1996:278):

(10)	i. 'Fazit	ii. Gra'phit
	'Konsul	Mo'dul
	'Amok	Ba'rock
	'Ballast	Da'mast
	'Fakir	Pa'pier
	'Turban	ur'ban
	'Pinguin	Herme'lin
	'Tenor	Te'nor
	'Konsum	Kon'sum

To assign the stress to the words in (10ii) correctly, it is necessary to block the application of the extrametricality rule. However, it is not always possible to assume that the final consonants in (10ii) are unduly long, as is shown by the contrast between [me'taɪə] with ambisyllabic /l/ and [kɔn'zumə]. Moreover, the stress in a word like *'Ballast* is in any case exceptional.

To conclude: notwithstanding the word stress rule in (1), one has to lexically specify some supplementary information for a large (and not well-defined) set of words in order to correctly assign stress. The contrast with the Latin stress rule is evident; as already mentioned at the beginning of this section, the exceptions are well-defined and rather marginal in Latin (cf. *Arpi'nās*, etc.). In fact, the Latin stress rule allows one to predict the accentual behaviour of native words, as well as of loan words (cf. Lat. *'cyklōps* → *cy'clōpis* in comparison with the Greek model *'kyklōps* → *'kyklōpos*), almost without exceptions. As

for MSG, the stress rule proposed in (1) makes the correct prediction only for a part of the lexicon, but it does not work correctly for a number of native words (cf. (6iii) above), for loan words that have been nativized (cf. (6ii) and (10) above), and for a relevant number of non-native words (cf. (6i) above).

3. *Is MSG word stress really quantity-sensitive?*

The sensitivity of MSG word stress to the syllable weight is far from clear. If one compares German with other languages that clearly display the correlation between syllable weight and stress, a number of differences can be observed (cf. Kaltenbacher 1994a). This comparison also makes clear how deeply syllable weight is anchored into the MSG phonological system. According to Trubeckoj (1939), the languages of the world are grouped, with respect to their minimal prosodic unit, into mora-counting languages and syllable-counting languages. The discriminating criterion is provided by the occurrence of a vowel length opposition. The following typological implication, that in a given language L syllable weight plays a role for the word stress iff L also possesses a vowel length opposition, has been strongly confirmed by Ohsiek (1978) on the basis of a sample of about 140 languages. Moreover, Trubeckoj [1939] (1971:211ff.) proposes a set of criteria to establish whether in a given language long vowels are to be considered bimoraic (i.e. they are assigned a "plus" with respect to the short ones) or not. The following criteria can be applied to German:

- morphological boundaries run across long vowels, so that the latter can be considered the sum of two short vowels belonging to two different morphemes;
- long vowels behave like diphthongs with respect to other phonological rules, for instance, both long vowels and diphthongs undergo the same shortening processes;
- a syllable containing a long vowel must be treated as two light syllables in word stress rules.

The last criterion is useless for our purposes, since it concerns the assumption we have to prove, at least according to the stress rules seen above in §2. As has been pointed out by Kaltenbacher (1994a: 45ff.), the other criteria provide rather unsatisfying results too, when applied to German. The first case, i.e. long vowels that are

the sum of two short ones, is not present in German, while it occurs in clearly mora-counting languages as for instance in Egyptian Arabic (cf. (11i)), in Latin (cf. (11ii)) and in Greek (cf. (11iii)):

- (11) i. kata'b+u+u wrote+they+it ii. 'rosa+a rose+ABL.SG iii. 'logo+oi discourse+DAT.SG

As for the second case, Trubeckoj [1939] (1971:212) points out that in certain central Slovak dialects there is a rhythmic law, according to which long vowels are shortened when immediately following a long syllable. This shortening also concerns rising diphthongs like *ie*, *uo*, *ia* *e iu*, which are substituted by a short monophthongal vowel. Moreover, in Egyptian Arabic a shortening process affects long vowels when occurring in a closed syllable:

- (12) i. 'bee.tu 'his house' ii. 'bet.na 'our house'

Notice that the shortening has nothing to do with stress, which occurs in both cases on the first syllable. In German, diphthongs occur both in stressed and in unstressed syllables, and long vowels are not limited to open syllables:

- (13) i. Haus vs. hau'sieren
'Neutrum vs. neu'tral
ii. 'Autor vs. Au'to[:]ren
Ho[:]lf vs. ho'fieren

Therefore, German does not seem to meet the criteria requested by Trubeckoj to establish the relevance of a vowel length opposition in a language. However, vowel length is clearly correlated with stress. As can be seen from the pairs in (13ii), stressed vowels surface as long independent of the syllable structure as in *Ho[:]lf* vs. *ho'fieren*. Note, moreover, that the syllable weight is not dependent on the position of stress. For instance, a diphthong or a complex coda are not reduced in unstressed syllables:

- (14) Eu'nuch, Kan'dare

Thus, it seems more adequate to assume that vowel length is due to stress than viceversa, as for example in Reis (1974), where

tense vowels are considered to be lengthened under stress, or in Vennemann (1991b) and in Becker (1996), where vowels are considered to be distinguished by a syllable cut correlation in the line of Turbeckoj (1939) and eventually lengthened under stress. In a diachronic perspective, we can say that German has changed from an older stage, when it displayed a vowel length opposition, to the modern system. In other words, German underwent a collapse of vocalic length, similarly to what happened to almost all Romance languages in comparison with Latin. From this viewpoint, long vowels are rather to be considered as relics preserved in the system, which are still useful at a functional level:

“Es dient zur Erreichung unmarkierter Akzentpositionen, indem gespannte Vokale bzw. solche mit sanftem Schnitt in offener, akzentuierter Silbe als Langvokale und in unakzentuierter Position in der Regel als Kurzvokale realisiert werden. Die Schwere der Silbe wäre dann nicht Ursache, sondern Folge der Akzentposition” (Kaltenbacher 1994a:50).

Note that the functional reanalysis of vowel length in stressed syllables is not yet complete, since we still find cases of unstressed syllables containing long vowels, as in *‘Demul:lt, ‘Mona[:lt, etc.* The latter are, however, often subject to shortening processes (cf. Wiese 1996:279).

All these arguments of typological order speak against the assumption that in MSG vowel length is distinctive and, thus, relevant for the stress rules. Recall that vowel length is usually held to be an essential property for a language to make use of syllable weight for accentual purposes, as pointed out more recently by Hayes (1989:290), who observes that “... the languages that have a vowel length contrast and the languages that have a distinction of syllable weight appear to be largely coextensive”.¹ In this vein, since vowel length is questionable in German, it is not possible to make use of the syllable weight to adequately describe MSG word stress.

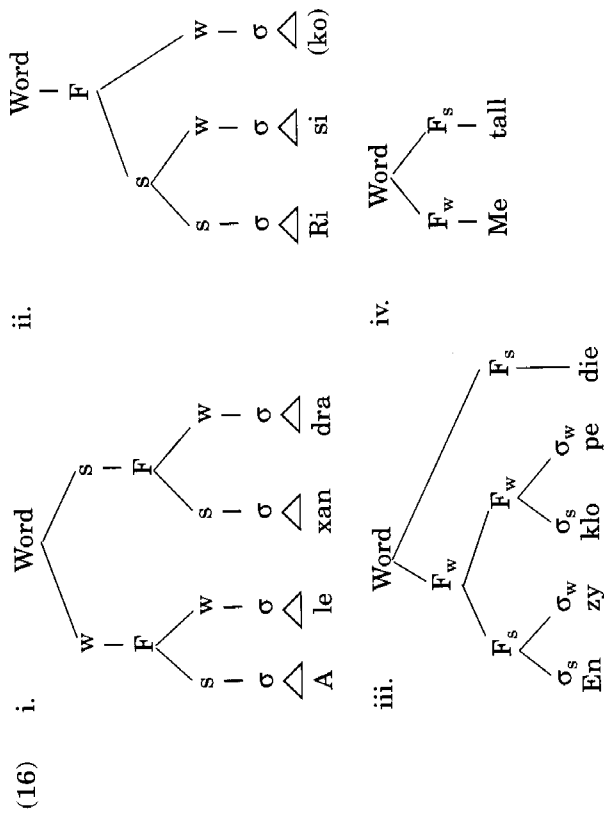
4. Quantity-insensitive approaches to MSG stress

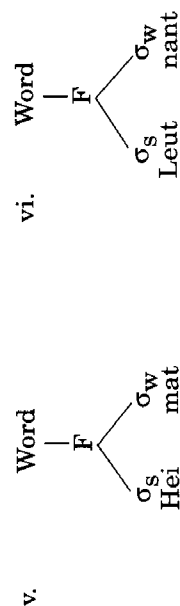
Since MSG cannot clearly be considered sensitive to syllable weight, one can imagine a phonological model that assigns stress on a non-quantitative basis. According to Wiese (1996:282ff.), MSG stress is accounted for by the following rules:

(15) Stress rules

- a. *Foot rule.* Going from right to left, construct feet of the type $\begin{smallmatrix} F, \\ \wedge \\ s \ w \end{smallmatrix}$ or, if not possible, $\begin{smallmatrix} F, \\ \wedge \\ s \end{smallmatrix}$.
- b. *Word rule.* In a phonological word, the right-most foot is strong.
- c. *Adjunction rule.* Adjoin remaining syllables in a minimal way as weak members of a foot.

The basic prosodic unit, the foot, is defined by Wiese as consisting of a single syllable or a sequence of a strong syllable followed by syllables with weaker stress. An extrametricality rule must be added to (15), so as to make the final syllable invisible to the stress rules (cf. Wiese 1996:276), similar to what we have seen above in (3). However, Wiese assumes coherently that extrametricality must underlyingly mark the root nodes of segments, i.e. the nuclear vowels. With respect to the approaches sketched above in §2, the focus is now put on the erection of trochaic feet rather than on syllable weight. In this way, it is possible to account for the word stress in the cases already mentioned (cf. (4) above):





As for (16ii), note that the final syllable of *Risiko* must be lexically marked as extrametrical so as to assign stress correctly. In this connection, Wiese (1996:285) emphasizes that "there is no identifiable phonological or other factor which would make antepenultimate stress a predictable matter". In other words, extrametricality in German cannot be assigned by rule, for instance being dependent on the number of final consonants, since there are words with antepenultimate stress without final consonants (*Risiko*), with one final consonant (*Marzipan*) or with two final consonants (*Leopard*). In all cases where the antepenultimate syllable bears stress, it must be lexically specified as extrametrical, as in the following examples:

- (17) i. E'lisab(e)th, 'Barbar(a), 'Theod(o)r
 ii. 'Talism(a)n, 'Turand(o)t, 'Sigism(u)nd

Notice that in the words in (17ii) the penultimate syllable is closed and thus heavy: according to Giegerich's (1985) and Gamon's (1996) models seen above, it should bear stress.

As for (16iii-iv), it is necessary to specify in the lexicon that the final syllable of these words is underlyingly associated with a foot which cannot be altered by the application of (15b). According to Wiese, the underlying representation of these words is the following:

- (18) i. $\begin{array}{c} \text{F} \\ | \\ \text{/entsyklopedi/} \end{array}$ ii. $\begin{array}{c} \text{F} \\ | \\ \text{/metal/} \end{array}$

Finally, the stress rules make the correct prediction as for the words in (16v-vi) which represent a major difficulty in Giegerich's model, since they are partly native words, partly nativized loan words. From this viewpoint, Wiese's model is more adequate than the quantity-based approaches.

5. Against rule-based approaches to MSG stress

It has already been emphasized in the preceding section that

Wiese's model appears more adequate than the quantity-based ones, since it is able to account for word stress both in native words and in nativized loan words. However, Wiese does not deny the costs of his approach in terms of lexical representation of prosodic information, which turns out to be necessary in order to assign stress correctly to a large set of words. For all these words, stress is not phonologically conditioned, but must be somehow represented lexically. This is true for the words in (17) and (18) above, where either extrametricality lexically marks the last nuclear vowel of the words, or the final syllable is lexically associated with a foot that will then bear word stress. The lexical conditions on stress are, however, much more than this. There is a large set of words, for which Wiese assumes a complex morphological structure, from which the following examples are taken:

- (19) i. +um 'Stadi+um, 'Opi+um ~ Refe'rend+um, Al'pin+um
 ii. +us 'Radi+us, 'Stimul+us ~ Pazi'fism+us, Euka'lypt+us
 iii. +a 'Amer+ik+a, 'Pergol+a ~ Mar'tin+a, Vi'ol+a

According to Wiese (1996:120), these suffixes belong to the so-called class I suffixes, which influence word stress. The variation between stress on the antepenultimate and the penultimate syllables is explained once more by making reference to extrametricality: in the case of words bearing stress on the antepenultimate syllable, the last syllable of the stem preceding the suffix is marked as extrametrical. As a consequence, the underlying representation of these words is the following:

- (20) 'Stad(i)+um, 'Op(i)+um, 'Rad(i)+us, 'Stim(u)l+us, A'mer+(i)k+a,
 'Perg(o)l+a

Note that the extrametricality of these vowels is independent of their morphological status, i.e. whether they are part of a suffix (as in *Amer+(i)k+a*) or of a lexical stem (as in *Stim(u)l+us*). Therefore, supplementary lexically specified information is once more needed to account for stress. Moreover, despite the use of morphological boundaries and suffixes, which sometimes appears questionable,² extrametricality fails to explain the following cases:

- (21) Nu'kle(o)l+us → Nukle'ol+en
 'Pod(a)gr+a → po'dagr+isch

In these words, the extrametrical vowel unexpectedly bears stress, since the class I suffixes *-en* and *-isch* attract stress on the immediately preceding syllable. However, given the extrametricality of this vowel, we would expect the antepenultimate syllable to bear stress: **Nu'kle(o)len*, **pod(a)gr+isch*.

Finally, there is the well known group of words that violate the *Dreisilbengesetz*, since the ante-antepenultimate syllable bears stress (cf. Benware 1980:312, Wiese 1996:285):

- (22) i. 'Nominativ, 'Akkusativ, 'Indikativ, 'Imperativ, 'Superlativ, 'Komparativ
- ii. 'Genitiv, 'Konjunktiv, 'Substantiv, 'Adjektiv, 'Singular, 'maskulin, 'feminin
- iii. 'Dativ, 'Aktiv, 'Passiv, 'Plural, 'Dual, 'Affix, 'Suffix, 'Präfix, 'Objekt, 'Subjekt

All these words are grammatical terms; independent of their length, they all have initial stress. Thus, it seems adequate for the words reported in (22) – not just for those with ante-antepenultimate stress – to specify that grammatical terms have initial stress (cf. Wurzel 1980:305).³

To sum up, Wiese's proposal appears descriptively adequate only if a high number of words is lexically marked by means of several procedures: extrametricality, foot association, initial stress, etc. More generally, the whole rule-based strategy is questionable in this approach, as well as in recent generative treatments of stress (cf. Hurch 1996a, b). In these works, the prosodic level of primary stress is immediately related to the level of secondary stress(es). The same principles that guide primary stress assignment also lead to the erection of prosodic trees, without distinguishing between a level of (morpho-)lexically conditioned primary stress and a level that obeys more general prosodic principles. In other words, "the mere placement of a primary word accent does not itself build up a prosodic pattern" (cf. Hurch 1996a:81). To make clear what is precisely meant by opposing primary and secondary stress, let us take the word *Enzyklopedie*, already quoted in (4) above. While it clearly bears primary stress on the final syllable, the secondary stress is variable (cf. Wiese 1996:292), according to the selected prosodic pattern: *Enzyklope'die* or *Enzyklope'die*. Since these approaches assume that there is no relevant difference between primary and secondary stress, we would expect the same inconsistency we observe in the case of secondary stresses to hold true for the primary stress, too. This is,

however, not the case. Primary stress is usually stable; possible variation can be found in cases of loan words not completely integrated into the native lexicon (I will come back to this matter later). This leads to the conclusion that "it is the primary accent which, if we have a dependency relation at all, determines (or at least influences) the location of secondary stress and not vice versa" (cf. Hurch 1996a:84). Opposing primary and secondary stresses opens a completely new avenue with respect to prosody. It is namely in the second case, i.e. when secondary stresses are involved, that typical prosodic phenomena take place, as for instance accent clashes, which induce the re-assignment of the secondary stresses, as in the following cases (cf. Féry 1986:34):

- (23) Oskar-Ulrich 'Meyer → Oskar-Ulrich 'Meyer,
'Nachmittag → 'Nachmittag
'Handarbeit → 'Handarbeit
halb,toter 'Mann → halb,toter 'Mann

However, such criticism against rule-based prosodic models does not imply the refusal of any hierarchical organization of accentual levels. As is shown by the examples in (23), primary stress can have domain upon the compound or the whole phrase, determining the shift of the secondary stress. To establish the prosodic characteristics of a given language, it is then necessary to distinguish between what is strictly prosodically conditioned and what is conditioned by the interaction with other components of grammar. A nice example of the opposition of these two levels is given by the accent clash in *halb,toter 'Mann*: the clash is given in this case by the morpho-prosodically determined position of the primary stress in *halb'tot*. However, the rhythmically conditioned stress shift repairs the prosodically uneven series of primary stresses within the noun phrase.

Setting apart these two levels also allows one to establish the main functions fulfilled by stress (cf. Wurzel 1980). A first basic function of stress is, as already mentioned, rhythmic: to put segmental substance into adequate prosodic patterns. The latter are the prosodic (i.e. purely phonological) basis of stress. These "rhythmic motifs" (cf. Hurch 1996b:215) are, however, only one of the elements of a natural theory of stress.⁴ One has to bear in mind that the prosodic principles/preferences may (and in some cases must) interact with other components of grammar, so as, for instance, to be employed to fulfil morphological purposes. As an example, take the Suletin dialect of Basque (cf. Hurch 1996a:76), where there is a systematic opposi-

tion between *a'laba* 'girl' and *ala'ba* 'the girl'. In Suletin, primary stress is usually assigned to the penultimate syllable of words. The difference reported here reflects the two declination types, undetermined vs. determined. In particular, *a'laba* is the undetermined absolutive form, whereas *ala'ba* is derived by means of the suffixed determiner -a. The derived form bears stress on the penultimate syllable, and it is successively reduced to *ala'ba* because of the contraction of the vocalic sequence [a+a], without restressing. One must add that vowel contraction is quite a general phenomenon in Suletin, which is not restricted to the considered vowels, as can be seen in *'buru* 'head' vs. *bu'ru* 'the head'. In the case of Suletin, a segmental phonological process, i.e. vowel contraction, has created the basis for a morphological reanalysis of the prosodic pattern.

In a similar way, stress usually lay in Proto-Germanic on the first syllable of the word, which was in most cases the first syllable of the lexical stem. The development of prefixation, as well as the effect of phonological processes of reduction of unstressed syllables, have induced the morpho-prosodic reanalysis of stress. As reconstructed by Ramat (1986), in Common Germanic, a later stage with respect to Proto-Germanic, there were two basic stress patterns \sim and \wedge , that can be represented by the Gothic pair *bí-mait* 'circumcision' vs. *bí-maitan* 'to circumcise'. Notice that the primary stress lies on the stem in the verb, while in the verbal noun it lies on the prefix, i.e. on the first syllable of the word.⁵ However, this is the result of a reanalysis, because it seems that "in una prima fase del germanico l'accento sia stato posto meccanicamente e indiscriminatamente sulla sillaba iniziale della parola e che poi sia stato rivalutato l'aspetto semantico dando particolare enfasi al monema radicale" (cf. Ramat 1986: 37). The effects of the "reevaluation of the semantic aspect", i.e. of the morpho-prosodic reanalysis, can be found in Old High German *fir-lúst* 'loss' vs. Gothic *frá-lusts* 'id.'. As a consequence, stress has become morpho-prosodically motivated in German, since it usually signals the root morpheme.

In what follows, an attempt will be made to investigate more accurately the different elements that contribute to the shaping of German prosody.

6. Functions of MSG word stress

As a result of the process of morpho-prosodic reanalysis, which already started in Common Germanic, the main role played by MSG

word stress is to emphasize the root morpheme. In other words, it fulfils the morphological function (cf. Wurzel 1980:304). This holds true for most of the native lexicon, both at a paradigmatic and at a syntagmatic level. From this point of view, MSG word stress is strongly unnatural, since the morpho-prosodic function, i.e. the signalling of the root morpheme, has a priority status with respect to the other prosodic preferences. For example, in a complex words like *Ver'arbeitungen*, stress is assigned according to the principle of paradigmatic stress, i.e. the root morpheme always bears the primary stress:

- (24) $\begin{array}{l} [\text{arbeit}] \\ [[\text{arbeit}]\text{len}] \\ [\text{ver}[[\text{arbeit}]\text{len}]] \\ [[[\text{ver}[\text{arbeit}]]\text{ung}]\text{len}] \end{array}$

However, the principle of paradigmatic stress, which has been completely morphologized in MSG, corresponds to the universal prosodic preference according to which "a stem syllable is preferred over a derivational morpheme and the latter over an inflectional ending" (Hurch 1996a:80) as the domain of paradigmatic accentuation. Thus, the paradigmatic stress reveals at least the traces of a universal preference which establishes the privileged domain of stress on root morphemes rather than on affixes.

On the basis of the paradigmatic stress, which is morphologically conditioned, the rhythmic-prosodic structure is then erected; this, i.e. the domain of secondary stresses, is conditioned by the primary stress, not viceversa. Notice in this respect that in German a continuum may be observed between suffixes (and partially prefixes) that obey the morpho-prosodic function of preserving the primary stress on the root morpheme, and suffixes that violate it causing a stress shift (cf. Wiese 1996:120ff.). This distinction, which is one of the characteristics developed in German under the influence of the linguistic contact with Latin and the Romance languages, is to a large extent due to the condition of nativeness, where native suffixes usually do not determine stress shifts. However, the distinction is not clear-cut. There are indeed native suffixes (or completely nativized loan suffixes) that do cause stress shifts. In my opinion, there are two elements that disturb the paradigmatic function of stress of signalling the root morpheme: on the one hand, the lexical status of the morpheme, i.e. native vs. non-native, and on the other the morphological status of the suffix, i.e. inflectional vs. derivational. Inflectional

suffixes usually do not cause stress shifts with respect to the root morpheme, whereas derivational suffixes often do cause them. Between the two poles of the inflection-derivation continuum are the suffixes that do not prototypically belong to either of the two categories (they are placed in the middle of the continuum); they may or may not cause stress shifts. Let us look at the following data:

- (25) i. a. -s, -(e)n, -er, -(e)st, -(e)t, -(e)te, -end
 'Arbeit-s 'arbeit-en
 'Arbeit-e 'arbeit-ete
 'Arbeit-en 'arbeit-est
 'arbeit-end
 b. -en
 Profes'sor-en
- ii. a. -er, -(e)st
 'demütig-er, 'demütig-(e)st
 blut'arm, stein'reich
 b. 'hochwahrscheinlich
- iii. a. -in, -sche
 'Arbeiter-in, 'Bäcker-sche
 b. -in, -esse, -ine
 Profes'sor-in, Pin'guin-in, Baro'n-esse, Blon'd-ine
- iv. a. -schaft, -ung, -er, -heit, -(ig)keit, -sal, -bar, -haft, -lich, -los, -sam, -tum, -nis, -ling, -isch
 'Arbeiter-schaft, Ver'arbeit-ung, 'Arbeit-er,
 'Albern-heit, 'Arbeitslos-igkeit, 'Schick-sal, 'liefer-
 bar, 'Jugend-haft, 'demüt-ig, 'heimat-lich, 'arbeits-
 los, 'tugend-sam, 'Herzog-tum, 'Erbar-m-nis,
 'Schreiber-ling, 'habsburg-isch
 b. -isch, -er, -or, -ik
 Ja'pan-isch, Ja'pan-er, Kre'dit-or, Auto'mat-ik
 c. -ei, -abel, -al, -är, -ant, -ell, -esk, -iv, -os/ös, -ier-, -age, -and, -ant, -anz, -ar, -at, -ent, -enz, -eur, -ie, -ik, -ion, -ismus, -ist, -ität, -ur
 Metzge'r-ei, komfor't-abel, natio'n-al, reaktio'n-är,
 interes's-ant, univer's-ell, balla'd-esk, ak't-iv,
 ruin'ös, spio'n-ieren, Spio'n-age, Dokto'r-and,
 Protes't-ant, Stimu'l-anz, Archi'v-ar, Deka'n-at,
 Interes's-ent, Prä's-enz, Komman'd-eur,
 Photogra'ph-ie, Poli't-ik, Produk't-ion, Leni'n-
 ismus, Sozia'l-ist, Neutral-i'tät, Korrek't-ur

ig,

In (25i) are clearly inflectional suffixes: they usually do not disturb the principle of preserving stress on the root morpheme. The only exception is constituted by the plural suffix *-en*, which causes stress shifts in a certain number of non-native words. Consider, however, that the plural has been defined a non-prototypical inflectional category by several authors (cf. Beard 1982, Dressler 1989). In (25ii) are suffixes that are employed for the gradation of adjectives. It is well known that adjective gradation displays non-prototypical inflectional characteristics (cf. Plank 1981:31, Dressler 1989:6). These suffixes seem, however, to obey the functional principle of preserving stress on the root morpheme. Also in cases where gradation is obtained by means of composition (cf. *blut'arm*, *stein'reich*, etc.), stress is preserved on the root morpheme, in contrast with the usual stress in compounds (cf. Wiese 1996:296ff.). In other cases, however, the usual stress for compounds is found (cf. (25iib)), which violates the principle of paradigmatic stress. In a similar way, gender derivation is usually held as a non-prototypical derivational category (cf. Dressler 1989:6, Doleschal 1992). Native gender suffixes do not usually violate the principle of paradigmatic stress (cf. (25iia)). However, in combination with non-native words, and in particular with animal names (cf. Wiese 1996:293), stress shifts are observed (cf. *Pinguin* → *Pingu'inin*). Moreover, non-native suffixes usually do not obey the principle of paradigmatic stress (cf. *Ba'ron* → *Baro'nesse*, *'Blonde* → *Blon'dine*, etc.). The difference between native and non-native suffixes also determines to a large extent the distribution of derivational suffixes that obey the paradigmatic principle and of those that violate it (cf. (25iv)). However, the distribution is not strictly dependent on the condition [\pm native]. In the case of *-er*, an etymologically non-native suffix (< Lat. *-ārius*), which is completely integrated in German, does not give rise to stress shifts (cf. *'Arbeiter*, etc.), apart from a handful of non-native words (cf. *'Japan* → *Ja'paner*). In other cases, a native suffix like *-isch* determines stress shifts in non-native words (cf. *'Japan* → *Ja'panisch*);⁶ moreover, a suffix like *-ei* (< Old French *-ie*), which can be considered completely integrated in MSG – it can for example be combined with native words (cf. *Bücherei*, *Metzgerei*, etc.) –, behaves like non-native suffixes since it always attracts stress.⁷ Finally, note that any other non-native derivational suffix reported in (25ivc) is stress-bearing, with the exception of *-ik*, which stands somewhere in between.

The picture emerging in (25) is then mixed. On the one hand, there is the principle of paradigmatic stress, which is dominant in inflectional morphology and in native morphemes. On the other

hand, German is provided today with a number of non-native derivational suffixes, which obey a different and opposite functional principle, according to which stress is placed on the suffix rather than being preserved on the root morpheme. In the middle of these two poles are either non-prototypically inflectional suffixes or native or completely integrated derivational suffixes that attract stress on the immediately preceding syllable.

7. Segmental conditions on stress

In the preceding section, it has been observed that a suffix containing schwa is able to determine stress shifts in the case of a non-prototypical inflectional category like noun plural (cf. *Prof'essor* → *Prof'esoren*). However, this is a rather marginal phenomenon with respect to the other (mostly inflectional) suffixes containing schwa, which are essentially stress-neutral. In general, they are the result of linguistic changes that have diachronically affected unstressed vowels. As a consequence, the only full syllables in MSG are in many cases the stressed ones, as can be observed by comparing Old High German (= OHG) with MSG:

- (26) OHG enti sinero degano filu (*Hild.* 19)
MSG und viele seiner Degen
'and many of his warriors'

Notice that vowel reduction affected unstressed vowels, independent of their occurrence in suffixes or in root morphemes. Synchronically, we can induce the opposite generalization: only full syllables (i.e. with a non-schwa-vowel) can be stressed (cf. for this principle Vennemann 1991a:97). Moreover, syllables containing schwa do not influence stress, which usually mirrors the morpho-phonetic principle of paradigmatic stress (see §6 above). Diachronically, the reduction of unstressed syllables played the role of emphasizing the root morpheme; apart from a small number of native words that preserved unstressed full syllables (cf. *Heimat*, *Monat*, etc.), the stress-bearing root morpheme is surrounded by reduced syllables, which can also be prefixes and suffixes. This state of affairs has probably induced a reanalysis of schwa as a landmark of stress; in the case of non-native words (i.e. polysyllabic words with non-initial stress), schwa has begun to assume a demarcative function for stress, since the last syllable before the inflectional schwa-endings was the

stressed one. In this sense, schwa attracts stress on the preceding syllable. However, as has been shown in (25i), this phenomenon is not pervasive. It mostly concerns some native suffixes in combination with non-native words. The stress-attracting function of schwa is more evident in the case of non-derived loan words. Consider the following pairs of loan words:

- (27) i. A'analysis ii. Ana'lyse
'Genesis Ge'nese
Me'talepsis Meta'lepse
Me'tathesis Meta'these

On the basis of these data, Vennemann (1990:406, 1991a:98) has proposed the following generalization:

- (28) A non onset-less reduced ultima arrests the accent on the last full syllable.

There are a couple of native words that apparently contradict it (cf. Benware 1980:291), as for instance *'Ameise* and *'Brosame*. In the first case, it has been pointed out that the word is "felt as a compound", since word games like *'B-Meise* are possible (cf. Vennemann 1991a:100, Eisenberg 1991:40). However, the form *âméize* is historically attested as well (see below). In the other case, the feminine form alternates with a neutral form without schwa: *'Brosam*. Vennemann's generalization is able to account for stress shifts concerning loan words that display a different stress with respect to the donor language (in this case Italian):

- (29) It. 'oboe → MSG O'boe
It. 'rendita → Ren'dite

Note that, as shown by *O'boe*, the formulation of (28) can be simplified, since an onset-less reduced syllable also arrests the accent on the last full syllable. Moreover, schwa-conditioned stress shifts may be observed diachronically:

- (30) MHG 'holunder → MSG Ho'lunder
'wecholder → Wa'cholder
'hornu₃ → Hor'nisse
'vorhele → Fo'relle

However, as far as these diachronic stress shifts are concerned,

the question is much more complex. A word like *le'bendig* could be added to the list in (30), which has unexpectedly acquired stress on the penultimate syllable with respect to the OHG form *'lebedec*. Notice that *'lebedec* has otherwise given rise to forms like *'lebtig*, *'lemtig*, etc. in Upper German dialects (cf. Grüninger 1914:38, Behaghel 1928:262). This word has been the subject of a long debate among scholars on why and how the stress shift took place, "Und wenn das adj. *le'bendig* ... nicht gewesen wäre, so hätten sich die grammatiker vielleicht nicht so eifrig um eine erklärungs geplagt, wie jetzt der fall gewesen ist" (Hammerich 1921:275). More recently, this stress shift has been used as evidence for the complete restructuring of MSG word stress, which is nowadays supposed to have become a final accent just as in Latin (cf. Vennemann 1995, *in press*). In this respect, notice firstly that from a morphological point of view the violation of the principle of paradigmatic stress (*'lebed* → *le'bendig*), which is usually not determined by the suffix *-ig* (cf. *'Demut* → *'demütig*), is coupled with its non-productivity with adjectival bases. Besides *le'bendig*, the only reported examples are namely *kundig*, *nie-drig*, *untertänig* and *völlig* (cf. Fleischer & Barz 1992:258). Secondly, one has to consider that the stress shift in *le'bendig* is neither an isolated nor a recent phenomenon (cf. Behaghel 1928:262). On the contrary, it concerns a large set of words, of which Grüninger (1914:67ff.) has tried to track down the first occurrence:

- (31) IX c. un'quethandes, un'holde, ful'gangan, ala'waltendan
 X c. zw'i'houbito
 XII c. al'wäre
 XIII c. all'mächtig, le'bendig, Al'mosen, A'meise, dri'velde, ge'-neister, Lam'parten, Nor'wegen, O'ttacker, West'falen
 XIV c. Bur'gunden, e'lende, dri'valtig, Gun'dacker
 XV c. teil'haftig, kna'batzen, Schaff'hausen
 XVI c. Dil'dappe, Fo'relle, Hor'nisse, Kiff'arbeits, Lat'wergen, La'wendel, Schla'raffe, Wa'holder, barm'herzig, drei'faltig, glück'selig, hold'selig, ein'fältig, leib'haftig, kein'nützig, wahr'haftig, will'kommen, je'tzunder, gris'gramen, kar'nöffeln, po'pitzten, scha'latzen, schma'rotzen, Fils'hofen, Gang'hofen, Gerst'hofen, West'sachsen
 XVIII c. Ham'butte, Ho'lunder

Independent of the complete reliability of Grüninger's reconstructions, which are mostly connected with the metric context in which the words occur,⁸ two points seem to me to emerge from the data in (31). First, notice that there is a growing tendency towards

stress shifts to internal heavy syllable. In many cases, this tendency is coupled with the condition seen above in (30) of a final schwa. Moreover, the stress shifts registered by Grüninger did not always cause a change in the modern pronunciation of the words, as shown by MSG *'Ameise*, *'Elend*, etc. Second, the tendency towards stress shifts is very old; it dates back to OHG times. This shows that Latin-Romance influence is not sufficient to explain stress shifts in terms of a restructuring of German stress due to language contact. Certainly, the growing number of loan words and suffixes of Latin and Romance – and in particular, French – origin might have played a more and more important role within the older German lexicon, leading to the picture described in (25) above. However, the tendency towards stress shifts to internal heavy syllables is an older phenomenon, which cannot be directly coupled with foreign influence.⁹ Rather, it depends in my opinion on the universal preference, according to which "a potential primary accentual unit in a position of possible accentuation will more readily exhibit stress if it exhibits quantity" (cf. Hurch 1996a:92). Thus, it turns out that syllable weight did play a minor role in German word stress since it caused some stress shifts to take place. However, it acted as a universal preference, not as a language-specific device to stress assignment. This explanation, already proposed by Behaghel (1928:260), who attributed it to the effects of speakers' "natürliches Sprachgefühl", is empirically supported by the fact that "bei vielen Wörtern mit schwerer zweiter Silbe eine zweisilbige Form mit dem Akzent auf der ersten Silbe besteht neben einer dreisilbigen Form mit der Betonung der zweiten Silbe (*'Ameis* neben *A'meise*, *'jetzund* neben *je'tzunder*, usw.)" (Grüninger 1914:80).¹⁰

The universal preference for the stressing of heavy syllables, which can be observed throughout the whole linguistic history of German since the earliest times, is also responsible for stress shifts heard in everyday speech, just like the pronunciation *O'tranto* instead of the more common (and corresponding to the Italian model) *'Otranto* (cf. Vennemann *in press*).

8. Prosodic patterns in the MSG native lexicon

In §6 it has been shown that MSG accent is essentially dependent on the principle of paradigmatic stress. In this sense, it primarily fulfils a morpho-prosodic function (cf. Hurch 1996b). With this in mind, we will now consider the MSG word stress description provided by Eisenberg (1991), who basically assumes that "wir sprechen vom

Akzent eines Wortes dann, wenn vom Akzent der Formen eines Flexionsparadigmas die Rede ist, anderenfalls sprechen wir vom Akzent von Wortformen" (Eisenberg 1991:44). In other words, two words like *Kind* and *Ruder* are according to Eisenberg bisyllabic at a paradigmatic level, since "beide Flexionsparadigmen maximal zweisilbige Formen enthalten" (*ibid.*):

- (32) i. Ruder ii. Kind
Ruder-s Kind-es
Ruder Kind-er

At a paradigmatic level, we thus obtain two analogous structures, where a syllable containing a full vowel is followed by a syllable containing schwa:

- (33) i. {<1, [ru:]>, <2, [dæ]>}
ii. {<1, [kn]>, <2, [dæ]>}

If we recall that syllables containing schwa are unstressable (they are inert from a prosodic point of view), we obtain the following picture, where the structure of stressable syllables (= *Betonbarkeitsstruktur*), the prosodic structure (= *Betonungsstruktur*), and the stress structure (= *Akzentstruktur*) are represented:

- (34) i. *Ruder* {<1, [ru:]>, <2, [dæ]>}
ii. *Kind* {<1, [kn]>, <2, [dæ]>}
Betonbarkeitsstruktur {<1, +>, <2, ->}
Betonungsstruktur {<1, ' >, <2, ->}
Akzentstruktur {<1, ' >, <2, ->}

The *Betonbarkeitsstruktur* refers, as already mentioned, to the difference between stressable (i.e. with a full vowel) and unstressable (i.e. with a schwa vowel) syllables. The *Betonungsstruktur* refers to the whole prosodic structure of a given word, taking into consideration the accentual hierarchies: "τ" represents a primary stress; "σ" a secondary one; "σ'" a prosodically inert syllable. The *Betonungsstruktur* is motivated by the *Akzentstruktur*, the level at which the primary stress ("τ") is represented. As for the words in (34), notice that the *Betonbarkeitsstruktur* and the *Akzentstruktur* are isomorphic. In this way we are able to give a formal representation of what we observed above in §6, that MSG has completely morphologized the principle of paradigmatic stress with respect to OHG, since

any other unstressed syllable has been reduced. The isomorphism between *Betonbarkeitsstruktur* and *Akzentstruktur* is thus the result of the diachronic changes that mark the distance between OHG and MSG observed in (26). In this respect, it is important to emphasize that the prosodic pattern reported in (34) corresponds to the absolute majority of German substantives belonging to the core lexicon. In other words, the typical MSG word is constituted by a stressable syllable followed by a syllable containing a schwa. This is the canonical structure of substantives in MSG (cf. Bech 1963): a prosodic pattern ("Akzentmuster"), "das weitreichende Wirkung für Analogiebildungen entfalten kann. Der Trochäus [' , -] ist das Substantivmuster" (Eisenberg 1991:47). Moreover, the prosodic pattern has an immediate consequence on inflectional morphology: substantives belonging to the MSG core lexicon form their inflectional paradigms in order to preserve the trochaic canonical structure. In fact, in words like *Ruder*, inflectional suffixes are never syllabic (cf. *Ruder-s*, *Ruder-n*, etc.). Thus, "Die prosodische Struktur bleibt von der Flexion unberührt" (Eisenberg 1991:48).

Besides the huge number of words constituting the majority of the core lexicon, there is a minor part of the native lexicon, which is composed by words like *Uhu*, *Mutti*, *Papa*, *Opa*, etc. They also display the trochaic pattern, but there is no complete isomorphism between *Betonungsstruktur* and *Akzentstruktur*:

- (35) *Mutti* {<1, [mʊ]>, <2, [ti]>} >
Betonbarkeitsstruktur {<1, +>, <2, +>}
Betonungsstruktur {<1, ' >, <2, ->}
Akzentstruktur {<1, ' >, <2, ->}

Notice however that the effects of the prosodic pattern on the inflection are evident also for this small class of substantives; inflectional suffixes do not alter the trochaic pattern (cf. *Muttis*, *Opas*, *Uhus*, etc.). Taking the other lexical classes into consideration (i.e. adjectives and verbs), Eisenberg (1991:55) concludes that the trochaic prosodic pattern is dominant in the core lexicon, followed by the dactylic pattern containing two unstressed syllables, as in the following noun:

- (36) *Monat* {<1, [mo:]>, <2, [na:]>, <3, [tə]>} >
Betonbarkeitsstruktur {<1, +>, <2, +>, <3, ->}
Betonungsstruktur {<1, ' >, <2, ->, <3, ->}
Akzentstruktur {<1, ' >, <2, ->, <3, ->}

The MSG core lexicon thus displays a trochaic-dactylic prosodic pattern. Moreover, Eisenberg's proposal allows nicely the formalization of the difference that we observed in §6 between native and non-native suffixes. On the one hand, native suffixes do not alter the MSG canonical prosodic pattern. On the other hand, they increase the non-isomorphism between the *Betonbarkeitsstruktur* and the *Akzentstruktur*:

- (37) i. 'tätig, 'tätiger, 'tätigeres
 {τ, -, -} {τ, -, -} {τ, -, -, -}
 ii. 'eitel 'Eitelkeit
 {τ, -, -} {τ, -, -} {τ, -, -, -}
 iii. 'sauber 'sauberlich 'sauberlicheres
 {τ, -, -} {τ, -, -} {τ, -, -, -, -}

Notice, however, that words formed with stressable suffixes like *-heit* or *-lich* build, as far as possible, dactylic or trochaic feet at the level of *Betonungstruktur*. In this way, the trochaic-dactylic rhythm is maintained, which is normal for the core lexicon.

9. Loan words and prosodic patterns

Having investigated the characteristics of MSG stress in the preceding sections, I will now deal with the behaviour of loan words that are present in German. As already mentioned in §6, non-native suffixes behave in a remarkably different way with respect to the native ones; they attract stress, obscuring the morpho-prosodic function dominant in the native lexicon. Moreover, the presence of suffixes, and more generally of words, with unreduced unstressed syllables decreases the isomorphism between *Betonbarkeitsstruktur* and *Akzentstruktur*, which is one of the main properties of the native lexicon. These two factors have strongly influenced the German lexicon as a consequence of the contact with the Latin-Romance area. Moreover, German has considerably changed with respect to its older stages, since it underwent a number of diachronic processes, which have been partially illustrated above. To give an idea of these changes, let us look at the different ways in which loan words have been received and integrated into different stages of German:

(38)

		OHG/MHG	MSG
i.	Lat. archi'ater	> 'arzat	Arzt
	Lat. 'asinus	> 'esil	'Esel
	Lat. noc'turnus	> 'nuohtarnin	'nüchtern
	Lat. 'schola	> 'scuola	'Schule
ii.	Lat. al'tare	> 'altari, 'altære, 'alter Al'tar	
	Lat. ele'phantus	> 'helpfant, 'helfant	Ele'fant
	OFr. pa'lais	> 'palas	Pa'last
	OFr. bannière	> 'banier	'Banner, Pa'nier
iii.	Lat. (ars) gram'matica	>	Gram'matik
	Lat. littera'tura	>	Litera'tur
	Lat. (aes) mine'ralis	>	Mine'ral
	Lat. (pars) mi'nuta	>	Min'ute
	It. al'tana	>	Al'tan
	It. al'legro	>	Al'legro
	It. can'none	>	Ka'none
	It. gra'nata	>	Gra'nate
	Fr. al'lée	>	Al'lee
	Fr. ar'mée	>	Ar'mee
	Fr. par'fum	>	Par'fum
	Fr. per'ruque	>	Pe'rique

In earlier stages of German, loan words usually took initial stress, compared to French, where loan words are pronounced with a final stress, or to Latin, which has a quantity-sensitive stress (s. §2 above). Nothing comparable happens today; loan words often preserve the original accent of the donor language. From this viewpoint, there is a remarkable contrast between the words already borrowed in OHG and those re-introduced in later stages (cf. (38ii)). One must add, however, that the integration of loan words does not take place as a mechanic process. Also for OHG, Ronneberger-Sibold (*in press*) mentions that "in a few words such as *evan'gelio* 'gospel', *a'postol(o)* 'apostel', *na'tura* 'nature' the original accent was maintained. This, most probably, gave them a rather bookish character, as opposed to the more popular translations *cuat'undida* 'good news', *boto* 'messenger' and *c(h)nuat* 'substance' respectively". This observation helps us understand how complex the relations among the several strata of German lexicon are. Recall that German stress has undergone a process of reanalysis, according to which primary stress has acquired the morpho-prosodic value of signalling the root morpheme. This process of reanalysis is very old, since in OHG the purely phonological condi-

tions of stress already appeared weak, as shown by the contrast quoted above in §5 between OHG *fīr-lūst* 'loss' and Goth. *fīr-lūsts* 'id.'. At the same time, other phonological processes modified the make-up of German words, leading to the actual MSG canonical prosodic pattern. Moreover, the constant linguistic contact with the Latin-Romance area has determined a stratification of several sound shapes within the German lexicon, in correspondence with the original language of the loan words (cf. Ronneberger-Sibold *in press*:7):

(39) Sound shapes of German words	
Prototypical native sound shapes	Prototypical nonnative shapes
stressed initial syllable	- Initial stress, but full vowels in unstressed syllables: 'Estrich, 'Wallach, 'Arbeit, etc.
vowel + schwa-syllable	- Non-initial stress, but Schwa in final syllables: Lītera'tur, Aduo'kat, etc.
'Mutter, 'Vater, 'Kinder, etc.	Fo'relle, Li'belle, Mi'nute, etc.
	- 'Italo-Spanish' type: Penultimate stress, final -a or -o: Al'legro, Ar'mada, etc.
	- 'French' type: Final stress on open syllable: Al'lee, Bü'ro, etc.

The sound shapes play an important classification role within the lexicon. For instance, in word creation the difference in sound shapes is relevant in assigning stress to trade names (cf. Ronneberger-Sibold *in press*):

- (40) i. Latin type: Bac'trim, Nata'bec, Rifa'prim, Para'gar, Mipo'lam
 ii. French type: Er'gee
 iii. Italo-Spanish type Ro'wenta, Ha'nuta, E'duscho, Me'dima, Me'tabo

Trade names are usually the result of complex mechanisms of segmental combination (cf. for instance *Ergee* < *Edwin Rösler Gelenau Erzgebirge*, the name of a manufacturer of ladies' stockings). In order these trade names to be stressed, a matching with the foreign prototypes presumably takes place. Notice that the reported sound shapes are systematically avoided in common nouns and adjectives in ordinary usage, which are created by the same techniques. Accordingly, such words usually display initial accent.¹¹ For instance,

'Dimido (< *Dienstag-Mittwoch-Donnerstag*) is stressed on the first syllable, in contrast with *Me'dima* or *Me'tabo* mentioned in (40iii), that imitate the Italo-Spanish type of *To'rero*. More generally, the analogical matching with stored lexical patterns is an essential factor for stress-assignment (cf. Aske 1990, Schindler 1994). A particularly interesting case is provided by the recent Euro-word *Telekom*. If it were the name of a medical drug, it would probably be pronounced [tele'kom], with final stress on a long tense vowel, on the basis of the Latin model displayed by other medical terms like *Karzi'nom*, *Sar'kom*, etc. However, since it belongs to the ordinary vocabulary, *Telekom* has been grouped with the common abbreviations, that follow the native model, thus [te'ləkum].

Notice that the sound shapes in (39) are meant to be prototypes: the classification is therefore not clear-cut, but gradual, according to the properties of the single items. In this perspective, it fully agrees with what we observed in (25) concerning the native and non-native suffixes. In both cases, the picture we obtain is mixed. In the core lexicon, which inherits properties ultimately going back to Germanic (i.e. fixed stress on the initial stem syllable) by virtue of a morpho-prosodic reanalysis, a tendential isomorphism between *Betonbarkeitsstruktur* and *Akzentstruktur* can be observed, whereas loan words usually display the opposite properties that are typical for the Latin-Romance area, i.e. stress-shifting suffixes and non-isomorphism between *Betonbarkeitsstruktur* and *Akzentstruktur*.

10. Integration paths for loan words

As is often the case in language contact, the loan elements that are borrowed by the recipient language can be subject to integration processes that aim at reducing the distance of the loan elements from the native ones. From this point of view, the investigation of the integration processes can help us grasp the inner properties of the recipient language. In this respect, the most interesting properties of loan words' integration processes (cf. Volland 1986) are the possible stress shifts occurring in the recipient language with respect to the donor one. If this does not tell us how MSG stress works naturally (as has been said, it is governed morpho-prosodically, i.e. in an unnatural way), nor how deep the etymological consciousness in speakers' minds is (they actually classify lexical items on the basis of prototypes), it can provide us with some hints on how MSG reacts to the presence of loan material. In (41) a list of loan words with a deviating stress is given.¹²

- (41) i. 'Billard
 Bū'ro, 'Būro
 Chevreau [ʃə'vro:, ʃevro]
 Chiffon [ʃifʃ, ʃiʃ]
 'Couscous
 De'pot, 'Depot
 'Kognak
 'Kolchos
 'Kaffee
 'Rondo
 Tri'kot, 'Trikot
- ii. Camembert, 'Camembert
 Chicoree [ʃikore, ʃiko're]
 'Cholera
 Kaba'rett, 'Kabarett
 'Kanapee
 Kompagnon [kɔmpaɲjɔ̃, kɔmpa'ɲjɔ̃]
 Mokas'sin, 'Mokassin
 'Pellagra
 'Podagra
 'Razzia
 'Turandot
- iii. 'Kiosk, Ki'osk
 'Kompaf
 'Konsum
 'Leutnant
 'Tenor
- iv. 'Karneval
 Konti'nent, 'Kontinent
 'Korridor
 Kre'ditor, 'Kreditor
 'Marzipan
 'Trampolin, Trampo'lin

First of all notice that in these words the stress has shifted with respect to the donor languages towards the left edge of the word.¹⁴ Stress shifts take place both in cases where the integration process does not affect the segmental make-up of a given loan word (cf. (41i-ii)) and in cases where there is a segmental integration of the loan word (cf. (41iii-iv)). Moreover, stress shifts also occur in cases where either the stressed syllable in the donor language is closed, i.e. heavy (cf. 'Kognak, 'Kiosk), or there is an internal heavy syllable (cf. 'Mokassin, 'Turandot).

To account for these stress shifts, recall that the prototypical undervived German noun displays a perfect isomorphism between the *Betonbarkeitsstruktur* and the *Akzentstruktur* (i.e. a full syllable followed by a reduced one). As a consequence, the preferred prosodic patterns in the core lexicon are trochees and dactyls. With this in mind, we can represent the integration process displayed by the words in (41) as the extension of the dominant native prosodic pattern to non-native words, where the non-isomorphism between the *Betonbarkeitsstruktur* and the *Akzentstruktur* is maintained nonetheless:

- (42)
- | | | |
|------------------------------|--------|--------|
| | Bruder | Kognak |
| <i>Betonbarkeitsstruktur</i> | {+, -} | {+, +} |
| <i>Akzentstruktur</i> | {τ, -} | {τ, -} |

It is the prosodic pattern of native nouns that is extended to non-typical German stems. With the increase of the non-isomorphism between the *Betonbarkeitsstruktur* and the *Akzentstruktur*, some relevant effects on the segmental level come about, such as the functionalization of the opposition between unstressed full and reduced syllables, which is now employed in minimal pairs like the following:

- (43)
- | | | |
|--------------|-----|---------------|
| Wille 'will' | vs. | Villa 'villa' |
| Kante 'edge' | vs. | Canto 'song' |

Moreover, the increased complexity of the *Betonbarkeitsstruktur* sometimes allows the functionalization of word stress as a distinctive feature at the lexical level, in addition to its "syntactic" use in complex words such as 'übersetzen 'to cross' vs. über'setzen 'to translate' (cf. Dogil 1981, Wurzel 1980):

- (44)
- | | | |
|-----------------------|-----|--------------------------|
| 'Konsum 'supermarket' | vs. | Kon'sum 'consumption' |
| 'Party 'party, feast' | vs. | Par'tie 'party, faction' |
| 'Tenor 'content' | vs. | Te'nor 'tenor' |

In this perspective, the words in (41) represent the result of the matching with the dominant prosodic pattern. For other foreign words showing non-native stress patterns (as *Maga'zin*, *Kon'zert*, *Me'tall*), the trochaic pattern applies starting with the end of the inflected word forms, i.e. with the last foot. Words stressed on the last syllable display syllabic inflectional endings, as can be seen in the following pair:¹⁵

- (45) *Kredit* vs. *Kredit*
plur. *Kredits* *Kredite*

Thus, following Eisenberg's (1991) idea, it is possible to outline the integration paths covered by foreign words when entering into the German lexicon. At the first stage, the prosodic pattern is applied according to the non-native prototype, i.e. starting with the end of the word (cf. *Maga'zin(e)*). This behaviour is driven by the habit of considering the *Betonbarkeitsstruktur* and the *Akzentstruktur* isomorphous as in native words, where the last - actually the only - stressable syllable coincides with the head of the trochee (s. §7 above, where a similar interpretation holds true for a final schwa). In this sense, the final part of the word, taken as a paradigmatic unit, constitutes the target to be matched with the prosodic pattern (cf. Munske 1982:250). Successively, the matching takes place at the level of word form, giving rise to stress shifts as in *'Trampolin*, *'Kompaf*, etc. At the end of this process, the integrated forms correspond to the native prosodic canon also in the paradigmatic form: *lieutenant* > *Lieute'nant* > *'Leutnant(s)*. Recapitulating:

- stage I: matching the original stress with the non-native prosodic patterns:
It. magaz'zino > *Maga'zin* (pl. *Maga'zine*)
Betonbarkeitsstruktur (+, +, +, -)
Akzentstruktur (', -, -, -)
- stage II: integration of the word form into the native prosodic pattern:
It. trampo'liino > *'Trampolin* (pl. *'Trampoline*)
Betonbarkeitsstruktur (+, +, +, -)
Akzentstruktur (', -, -, -)
- stage III: integration at the paradigmatic level:
Fr. lieute'nant > *'Leutnant* (pl. *'Leutnants*)
Betonbarkeitsstruktur (+, +)
Akzentstruktur (', -)
- stage IV: integration at the level of *Betonbarkeitsstruktur*:
It. putto > *Putte*
Fr. oncle > *Onkel*
It. ca'nale > Swiss German [k*ænnəl]
Fr. bou'teille > " [budəl]
Fr. chandelle > Alsatian German [ʃaŋəl]
Betonbarkeitsstruktur (+, -)
Akzentstruktur (', -)

At the last stage, widely documented in the dialects (cf. Schirmunski 1962:157), the integration process leads to the re-establishing of a complete isomorphism between *Betonbarkeitsstruktur* and *Akzentstruktur*. In this case, Eisenberg's (1991) correlation between prosodic canon and inflectional endings can be observed (cf. *Putte-n*, *Onkel-s*, etc.). Notice finally that another way to obtain a native prosodic pattern makes use of non-prototypical inflectional means, as in the case of loan words that display stem inflection as *Konto* → *Kont-en*, *Firma* → *Firm-en*, etc., otherwise uncommon in MSG noun inflection (cf. Gaeta 1995).

11. Conclusion

To sum up, I hope I have been able to convince the reader that German indeed preserves its Germanic blood with respect to stress phenomena. However, the MSG blood is not as red as the Germanic one; the Germanic initial stress has been reanalysed as a morpho-prosodic principle of keeping stress on the root morpheme. With the help of phonological processes of reduction of unstressed syllables, canonical prosodic patterns have come into existence which are largely dominant within the core lexicon. Moreover, in the course of time German has undergone massive blood transfusions from languages that display opposite properties such as stressed suffixes and unstressed full vowels. Loan words now constitute prototypically structured sets of the lexicon, which display a certain autonomy and vitality. This is reflected in word creation, as well as in some phenomena of the integration of loan words that match a particular prototype. Notice that the latter may also be true for etymologically native words that have been reanalyzed as loans as in the case of *Herme'lin*, which is a native word (< OHG *'harmilin*) that has acquired foreign stress as a consequence either of the direct influence of *It. ermellino* - which is actually a German loan word (cf. Kluge 1989: 306) - or of the landing in the realm of foreign prototypes.

Nonetheless, native prosodic patterns still work as relevant patterns for the integration of loan words. This is the reason why it sounds methodologically odd to consider the last syllable of integrated loan words like *'Turandot* or *'Mokassin* as extrametrical (i.e. lexically marked), as assumed for instance by Wiese (1996) and discussed in §4 above. Since integration processes usually diminish the distance between native and non-native words, it is at the very least counter-intuitive to assume that an integrated word has become lexically

marked with respect to other loan words. Finally, we have been able to uncover some manifestations of the universal preferences that drive the prosodic organization of language, the rather unnatural characteristics of MSG stress notwithstanding. In this sense, foreign words are very useful as external evidence to observe speakers' phonological behaviour.

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Notes

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1 There are, however, some exceptions to this generalization, as for instance Ilocan, where vowel length is predictable and non-distinctive, while stress rules are sensitive to the syllable weight. In Eastern Chremis stress rules seem to distinguish between full (bimoraic) and reduced (monomoraic) vowels, which appears to be a difference of vocalic quality rather than of syllable weight (cf. Hayes 1989).

2 This question is too complicated, however, to be discussed in the present paper. In any case, consider that according to Wiese (1996:288) "roots and suffixes are treated in basically identical ways with respect to their status as lexical entries". The difference of status between the two categories relies on the fact that "suffixes carry a subcategorization frame ensuring that they do not occur on their own (as 'free morphemes do') (ibidem).

3 Note, moreover, that in some cases stress is relevant to distinguish respectively between the grammatical term ('Subjekt', 'Objekt') and the generic word ('Subjekt', 'Objekt' 'subject, object, topic'). However, not all grammatical terms are involved by this generalization, as for instance *Fu'tur*, *As'rist* (cf. Wurzel 1980:306).

4 The reader is referred to Hurch (1996a, b) for a deeper investigation of the natural preferences that shape speakers' prosodic competence.

5 It is a matter of speculation how the reanalysis took place in Common Germanic. In any case, "la possibilità di infiggere particelle tra prefisso e verbo rende probabile che i preverbi avessero originariamente l'accento principale (got. *uz-uh-iddja* (Joh. 16.28) 'e uscì') (Ramat 1986:37).

6 As Fuhrhop (p.c.) points out, stress shifts determined by *-isch* may also be observed with native words, like *Buchhalter* → *buchhalterisch*, *Luther* → *lutherisch*, etc.

7 However, the stress shift is optional in cases like *Ei* → *Eie'rei* ~ *Eierei*, etc. (cf. Meinhold & Stock 1982:230).

8 Hammerich (1921:276) has criticized as essentially inadequate Grüniger's way of proceeding. Notwithstanding the correctness of his criticism, there are examples that clearly speak in favour of Grüniger's reconstruction, as for instance the verse *Diu erde amêize und binen gebirt* in a XIIIth c. text (cf. Grüniger 1914:20).

9 A third observation must be added; as reported by Behaghel (1928:261f.), such stress shifts are widely documented both in southern and in northern German dialects, as for example in Zips (Bavarian) *ju'denne* 'Jüdin', in Alemannian *a'fange* 'anfangs', in Horneburg (Hannover) *e'lenich* 'elend', etc.

10 One must add that in OHG polysyllabic un-prefixed adjectives (and in Oldfrid the trisyllabic substantives *un'mahin* e *un'fruat*) displayed a stress shift from the first to the internal syllable. Moreover, the tendency towards the stressing of a heavy penultimate syllable is a widespread phenomenon (cf. Dogil 1981 for some insights about this subject).

11 Non-initial accent with common words is only found in three items of the corpus sampled by Ronneberger-Sibold, i.e. *La'bor*, *Audi'max* and *A'zubi*, where *'Audimax* and *'Azubi* can also be pronounced with stress on the first syllable.

12 According to the *Duden*, the first variant reported in (41) is more widespread than the second one.

13 Several authors (cf. Vennemann 1990 and Wiese 1996 reported above) have objected that proper nouns such as *Turandot* do not pattern with the regular lexicon. However, as Berg (1997) has pointed out, this is not the correct way to look at the problem. In fact, proper nouns are nicely sensitive to the different sound shapes, which are present in the German lexicon.

14 The cases where the opposite happens (cf. *O'tranto* in §7 above) occur much more seldom; we have seen possible motivations for that. Kohler (1995:186) assumes a strong tendency for MSG towards stressing penultimate syllables, as shown for example by loan words coming from rather exotic languages like Japanese, where speakers would not have any clear intuitions: *Kawa'saki*, *Mitsu'bishi*, etc. However, the more established word *Kimono* tells us much more about the real direction of integration processes.

15 However, the MSG inflectional system is much more complex than we can discuss here (cf. Wurzel 1984, Gaeta 1995). In fact, the correlation between prosodic patterns and inflectional classes is not strict, as shown by the plural of *Tri'kot-s*, *Bü'ro-s*, etc. (cf. Kaltenbacher 1994b). For these words, however, the trochaic accentuation occurs as well: *Tri'kot*, *Bü'ro*.

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