VIEW[z]

VIENNA ENGLISH WORKING PAPERS

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LETTER FROM THE EDITORS

Dear readers,

We proudly present our last VIEWS issue of this millenium!! A memorable moment for us, looking back on eight years of, we like to think, generally successful discussions of highly diverse topics in the wide field of English language studies. Diachronic and synchronic, phonological, morphological, syntactic, semantic, pragmatic, socio-linguistic and applied linguistic views have been represented; some more intensely than others, but all of them seriously read and thought about. This diversity, we hope, has not only reflected our own, as well as our readers' research interests, but has also helped all of us to maintain a broader scholarly horizon than is possible within our various fields of specialisation.

With the same intentions and new, invigorated energy we want to continue VIEWS in the 21ˢᵗ century and think that this issue, standing between the 'old' and the 'new', cannot only be seen as a symbolic, but hopefully also very real, bridge between the two. Two of the three contributors, Niki Ritt and Gunther Kaltenböck, have been on the editorial team right from the start and are well-known to VIEWS readers; the third, Susanne Reiterer, a Ph.D. student in Vienna, is a "newcomer". But not only is she new to VIEWS, so, too, is the topic of her contribution: EEG measuring of brain activity during foreign language processing. The description of the theoretical and methodological framework of her Ph.D. project in the field of Cognitive Neuroscience is definitely a new topic for VIEWS. While the former two contributors have provided us with papers that fall into their "old", and thus in VIEWS well-established, areas of research, the topics them-selves are "new". Or are they? Niki Ritt has taken up what he calls an old myth in historical linguistics, namely the fixing of Germanic word-stress and its alleged effects on the history of English, and develops a fairly bold (I didn't say irresponsible, did I?) line of argumentation. And Gunther Kaltenböck has focussed on a seemingly old hat in English syntax – anticipatory it *– and shows that from a different perspective, the old hat suddenly looks very new.*

So, in more ways than one, this issue stands in-between the old and the new – and we are very happy about that – but in order for this combination to be truly constructive and successful, we, as editorial team, are fundamentally dependent on your continued collaboration and support; in all senses of the word: First of all, please keep up your interest in reading VIEWS and, even more importantly, continue or start responding to contributions and express your own VIEWS! And then, on the more profane level, we would also need to repeat our re-quests for your financial support to keep VIEWS going – bank notes of whatever denomination, simply put in envelopes are very welcome and highly appreciated. Along the same line, we wish to thank our advertiser, the Campus bookseller Kuppitsch*, who is always at your service for whatever book you'd like to get. In the meantime, delve into and enjoy VIEWS!*

The Editors

VI@w[z]

c/o
Institut für Anglistik & Amerikanistik der Universität Wien
Universitätscampus AAKH, Spitalgasse 2, Hof 8
A – 1090 Vienna; Austria

fax	**(intern.) 43 1 4277 9424**
eMail	**nikolaus.ritt@univie.ac.at**
w³	**http://www.univie.ac.at/Anglistik**

Which it *is it? Some remarks on anticipatory* it

Gunther Kaltenböck

1. Introduction

This paper takes a closer look at the syntactic status of anticipatory *it*, the initial element of so-called *it*-extraposition constructions, which are illustrated in (1).

(1)   a. *It* is surprising that John went to London
        b. *It* is easy to play tennis
        c. *It* is fun living in London

It-extrapositions are generally assumed to be derived from a syntactically more basic non-extraposed counterpart (with canonical word order, e.g. *That John went to London is surprising*) by an extraposition movement which shifts the subject (or less commonly object) clause to the right (cf. e.g. the transformational accounts by Rosenbaum 1967, Emonds 1976, and more recently Huddleston 1984). Quirk et al (1985: 1391) describe extraposition very generally as "postponement which involves the replacement of a post-poned element by a substitute form", viz. anticipatory *it*.

The main syntactic effect of deriving *it*-extraposition by shifting the subject of the non-extraposed version to the end of the sentence is that of depriving the embedded clause of its subject position. With the subject being an obligatory syntactic function in most clause types, this transformation requires the insertion of a dummy element to fill the vacated subject position. This dummy element has been variously called "preparatory *it*" (Jespersen 1949, VII: 142), "provisional *it*" (Kruisinga 1932: §1003), "introductory *it*" (Hornby 1975: 17), or , most commonly, "anticipatory *it*" (cf. e.g. Quirk et al 1985: 1391; Seppänen et al 1990).[1] The resulting sentence is thus generally seen as containing two subjects: the formal or anticipatory subject and the extraposed, postponed, logical or notional subject, i.e. the embedded clause (cf. e.g. Quirk et al 1985: 1391; Seppänen et al 1990: 748). A different view is expressed by Huddleston (1984: 66-68; cf. also Visser (1963: 57)), who,

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[1] The term anticipatory *it* is sometimes given a wider definition which includes cleft *it*; cf. e.g. Quirk et al (1985: 349), Curme (1931: 9-12). In the present discussion, however, I will disregard the category of cleft *it* (e.g. *It was John who broke the window*).

having evaluated the syntactic function of both constituents according to a set of six criteria, concludes that anticipatory *it* and not the embedded clause is subject of the *it*-extraposition although not conforming entirely to the subject prototype.

There is disagreement not only on the syntactic function of anticipatory *it*. Its overall syntactic and semantic status – the focus of this paper – is far from clear even though most grammarians seem to at least imply that anticipatory *it* has the function of anticipating (hence the name) or "heralding" (Jespersen 1949, VII: 144) the extraposed constituent. To elucidate the specific nature of anticipatory *it*, it is necessary to compare it to other, related uses of the pronoun *it*. Modern grammars commonly distinguish two basic uses of *it*, viz. the referential pronoun or 'referring *it*' and the semantically empty, un-specified 'prop *it*'.[2]

2. Referential *it* and prop *it*

The referential uses of *it*, illustrated below in (2), can be further subclassified into 'anaphoric', or perhaps more appropriately 'textual'[3], where the pronoun refers to an antecedent NP with which it is co-referential (cf. (2)a) and 'situational'[4], where *it* refers to an extralinguistic object without previous mention of it in the text (cf. (2)b):

(2)   a. Referring *it*: textual ("anaphoric")
            The flat is very nice but unfortunately *it*'s too expensive

        b. Referring *it*: situational
            Isn't *it* rather nice? (said to somebody looking at a photograph)

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2   The terminology adopted here is the one from Quirk et al (1985: cf. e.g. 347-48); other terms sometimes used for prop *it* are ambient *it*, dummy, empty, expletive *it*, pleonastic *it*, impersonal *it*, introductory *it*, non-referring *it*.

3   The distinction of 'anaphoric' and 'situational' *it* has been proposed by Seppänen and Seppänen (1978: 283-84). However, their use of the term anaphoric is somewhat misleading as it seems to be used as synonym of 'co-referential' and not in the sense of 'pointing backwards', i.e. the opposite of 'cataphoric'. Although typically anaphoric, referring *it* may occasionally also be cataphoric in function, cf. right-dislocation, e.g. *It's very useful, this tool*. The term 'textual' (as counterpart to 'situational') thus seems to be more appropriate as it unambiguously includes both anaphoric and cataphoric reference.

4   Seppänen and Seppänen's (1978: 283) category of 'situational' also includes cases such as *It must be the postman* (said on hearing the doorbell). Such instances are, however, problematic, as they are also classifiable as *it*-clefts with an omitted (since situationally recoverable) relative clause (cf. e.g. Quirk et al 1985: 349; Collins 1991).

Prop *it*, on the other hand, does not refer to any anaphor or extralinguistic item, but is generally considered to be semantically empty (cf. e.g. Kruisinga (1932: 715), Visser's (1963:36)).[5] It is used as an 'empty' or 'prop' subject especially in expressions denoting time, distance and atmospheric conditions (cf. Quirk et al 1985: 348-49), hence the occasional use of the terms 'ambient *it*' (e.g. Bolinger 1977: 77) or 'weather *it*'. Compare for instance the following uses of prop *it*:

(3)   a. *It*'s half past ten
         b. *It*'s raining again
         c. *It*'s getting dark
         d. *It* is Saturday

The generally held view that prop *it* is a more or less meaningless 'dummy' is, however, challenged by Bolinger (1977: 77-87), who maintains that it "retains at least some value beyond that of plugging a grammatical hole" (Bolinger 1977: 67). Bolinger's discussion builds on the notion of "all-encompassing states" – as used by Chafe (1970) – to describe sentences such as *It's late, It's Tuesday*. According to Chafe (1970: 101) "they [all-encomp. states] cover the total environment, not just some object within it". For Bolinger this is an indication that prop *it* (or in his terms ambient *it*) does possess some referential value even if its referent is of a very general nature, in this case the 'environment' that is central to the whole area. Bolinger, however, points out the need to modify the notion of 'totality' in Chafe's definition, especially in view of the fact that the reference of prop *it* can be further specified and hence restricted, usually by the addition of an adverbial; cf.:

(4)   a. It is cold
         b. It is cold in here / outside / in the dark / at UCL

Thus, it is possible for prop (ambient) *it* to embrace less than the totality of the ambience, the restriction being either stated explicitly (as in (4)b) or contextually. The main difference between (4)a and b, Bolinger maintains, is however not so much the degree of ambience (encompassed by *it*) but the degree of obviousness involved, which often renders additional specification (by an adverbial) redundant. Compare, for instance, the following example of an implied adverbial, where *Kansas City* clearly contrasts with an unexpressed *here* (cf. Bolinger 1977: 80):

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5   Cf. however also Quirk et al's (1985: 349) slight modification: "This 'PROP *it*', if it has any meaning at all, refers quite generally to the time or place of the event or state in question". Later they maintain that it "has little or no semantic content" (op. cit.: 748).

(5)   God it's hot; I wonder if it's as hot as this in Kansas City

As pointed out by Bolinger (1977: 80), obvious ambience is not limited to expressions of weather and time, but is also to be encountered in connection with occasions, as manifested by event nouns. Cf.:

(6)   a. *It*'s her graduation (next week)
          b. *It* was the annual Moose picnic (at the park)

It is this obviousness of reference that makes it impossible to elicit further specification of prop *it* by using the interrogative pronoun *what?* (cf. **What is raining?*). This is true even for a case like (7)a below, where *it* could be replaced by *things* as in (7)b.

(7)   a. It seems to me that in the early sixties it was more fun
          b. It seems to me that in the early sixties *things* were more fun

In either case it would be judged inappropriate to ask *What was more fun?* as this would be asking the obvious; we are simply supposed to know (cf. Bolinger 1977: 80).

In Bolinger's view prop *it* is thus "a definite nominal with almost the greatest possible generality of meaning, limited only in the sense that it is neuter" (Bolinger 1977: 84).

3. Three definitions of anticipatory *it*

Given the basic dichotomy of prop *it* and referring *it* what exactly is the status of so-called anticipatory *it*? Although most grammatical descriptions seem to agree on an essentially forward-looking character of anticipatory *it*, opinions diverge considerably on the question of its precise syntactic and semantic status. Depending on the grammatical framework, anticipatory *it* (henceforth ANTIT) is placed in proximity to either prop *it* or referring *it*, or established as a more or less separate third category. In the following I will briefly look at the three basic definitions of ANTIT in turn, based on the discussion by Seppänen et al (1990).

3.1. Independent category ANTIT

One possible analysis is to set up an independent third category ANTIT, which is outside the dichotomy of referring *it* and prop *it* and takes the cataphoric (i.e. forward-looking) function of ANTIT to be an inherent property of the pronoun itself. This view seems to be implied in Curme's (1931: 10) observation that ANTIT differs from impersonal *it* in that it has "a little

concrete force, since it points to a definite subject". A similar view has also been detected by Seppänen et al (1990: 749-50) in the transformational analysis offered by Rosenbaum (1967) which derives the *it*-extraposition *It surprised us that Peter was ill* from the following underlying structure: 'It that Peter was ill surprised us'. In this way the embedded sentence, which is then extraposed to the end of the clause, is treated as a postmodifier of the pronoun *it*, similar to the *that*-clause postmodifying the NP in *The claim that Peter was ill surprised us*, which may be transformed to *The claim surprised us that Peter was ill*. From this parallelism of the deep structures Seppänen et al (1990: 750) conclude that ANTIT in Rosenbaum's framework has to be seen as having a function analogous to that of the article in the case of *the fact* + S, which is clearly cataphoric.

Such a view, however, which attributes the cataphoric or anticipatory function of ANTIT to the meaning of the pronoun itself, can easily be dismissed. As pointed out by Seppänen et al (1990: 751), there are various reasons for rejecting this analysis, the most convincing piece of evidence being provided by the extraction of elements from the *that*-clause by a fronting movement (topicalisation or *wh*-movement). They point out that if it were true that ANTIT had an inherently forward-pointing character, the example in (8)b should be impossible, as typical attributive clauses (cf. (9)) retain their island character even if extraposed from their complex NP (cf. (9)b, d). Examples like (8)b therefore show that the extraposed clause cannot be a detached postmodifier of ANTIT.

(8) a. **It** was ludicrous that John wanted to invite those Scottish girls to the party

$$\Rightarrow$$

  b. Those Scottish girls **it** was ludicrous that John wanted to invite **t** to the party

(9) a. The idea *that John wanted to invite those Scottish girls to the party* was ludicrous (non-extraposed) $\Rightarrow$

  b. **Those Scottish girls* the idea *that John wanted to invite* **t** *to the party* was ludicrous

  c. The idea was ludicrous *that John wanted to invite those Scottish girls to the party* (extraposed) $\Rightarrow$

  d. **Those Scottish girls* the idea/suggestion was ludicrous *that John wanted to invite* **t** *to the party*

While it might be possible to doubt the acceptability of a sentence like (8)b and therefore question the validity of this evidence, it still seems justified to dismiss the view of an inherently cataphoric ANTIT, as there is clearly no evidence that would support it (cf. also the lack of expectancy/anticipation of many instances of *it*-extraposition discussed in 7. below that provide evidence against an inherently cataphoric function of ANTIT).

3.2   Referential *it*

A second type of characterisation treats ANTIT as a special kind of referring *it*, with the difference that referring *it* is usually anaphoric (i.e. backward-looking[6]) while ANTIT is cataphoric, i.e. co-referential with the complement clause. Thus, the very fact that ANTIT is referential, i.e. presupposing an antecedent[7] to which it refers, accounts for its anticipatory force. The view of ANTIT as a referential pronoun is to be found, for instance, in Zandvoort (1962: 134), Visser (1963: 43) and Onions (1932: 142), who stipulates that ANTIT like referring *it* "represents definitely some noun or noun equivalent". The same position is taken by Emonds (1970, referred to in Jackendoff 1977: 67), who explicitly states that in a sentence such as *It was a pity that John was late* the pronoun *it* is co-referential with the post-verbal subject clause (cf. Seppänen et al 1990: 752). More recently, Quirk et al (1985: 349) seem to adopt a similar position when they state that ANTIT "is not quite void of meaning, since it arguably has cataphoric reference (forward coreference) to a clause ... in the later part of the same sentence". This characterisation, however, appears to contradict their earlier statement that "[e]ven less meaning can be claimed for the *it* which occurs as an anticipatory subject ... in clauses with extraposition" (ibid.), which places ANTIT in close proximity to the semantically empty prop *it*.[8] Moreover, it is not quite clear whether Quirk et al might not imply an inherently cataphoric function of the pronoun (of the type discussed in 3.1. above – as is claimed by Seppänen et al (1990: 749)) when they point out that the cataphoric reference of ANTIT can be justified by the feeling of ellipsis in sentences such as (10), which is like any ordinary *it*-extraposition except that the antecedent of *it* has to be supplied from the linguistic context (cf. Quirk et al 1985: 349):

> (10)   A: They lost the game
> B: Yes, so I hear. *Isn't it a shame?*

However, their example of a referring *it*, which parallels the use of ANTIT in (10), seems to suggest that this is not the case (cf. Quirk et al 1985: 348).

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6   Cf. however forward-referring uses such as the following: *When <u>it</u> arrived <u>the parcel</u> was completely damaged.*

7   The term antecedent is used here in the general sense of 'textual referent' which includes both anaphoric and cataphoric reference.

8   Cf. also Quirk et al's (1985: 1392) similarly contradictory footnote: "The *it* used in extraposition is called 'anticipatory *it*' because of its pronominal correspondence to a later item. But informationally, this is similar in effect to prop *it* ... which likewise enables us to end the clause at a focal point".

(11)   Many *students never improve. They get no advice and therefore keep repeating the same mistakes. It*'s a terrible shame.

3.3. Prop *it*

The third type of analysis, finally, identifies ANTIT as prop *it*, suggesting that just like the semantically empty prop *it*, it has the function of a meaningless dummy. The only difference lies in the fact that ANTIT is used together with a notional subject or 'subject proper'. This view has been proposed by Seppänen et al (1990) and seems to have been implied by Jespersen (1949, VII: 144), who refers to ANTIT as "dummy subject".[9] Although Seppänen et al (1990: 756) maintain that this analysis reappears also in Leech and Svartvik (1975: §756), this cannot be confirmed as Leech and Svartvik do not explicitly discuss this issue. It is true, however, that certain transformational accounts derive *it*-extraposition by moving the subject to sentence final position while leaving the subject position vacant, thereby creating a structure, (12)a, which is identical with subjectless sentences such as (12)b (cf. Langacker 1974: 11; Seppänen et al 1990: 756):

(12)   a. — was surprising that Peter was ill
        b. — was raining very heavily

The surface structures of both sentences are then derived by the same insertion rule (inserting dummy *it*), which implies identity of *it* in the two structures.

4. Evidence

Having discarded the first view of ANTIT, namely that ANTIT is an inherently cataphoric pronoun, there remain thus two essentially different analyses of *it* in extraposition, which identify *it* with either of the two categories of *it* discussed above: referring *it* and prop *it*. In the following I will briefly discuss the evidence presented for each of the two views.

4.1. Referential pronoun?

In an attempt to back up their view of ANTIT as being identical with prop *it*, Seppänen et al (1990: 753-54) first of all point out alleged weaknesses of an interpretation in terms of referentiality. Thus they claim that if *it* were

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[9] Cf. however also Jespersen's (1949, VII: 142) contradicting characterisation of ANTIT as "referring to something that follows", which parallels his definition of anaphoric *it*: "referring to something previously named".

referential it should alternate with (be replaceable by) the stressed pronoun *that*, which is used particularly with a sentential antecedent. This is in fact the case with antecedent/anaphor pairs as in (13)a and right-dislocated structures as in (13)b, but not – so they claim – in cases of extraposition, e.g. (13)c:

(13)   a. *I shut all the windows* but *it/that* didn't help
         b. *It/That* won't be easy - *to get a taxi to the station*
         c. *It/*That* won't be easy *to get a taxi to the station*

Although Seppänen et al argue that extraposition is not possible with introductory *that*, such constructions clearly do exist in spontaneous spoken language, as has been shown by Montgomery (1989). In his corpus of 45 hours of spoken American English, Montgomery found 31 examples of what he calls '*that*-extrapositions' as opposed to only 14 instances of *it*-extraposition. While his category of *that*-extraposition also includes constructions where a pause intervenes between matrix and complement clause and as such resemble patterns of right-dislocation[10], these represent only a small subtype – the rest have to be taken as clear-cut cases of extraposition even in Seppänen et al's terms.[11] This substitution test therefore has to be dismissed as not being able to provide conclusive evidence against the referential nature of *it*.

As a second test intended to reveal the lack of referential force of *it* Seppänen et al propose the replacing of *it* by *they* (or *those*) in sentences with plural pronominal reference such as (14):

(14)   a. **They* are two different things *to receive letters and to answer them*
         b. **They* are open questions *when he bought it and where he hid it*

According to Seppänen et al (1990: 754) these structures ought to be grammatical on account of sentences such as the following, where *they* is used to refer to a sentential antecedent.

(15)   *To speak French* and *to understand mathematics* are both important, but *they* are not the most important things in the world

The ungrammaticality of (14)a and (14)b is therefore interpreted by Seppänen et al as evidence against the referential nature of *it* – an observation which,

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[10] I.e. constructions where some constituent is deferred (dislocated) to the end of the sentence with its canonical position being filled by a pro-form (here: *it*), e.g. *It's very useful, this tool*.

[11] Moreover, as Montgomery (1990: 250) points out, none of the examples represent an afterthought, a communicative function often claimed for the dislocated element of a right-dislocation (e.g. Huddleston 1984: 451).

they say, is confirmed by the fact that (14)a and b are not easily repairable as instances of extraposition. Seppänen et al, in other words, take *they* as the plural equivalent of *it* and conclude from the ungrammaticality of a multiple extraposition construction with the undeniably referential *they* that *it* has to be non-referential for an *it*-extraposition to be grammatical. While it is questionable whether in a sentence like (15) *they* is really co-referential with the whole clause (cf. *What are not the most important things in the world? French and maths*) and at least (14)a is easily repaired as an extraposition (cf. *It's two different things to receive...*), Seppänen et al (1990: 753) themselves are forced to admit in a footnote that Channon (1980) is basically correct in pointing out that *they* (and *those*) is unable to replace referential *that* and hence cannot be taken as plural equivalents of *that*. Cf.:

(16)   Don likes *to ski* and *to skate*. Steve likes *that*/**them*, too

If *that* as an undeniably referential pronoun cannot be replaced by *they* or *those*, it would be wrong to conclude from the ungrammaticality of *they* in structures such as (14)a and (14)b that *it* is not referential.[12] It thus seems that the evidence produced by Seppänen et al is not sufficient for discarding an analysis of *it* in terms of a referential pronoun.

4.2. Semantically empty?

As for evidence adduced in support of their own analysis of *it* as a meaningless dummy like prop *it* (impersonal *it*), Seppänen et al (1990: 756) produce first the rather weak universalist argument that "in many languages – though not in modern English and its closest cognates – the English impersonal *it* and anticipatory *it* have no equivalent at all". A second piece of evidence is derived from the above mentioned test of replacing *it* by *that* or plural *they*, which has already been dismissed as not producing any satisfactory evidence. As a third piece of evidence intended to prove the meaningless status of *it*, Seppänen et al (1990: 757) make use of the coordination test (previously applied by Morgan (1968: 84)), which shows that in coordinated structures like in (17) and (18) with two occurrences of *it*,

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[12] Seppänen et al defend their line of reasoning by pointing out that in a sentence like (1) it is indeed possible to replace *that* by *those*.
(1) Either *you dropped the eggs* or *Bill stepped on them*. *Those* are precisely the sort of things that I know would happen
It seems, however, that here the acceptability of *those* is exclusively attributable to the special type of polar structure (*either...or*) and, moreover, does not present any evidence for the co-reference of *they* with sentential antecedents.

one anticipatory and the other impersonal (prop *it*), the second occurrence (*it* + copula) can be reduced (i.e. ellipted). Cf.:

(17)   a. *It* was 2 o'clock, and [*it* was] still impossible to know when they would come to relieve us

   b. *It* is snowing, and [*it* is] rather difficult to go on driving

(18)   a. At ten *it* was impossible to see anything, and at noon [*it* was] so dark that you needed a candle if you wanted to read

   b. *It* is difficult to continue and [*it* is] clearly too late for us to return

These facts of coordination indeed seem to suggest that ANTIT and prop *it* are if not identical, at least very similar, otherwise suppression of the second *it* would not be permitted. While there is no denying that the coordination test reveals a close similarity of ANTIT and prop *it*, it does not necessarily provide evidence for the assumption that ANTIT is devoid of meaning. In fact, Bolinger (1977: 82-83) uses exactly the same test to prove that ANTIT is essentially meaningful. Thus, while the coordination test clearly shows that ANTIT and prop *it* are more or less identical, the conclusions it allows to draw about the status of ANTIT depend on one's analysis of prop *it*.

   Moreover, the coordination test can also be used to produce evidence that lends support to a referential view of ANTIT, thereby disproving the approach suggested by Seppänen et al. Compare the following:

(19)   a. I kept driving. *It* was very difficult and [*it* was] clearly too late for us to turn back

   b. A: Have you heard of the bank robbery in London?
      B: Yes, *it*'s terrible, and [*it*'s] hard to believe they actually got away with it

   c. A: Have you heard of his adventure in New Zealand?
      B: Yes, *it*'s really frightening, but [*it*'s] good to know it all ended well

   d. In the evening we reached Drummnadrochit, which meant that we had almost reached our destination. Only *it* was snowing and therefore [*it* was] rather difficult - to drive up the last few miles to Inverness

   e. The situation changed from bad to worse. At 10 o'clock *it* was simply unbearable and [*it* was] still raining like mad

In the first three examples, (19)a-c, ANTIT is coordinated with referring *it*. Contrary to Seppänen et al's implications, these sentences are perfectly acceptable and thus show that the two *it*s involved must be equal in status. Incidentally, it is Seppänen et al themselves who explicitly argue for a referential analysis of the type of *it* contained in (19)b, referring to a clausal anaphora (cf. Seppänen et al 1990: 755). Moreover, examples (19)d and e

show that even prop *it* allows coordination with referring *it* (right-dislocations such as the one in (19)d are explicitly treated by Seppänen et al (1990: 753) as instances of referential pronouns, referring to the right-dislocand; cf. also: *It was snowing, and therefore rather difficult - the whole situation*). The coordination evidence provided by sentences as the above thus clearly undermines an approach which tries to identify ANTIT as a semantically empty dummy, since it would force a similar characterisation for cases where the referential status of *it* is beyond doubt.

5. Referentiality revisited

Rather than providing evidence for an analysis of ANTIT as semantically empty, the coordination test supports the view proposed by Bolinger (1977: 82; cf. also Bolinger 1970), who argues that prop *it*, ANTIT and referring *it* are not in fact three distinct morphemes, but all manifestations of the same *it*, which can be characterised as an abstract nominal with the meaning 'definite'. While conceding that the different instances of *it* are not all exactly the same, he nevertheless contends that "they are at least connected by a gradient too smooth for separation to be anything but arbitrary" (ibid.).

Such an analysis – unlike the one proposed by Seppänen et al – has the additional advantage of capturing the semantic similarity of structures such as in (20):

(20)   a. It's pleasant *to travel by bus*
         b. It's pleasant *travelling by bus*
         c. It's pleasant *the travel by bus*

In Seppänen et al's terms the *it* in (20)c would be crucially different from the ones in (20)a and (20)b, the former being referential, the latter two being semantically empty. Bolinger's (1977) view, on the other hand, allows to account for their obvious similarity by assigning to all of them the status of 'definite nominal', while the differences between them are taken care of by varying positions on a scale of gradience.

The scale of gradience linking (and distinguishing) the different uses of *it* (such as prop *it*, ANTIT, referring *it*) appears to be essentially determined by the scope of reference. It was already mentioned (cf. 2) that prop *it* in Bolinger's view has a referent of an extremely general nature, i.e. typically the 'environment' that is central to the area (cf. *It's raining, It's Sunday*). Moreover, this referent of prop *it* is so obvious that it defies any further questioning of the type **What's raining?*, **What's Sunday?*. It is possible, however, to somewhat narrow down the reference of *it* by adding an adverbial specification at the end: e.g. *It's cold <u>out</u>, It's late <u>now</u>*. This adverbial

specification may also take the form of a PP (*It's raining <u>in California</u>, It's a total mess <u>after a flood</u>*) or clausal constituent (*It's hard <u>once you try to do a job like that</u>*). Such a clausal structure is of course highly reminiscent of that of an *it*-extraposition (cf. *It's hard to do a job like that, It's hard doing a job like that*). This obvious structural similarity raises the question of where to draw the line separating ANTIT from prop *it*, or *it*-extraposition from superficially similar constructions. A useful test for determining whether the scope of reference is still of a very general and vague nature, as is typical for prop *it*, or whether the pronoun has the more clearly and narrowly defined reference of an ANTIT, delimited by the scope of the extraposed complement clause, (i.e. distinguishing adverbial from subjectival referents) is the use of the interrogative pronoun *what?*. If the answer to a question introduced by *what* is not possible or of an exceedingly general nature as in (21) below, the pronoun represents a prop *it*. If, however, the answer corresponds with the extraposed element, as in (22), the *it* can justifiably be taken as anticipatory, its scope of reference being more narrowly defined by the extraposed subjectival clause.[13] Despite this fairly clear boundary separating the 'environmental' reference of prop *it* from the more narrowly defined reference of ANTIT, a certain degree of 'fuzziness' is introduced by adverbials restricting the wide reference (in Bolinger's sense) of prop *it*, as in examples (21)b, c, d, e below.

(21)

a.	It's snowing	→	*What's snowing?
b.	It's late *now*	→	What's late? *Now
c.	It's hot *in California*	→	What's hot? *In California
d.	It's a total mess *after a flood*	→	What's a total mess? Things are (*After a flood)
e.	It's hard *once you try to do a job like that*	→	What's hard? Things/Life/... (*Once you try to do a job like that)

(22)

a.	It's hard *to do a job like that*	→	What's hard? To do a job like that
b	It's hard *doing a job like that*	→	What's hard? Doing a job like that

A further degree of fuzziness is introduced by *when*-clauses with their intermediate status between extraposed subjects and adverbials. Some of them satisfactorily answer a *what*-question (cf. (23)a) whereas others do not (cf. (23)b).

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[13] Obvious exceptions to this general rule are the matrix clauses *it seems, it appears* which do not allow questioning of their extraposed complement clauses.

(23)

a.   It's not clear *when she disappeared*

→   What's not clear? When she disappeared

b.   It's easy *when you try hard enough*

→   What's easy? *When you try hard enough

Unlike (23)a, where the *when*-clause has subjectival status (and can therefore take non-extraposed position), the *when*-clause in (23)b represents an adverbial specification with no direct (co-referential) link to *it*. This independence of *it*, as well as its generality of meaning, can be demonstrated by the possible substitution of a noun with a similarly wide reference, e.g. *things*: cf. *Things are easy when you try hard enough*. Moreover, any attempt at determining the precise status of *it* will have to take into account the context of an utterance, which can help 'disambiguate' the potentially 'ambiguous' status of a sentence as the following:

(24)   It's difficult when there is no one there to help you

Depending on the context (24) may either have the interpretation 'Life is / Things are difficult when there is no one there to help you', or 'The fact of no one being there to help you is difficult to cope with'.

On the other end of the scale of gradience which determines the status of *it*, the reference of *it* is narrowed down from a clausal (verbal) concept (expressing some state-of-affairs) to that of an NP (i.e. a 'single' referent). Compare:

(25)   a. It's amazing *that John decided to leave the country*
         b. It's amazing *the things he does*
         c. It's amazing, *his determination*

The *it* in (25)b and (25)c represents what is commonly understood to be a referential pronoun (cf. e.g. Quirk et al 1985: 1310) with a clear referential link to the sentence final NP. In the case of (25)b, however, this referential connection could be argued to be somewhat weaker than in (25)c due to the lack of number agreement with the postponed constituent (cf. also Huddleston 1984: 452). There is, no doubt, a very smooth and subtle transition from so-called ANTIT to so-called referring *it,* which makes it difficult to determine the exact boundary separating *it*-extraposition from a closely related construction such as right-dislocation. Compare the following:

(26)   a. It's a bit of a nuisance *to decorate the room*
        b. It's a bit of a nuisance *decorating the room*
        c. It's a bit of a nuisance *the decorating of the room*
        d. It's a bit of a nuisance *the decoration of the room*

The overlap of *it*-extraposition with right-dislocation (cf. also the terms 'clarification of reference construction', 'amplificatory NP tag') is already noticeable in the *ing*-clause, (26)b, which according to Quirk et al (1985: 1393) has "just as much affinity with a noun-phrase tag ... as with a genuine extraposed subject". This borderline status of extraposed *-ing* clauses is also mentioned by Huddleston (1984: 316), who notes that "native speaker judgements are not uniform" on the question of whether certain gerundial constructions are acceptable as extrapositions. Even more obvious is the ambiguity with single, unexpanded *-ing* forms, such as *rollerblading, studying, overtaking* (cf. *It's fun rollerblading*). Despite their intermediate status between nouns and verbs (cf. e.g. Quirk et al 1985: 1065, Esser 1994: 25), these "naked" (Esser 1994: 25) *-ing* forms are here taken to be closer to NPs and therefore considered outside the class of *it*-extraposition, representing instead instances of right-dislocation (cf. Kaltenböck 1998 for a more detailed discussion of the distinction between *it*-extraposition and right-dislocation).

    While noun phrases as in (26)c and d are generally taken to be outside the class of extraposition – representing instances of right-dislocation (clarification of reference construction), Huddleston (1984: 452) draws our attention to a special type of NP, illustrated in (27) with examples from the International Corpus of English (ICE-GB) (cf. also (25)b above), that suggests an analysis in terms of extraposition:[14]

(27)   a. It's amazing the way she's so quick at picking up the music (S1A-091-332)
        b. It's amazing the number of German theologians that sided with Hitler
           (S1A-053-196)

The NPs in these examples are of the form '*the* + N... + relative clause'. Since they are semantically close to subordinate interrogative clauses, cf.: *how quick she is at picking up the music, how many German theologians sided with Hitler*, they may still be included in the class of extraposition. It is examples

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[14] The same point is made by Jespersen (1949, VII: 147), who states that apart from the usual cases of finite clause, infinitive or *-ing* clause "any group of words may be represented [by anticipatory *it*]; chiefly, however, in such a way that the group is the equivalent of a clause".

such as these and the gerundial clauses above that illustrate the fuzzy borderline between extraposition and right-dislocation.

The scale of gradience sketched out for *it* can be summed up in the following diagram and is further illustrated by the examples (28) below:

Type of *it*:	PROP *IT*	ANTIT	REFERRING *IT*
	'wide reference'		'narrow reference'
Type of reference:	environment (+ possible adverbial restricion)	state of affairs (clausal concept)	'single' entity/referent (NP)
Scale of gradience:			
Examples:	a, b, c, d	e, f, g, h, i	j, k

(28)   a. *It*'s raining / cold / snowing
b. *It*'s cold in here / out / at UCL / in the dark / down there / in California
c. *It*'s a total mess after a flood
d. *It*'s hard once you try to do it well

e. *It*'s not much fun when you have to work all the time
f. *It*'s tough to make him understand
g. *It*'s interesting that John went to London
h. *It*'s nice sitting around and talking
i. *It*'s amazing the amount of beer he puts away

j. *It*'s amazing, his determination
k. He bought a book but left *it* in the shop

Thus it is possible to place all the various instances of *it* on a scale of gradience which distinguishes different types of reference: at one end (prop *it*), *it* has an extremely wide scope of reference which typically allows the substitution of *things* (cf. *things are easy when you try really hard*), but may be even more general than 'things', embracing the weather, time, circumstance, "whatever is obvious by the nature of reality or the implications of context" (Bolinger 1977: 85). At the other end (referring *it*), the scope of reference is very tightly restricted to a specific entity or referent and hence more focussed, which considerably enhances the referential force of the pronoun. ANTIT takes a middle position between these two poles with the scope of reference being somewhat wider than for truly referential *it* but lacking the generality of reference associated with prop *it* and thus still allows questioning of the extraposed concept by *what?*.

6. Reference direction

The scale of gradience sketched out above (cf. 5) corresponds with Bolinger's (1977: e.g. 87) view that all the uses of *it* stem from a common semantic base, which is essentially that of a referential pronoun, albeit with varying degrees of reference, pointing to some kind of antecedent. While Bolinger seems to imply that this common referential character is always, in principle, anaphoric (i.e. backward-looking), it is more likely that the direction of reference is not necessarily fixed and may just as well be cataphoric, since it is possible for right-dislocations as well as *it*-extrapositions to be uttered 'out of the blue', i.e. discourse-initially, with no previous context being able to provide an anaphor. Cf.:

> (29) # Good morning. It is a great pleasure for me to announce Annie Lennox

It is more plausible to assume that while all uses of *it* retain (as a kind of smallest common denominator) the character of a "definite nominal" (Bolinger 1977: 84), and hence a potential referential function, the exact type (scope) of reference, and its direction (i.e. whether anaphoric or cataphoric) is essentially determined by the context. In other words, it is the (linguistic and extralinguistic) context that shapes the referential force attributed to *it*, determining not only the referential direction but also expanding or contracting its scope of reference (e.g. reference to an entire state-of-affairs or single referent). The following example illustrates this contextual influence on the reference of *it*. The sentence *It's difficult when there is no one there to help you* can be interpreted as *it*-extraposition with the meaning of 'having no one to help you is a difficult situation to cope with', i.e. *it* referring to the extraposed complement clause (alternatively also as prop *it* with the meaning *Life is difficult / Things are difficult* – see (24) above). However, the same sentence in response to *Why don't you finish your work?* is more likely to refer to 'the work' or 'the act of finishing the work'. The *it* is always essentially the same. What changes is the context and hence the availability of anaphors with which the pronoun may establish a referential link. Similarly, in the case of a so-called ANTIT the anaphor 'attracting' the pronominal reference is an entire clause (*-ing* clause, *to*-infinitive, *that*-clause), while with so-called referential *it*, it is usually an NP, which is responsible for a 'narrower' scope of reference and can be seen as having the effect of focussing and thereby enhancing the referential link. This view does not contradict Bolinger's (1977: 83) view that ANTIT is a fairly independent lexical item and not a direct copy of the extraposed complement. If ANTIT

does not copy extraposed nominals, the complement clause can still be seen as attracting the referential force of *it*.

The view of ANTIT proposed here can also explain the "undoubted feeling of expectation of the logical subject" detected by Seppänen et al (1990: 758) for *it*-extraposition. While it is no doubt true that *it*-extrapositions may exhibit a certain 'anticipatory force' (which Seppänen et al associate with the valency of the matrix predicate (Seppänen et al 1990: 759-60) since in their view ANTIT is nothing but a dummy element) it has to be pointed out that this need not necessarily be the case as, for instance, when the extraposed complement clause conveys already 'given' (i.e. retrievable) information, or is omitted altogether. Cf.:

(30)   A: John didn't come to the party
        B: It's a shame *he didn't come* / It's a shame *he didn't* / It's a shame Ø

Clearly, the lack of 'expectation' here cannot be attributed to the matrix predicate[15] but is the result of the preceding context, which has already satisfied the referential force of *it* by providing a suitable antecedent. In contrast, if the sentence *It's a shame [John didn't come to the party]* were uttered out-of-the-blue with no preceding context (e.g. initiating a conversation) the matrix clause without the complement clause would certainly be felt to be incomplete, since the 'anaphor slot' is left unfilled.

It is obvious that Seppänen et al's (1990) approach of viewing ANTIT as a dummy element devoid of meaning cannot satisfactorily handle sentences such as the ones in (31).

(31)   a. A: They lost the game
           B: Yes, so I hear. *Isn't it a shame*

        b. A: Where did you first meet her?
           B: *It must have been here*

The B-sentences in (31)a and (31)b are described by Quirk et al (1985: 349) as ordinary *it*-extrapositions derived by ellipsis of the complement clause, the antecedent of *it* therefore being provided not by the complement clause itself but by the preceding context. Instead of treating the instances of *it* in (31) as ANTITs, Seppänen et al are forced to analyse them as regular anaphoric pronouns (of the type *Where is my book? I can't find it*) since they clearly

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[15] Only a small number of matrix predicates can justifiably be said to create a 'feeling of expectation'; e.g. *it seems, it appears, it's worth, it turns out, it happens*. These are special in that they represent highly grammaticalized matrix clauses with parenthetical function which always introduce a 'new' (irretrievable) complement clause and are therefore near the prop *it*-end of the scale.

cannot be taken as semantically empty dummies. Consequently, the B-sentences do not represent extrapositions. Such a view, however, fails to capture the obvious similarity of sentences such as in (32)a and 'complete' *it*-extrapositions, a similarity which is emphasised by the existence of extrapositions with pronominal complements, (32)b, and extrapositions whose complement clause is a verbatim repetition of previous material and thus, strictly speaking, redundant. Compare:

(32) a. A: They lost the game
         B: Yes, so I hear. It's a shame Ø

      b. A: They lost the game
         B: Yes, so I hear. It's a shame *they did*

      c. A: They lost the game
         B: Yes, so I hear. It's a shame *they lost the game/it*

Both (32)c and especially (32)b – termed here 'given complement extrapositions' – are by no means rare exceptions, but figure prominently in the one-million-word ICE-GB corpus (i.e. the British component of the International Corpus of English; 321 instances in spoken, 163 instances in written) and have also been noted by Erdmann (1990: 127-28), who points out that so-called anticipatory *it* "can also be anaphoric. This involves a previously mentioned element of the text being taken up by *it*, and repeated word for word or summarised in the same sentence".

It is sentences as the ones in (32) with their undeniable similarity that reveal the dilemma of an analysis which insists on a non-referential view of ANTIT. Clearly, what describes the situation most accurately is not so much a switch from referentiality (in (32)a) to non-referentiality (in (32)b and (32)c), but a simple change of reference direction. The difference between an 'ordinary' *it*-extraposition and (32)a or (32)b and (32)c thus is not determined by a different status of the *it*, but by the respective contexts and informational value of the complement clause, both of which may provide the antecedent with which the pronoun, owing to its definite character (cf. Bolinger 1977), establishes a link. The referential link of *it* may therefore be both forward-(cataphoric) and backward-pointing (anaphoric). The equal status of both instances of *it* can also be demonstrated by way of the coordination test applied in 4.2. above. Cf.:

(33)   A: John's not coming to the party
         B: Really? *It*'s a shame, and [*it*'s] rather annoying that he didn't tell us before

Moreover, it is worth pointing out that such a switch of referential direction is by no means uncommon, as can be seen, for instance, with cases of left- and right-dislocation. Cf.:

(34)   a. *This book*, *it*'s really fascinating (backward reference)
         b. *It*'s really fascinating, *this book* (forward reference)

The close similarity of *it*-extrapositions with omitted complement clause and 'complete' *it*-extrapositions is also illustrated by the following text passage from the ICE-GB corpus, where the reference of *it* is taken for granted by speaker A (hence the complement omission) and further specified only after the intervention by speaker B.

(35)   B: You are such a plonker No plonker isn't the right word
         A: What does *it* matter
         B: What does what matter
         A: What does *it* matter *what the right word is*
            (S1A-085-343)

Sentences of the type illustrated in (32) above thus remind us not only of the necessity of having a concept of gradience for referentiality (cf. 5), but also emphasise the need of introducing the additional parameter of 'direction of reference'.

While with 'new complement extraposition' the direction of reference is clearly and unambiguously cataphoric, the situation is somewhat less clear with 'given complement extraposition' where the pronoun, theoretically speaking, allows a referential association with both the extraposed complement clause and some previous material (repeated in the complement clause). This possibility of a 'double reference' is especially noticeable with *it*-extrapositions whose complement clause consists of a verbatim repetition of a previously expressed concept or a pro-form. However, in most cases the forward-pointing reference can be taken as dominant due to the co-occurrence of pronoun and antecedent (i.e. the complement clause) within the same syntactic unit and often within the same tone unit. Moreover, the very fact that already 'given' material is added in the form of a complement clause seems to suggest that a possible anaphoric link of the pronoun has not been successful or is at least judged problematic by the speaker. The direction of reference is again unmistakably clear in the case of complement omission where the pronoun assumes the function of what is traditionally referred to as referring *it* with anaphoric reference and as such takes a position on the far right of our scale. In this particular function *it* is therefore interchangeable

with the pronoun *that* (cf. e.g. *That's amazing*), as is indeed true for all *it*s introducing 'given complement extraposition', while such a substitution is usually deemed unacceptable with 'new complement extraposition' (cf. however *that*-extraposition as discussed by Montgomery 1989). The reason seems to be that *that* is predominantly anaphoric in its function (as well as more 'definite'), whereas *it* is more neutral in this respect allowing both cataphoric and anaphoric 'ties'.[16] In the ICE corpus we find several examples which display speaker indecision with regard to the choice of backward pointing *it* or *that*. Cf.:

(36)   a. B: I mean I think *it* is uh *that*'s quite true (S1B-039-105)

     b. B: I mean four of the five sabbaticals were missing
       A: *That*'s irrelevant
       B: *It* isn't irrelevant
         (S1A-068-160)

7. ANTIT omission

The varying referential functions of ANTIT also seem to have an impact on the ease with which ANTIT may be suppressed. Bolinger (1977: 73), in fact, hints at a possible correlation between information status (equated with syntactic type) of the complement clause and deletability of ANTIT. He claims that with a *that*-clause, which according to him typically represents the 'comment' (i.e. irretrievable information) of the *it*-extraposition, the motivation for ANTIT is weaker – in contrast to an extraposed *to*-infinitive, which in his view is usually the 'topic' (i.e. retrievable information). While it has been shown that there is no neat correlation of information status and syntactic type of the complement clause (cf. Kaltenböck 1998), the possibility of *it* omission does indeed appear to depend largely on the information status of the extraposed complement clause. Bolinger hypothesises that an ANTIT which stands in for a (typically irretrievable) *that*-clause (and is therefore also less known) is more easily dispensable since it does not fit in with the Functional Sentence Perspective (FSP) principle of 'given-before-new'.[17] However, it is more likely that the necessity of explicit mention is reduced for

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[16] Cf. Bolinger's definition of ANTIT as "a 'definite' nominal with almost the greatest possible generality of meaning, limited only in the sense that is is 'neuter'" (Bolinger 1977: 84).

[17] Bolinger (1977: 73) is not very clear on the exact relationship between FSP and *it* omission.

an *it* with (the possibility of) an anaphoric link (i.e. given complement extraposition) since this appears to be the default type of referential direction for a pronoun. On the other hand, the more unusual cataphoric reference direction always requires explicit presence of the *it*. Compare, for instance, the examples of 'given complement extraposition' in (48) below, where no *it* is needed to link the comment (i.e. *difficult, strange*) to the state-of-affairs being commented on (i.e. the topic; *him reading 3 books in one day*), while the necessity of a 'placeholder' pointing to some topic to be newly introduced in the discourse is clearly demonstrated by the unacceptability of (38)a, b.

(37)   a. A: He read 3 books in one day.
       B: ∅ Easy *to do that*

       b. A: He read 3 books in one day.
       B: ∅ Strange *to do something like that*

       c. A: He read 3 books in one day.
       B: ∅ Strange *that he did something like that*

(38)   a. # ??Easy to play tennis
       b. # ??Strange John has to go to London

The acceptability of the sentences in (37) contradicts Bolinger's claim that *to-*infinitives do not allow the elision of *it*.

The view that 'given complement extrapositions' are more prone to elision of *it* is also in line with the functional analysis of the two types: while 'new complement extraposition' is characterised by the end-focus principle (cf. Quirk et al 1985: 1357), the governing functional principle of 'given complement extraposition' is that of 'first-things-first' (Givón e.g. 1983: 20), and in this function 'given complement extraposition' can easily dispense with any element of low informational value preceding the highly informative matrix predicate.

The analysis proposed here is also supported by the following examples of *it* omission from the ICE-GB corpus (cf. (39)), where the complement clause is clearly retrievable from the preceding context, as well as by the examples of ANTIT + operator ellipsis listed by Quirk et al (1985: 898) (cf. (40)) – all of which presuppose a context in which the complement clause is retrievable (i.e. given complement extraposition).

(39) a. [2 friends talking about a night club]
         A: ∅ Something like six quid *to get in* as well isn't it
            (S1A-099-353)

      b. A: Yeah
         B: ∅ Probably worthwhile *doing that* I think
            (S1A-035-86)

(40) a. ∅ Good *to see you*
      b. ∅ No wonder *she's late*
      c. ∅ (A) Shame *he's late*
      d. ∅ Odd *he won't help us*

8. Conclusion

In this paper I have tried to throw some light on the syntactic status of anticipatory *it*, a label commonly used by modern grammars but not given a clear, uncontradictory definition. First, various analyses of ANTIT were discussed and it was pointed out that neither the approach which takes ANTIT to have inherent cataphoric function, nor the view – proposed by Seppänen et al (1990) – that ANTIT is a meaningless, semantically empty dummy element are tenable. Instead, I adopted and slightly modified Bolinger's (1977) position according to which the *it* of an extraposition is a 'definite nominal' retaining at least some of the referential force of a referring *it* which allows to establish a referential link with some clausal constituent in the context. It is related to other types of *it* (prop *it*, referring *it*) by a scale of gradience which specifies the scope of reference (narrow vs. wide). Such a view of ANTIT has the advantage of not only capturing obvious similarities between the *it* in extraposition and related constructions (e.g. forms of right-dislocation, adverbially modified prop *it*s) but also accounts for borderline cases, i.e. *it*s with an intermediate status between prop it and ANTIT, or ANTIT and referring *it*.

   With the referential link of ANTIT being essentially determined by the linguistic and extralinguistic context, the exact reference of ANTIT is also influenced by the information status of its complement clause (i.e. the extraposed clause). In the case of so-called 'given complement extraposition', viz. an extraposition whose complement clause expresses a retrievable state of affairs, it can even be argued that the discourse function of this type of extraposition is precisely that of ensuring (in the form of a 'safety-belt device') the correct referential linking of ANTIT with its intended contextual referent, thereby enabling the correct processing of the comment expressed in the matrix predicate.

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Brain activity during foreign language processing: comparing students of English and students of other disciplines.[1]

Susanne Reiterer

1 Introduction and theoretical background

To put it in a nutshell, the whole question of this investigation is, whether there are different mental strategies at work in "good" versus "bad" language comprehenders, and whether we are able to capture their thinking-processes with a brain-imaging technique right at the time when they are trying to understand a text spoken in a foreign language, which is in this case English.

Generally speaking, human language processing has been associated with specific temporo-parietal areas (language-specific areas) of the left hemisphere. But the narrow view of the localistic theories of the left hemisphere as being mainly or solely responsible for the processing or generating of language has long been abandoned. Holistic theories which focus on the cooperation of the hemispheres and areas of the whole brain are replacing stricty localistic viewpoints. It is, however, not yet clear which role the right hemisphere plays in language processing and how areas cooperate over the whole brain when they are engaged in a language task.

The idea that the human language capacities are "situated" in the left hemisphere, goes back to French physician MARC DAX.

In 1836 Marc Dax was the first to observe that language and speech disorders only followed damage to the left and never to the right side of the brain. He concluded that each half of the brain must be responsible for different functions, postulating that the left hemisphere controls language. His theory, however, was not accepted until 1861, when PAUL BROCA, another French neurologist, described the case of a patient who could understand but not articulate language. (But he could sing!) This patient had a well-defined lesion in a part of his left frontal cortex (= the so-called Broca's Area). This

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[1] This contribution provides a short description of my dissertation project in the field of Cognitive Neuroscience, which establishes a link between Linguistics and Neurophysiology, amongst various others.

and other similar findings lead Broca to the following, now famous, utterance, "Nous parlons avec l'hemisphère gauche!".

The third famous neurologist who observed and described deficits of language-understanding as a result of damage to a different area (different from that of Broca) of the left hemisphere was CARL WERNICKE.

1.1 Hemispheric interaction and the "right/left-debate"

The classical WERNICKE-GESCHWIND Model of language representation in the brain is in a form still valid today and used as a valuable tool in the classification of different kinds of aphasias. It describes the pathways of language processing and ascribes them entirely to areas in the left hemisphere. In the last 100 years of empirical research on the brain, the theories and viewpoints concerning the representation of language in the brain, or simply, brain organization on the whole with respect to simple and higher cognitive functions, have changed several times alongside the introduction of new methods of investigation and the development of new interdisciplinary branches of science. Although already proposed around 1870, the role of the right hemisphere in language processing was neglected until a few decades ago. In 1870 the British physician JOHN HUGHLINGS JACKSON found that the inactivation of the right hemisphere causes a monotonous, affectless character of the patient's speech together with the inability to regulate the voice according to the degree of the situational emotivity. In this situation, where the left hemisphere "talks alone", the patient shows greater talkativeness, because the language act is not controlled or regulated by the right hemisphere. Thus, a person with a disorder in the right hemisphere understands the denotational meaning of what is said, but fails to recognize, whether it is spoken in an angry, sad or humorous way.

In contrast to that, a patient with a damaged left hemisphere will neither comprehend what is said, nor be able to produce coherent, intelligible speech, but will still be able to comprehend and produce the emotional tone. Jackson regarded the two hemispheres as controling or 'helping' each other in that they complementarily work together on the language input and output. ROMAN JAKOBSON (1980) praised the work of Jackson with the words,

> One might recall that over one hundred years ago scientific intuition enabled the sagacious J.H. Jackson to assign the intellectual language to the left and the emotional language to the right hemisphere. (Jacobson 1980)

These findings are compatible with those made a hundred years later by the neurologist NORMAN GESCHWIND.

Generally speaking, one can say that through the ever increasing research on the brain, the vital role of the left hemisphere for language has been consolidated to such an extent that it came to be called the "dominant" hemisphere. As a consequence of this, the right hemisphere has been neglected for a long time until from the 1970s onwards research was able to show that also the right hemisphere is engaged in language processing. However, the role of the right hemisphere within that is not yet clarified. Some people say what the right hemisphere does with language is not linguistic, but paralinguistic. There is still an ongoing debate about that.

Within the last 20 years of research in this field a notable degree of neurolinguistic sophistication has been attained beyond the stereotype that (right-handed) humans are strongly lateralized for language in their left hemisphere.

Although language production is attributed to the left hemisphere, it is now less controversial to acknowledge that the right hemisphere processes certain language comprehension abilities. At this point I want to draw your attention to the fact that language production is scarcely investigated in normal persons !

The reason for the lack of research here is a technical-methodological one. With almost all of the non-invasive brain-imaging methods (like **EEG, MEG**-magnetoencephalography, **fMRI** – functional magnatic resonance imaging) it is not possible for the subjects to execute body or face movements during the investigation, because of the great risk of muscle-artifacts. (The only exception to this is the **PET**-scan – positron emission tomography – where utterances of words and sentences have been investigated. But also with this method movements must be controlled with great caution)

1.2 Meaning and the right hemisphere

In addition to the emotional aspects of language, an increasing amount of evidence suggests that the right hemisphere contributes also to the comprehension of semantic relations (Christine Chiarello, 1997).

The superiority of the right hemisphere with respect to SPATIAL ORIENTATION is well documented in the neuropsychological literature. The whole notion of spatial imagination in visuo-spatial tasks and GESTALT PERCEPTION is linked to the right hemisphere.

Some cognitive theories of language (e.g. LAKOFF) stress the importance of the spatial relationships within and around our body as the basic underlying mechanism of how we conceptualize our world. This kind of spatially-oriented thinking or 'feeling' is reflected in the semantic relations and meta

phoric expressions of our language. From this point of view it seems to me very appealing to interpret right hemisphere activation during a specific language task as semantic processing by using spatial imagination.

The difficulties which arise from dealing with the Language-Brain interface, can in part be attributed to the fact that language is not a simple, rudimentary or basic cognitive accomplishment, one that could neatly be located in the brain, but a rather complex and intricate cognitive system, which comprises an interplay of various aspects, like, perceptual, mnemonic and motor processes. Some of these processes may be served better by the left hemisphere and others by the right, or even by the simultaneous cooperation between both hemispheres. Thus the whole brain could contribute to language processing.

1.3 Is LOCALIZATION the only key to brain organization?

> During human language processing numerous distributed cortical and sub-cortical neuronal systems are activated which have to cooperate according to the task demand. Neurobiological findings show that neurons or neuronal assemblies which are likely to perform a task synchronize their discharges whereas neurons which are engaged in another task do not. (Weiss - Rappelsberger 1998)

The idea that not only the localization of functions in the brain is important, but also the exact temporal activation patterns at a given point in time, is stressed by neurobiologists like, for example, Wolf Singer, Andreas Engel, Michael Merzenich, among others. The concept is called: "TEMPORAL BINDING".

Roughly speaking, it states that those neuronal assemblies which are engaged in a task can cooperate with other neurons for the fulfillment of this task by being 'active' (releasing electric discharges) at precisely the same moment in time. In this way special activation patterns can be achieved, which are characteristic of and needed for the performance of certain cognitive tasks. For the investigation of such activation patterns the EEG together with its computerized methods of analysis is an interesting research-tool.

2 Methodology

2.1 The EEG

The knowledge of electric currents continuously produced by the brain goes back to the past century. Richard Caton (1875) discovered such currents in monkeys and rabbits. However, with the tools available at the time, not more than their presence could be established. Their existence in man was proved in 1929 by Hans Berger, who was the first to record them from the intact human scalp. (A good overview about the EEG can be found in H. Petsche, 1998).

Activated nerve-cells of the brain generate electric signals, the so-called action-potentials of postsynaptic electro-chemical processes. With the application of 19 metal electrodes (standard procedure) which are glued to the scalp (or attached to the scalp by means of an application-cap) according to an internationally agreed positioning system (the so-called "10/20-system") the oscillatory activity of the cortex ("brain waves") is recorded. During registration, oscillations are amplified, filtered, digitized and then, after the recording, inspected for artifacts and analysed further.

2.1.1 Methods of analysis

Roughly speaking, there are two distinct ways in which the raw data of the recorded EEG can be further analysed. That is either by looking at the TIME characteristics of quickly changing local activities (comparable in one way to a reaction-time study paradigm) or at the FREQUENCY characteristics of the spontanuous EEG activity of all electrode positions during a "longer" period of time (e.g. 2 minutes). The first method is called the study of the "ERP's" (> Event Related Potentials), whereas the second method (the one I am dealing with) is called "SPECTRAL ANLYSIS", or more specifically "COHERENCE ANALYSIS". The frequency range to be investigated with Spectral Analsysis in these experiments dealing with human cognition, normally ranges from approximately 1 to 32 Hz. Hertz is defined by oscillation per second – so, if you have 8 oscillations per second you get the very characteristic and famous Alpha-Rhythm. In this study the different frequency bands have been subdivided according to the following classification:

0,5 – 3,5 Hz   (Delta)
4,0 – 7,5 Hz   (Theta)
8,0 – 10,0 Hz   (Alpha 1)   +   10,5–12,5 Hz   (Alpha 2)
13,0 – 18,0 Hz   (Beta 1)   +   18,5 – 31,5 Hz   (Beta 2)

Each frequency-band reflects the activity generated by a different mental state of arousal. "Slow waves", that are oscillations within the frequency range of the Delta or Theta band reflect a sleeping condition or a condition of deep relaxation. If a person is awake and shows this kind of oscillations, it can demonstrate pathological disorders of the brain. Traditionally speaking, the Alpha rhythm reflects that the person is in a relaxed condition.

The Beta range indicates mental or cognitive involvement in a task, as is the case in language processing. These frequency ranges are then closely inspected, one after the other. If two electrodes (the underlying cortical area) oscillate within the same frequency range at a given point in time,(e.g. 2 minutes of watching and listening to news in English) then these two parts of the brain are said to cooperate for performing this task. It is this COOPERATION of two different areas of the brain which is called "COHERENCE". If coherence is high between the EEG-signals of two electrodes positioned on the scalp, there is an increased functional interplay between the neuronal assemblies generating those signals. If coherence is low, the functional interplay between them is low! Coherence ranges from 0 – 1 and is expressed by a coherence-coefficient.

Two components of these electric oscillations can be measured:

A. Changes in AMPLITUDE (power changes) which mean either an increase or a decrease in amplitude of the generated oscillations at a single electrode place. These amplitude changes describe the more local changes in the electric activity of the underlying neuronal networks.

B. The second component is the above mentioned COHERENCE between two EEG-signals and their respective underlying areas.

2.2 Experimental design and general procedure

The two groups of students under investigation consist of 38 German-speaking, right-handed, female students between the age of 20 - 30 years. There are 19 students in each group.

The first group is the one of the "experts", the "English students". They are volunteers studying English Language and Literature at the University of Vienna at an already advanced level ("2. Studienabschnitt"). They are assumed to be "good language learners" with regard to English as a second

language, having a profound knowledge of the English language and good comprehension skills, because English is the very subject and medium of their studies.

The control group is the "lay-persons"- group. There are students of various disciplines, except language studies (most of the students of this group study medicine or psychology). They all have basic or intermediate knowledge of English because they learned English at school and had to do an English-exam to pass their A-levels, but their level of proficiency is clearly lower compared to that of the English-students. They certainly lack particular language comprehension skills which the language students have acquired or accumulated during the course of their studies. The most important criterion for inclusion in this group is that the students have not developed their English-skills anymore in a decisive way since their school-leaving examinations.

2.2.1 Questionnaires

Prior to the investigation all the subjects are asked to fill in two questionnaires. The first one is a "Curriculum Vitae" about their personal experience with English as a second language and the amount of "exposure" to that language. The second questionnaire controls for handedness, which is a crucial factor in the cerebral organization of language.

2.2.2 Stimuli

After the electrodes have been placed on the scalp, the participants are seated in the dimly lit, sound-reduced experimental room to watch a series of video-taped sequences of TV-news. The stimulus-video has a length of 30 minutes (in total) with the single language and control sequences having a mean length of 2 minutes.

The text sequences are video-taped recordings of TV-news or parts of TV-interviews spoken by male speakers in a monologue fashion. Each text covers a different topic of public, political, social or scientific life. The speech sequences are presented in British English, American English and Austrian German respectively. (The texts were recorded from CNN, NBC, BBC and ORF). Within the three language blocks, the form, i.e. the modality of presentation is modulated. In each language block, again three different situations of speech are presented.
1. One sequence is a normal TV-picture with a person speaking (the input-modality is visual + auditive).

2. One sequence is presented without the voice of the speaker, so that the students can see and watch the speaker gesticulate while talking, but don't hear what he is saying (the input modality is VISUAL only; the students are watching articulation, mimicry and gestures).

3. The third kind of sub-sequence is the presenting of a spoken text via earphones with no picture of the speaker on the TV-screen. (The input modality is only AUDITIVE; the students are listening to a spoken text, while looking into the blank screen.)

These three language blocks together with the control sequences are shown to the students in randomized order.

Here is an example of the table of contents of such a stimulus video-cassette:

Block A   British English

1) John Cleese ("How to irritate people"; vis. + aud.)	(3' 15)
2) Control sequence (grey flickering TV-screen)	(1' 30)
3) About South Africa (acoustic only)	(3' 00)
4) Chris de Burgh, interview (visual only)	(2' 30)
5) Control sequence (looking at a black point)	(1' 30)

Block B   American English

1) Control picture ("grey flickering")	(2' 20)
2) Senator Baker about Clinton (CNN; visual + aud.)	(2' 40)
3) Looking at a black point	(2' 05)
4) CNN – correspondent in front of White House (visual)	(2' 00)
5) About bacteria (acoustic only)	(2' 20)

Block C   Austrian German

1) Prof. Johannes Huber (ORF:"Zur Sache"; visual)	(2' 00)
2) Looking at a black point	(1' 30)
3) Fritz Verzetnitsch (ORF: about "tax-reform")	(2' 30)
4) About the "Wiener Börse" (Ö1: only auditive)	(2' 20)
5) Control picture ("grey flickering ")	(1' 30)

The brain waves are recorded during these periods when the students are watching and listening to the video sequences. After each sequence of language input their understanding and comprehesion are controlled by questions about the texts. During the control situations the subjects sit resting and looking into the black TV-screen or at a black point.

The texts were chosen to be rather difficult, but not inaccessible, in order to be only roughly but not thoroughly understood by the Non-English students. They should however be able to follow some parts of the texts so

that they do not give up listening but stay alert and keep struggling to understand the whole sequence of speech presented to them.

The texts are expected to be understood rather well by the language students.

2.2.4 Reasons for choosing this stimulus-material

I have chosen to present the language stimuli as multimodal parts of real spoken speech where the speakers can be seen articulating and gesticulating, to imitate a natural and frequent communicative situation of every-day life. The intention behind this is to investigate the mental processing of language as it occurs in context, and not language as isolated sentences or words. The cerebral organisation of language on the word- and sentence level has been investigated extensively with PET-, fMRI and EEG-studies and therefore voices have been raised that more research should be carried out on the processing of coherent language on the discourse level, where, phonetic, grammatical as well as semantic, pragmatic aspects of language have to be analysed and integrated. This could shed a new light on the question of the interface between language and brain. It could of course equally well be the case that too many uncontrolled parameters come in when looking at the processing of a coherent text, so that the interpretation of a study of this kind becomes too difficult and may well be too unspecific and unsubstantial in its predictive power. It is hoped that the present study will throw light on this issue.

3   Hypotheses

The experimental design reflects the overall assumption that there is a clear difference between the two groups insofar as the understanding of the English texts is concerned. The English students should understand the texts easily and in detail. The students of the control-group should have difficulties in understanding the texts properly and therefore have to make a great effort.

It is of great interest to me where in the brain and how this process of trying hard and struggling to understand the foreign language takes place.

It is of course equally interesting to watch out for the brain activity during "normal" i.e. effortless understanding of a language. I suppose that the two groups of persons use different strategies to come to terms with the pieces of speech presented.

The whole question of this investigation - whether there are different mental strategies at work in "good" versus "bad" language "comprehenders" - has been influenced by a concept used in the field of psychology, called

"Cortical Effort" or "CORTICAL EFFICIENCY", a term coined by the American psychologist Richard Haier.

At the Viennese Institute of Psychology research groups are currently investigating the brain-strategies of people with good spatial imagination and of those with poor spatial faculty of pattern-visualisation. The investigations having been carried out so far tell us that people with a good spatial orientation-skill activate the brain only in a very specific way at narrowly-defined locations in the brain and show lesser overall intensity of activation than their counterparts when performing a mental rotation task. They have developed a more efficient cortical strategy for the things they are good at.

I wanted to examine whether this holds true also for the processing of language.

These general assumptions can be specified in two hypotheses.

3.1 Hypothesis 1

The group of the English students (I will call them group 1), which has already developed an efficient strategy for processing the second language, shows generally less and more focal activity. This should reflect their reduced effort and their good comprehension abilities.

Group 2 (Non-English students) shows a more intense and diffuse activation of cortical areas of the whole brain. This should reflect the "struggling" with the English texts and signify a "holistic" strategy, which is characteristic of earlier stages in the second-language-acquisition process.

3.2 Hypothesis 2

Group 1 is expected to exhibit more activation in the left hemisphere around the areas of the so-called language-sensitive centres, because the mechanisms they use for processing English come closer to those of processing the mother-tongue. Language students could also have integrated the second language into a common mental language system where they have developed a common non-language-specific reference system for deep semantic understanding.

Group 2 should more extensively make use of general cognitive abilities and rely more heavily on superficial extralinguistic or perceptual clues for decomposing the foreign language texts into meaning. This process could provoke a higher right- or bihemispheric activation of the brain.

3.3 Questions arising

- An interesting question arising from this is whether the two languages show a different lataralization-effect. For example, does the mother-tongue German produce a stronger left hemispheric bias?
- Or, are there different places of processing for a foreign language and for the mother-tongue?
- Is ease of processing (ease of understanding the L2) reflected in the brain activation patterns?
- Is the brain of an English-student more effectively organised with respect to English as a second language, than the brain of a, say, student of psychology ?
- Are there any differences in brain activation elicited by the different modalities of stimulus-presentation ?

3.4 Brain mapping

For the time being I cannot show any results, but, I can provide a few examples of the "empirical end-product", the data which are produced by a brain mapping-technique (Petsche, Rappelsberger et al.) and which form the basic tools for the final interpretation of brain activation.

The brain activation during stimulus processing is depicted by the following four possibilities of representation-schemata (Each picture represents a special stimulus sequence (e.g. processing the CNN-text) from which a control sequence is subtracted (e.g. looking into the black TV screen):

A. Multi-coloured (in the original) brain mapping picture provides information on the increase and decrease of the mean values of AMPLITUDE (1) and COHERENCE of the neighbouring (2a) and the corresponding interhemispheric (2b) electrode-positions for the different frequency-bands (p. 5).

Figure (1)

    (1)   (2a)   (2b)   (1)   (2a)   (2b)
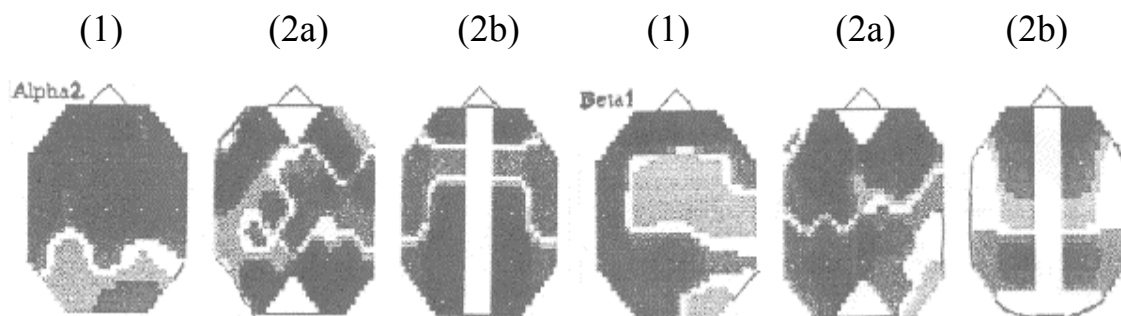
B. Statistically significant differences in increase and decrease of amplitude (1) and coherence (2a,2b; comp. Fig. 2) between electrodes,

between stimulus and control sequence, again provided for each frequency-band, are made evident by the (originally coloured) pictures below. (RED squares indicate INCREASE and BLUE squares indicate DECREASE of the above mentioned parameters)

Figure (2)

| (1) | (2a) | (2b) | | (1) | (2a) | (2b) |
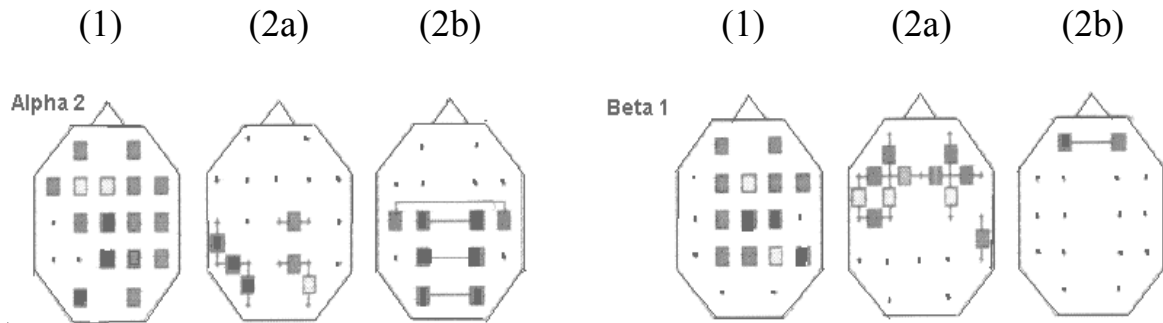
The last two models of brain-mapping use the statistical information of the method described under (2) and therefore depict only statistically significant differences between stimulus and control sequence.

C. Here the right and the left hemispheres are described separately. One can see the functional interplay between the electrode-positions represented by increase (solid lines; the thicker the lines, the stronger the coherence! generated by the areas underneath the electrodes) and decrease of coherence (broken lines) compared to the control sequence.
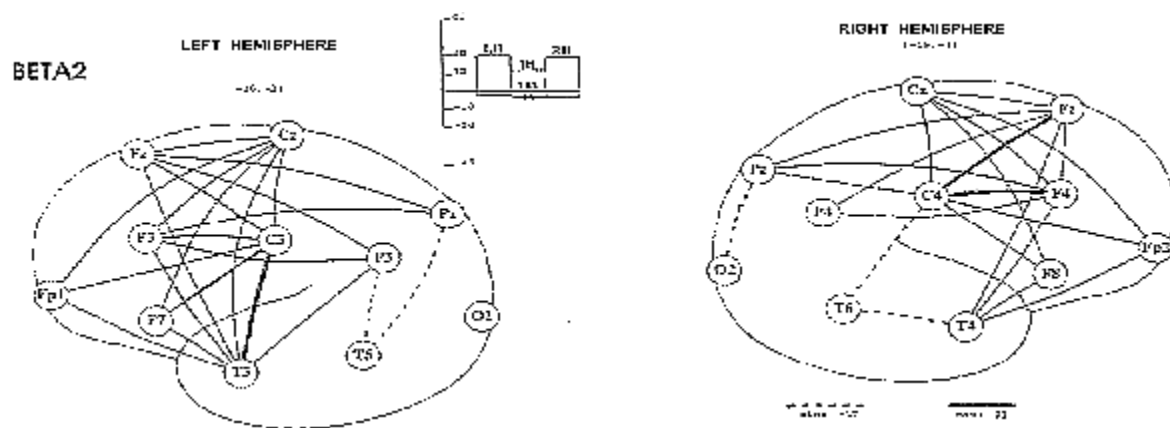

Figure (3)

D. The last way of depicting brain activity shows again increase and decrease in amplitude and coherence between all possible combinations of electrode-positions in one picture (per frequency-band – thus six pictures are possible for each sequence). Amplitude is characterized by the circles (full

circles meaning highest increase; empty circles meaning total decrease). Coherence is reflected again by solid and broken lines as described in "C").

Figure (4)

Theta   Alpha2   Beta2
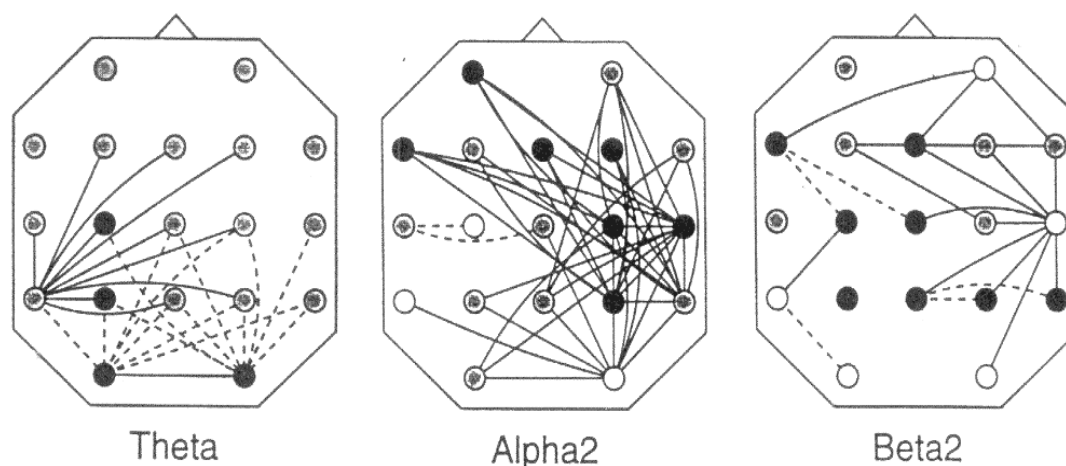
4 Concluding remarks

As this study is now in progress and far from being completed, I cannot speak about results yet. The "raw-material", the EEG-data were recorded and collected during the summer term and I am currently working on the analysis of the data, whereas the results and interpretations of the study will only be obtained in the course of the following one or two years.

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The prosodic evolution of English word forms or The Great Trochaic Conspiracy

Nikolaus Ritt

0. Introduction

It is a commonplace among historical linguists that many of the characteristics of Present Day English have somehow followed from the fact that in Germanic, the progenitor of English, word stress came to be fixed on the first, i.e. leftmost, syllable of the root. The immediate consequence of this fixing is supposed to have been that word final, i.e. the rightmost, syllables first came to be phonetically backgrounded and reduced, and then historically lost. This development does not only explain the large number of monosyllables in the core vocabulary of PDE, but is also supposed to have furthered the loss of inflectional endings and thus the typological change of English from an inflecting to an isolating language. Therefore, it can be considered indirectly responsible for the fixing of SVO word order as well, because the latter appears to have been necessitated by the very loss of morphological case marking, without which syntactic roles such as subject and object could not be unambiguously indicated anymore. Although the decisive role which the fixing of Germanic word stress seems to have played in the evolution of English on almost all levels is acknowledged by most linguists, however, the question how exactly it has exerted its influence has not really been addressed. There are many possible reasons for that, of course, but one of the most important ones is the methodological difficulty involved in causally relating a single specific property that a language assumedly acquired at an early historical stage with the long term typological development of one of its daughters, unfolding itself over a period of almost one and a half millennia. The issue appears almost too big to address and therefore the role of fixed root initial stress in the long term evolution of English has never really made it beyond a pedagogically convenient just-so story.

In this paper, I shall investigate if the established myth can be made scientifically slightly more reputable by doing two things.

First, I shall try to formulate a testable prediction concerning the consequences which the fixing of word-stress on the root initial syllable 'ought to have had' on the phonological evolution of English word forms and check whether history has borne this prediction out. In order to be at all interesting, of course, the prediction will have to go beyond the established notion that after stress was fixed on root-initial syllables all others were likely to reduce. Thus, in addition to that notion, I shall take into account that Old and Middle English are likely to have been stress timing, i.e. rhythmically organised into (nearly) isochronic feet, and that there may exist a universal preference for feet to be trochaic. From these assumptions a prediction can be derived deductively in the following way.

If it is assumed that

    a)   Germanic word stress came to be placed on the first root syllable and thus typically coincided with the first syllable at least of unprefixed items;

    b)   Old and Middle English were stress timing languages;

it follows that

    c)   Old and Middle English word forms should often have coincided with feet (if feet are defined as sequences of a stressed syllable plus one or more unstressed ones).

If it is further assumed that

    d)   the trochee is the universally preferred foot;

it follows that

    e)   the phonological evolution of the prosodic structure and the metrical weight of Old and Middle English word forms ought to have made them increasingly similar to trochees.

In other words, of the possibly infinitely large set of sound changes that might have occurred in the history of English, a significantly greater number of those are predicted to have 'made it', whose outputs were more trochee-like than their inputs. Or, to put it differently, whatever other factors might have favoured or disfavoured individual sound changes (such as the 'principle of least effort', the tendency of weak syllables to get reduced, the tendency of strong syllables to get further strengthened, etc.), the preference for trochees in stress timing languages ought to have been an independent player, whose influence ought to be empirically detectable in the evolution of word forms, if these coincided with feet often enough, which there is indeed reason to assume they did. In the first part of this paper, I shall take a crude look at the phonological evolution of English word forms from the Germanic to the Middle English period, check a large (and I guess representative) number of

English sound changes against the prediction just derived, and show that it seems indeed to be borne out.

Second, I shall propose that the causality behind the observed long-term effects of root-initial fixed stress can most adequately be grasped within a generalised Darwinian framework of linguistic evolution. In particular, I shall propose that the changes brought about by the combined influence of fixed stress and the universal preference for trochees can be viewed as adaptive in the sense that the structure of word forms came to be 'optimised' with regard to the prosodic roles they typically played.

Finally, as a kind of afterthought, I shall argue that 'foot optimisation' may not have been the only successful strategy for word forms to adapt to their prosodic environment, and speculate on potential reasons why the pressure on word forms to optimise their structures in that way seems to have decreased dramatically at the end of the Middle English period.

1. The Great Trochaic Conspiracy

Let me come back to the first point, however. As pointed out above, the assumption is that root-initial fixed stress, the stress timing character of English and the preference for trochees should have 'conspired' to make word forms increasingly similar to trochees during the Old and Middle English periods. Let me try and make it a bit more explicit why I think that such a 'conspiracy' can indeed be expected. First, I assume that Old and Middle English were stress timing. Now, the main characteristic of stress timing languages is that their rhythmic organisation is based on metrical feet, i.e. sequences of one plus a variable number of weak syllables (for a definition of the foot along these lines, cf. Hogg/McCully 1987). These feet are furthermore assumed to tend towards isochrony, i.e. they tend to be equally long in actual pronunciation (for a discussion of 'isochrony' in Modern English see Couper-Kuhlen 1993). This means that feet will be under a certain pressure to become similar to one another – at least with respect to timing. Thus, a standard foot is likely to emerge, towards which all others will tend to assimilate (first phonetically, eventually historically). Given this, the next question is of course, which foot type will be selected as the one to which all others assimilate. Although, theoretically, there are many options, it has been observed and become widely acknowledged that the most preferred foot in the languages of the world is the trochee, i.e. a foot consisting of one strong and one weak syllable. Therefore, it seems only plausible to assume that in a situation where there is pressure on feet to become uniform the

trochee will be chosen as the goal towards which all other foot types will tend to evolve. Now, since Old and Middle English major class lexical items were typically stressed on their first syllables (with some notable exceptions such as prefixed verbs) they can be assigned metrical structure and looked at as feet in their own right.[1] Thus, the evolution of word structure can be expected to mirror that of foot structure, so that we may expect an ever increasing number of Old and Middle English word forms to have become trochaic, or at least more and more similar to trochees. It is in this sense that I regard a trochaic 'conspiracy' in the phonological evolution to be expectable.

In the following I would like to present evidence that the 'predicted' conspiracy is indeed observable and that it seems to have constrained the impact of other expectable tendencies, such as the tendency of unstressed syllables to reduce and/or delete, or the tendency of stressed syllables to strengthen. First, however, the notion of similarity between feet needs to be clarified. Such similarity, it seems to me, can be measured on more than one level. First, and obviously, it can be observed on the syllabic level in that a foot counts as the more similar to a trochee, the closer its number of weak syllables is to one. Second, however, similarity between feet can also be measured in terms of their overall metrical weight. Of course, trochees will vary with regard to their weight, because they can theoretically consist of syllables of all sorts of structures. Since there are preferences for syllables as well, however, (see Vennemann 1989, for example), one can argue that preferred trochees will have structures such as CVCV or CVVCV (due to the preference for CV syllables). Therefore, the typical weight of a good trochee will vary between 2 and 3 moræ, if a mora is equalled to a segment in the rhyme of a syllable, and if onset maximal (OM) syllabication (i.e. [CV][CV], [CVV][CV] or [CVC][CV]) is assumed. On the assumption of general maximal (GM) syllabication, in which the intermediate C in a CVCV configuration would count as ambisyllabic (i.e. [CV[C]V], [CVV[C]V] or [CVC[C]V]) and weigh ½ mora, the weight of a typical trochee would be 2½ or 3½ moræ. Thus, a monosyllable with a [CVV[C] structure can be regarded as more similar to a trochee than a monosyllable with a [CV[C] structure, because the former weighs 2 moræ (OM) or 2½ moræ (GM) just like a typical

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[1] Clearly, such a statement is theoretically not unproblematic, because to say that a wordform is similar to a certain foot type implies that the wordform is itself regarded as a foot. Otherwise one would be comparing apples with pears. The assumption clearly deserves a detailed discussion, and I will show below that it is in fact crucial to question it. At this point, however, I will follow established practice and simply accept it as a working hypothesis that Old and Middle English word forms were isomorphic with feet often enough to be, at least informally, treated as such.

trochee, while the latter weighs only 1 mora (OM) or 1½ moræ (GM). By the same token, a trisyllabic item with the structure [CV[C]V[C]V] (4 moræ, GM) may count as more similar to a trochee than a trisyllabic item with the structure [CVV[C]V[C]V] or [CVC[C]V[C]V] (5 moræ, GM).

Let me turn to the evidence now. What needs to be shown is that most of the sound changes affecting the quantity of English word forms did indeed more often than not have outputs that were more similar to trochees than their inputs in the sense just outlined. To check whether this holds, I have classified a representative sample of changes affecting the quantity of English word forms with regard to the following parameters:

a) σ_s: How a change affected the stressed or strong syllable: here 'S' will mean strengthening, 'W' weakening, and '/' that there was no change in that respect.

b) σ_w: How a change affected (one of) the unstressed or weak syllables: again,
'S' will mean strengthening, 'W' weakening, 'D' deletion, and '/' that there was no change in that respect.

c) $\#\sigma$: How a change altered the number of syllables in the word form: a change from bisyllabic to monosyllabic structure will be represented as '2 > 1', and all others accordingly.

d) W_o and W_g: How a change altered the overall metrical weight of the word form under Onset Maximal (W_o) and General Maximal syllabication (W_g) respectively: a change from two to three moræ will be represented as '2 > 3', and all others accordingly.

e) $\rightarrow\sigma\sigma$: Whether the outputs of a change were more similar to trochees in terms of the number of weak syllables in the foot: '+' will mean 'yes', '−' will mean outputs were in fact less similar to trochees than inputs, and '/' will mean that they were not different from inputs in that respect.

f) $\rightarrow W$:[2] Whether the outputs of a change were more similar to trochees in terms of their overall metrical weight: again, '+' will mean 'yes', '-' will mean outputs were in fact less similar to trochees than inputs,

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[2] Simplistically but practically, weight will be calculated in moræ, one mora being defined as a segment in the rhyme of a syllable. Since weight will depend on the underlying syllabication, I shall calculate weight alterations both on the basis of an onset maximal syllabication (W_o), and on the basis of a general maximal one (W_g). Ambisyllabic rhyme elements will count ½ mora, problematic though this may be.

and '/' will mean that they were not different from inputs in that respect.

The parameters that sum up all the others and that ultimately count for the question to be addressed are (e) and (f), of course. If you prefer not to get lost in detail, you may want to focus your attention on them when reading the tables in the following sections.

In my choice of sound changes I have tried to be comprehensive. In fact, the only ones that I have deliberately left out of the discussion are Old English Breakings (as in *sterfan > steorfan* 'to die'), because the quantities of the vocalic nuclei that were affected by them and that they produced is highly disputable. Furthermore, I probably ought to point out that my classification is only concerned with the quantity of affected word forms, though in the widest sense. All aspects concerning the quality of the affected segments or their environment are left out of the discussion. The resulting pictures of the changes are thus necessarily incomplete.

1.1. Germanic High Vowel Deletion

This change deleted word final high vowels, if they occurred either after a strong syllable of after two syllables. (1) lists some typical examples (cf. Lass 1994: 98ff.).

(1)

wurm+i > OE *wyrm* (as opposed to *win+e*)
flo:ð+u > OE *flood* (as opposed to *sun+u*)
wered+u > OE *wered*
lirn+unᵇ+u > OE *leornung*

The change left stressed syllables as they were. It deleted unstressed syllables in trisyllabic word forms, as well as in disyllabic word forms with heavy first syllables. Trisyllabic word forms thus became disyllabic, and some disyllabic word forms became monosyllabic. The overall metrical weight of the word forms was reduced by one mora, if moræ are equalled to the number of phonological segments in the rhymes of syllables.

As already mentioned above, the exact calculation of metrical weight depends on the assumed theory of syllabication. On the assumption of maximal onsets rhymes, and therefore moræ, are minimised. The word form *wurmi* must be syllabified [wur][mi]. The first syllable counts two moræ because the rhyme is [ur], the second syllable counts one mora because the rhyme is [i]. The overall weight of the word form is thus 3 moræ. Deletion of the final vowel would then result in a bimoric word from, because wyrm is syllabified [wyr][m, the final vowel being extrametrical, as the theory requires. On a general maximal assumption, on the other hand, *wurmi* is

syllabified [wur[m]i]. Consequently, it weighs 3,5 moræ, and the deletion of the final vowel would yield [wyr[m], weighing 2,5 moræ.

The behaviour of this sound change with regard to the parameters introduced above is summarised in table (2):

(2)

TYPE	σ_s	σ_w	#σ	W_o	W_g	→$\sigma\sigma$	→W
*wurm+i	/	D	2>1	3>2	3½>2½	–	/
*flo:ð+u	/	D	2>1	3>2	3½>2½	–	/
*wered+u	/	D	3>2	3>2	4>3	+	+
*lirn+un↳+u	/	D	3>2	5>4	6>5	+	+

Where the change affected trisyllabic forms, its outputs were clearly 'better' feet both in terms of syllable structure as well as in terms of weight. While for disyllabic forms this is not true, it is important to be aware that at least in terms of weight the outputs were still within the possible weight range of trochees. Thus, on that level, the change did increase the number of English word forms that were equivalent to optimal feet, and appears, at least on the whole, to be compatible with the assumption of a trochaic conspiracy.

1.2. Medial syncope[3]

The change deleted high vowels in the middle syllables of trisyllabic word forms with heavy first syllables. A typical example is *xæur+i+ðæ > hier+de as opposed to *nær+i+dæ > ner+e+de. (cf. Lass 1994: 100f.) The change left the stressed syllable as it was, deleted one unstressed syllable, thereby reduced the syllables in the word form from three to two, and reduced the overall weight of the word form by half a mora under general maximal syllabication. Under onset maximal syllabication, it did not alter the weight of the word form. Table (3) summarises the observations.

(3)

TYPE	σ_s	σ_w	#σ	W_o	W_g	→$\sigma\sigma$	→W
*xæur+i+ðæ	/	D	3>2	/	5>4½	+	+

The change thus obviously increased the number of trochaic word forms, which seems to confirm our prediction.

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3 Cf. Lass, 1994: 98-102, from where also the examples are taken.

1.3. Old English Shortening before Consonant Clusters

The change shortened long vowels in stressed syllables before clusters of three consonants. Examples are *gɔdspell > godspell* or *bræmblas > bræmblas*. As table (4) shows, unstressed syllables were not affected by this change, and so was the total number of syllables in the affected word forms. However, the overall weight of the word forms was reduced by one mora, so that they became more similar, in this respect, to trochees.

(4)

TYPE	σ_s	σ_w	#σ	W_o	W_g	$\rightarrow\sigma\sigma$	$\rightarrow W$
gɔdspel	W	/	/	4>3	5>4	/	+
bræmblas	W	/	/	4>3	5>4	/	+

1.4. Old English Trisyllabic Shortening

The change shortened long vowels in antepenultimate heavy stressed syllables. Thus it reduced the overall weight of the affected word forms by one mora. An example would be *sɑmcucu > samcucu*. The characteristics of the change are summed up in table (5). Once more, the outputs of the change were more similar to trochees with regard to weight than its inputs had been.

(5)

TYPE	σ_s	σ_w	#σ	W_o	W_g	$\rightarrow\sigma\sigma$	$\rightarrow W$
sɑmcucu	W	/	/	5>4	5>4	/	+

1.5. Homorganic Lengthening

This change lengthened vowels before certain consonant clusters in monosyllabic and disyllabic word forms. Examples are *finde > fɪnde* or *cild > cɪld.* The overall weight of the word forms came to be increased by one mora. Note that weight calculation on the general maximal assumption is a bit complicated in the case of homorganic clusters, as there are reasons to assume that they counted only half a mora together, because they could be pronounced extraordinarily fast. Thus *finde* and *child* would have to be syllabified [fi[nd]e] and [chi[ld], their suprasegmental structures would be

(6)
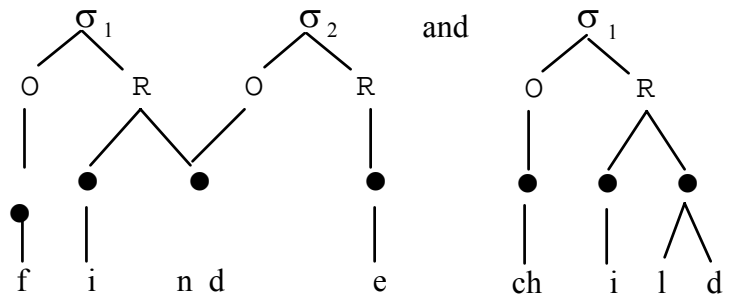
and they would weigh 2½ and 1½ moræ respectively. The scope of this paper does not allow a more detailed discussion of this analysis, but see Herbert 1986 or Ritt 1994. The effects of the change are summarised in table (7).

(7)

TYPE	σ_s	σ_w	#σ	W_o	W_g	$\rightarrow\sigma\sigma$	$\rightarrow$W
finde	S	/	/	3>4	2½>3½	/	/
child	S	/	/	2>3	1½>2½	/	+

What is relevant about this change with regard to the 'trochaic conspiracy' is that – at least under general maximal syllabication – the weight increase in items of the type *child* had the effect that more word forms came to fall within the weight range typical of trochees. Apart from that, Homorganic Lengthening was neutral with regard to the proposed conspiracy.

1.6. Early Middle English Shortening before Consonant Clusters

The change shortened long vowels before clusters of at least two consonants. A typical example would be *cǝpte > cepte*. Thus, the weight of the affected word forms was reduced by one mora, and thus came closer to that of typical trochees. Table (8) sums the effects of the change up.

(8)

TYPE	σ_s	σ_w	#σ	W_o	W_g	$\rightarrow\sigma\sigma$	$\rightarrow$W
cǝpte	S	/	/	4>3	4½>3½	/	+

1.7. Early Middle English Trisyllabic Shortening

This change shortened vowels in all antepenultimate syllables. Examples would be

(9)

> *suðerne > suðerne*   (5 > 4/6 > 5, with schwa loss: 5 > 4)
> *hælidai > hælidai*   (5 > 4/6 > 5)

Again, the overall weight of the affected forms was reduced by a mora and they became more similar to trochees in that respect. The effects are summed up in table 10.

(10)

TYPE	σ_s	σ_w	#σ	W_o	W_g	$\rightarrow\sigma\sigma$	$\rightarrow W$
suðerne	S	-	-	5>4	6>5	/	+

1.8. Early Middle English Open Syllable Lengthening

The change lengthened vowels in open syllables, typically when the last syllable was schwa. The classical example would be *make > mɑke*. Thus, the overall weight of the affected word forms was increased by one mora. The effects of the change are summed up in table (11).

(11)

TYPE	σ_s	σ_w	#σ	W_o	W_g	$\rightarrow\sigma\sigma$	$\rightarrow W$
make	S	/	/	2>3	2,5>3,5	/	/

At first sight, this change seems to have been neutral, at best, with regard to the 'trochaic conspiracy' I am proposing. However, its effects have to be seen in relation to schwa deletion, which is discussed in the following section.

1.9. Schwa deletion

The change deleted word final schwas, thus reducing both the number of syllables and the overall weight of the affected forms. Examples would be *bedde > bed, goode > good* or *erende > erend*. Table (12) summarises the effects of the change.

(12)

TYPE	σ_s	σ_w	#σ	W_o	W_g	$\rightarrow\sigma\sigma$	$\rightarrow W$
bedde	/	D	2>1	2>1	2½>1½	–	–
goode	/	D	2>1	3>2	3½>2½	–	/
erende	/	D	3>2	4>3	5>4	+	+

Obviously, this change seems to have counteracted the tendency of foot optimisation at least where it affected disyllabic word forms. Clearly, it represents an implementation of another tendency, namely the tendency of weak syllables to reduce/delete, and that tendency seems to be in conflict with foot optimisation. Such conflicts can be expected to occur, however, and they

do not automatically falsify the hypothesis of a trochaic conspiracy. However, one should expect a language to develop strategies for mitigating the effects of such conflicts, and, as will be argued in greater detail below, it seems indeed to have been the case that many 'undesirable' effects of schwa deletion came to be 'repaired' by concomitant sound changes. In particular, the weight loss caused through schwa deletion in items such as *mak(e)* seems to have been compensated through Open Syllable Lengthening. The argument will be pursued in greater detail below.

1.10. Middle English Breakings and related changes

1.10.1. /X/-breaking[4]

These changes created epenthetic vowels before /X/ codas. Examples include *ploZ > plouZ*, *eht > eyZt* or *agh(e) > ough*. The change sometimes increased the overall weight of the affected word forms, thus bringing them within the weight range of typical trochees, sometimes it compensated for the weight loss induced by schwa deletion, thus *keeping* the word forms within the weight range of trochees. Table (13) summarises its characteristics:

(13)

TYPE	σ_s	σ_w	#σ	W_o	W_g	$\rightarrow\sigma\sigma$	$\rightarrow$W
ploZ	S	–	–	1>2	1½>2½	/	+
eht	S	–	–	2>3	2½>3½	/	/
agh(e) [5]	S	–	–	2>2	2½>2½	/	/(+)[5]

1.10.1. /j/-breaking[6]

This change created epenthetic vowels before /j/ codas. Often, the coda was deleted in the process. Examples include *dæZ > dei* or *clæg > clei*. By re-arranging the structure of the affected rhymes, the change increased the overall weight of the affected word forms, because the extra-metrical, or ambisyllabic word final segments now came to be fully integrated into the

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4 Cf. Jones 1989: 142-151.

5 Here schwa deletion has to be taken into account, so that the strengthening of the stressed syllable didn't increase the overall weight of the word/foot, but compensated for the lost schwa mora. OM: [a][ghe] > [ou][gh, i.e.: 2>2, GM: [a[gh]e] > [ou[gh], i.e. 2½ > 2½.

6 Cf. Jones 1989: 152.

rhymes of the affected items. Thus, the change brought the affected words within the weight range occupied by trochees. Table (14) summarises its characteristics:

(14)

TYPE	σ_s	σ_w	#σ	W_o	W_g	$\rightarrow\sigma\sigma$	$\rightarrow W$
dæZ	S	/	/	1>2	1½>2	/	+

1.10.3. Vowel epenthesis in liquid+🖐 codas[7]

This change created epenthetic vowels in /L🖐/ codas. Examples include *galφe(s) > galowe(s)*, or *falφ(e) > falowe* (*> falow* /𝔂fal★⚕/). The change increased the syllables in the affected word forms by one. Its effects with regard to the trochaic conspiracy here proposed have clearly once more to be seen in connection with schwa deletion. The additional syllable it created eventually compensated only for the one lost through schwa deletion and thus kept the structure of the word forms trochaic. This also holds true with regard to weight. Table (15) summarises this.

(15)

TYPE	σ_s	σ_w	#σ	W_o	W_g	$\rightarrow\sigma\sigma$	$\rightarrow W$
fal🖐e	/	S	2>3(2[8])	3>3[8]	3½>3½[8]	+[8]	/[8]

1.10.4. *w*-vocalisation[9]

In this change, syllable final /w/s were vocalised as in *ewe > yeu(e)*. Since the affected segments became part of the nucleus, the weight of the word forms was increased, as table (16) shows. Looked upon in isolation, the change does not seem to have contributed much to the 'trochaic conspiracy'. The increase in weight again counteracted the effects of schwa deletion, however, and prevented the affected items from becoming lighter than trochees.

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[7] Cf. Jones 1989: 155.

[8] With schwa deletion being taken into account.

[9] Cf. Jones 1989: 157.

(16)

TYPE	σ_s	σ_w	#σ	W_o	W_g	$\rightarrow\sigma\sigma$	$\rightarrow$W
ewe	S	–	–	$2>3(2^{10})$	$2\frac{1}{2}>3(2^{10})$	/	/

1.10.5. Breaking before liquids[11]

This change created epenthetic vowels before codas containing /l/. Examples are *al > aul*, or *fals > fauls*. The weight of the affected word forms was increased by one mora, and thus words of the *al* type were brought within the weight range of trochees. See table (17):

(17)

TYPE	σ_s	σ_w	#σ	W_o	W_g	$\rightarrow\sigma\sigma$	$\rightarrow$W
al	S	/	/	$1>2$	$1\frac{1}{2}>2\frac{1}{2}$	/	+
fals	S	/	/	$2>3$	$2\frac{1}{2}>3\frac{1}{2}$	/	/

1.10.6. Other Breakings

Occasionally, epenthetic vowels came to be inserted before [♦]. Examples would be *fresh > freish*, *ash > aish* or *frensh > freinsch*. The change increased the weight of affected word forms by one mora and brought items of the *fresh*, *ash* type within the weight range of trochees. See table (18) for a summary:

(18)

TYPE	σ_s	σ_w	#σ	W_o	W_g	$\rightarrow\sigma\sigma$	$\rightarrow$W
fresh, ash	S	/	/	$1>2$	$1\frac{1}{2}>2\frac{1}{2}$	/	+
frensh	S	/	/	$2>3$	$2\frac{1}{2}>3\frac{1}{2}$	/	/

1.11. Summary

It seems that most changes did indeed 'conspire' to produce word forms more similar to optimal feet than their inputs, particularly with regard to weight. Some of them, such as Medial Syncope or vowel epenthesis in /L♭/ also produced (or maintained) trochaic syllable configurations. Thus, on the whole, the statement that Old and Middle English word forms were subject to a tendency of foot optimisation or 'trochaic conspiracy' seems to be

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[10] With schwa deletion being taken into account.
[11] Cf. Jones 1989: 159.

empirically adequate, and the prediction derived from the assumptions made in the introduction can be regarded as borne out. As has already been observed, however, there are a few changes, particularly schwa deletion, that are slightly more difficult to reconcile with it than most others. I have already indicated above why I think that they do not falsify the hypothesis of a 'trochaic conspiracy', but the subject clearly deserves a more detailed discussion.

## 2. Schwa deletion: an apparent exception?

Schwa deletion itself is, of course, a highly natural change, and the reduction and deletion of unstressed syllables is an extremely common phenomenon, generally speaking. If, however, the phonological evolution of English word forms was, as I am suggesting, constrained by a tendency to increase the number of trochee-like word forms, the inclination of schwas to get lost in unstressed final syllables would necessarily collide with it – namely in those cases where disyllabic items were concerned, such as when *make* was about to be reduced to *mak*. Through schwa deletion such word forms would become monosyllables and would not be trochees anymore. For the proposition made in this paper, this is clearly awkward. At the same time it needs to be pointed out, however, that there were a good many other cases in which schwa deletion did in fact contribute to, rather than counteract, the 'trochaic conspiracy'. Originally trisyllabic items such as *ærende > errand* would be good examples for cases where schwa deletion supported foot optimisation. So, schwa deletion was not all bad. One could take the easy way out now and argue, simply, that it is in the nature of 'tendencies' that they face occasional exceptions and are not falsified by them in the way they would be if they were regarded as predictive laws. However, such an attitude would clearly decrease the explanatory value of the proposed conspiracy dramatically (cf. Lass 1980 for arguments on this problem). Incidentally, however, the way in which schwa deletion came to be implemented and the way in which English phonology reacted to it can themselves be regarded as evidence that the effects schwa deletion had on disyllables were indeed regarded as 'undesirable' in just the way the assumption of a 'trochaic conspiracy' would predict. Thus, most of the Middle English lengthenings, epentheses and breakings increased the weight of monosyllables produced through schwa deletion and brought them back into (or kept them within) the weight range of trochees. Where these processes affected items that had become monosyllabic through schwa deletion, they can therefore be viewed

as 'repair mechanisms' restoring to word forms at least the weight, if not the syllabic structure, of trochees.

The plausibility of such a view has been demonstrated very convincingly for Open Syllable Lengthening by Donka Minkova (1982 and 1991). She has shown that OSL worked without exception only in those words whose second syllable consisted of a schwa. In all other types of words, the sound change was implemented more or less sporadically. She therefore suggested, quite adequately, I feel, that the lengthening was very much a compensatory change, making up for the loss of the final syllable. It restored the weight of an optimal foot, even if it could not restore its syllabic structure.

Particularly interesting in this connection is the fact that schwa deletion was blocked for a long time in the case of weak adjectives. It was once more Donka Minkova who suggested a reason for this which strongly supports the present argumentation. She observed that weak adjectives typically occurred in the syntactic environment Det Adj N. Since Middle English nouns typically began with stressed syllables, the weak adjectives would normally have constituted complete feet by themselves. This is illustrated for weak *blake* 'black' as opposed to strong *blak* in graph (19) (Minkova 1991: 179):

(19)

a. þæt blake smok(e)   b. his berd was blak
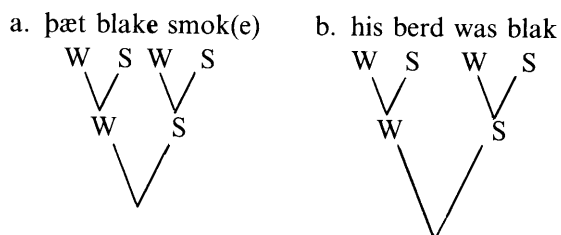
Thus, while strong adjectives might have had a good chance of being followed by a weak syllable, as in *His berd was blak as was the night*, for example, weak adjectives did not. Since trochees are assumed to be preferred feet, it is therefore no surprise that schwa deletion was blocked longest in adjectives that required the presence of the schwa in order to figure as trochees. This once more shows that even though schwa deletion seems to represent counterevidence to the assumption that foot optimisation was a relevant factor behind the evolution of Old and Middle English word forms, the way it was implemented does support the assumption of such a tendency after all.

3. Word forms and prosody: an adaptive relation?

Minkova's argument about blocked schwa deletion in weak adjectives raises another point that is problematic for the argumentation presented in this paper. A crucial part of the argument here proposed was that Germanic word forms could for all practical purposes be viewed as feet, because they were typically stressed on their first syllables. The way in which schwa deletion was blocked in weak adjectives, however, makes it obvious that the level on which preferences for certain foot types seemed to exert their influence was the level of actual utterances. After all, the reason for its delayed implementation in weak adjectives was that they were typically followed by words that had their stress on the first syllable, and only because of that did they show up as feet in their own right. Thus, the relevant domain was the tone group and not the lexical or the morphological word. That these two levels should not be confused has been pointed out clearly by Theo Vennemann, when he objected against the practice of non-linear phonologists to attribute detailed prosodic structure to isolated word forms.[12] Words, Vennemann argued, did not have prosodic structure at all. They just contained information about which of their syllables would come to be stressed, in case a word form happened to receive stress in an actual utterance at all.

In short, the phonological representations of word forms and the prosodic structures they assume in utterances must be regarded as two different cups of tea. Vennemann's argumentation is stringent, and Minkova's point about blocked schwa deletion supports it. For the hypothesis defended here, however, it creates difficulties. So far, I have assumed that word forms could be treated as if they were feet. If it now turns out that they cannot it is difficult to see why they should have been turned into better feet by phonological evolution at all? The question clearly deserves a more detailed discussion.

Changes that produce better feet will typically be diachronic implementations of low level phonological processes that operate, derivationally speaking, after the assignment of prosodic structure to actual utterances. They operate on prosodic configurations rather than on the phonological representations of lexical or morphological words. That such processes do affect the phonological structures of the latter, therefore, is a phenomenon that deserves explanation. In particular, it raises questions about the relationship between the phonological forms in which lexical items are stored and the prosodic configurations in which they eventually come to

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[12] His polemic was directed particularly against Giegerich's (1992) assumption that German monosyllables should be analysed as trochees whose second syllable was empty.

figure. As Vennemann has made obvious, this relationship is not straightforward, and it won't do to say that a lexical item simply has a certain prosodic structure. Rather, a word can be expected to appear in a variety of different prosodic configurations. In a sense, then, those prosodic configurations can be thought of as 'environments' for word forms. This means, however, that if a word form changes in a way that reflects processes which are typical of a specific prosodic environment, one can say that the word has 'adapted' its shape to that particular environment. Additionally, one may conclude that the affected word must have occurred often enough within the specific prosodic environment that favours the processes reflected in the adaptive change, because it would not make sense for a word to 'adapt' its shape to a prosodic environment in which it occurs only sporadically.

Let me elaborate the first point by taking a word form such as *ærende* as an example. No matter by what word it would have been followed, the minimal foot it would have come to figure in would have been $\sigma_s\sigma_w\sigma_w$, as for instance in *He his hlafordes ærende secgan sceolde* (K. Ælfred, *Bæda* II. ix, cf. OED sv. *errand*). Sometimes, it might even have figured in bigger feet, but never in smaller ones. If one assumes a prosodic preference for trochees, one will also assume that low level phonetic processes, operating after the assignment of prosodic structure, will have applied in such a way as to make the actual realisation of underlying /ꭍæ:rende/ more similar to a trochee in terms of weight and syllable structure. Phonetic weakening process reducing the duration of the long vowel in the foot head and/or a reducing or deleting the final syllable, may be quite plausibly assumed to have resulted in actual realisations such as [ꭍær2nd2] [ꭍærnd2] or [ꭍær2nd]. Obviously, such processes would have decreased the degree of iconicity in the relationship between the underlying form of the noun and its phonetic realisations. This would have constituted a 'disadvantage' for the form /ꭍæ:rende/, because it would have become more difficult to recover in perception and consequently more difficult to acquire as well. It is easily conceivable, then, that the balance between prosodic preferences and phonological iconicity might have been restored, occasionally, through reinterpretations of the underlying form as /ꭍærende/ /ꭍærnde/ or /ꭍærend/, respectively. These variants would have been more similar to the actual realisations [ꭍær2nd2] [ꭍærnd2] or [ꭍær2nd], and would therefore have been recovered and acquired more easily. This fact allows one to make predictions about what must have been likely to happen in a situation where original /ꭍæ:rende/ would have existed side by side with new /ꭍærende/, /ꭍærnde/ and /ꭍærend/: due to the combined pressure of prosodic preferences for trochee like feet, and the

semiotically grounded preference for maximal iconicity between representations of different phonolgical levels, forms such as /ˈærende/ and later /ˈærend/ will eventually have become the dominant variants within the speech community, because their greater iconicity would have made them easier to acquire than /ˈæ:rende/. Therefore, the latter would eventually have become 'extinct'. It is in this sense, then, that the changes of /ˈæ:rende/ to /ˈærende/ and eventually /ˈærend/ can be understood as 'adaptations' of phonological forms to their prosodic environments and the forces operating within that. The process is perfectly parallel to 'natural selection' as known in Darwinist approaches to evolutionary biology.

Now, the second point I have made above was that it makes sense for a form to adapt to an environment only if it comes to figure in it sufficiently often. The point is theoretically trivial but poses some problems in practice. Let me first take a simple case, however, to make the principle clear.

Thus, the case of /ˈæ:rende/ is not really problematic. As pointed out above, it would always have its first syllable stressed and would therefore always have figured in feet that were at least trisyllabic. Furthermore, if it happened to be followed by one or more unstressed syllables, the prosodic preference for trochees would have prompted basically the same phonetic adjustment processes as in such cases where a foot head followed immediately after the word. For cases such as *ærende*, one can therefore say, that the regular placement of primary stress on the first root syllable greatly constrained the number of prosodic configurations English word forms could come to figure in: /ˈæ:rende/ thus had trisyllabic or larger feet as its typical 'habitat' and it is no surprise that it were adaptations to exactly those prosodic configurations that proved to be evolutionarily successful.

It needs to be asked, however, if this was generally true of word forms with stress on their first syllables, or whether it held only for words such as *ærende*. In other words, it is the question what type of adaptive processes the prosodic environments would have favoured, in which other than trisyllabic word forms would normally come to figure. Since the case is obvious for words with more than three syllables (they would have behaved very much like /ˈæ:rende/), I shall only deal with shorter word forms. Thus, the following graph shows the possible feet in which mono- and disyllabic English word forms with primary stress on their first syllables can come to figure.

(20)

a. monosyllables (e.g.: *child*): $[\sigma_s(\sigma_{w_1})(\sigma_{w_2})(\sigma_3)...(\sigma_{w_n})]_\Sigma$
b. disyllables (e.g.: *make*): $[\sigma_s\sigma_{w_1}(\sigma_{w_{1+1}})(\sigma_{w_{1+2}})(\sigma_{w_{1+3}})...(\sigma_{w_{1+n}})]_\Sigma$

Clearly, the matter is more complicated than with trisyllables. Take disyllabic word forms first: the minimal feet in which they can figure are obviously trochees. In this case, one would hardly expect any prosodically conditioned adjustment processes to operate on them, because trochees are preferred anyway. Alternatively, they may be followed by a number of unstressed syllables. In that case one would of course expect similar adjustment processes as in trisyllabic or longer words, i.e. shortenings and deletions. For monosyllabic forms, the situation is even more complicated. If they come to figure in feet by themselves, one would expect strengthening adjustment processes such as vowel epenthesis to create disyllables, and/or vowel lengthenings or other strengthenings of the stressed syllables to adjust at least the weight of the forms to that of trochees. If they are followed by a single unstressed syllable, they figure in perfect trochees, and hardly any adjustments would be required. If they are followed by more than one unstressed syllable, finally, one would expect the same reduction processes as in the heads of trisyllabic items.

In order to know in which way a di- and particularly a monosyllabic word form is likely to adapt, therefore, one would have to know how many weak syllables would typically come to follow it in actual utterances. One would have to know, in other words, which is its typical prosodic environment. In some cases, such as that of Middle English weak adjectives, this is relatively easy, as Minkova has already shown. They were typically followed by nouns with stress on their first syllables. Therefore, as one would predict, disyllabic forms were prosodically preferred, and schwa deletion was blocked in the respective items, while trisyllabic word forms lost their schwas relatively soon. Apart from such nice cases, however, the problem can only be resolved, it seems, by large scale statistical analyses, which would go beyond the scope of the present investigation. Only if it can be shown that di- and monosyllabic word forms did indeed typically figure in feet by themselves, can the hypothesis that their phonological evolution reflects an adaptation to this sort of environment be maintained

Of course, one might be tempted to argue that the types of prosodic adjustments and consequent adaptations of underlying forms that did occur can themselves be interpreted to suggest certain conclusions about the typical prosodic environments in which English word forms occurred. If the sketch of the mechanisms leading to prosodic adaptations outlined above is basically correct, the fact that even monosyllabic word forms by and large tended to become more similar to trochees might be taken to suggest that it must have been relatively common for them to figure in a foot by themselves. However,

unless there is independent evidence to prove the point, that argumentation is unpleasantly circular.

Even though reliable data on that problem are still missing I, however, do think it is possible to find some arguments by deduction that seem to suggest that my hypothesis might not be completely unjustified. Thus, it seems to me that if a language has typically polysyllabic word forms with primary stress on their first syllables it more or less follows that there will be a relatively high chance for even a monosyllabic word form to figure in a foot by itself, while in a language that has a sufficiently large number of monosyllabic items, on the other hand, this cannot be expected. The argument is based on the fact that prosodic prominence is not an absolute, but a relative phenomenon. Therefore, if a number of equally stressed monosyllables come to occur in a sequence, it is unlikely that each of them is perceived as equally prominent. Rather, some monosyllables will be perceived as stronger than others and thus assume the role of prosodic heads over the latter. In other words, feet will typically span more than a single word form. For the individual item this implies that it will come to figure either as a foot head or as a weak syllable within a foot and should be expected to adapt to those prosodic roles; in other words, to remain monosyllabic. The stressed first syllables in polysyllabic items, on the other hand, will always be more prominent than the weak syllables following them before the word boundary. Therefore, they will always constitute foot heads and are not free to figure as weak syllables in feet whose head is within a preceding word form. Thus, their beginning will mark a foot boundary, and force preceding word forms into the roles of feet in their own right. For monosyllables this means that in a language with a large number of such polysyllabic they will be relatively likely to wind up as feet – *quod erat demonstrandum*.

To illustrate the point, look at the constellations in the following examples[13], and see if the highlighted monosyllables constitute feet by themselves or figure as heads in larger feet:

(21) Prosodic environments of monosyllabic word forms:

a.

... /wæs in þa/ **tid** / Sæberht / cyning ...
... / cyning / **heht** / cirican ge/timbran ...
... and / sche was / afterward i-/ **mad**(e) / abbas of the / **sam**(e) / maydens, and ...

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[13] Taken rather randomly from the Helsinki Corpus for the purpose of mere illustration.

b.

... / **deyd**(e) / Seint /Fredeswyde ...> ... / <u>**deyd**(e)</u> Seint /<u>Fredeswyde</u> ...
... þe /**mor**(e) / larg(e) / spens ... > ... þe /**mor**(e) larg(e) / <u>spens</u> ...
... / **man** / may / serve / eiþer ... > ... / **man** may / <u>serv</u>(e) / <u>eiþer</u> ...
... having / **now** / made / use... > ... <u>having</u> / **now** made / <u>use</u>...
... **then** / made / peace... > ... **then** made / <u>peace</u>...

In (21a) the bold monosyllables are followed by polysyllables whose first syllable is a foot head by virtue of being followed by weak syllables within the same word from. Therefore, the monosyllables have little choice but to become feet, and respective adjustments ought to be expected. In (21b), on the other hand, this is not the case. There, the bold monosyllables are followed by other monosyllables, and there is some chance that they come to be prosodic heads over them.

What all this amounts to is that the very fact that Early English was characterised by a relatively large number of polysyllabic items with stress on their first syllables may have made it relatively probable that also monosyllabic word forms would come to figure as feet by themselves. Therefore, they can be expected to be affected by the 'Great Trochaic Conspiracy' in a similar way as polysyllabic items. In other words, the 'Great Trochaic Conspiracy' proposed in this paper would seem to be well motivated as a tendency affecting all types of Old and Middle English word forms. All of them, it seems, must have appeared as feet often enough to have a better chance of being replicated through language acquisition, if their lexical phonological structures anticipated the prosodically conditioned processes that typically applied on feet, i.e. processes that made feet as trochee-like as possible.

4. Monosyllabic 'exceptions' to the 'Trochaic Conspiracy' and alternative strategies of prosodic adaptation

As indicated above, I am very much aware that for a claim as strong as this, the deductions just made are a very weak support at best, and that without actual empirical investigations concerning the relation between word forms and feet, my argumentation necessarily remains somewhat circular. Being unable to provide sufficient empirical evidence at this stage, however, let me turn, finally, to another aspect that is interesting in relation to the story I have been telling. Once more it is related to the fate of monosyllables.

Thus, note that while some monosyllables did indeed adapt their weight and/or syllable structure to that of trochees, it is also a fact that some

monosyllables with the structure CVC have existed and proved stable throughout the evolution of English, and somehow seem to have escaped the 'Trochaic Conspiracy'. Thus, words such as OE *mon* 'man' or *scip* 'ship' have survived into Modern English with their metrical weight unchanged. Furthermore, the end of the Middle English period even saw a big increase of words of that structure, as ModE *bed*, *pit*, *bush*, *put*, *tag*, and many more go to show. What about these then? Are they irreconcilable with the account just given? Given a view that regards the trochaic conspiracy as an adaptive evolutionary process, it seems to me that they are not. After all, even if monosyllables have often occurred in feet by themselves, they will not always have done so. Sometimes, they will also have been followed by unstressed syllables and constituted feet together with these. In such constellations they will have figured as foot heads rather than feet, and for that prosodic role a CVC shape would have suited them perfectly. It is conceivable, therefore, that some words may have adopted the strategy of adapting their phonological structures to the function of foot heads rather than feet, relying on the possibility that they would come to figure as such often enough in order to be successfully replicated. That this strategy might for a long period not have been quite as successful as the alternative strategy of 'foot optimisation' does not imply that it was completely inviable: it is not inconceivable that a word form should have adopted it with some success. The existence of words of the type *mon*/*scip* have existed throughout the history of English does therefore not necessarily falsify the claim that 'trochaicness' was preferred by 'natural selection', because all this claim predicts is an increase of trochee-like word forms within the overall population of English words, and this, as I hope to have shown, can indeed be observed.

Much more challenging, of course, is the question why the number of CVC items seems to have increased dramatically by the end of the Middle English period, because this development seems to imply that it ceased to pay for words to adapt their structures to that of optimal feet, so that the direction of 'natural selection' came to be reverted. Although I cannot provide more than an educated guess concerning this problem, the perspective I have taken in this paper suggests that it might simply have ceased to be typical for monosyllabic word forms to figure as feet by themselves. While this observation is in similarly great need of empirical verification as the claim made above that until well into the Middle English period word forms did typically constitute feet in utterances, some well established factors such as the influx of iambic forms from Anglo-Norman during the Middle English period, or the fact that schwa deletion in disyllabic items created a large number of new monosyllables, do lend some probability to such a scenario.

After all, whatever the actual trigger of the development might have been, it follows from the argument about the relation between polysyllabicity and the probability of words to figure as feet that once the number of monosyllabic word forms increased beyond a certain critical number, the chance for monosyllabic words to appear as feet by themselves, and thus the 'rewards' for adapting their shapes to that of optimal feet would indeed have decreased dramatically. Therefore, a relatively small increase in the number of monosyllables, brought about by whatever cause, might easily have triggered a kind of snowball effect and done away, once and for all, with the foot – word correlation, which, as I hope to have shown, is essential for a 'Trochaic Conspiracy' to be evolutionarily advantageous.

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