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2008
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A Note from the Editors

You are reading the 10th anniversary volume of *SKY Journal of Linguistics*. Still, the history of the journal and its predecessor, *SKY Yearbook*, go back further into the history than ten years. In retrospect, ten years (or approx. 20 if one includes the precursor) may seem like a short time span. In spite of this, if one takes a glance at the previous volumes of either journal, one can see during this time, *SKY Journal of Linguistics* has been able to provide a relatively broad cross-section of internationally significant linguistic research. In addition, a closer look at the contents reveals that numerous prominent linguists from Finland and overseas have published their work in the journal and its predecessor. We of course hope that this tradition continues and that thereby the journal’s objective and ambition to publish high-quality linguistic research can extend long into the future.

During the journal’s short history, the editors of the journal have also witnessed and initiated some changes. One change that has been clearly visible during the last few years has been the increase of submissions and published articles coming from international linguists. This internationalization of the journal is a welcomed process and we hope that through this process we have also been able to attract new readers, which naturally may help Finnish – especially young – linguists to gain visibility in the linguistic world.

We are grateful to all the previous editors for setting an excellent example and establishing a strong foundation for the journal. We have wanted to acknowledge the previous editors’ important work by asking the editors of the first *SKY Journal of Linguistics* (Timo Haukioja, Ilona Herlin and Matti Miestamo) to write a greeting to the readers of the journal.

This year’s volume is a compilation of versatile and eclectic linguistic research. The individual papers represent different languages (Arabic, Finnish, Finnish sign language, Lillooet Salish, English, French) and different contexts for the analysis and use of language (text messaging, historical texts, language technology, prosody, etc.). We want to thank – again – the authors, as well as the external reviewers, without whom this work would not be possible, for a job well done.

*Pentti Haddington, Leena Kolehmainen, Mari Lehtinen, Jukka Mäkosalo & Heli Tissari*
Greetings from the editors of the first *SKY JoL*

In 1988, the Linguistic Association of Finland started publishing its annual yearbook. In 1999, after eleven issues under the name of *Yearbook*, the publication appeared under a new title, *SKY Journal of Linguistics*. To mark the continuity of the publication, the journal’s numbering started where the yearbook had left off, from number 12.

The real differences between the final *SKY Yearbook* and the first *SKY Journal of Linguistics* were minor. The title was new, the cover design was new, and the journal now featured a book review section; but still, just like the last yearbooks, it used anonymous peer review, it appeared annually, and it was open for contributions from all schools and fields of linguistics. The title change was thus part of an ongoing effort to bring the profile of the journal up to date.

Those three statements are still true of the *SKY Journal* a decade later. This does not mean that the journal has stagnated; times have changed, and the journal has changed with them, in ways that the editors of the 1999 volume could not have dreamed of. Contrary to popular belief, we did not dress in pelts, live in caves or hunt for a living with wooden clubs back in those days; we even had the Internet, but search engines were still in their infancy and nobody seriously expected everything to be available online. Now, thanks to the journal being at the forefront of open-access publishing, the potential readership of *SKY Journal of Linguistics* has grown dramatically: instead of being limited by the number of copies printed, it is now limited only by the number of linguists with an Internet connection. Furthermore, if the contact addresses given by authors are any indication, the pool of potential contributors seems to have expanded significantly as well.

Congratulations to the 10-year-old and best wishes for the decades to come!

*Timo Haukioja, Ilona Herlin, Matti Miestamo*  
*Editors of SKY JoL 12 (1999)*
External Reviewers of *SKY JoL* 21 (2008)

In addition to members of the current advisory editorial board, the following scholars, among a few others wishing to remain anonymous, have acted as external reviewers for *SKY Journal of Linguistics* in 2008:

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Introducing Weight-Sensitive EDGEMOST

Abstract

An Optimality Theoretic account of stress in Jordanian Arabic (JA) is proposed using LAPSE and EDGEMOST constraints. The proposal is based on treatment of EDGEMOST as a weight-sensitive alignment constraint (McCarthy & Prince 1993a). Accordingly, a constraint demanding alignment of a heavy stressed syllable to the rightmost or leftmost edge of a prosodic word and another demanding the alignment of a light stressed syllable to the rightmost or leftmost edge of a prosodic word are independently active constraints in any grammar. The interaction of these constraints with an edge oriented LAPSE along with a variety of stress-related constraints accounts for the stress pattern in JA. The proposal provides a straightforward mechanism for categorizing stress systems as weight-sensitive or weight-insensitive and further dividing weight-sensitive systems as exhibiting a default to the same or default to the opposite pattern. JA is categorized as exhibiting a default to the same side stress pattern.

1. Introduction

Iterative foot construction was proposed within generative phonology to account for stress assignment in systems that lack secondary stress (Halle & Vergnaud 1987; Idsardi 1992; Hayes 1995). This process relies on the notion of serial derivation and thus intermediate stages. Line Conflation was then devised to disallow intermediate feet from being stressed. Since OT (Prince & Smolensky 1993/2002; McCarthy & Prince 1993a, 1993b) does not accommodate intermediate stages of derivation, a number of accounts within OT have been proposed to handle the undesired residue of iterative footing. Separability (Crowhurst 1996) and Sympathy (de Lacy 1998) accounts are just two examples each of which has its deficits. The former decomposes footing into two separate processes of syllable parsing and head assignment, while the latter extends Sympathy Theory allowing markedness constraints as selectors (Al-Mohanna 2007).

Building on the work of Al-Mohanna (2007) on Cairene Arabic, the present study considers stress assignment in Jordanian Arabic (JA) discussed in Alghazo (1987), Al-Sughayer (1990), and Abu-Abbas (2003).
In the language, stress falls on the rightmost heavy syllable provided it is not beyond the antepenultimate, otherwise on the antepenultimate syllable.

Cross linguistically, there are two major factors that affect stress assignment processes. The first concerns the location of the stressed syllable within the word. Languages tend to designate an edgemost syllable, a leftmost (LM) or rightmost (RM), as the bearer of stress. Or at least, the stress-bearing syllable is calculated with reference to these edgemost syllables. The second factor is syllable weight. Heavy syllables have priority over light syllables when it comes to stress assignment. In the presence of more than one heavy syllable within a word, the edgemost factor comes into play, assuming that a language allows only one stress per word.

In metrical phonology, generalizations about stress are explained in terms of a metrical grid (Liberman 1975; Prince 1983), or a metrical foot (Halle & Vergnaud 1987). In OT grammar, stress assignment is determined by two basic constraints introduced in (1) and (2) below from Prince and Smolensky (1993):

(1) Weight-to-Stress Principle (WSP)

Heavy syllables are stressed.

(2) EDGEMOST (PK; L/R; Word)

A peak of prominence lies at the L/R edge of the word.

The main function of WSP is to avoid footing a sequence of a light (L) and a heavy (H) syllable as (LH), since in such a foot, the heavy syllable is not prominent, i.e., it is not the head. Equally sub optimal, as far as (1) is concerned, is footing HLL as H(LL), since the heavy syllable is in non-head position. The Edgemost constraint in (2) provides a gradient evaluation of outputs: the closer the candidate is to the designated edge the more harmonic it is with (2).

---

1 Stressed syllables are marked by a (') before the syllable.
2 WSP is violated here only when a light syllable is stressed in the presence of a heavy syllable.
The most familiar and simplest foot types are Trochaic and Iambic feet. They involve alternations between accented and unaccented syllables; syllables are thus grouped into pairs, and therefore form Binary Feet. Trochaic and iambic feet differ in their prominence patterns. In trochaic feet, the first syllable is more prominent than the second, while in iambic feet the opposite relation holds (Ewen & Hulst 2001). The interaction between WSP and EDGEMOST (PK; L/R; Word) is illustrated below in tableaux (3–5). A trochaic right-oriented system is considered where the requirement of these constraints is to stress the rightmost heavy syllable if the string contains one. We assume that the language allows a single stressed syllable per word. Accordingly, a hypothetical HHLL string will be stressed as H('HL)L, ruling out *(H)HLL and *HH('LL) as shown in (3) where (#) marks word boundary.

(3)

<table>
<thead>
<tr>
<th>Input: HHLL</th>
<th>WSP</th>
<th>EDGEMOST (PK; R; Word).</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. H('HL)L</td>
<td>σσ #</td>
<td></td>
</tr>
<tr>
<td>b. *(H)HLL</td>
<td>σσσ! #</td>
<td></td>
</tr>
<tr>
<td>c. HH('LL)</td>
<td>*!</td>
<td>σ #</td>
</tr>
</tbody>
</table>

Candidate (3a) wins over its closest rival (3b) by being more harmonic as to the dictates of EDGEMOST (PK; R; Word). In both candidates, a heavy syllable is prominent within the foot. Although (3c) is more harmonic with EDGEMOST (PK; R; Word) than the actual output, it violates WSP and thus loses to the actual output. This suggests that WSP crucially dominates EDGEMOST (PK; R; Word). Note that candidates (3a) and (3b) both violate WSP once and candidate (3c) violates it twice. Crossing out violation marks will leave us with one violation of WSP incurred by (3c). We will be following this strategy in the remainder of this study when counting violation marks of WSP. The stressed heavy syllable in (3a) is closer to the right edge of the word compared to the stressed heavy syllable in (3b). As mentioned earlier, EDGEMOST (PK; R; Word) is a gradient constraint. The heavy stressed syllable in (3a) is separated from the right edge of the word by two syllables, while in its rival (3b) the stressed heavy syllable is separated from the right edge of the word by three syllables. Candidate (3c)
is ruled out since neither of the heavy syllables receives stress and thus the crucial domination of WSP over EDGEMOST (PK; R; Word).

Within a hypothetical LLHH string, stress will fall on the final heavy syllable according to the two ranked constraints established so far. The final two syllables are equivalent in weight allowing EDGEMOST (PK; R; Word) to optimize (4a) as shown in (4):

\[
\begin{array}{|c|c|c|}
\hline
\text{Input: LLHH} & \text{WSP} & \text{EDGEMOST (PK; R; Word).} \\
\hline
\text{a. } L\text{'LH}'H & & \\
\hline
\text{b. } L\text{'}(H)H & \sigma!# & \\
\hline
\text{c. } L'(LH)H & \sigma! & \sigma\sigma# \\
\hline
\end{array}
\]

Candidate (4a) wins over its closest rival by satisfying the dictates of EDGEMOST (PK; R; Word). The prominent heavy syllable in (4a) is rightmost in the word, whereas it is separated by a syllable in (4b). Candidate (4c) is excluded due to a fatal violation of the higher ranked WSP.

In the absence of heavy syllables from a string of syllables, stress is determined by the edgemost constraint alone. Tableau (5) illustrates stress assignment in the hypothetical string LLLL.

\[
\begin{array}{|c|c|c|}
\hline
\text{Input: LLLL} & \text{WSP} & \text{EDGEMOST (PK; R; Word).} \\
\hline
\text{a. } L\text{'LL} & \sigma & \\
\hline
\text{b. } L'(LL)L & \sigma\sigma!# & \\
\hline
\text{c. } (L'L)L & \sigma\sigma!\sigma# & \\
\hline
\end{array}
\]

In tableau (5), WSP is vacuously satisfied by all three candidates since a heavy syllable does not exist. Determining the optimal output falls on the shoulders of EDGEMOST (PK; R; Word) which favors candidate (5a) since the stress bearing syllable is separated from the right edge of the word by a
single syllable. Candidate (5b) has a stressed syllable that is separated from the right edge by two syllables, and finally the stressed syllable in (5c) is separated from the right edge of the word by three syllables.

2. Stress-Assignment Principles in JA

Syllable quantity plays a major role in stress assignment in all Arabic dialects including JA. Stress is assigned to the rightmost heavy syllable provided that it is not separated from the right edge of the word by more than two syllables, i.e., pre-antepenultimate syllables are never stressed in JA. In the absence of a heavy syllable under the condition above i.e. in the ultimate or penultimate syllable, the antepenultimate syllable is stressed. Word-final CVC syllables are considered light and never attract stress. This is due to the extrametricality of the final consonant as shown in the discussion below. Data in (6) include various possible structures in JA starting from disyllabic words\(^3\) all the way to words with five syllables:\(^4\)

(6)

<table>
<thead>
<tr>
<th>a. Disyllabic words</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>'da.wa</td>
<td>‘medicine’</td>
</tr>
<tr>
<td>ma.'h(^5)all</td>
<td>‘a store’</td>
</tr>
<tr>
<td>'fi.him</td>
<td>‘he understood’</td>
</tr>
<tr>
<td>da.'maar</td>
<td>‘destruction’</td>
</tr>
<tr>
<td>mis.'maar</td>
<td>‘a nail’</td>
</tr>
<tr>
<td>qaa.'nuun</td>
<td>‘a law’</td>
</tr>
</tbody>
</table>

\(^3\) Content words in JA are minimally bimoraic. A single heavy syllable or two light syllables are minimally required to form a content word in the language.

\(^4\) A detailed morpheme by morpheme analysis of these examples is irrelevant to the main goals of this paper and requires a daunting description of Arabic morphology.

\(^5\) /h/ symbolizes a voiceless pharyngeal fricative.
b. **Trisyllabic words**

<table>
<thead>
<tr>
<th>Trisyllabic Word</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>'ba.ra.k-a</td>
<td>‘a blessing-fem.’</td>
</tr>
<tr>
<td>ba.ra.'ka-at</td>
<td>‘blessings’</td>
</tr>
<tr>
<td>ma.'haa.kim</td>
<td>‘courts’</td>
</tr>
<tr>
<td>fi.'him.na</td>
<td>‘he understood us’</td>
</tr>
<tr>
<td>xaa.'tim.hum</td>
<td>‘their ring’</td>
</tr>
<tr>
<td>'msaa.wa.mah</td>
<td>‘bargaining’</td>
</tr>
<tr>
<td>mir.tab.'kiin</td>
<td>‘confused’</td>
</tr>
<tr>
<td>'muh.ta.ram</td>
<td>‘respectable’</td>
</tr>
<tr>
<td>'mak.ta.bi</td>
<td>‘my office’</td>
</tr>
</tbody>
</table>

c. **Words with more than three syllables**

<table>
<thead>
<tr>
<th>Multi-syllable Word</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>mis.taʕ.ma.ra.ti</td>
<td>‘my colony’</td>
</tr>
<tr>
<td>miz.'ra.ʕa.tu</td>
<td>‘his farm’</td>
</tr>
<tr>
<td>miz.ra.'ʕat.hum</td>
<td>‘their farm’</td>
</tr>
<tr>
<td>miš.ta.ra.'jaat</td>
<td>‘purchases’</td>
</tr>
<tr>
<td>muh.'ta.ra.ma</td>
<td>‘respectable (fem.)’</td>
</tr>
</tbody>
</table>

Data in (6) confirm the stress assignment rules in JA. A pre-antepenultimate syllable is never stressed. This leaves the last three syllables from the right edge as stress bearers in the language. The rightmost heavy syllable is stressed, and if one is not found among the final

---

6 (ʕ) symbolizes a voiced pharyngeal fricative.
three syllables of the word, then the antepenultimate syllable receives stress.⁷

2.1 The basic constraints

McCarthy (1979a, b) argues that feet are bounded in size in terms of the moras they have, rather than by the number of syllables a foot has. A foot according to McCarthy is made up of mora of the stressed syllable and at most two following moras. This in effect allows binary feet to consist of two light syllables, one heavy syllable, or a heavy and light syllable. Thus feet are minimally bimoraic and maximally trimoraic. Foot binarity is expressed through the OT constraint FOOT BINARITY, introduced in (7). In JA, a dialect that does not allow unbounded feet, this constraint is ranked very high in the grammar.

(7) FOOT BINARITY (FTBIN)

Feet are binary at some level of analysis (µ, σ)⁸

According to (7), a trisyllabic word is parsed as (σσ)σ or σ(σσ), and a trimoraic word is parsed as (μμ)μ or μ(μμ).⁹ Favoring σ(σσ) over (σσ)σ or μ(μμ) over (μμ)μ is determined by a high ranked EDGEMOST (PK; R; Word). On the other hand, favoring (σσ)σ over σ(σσ), or (μμ)μ over μ(μμ) is the function of a high ranked NONFINALITY(NF) constraint that banns the head of a prosodic word from appearing at the end of the word. This constraint is formulated in (8) from Prince and Smolensky (1993):

(8) NONFINALITY

No head of Prosodic Word is final in Prosodic Word.

---

⁷ A single foot per word is erected and thus only primary stress is marked. No evidence for secondary stress in JA is available. An argument for the mono-foot construction is discussed below.
⁸ Feet are placed within parentheses.
⁹ Tri-moraic feet are also permissible. A heavy syllable may be followed by a light syllable to form a binary foot at the syllable level as in (15a).
The word ‘head’ here is used to refer to the stressed syllable within the foot or the stressed foot within the word. Feet in JA are trochaic. This means that within the foot, the stressed syllable precedes the unstressed syllable. Feet are however assigned at the right edge of the word. Heavy syllables are prominent within the foot since they attract stress. This fact is a function of WSP introduced earlier in (1) and repeated in (9) for convenience:

(9) Weight-to-Stress Principle (WSP)

Heavy syllables are stressed.

This constraint is responsible for ruling out trochees with the structure (‘LH) because the heavy syllable is parsed in a dependent position.\(^{10}\)

The interaction of the constraints introduced so far accounts for most of the stress patterns in the data in (6). Additional constraints will be introduced throughout the discussion. For the purposes of the NF constraint, a head foot and head syllable will be represented as 'F and 'σ respectively. Tableau (10) provides an account of the stress pattern of a disyllabic LH word like /da.'maar/ ‘destruction’:

(10)

<table>
<thead>
<tr>
<th>Input: damaar</th>
<th>FtBIN</th>
<th>WSP</th>
<th>NF</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. (\varepsilon) da('maar)</td>
<td></td>
<td></td>
<td>*F and *σ</td>
</tr>
<tr>
<td>b. ('da.maar)</td>
<td></td>
<td>*!</td>
<td>*F</td>
</tr>
<tr>
<td>c. ('da)maar</td>
<td>*!</td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

The optimal candidate is (10a) which contains a stressed heavy syllable in concord with WSP and FtBIN since the syllable is bimoraic. Its poor performance on NF is irrelevant given the constraint ranking in the tableau. Candidates (10b) and (10c) are ruled out by the dictates of WSP and FtBIN respectively.

\(^{10}\) ('LH) trochees are allowed in JA only when the heavy syllable has an epenthetic vowel. See Abu-Abbas (2003) for details.
In words with three heavy syllables HHH, as in /mirtab.‘kiin/ ‘confused’, the rightmost heavy syllable will receive stress. This suggests that EDGEMOST (*σ; R; Word) must outrank NF(*F,*σ), otherwise the penultimate syllable will receive stress as tableau (11) shows:

\[
\begin{array}{|c|c|c|c|}
\hline
\text{Input:/mirtab.‘kiin/} & \text{FtBIN} & \text{WSP} & \text{EDGEMOST} & \text{NF} \\
\hline
\text{a. } \sigma \text{ mir.tab.} (‘kiin) & & & \#*F & *σ \\
\text{b. mir(tab)kiin} & & & σ!# & \\
\text{c. } (‘mir)tab.kiin & & & σ!σ # & \\
\hline
\end{array}
\]

The three candidates in (11) all have binary feet and heavy stressed syllables thus obeying FtBIN and WSP. Choosing (11a) as the optimal output is a function of EDGEMOST since this is the only candidate with a final stressed syllable.

The analysis of LHL forms as in /fi.him.‘na/ ‘he understood us’ requires a crucial domination of WSP over EDGEMOST as tableau (12) exemplifies:

\[
\begin{array}{|c|c|c|c|}
\hline
\text{Input:/fi.him.‘na/} & \text{FtBIN} & \text{WSP} & \text{EDGEMOST} & \text{NF} \\
\hline
\text{a. } \sigma \text{ fi(him.}na) & & & σ # & *F \\
\text{b. fi(him.} ‘na) & & *! & & \#*F & *σ \\
\text{c. fi.him.} (‘na) & *! & * & & \#*F & *σ \\
\hline
\end{array}
\]

Candidate (12a) violates EDGEMOST, since the stressed syllable is removed from the edge of the word. The other two candidates do not violate this constraint because the stressed syllable is final in the word. Nevertheless, these two candidates fail to surface since both have a light syllable as the primary stress bearer in violation of WSP, and (12c) incurs an extra violation by having a monosyllabic, monomoraic foot in violation of FtBIN. The domination of WSP over EDGEMOST is crucial, since reversing the order
will produce (12b) as the optimal output. However, a potential candidate like fi(‘him)na is more harmonic to the hierarchy established thus far since it fares better as to the requirements of NF.

In JA, a single stressed syllable per word is proposed. The only place in the literature where secondary stress has been considered is Hayes (1995). Otherwise, Kenstowicz (1981), Kenstowicz and Abdul-Karim (1980), Abu-Salim (1987) all do not recognize secondary stress in any Arabic variety. To account for the single stress per word in Cairene Arabic (CA), Al-Mohanna (2007) proposes an interaction of a constraint that requires parsing syllables into feet PARSE-SYL (McCarthy and Prince 1993b) with Lx≈PR (Prince & Smolensky 1993/2002) and *FT (de Lacy 1998). The requirements of Lx≈PR and *FT are contradictory. While the former obligates a minimum of prosodic configuration to license lexical representation, the latter militates against any form of structuring (Al-Mohanna 2007: 9). The hierarchy in (13) guarantees the erection of a single foot in a word as shown in (14).

(13) Lx≈PR >> *FT >> PARSE-SYL

(14)

<table>
<thead>
<tr>
<th></th>
<th>Lx≈PR</th>
<th>*FT</th>
<th>PARSE-SYL</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>σσ(‘σσ)</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>b.</td>
<td>(‘σσ)(‘σσ)</td>
<td></td>
<td>***!</td>
</tr>
<tr>
<td>c.</td>
<td>&lt;xxxx&gt;</td>
<td>*!</td>
<td>****</td>
</tr>
</tbody>
</table>

Candidate (14c) is ruled out by the high ranked Lx≈PR since it does not have any structure. On the other hand, (14b) is less harmonic than (14a) since it is fully parsed incurring two violations of *FT compared to a single violation by (14a).

Ranking PARSE-SYL higher than NF favors fi(‘him.na) over fi(‘him)na as shown in (15).

Candidate (14c) is ruled out by the high ranked Lx≈PR since it does not have any structure. On the other hand, (14b) is less harmonic than (14a) since it is fully parsed incurring two violations of *FT compared to a single violation by (14a).

Ranking PARSE-SYL higher than NF favors fi(‘him.na) over fi(‘him)na as shown in (15).

---

11 Failure of (12b) can be attributed to the fact that feet in JA are trochaic. Nevertheless, the hierarchy is still valid to account for structures like that in (22).
Candidate (15a) is optimal since only one syllable is not parsed compared to two syllables in (15b).

Other LHL might have a CVC final syllable as in /ma.'haa.kim/ ‘courts’. In such examples, final CVC syllables are considered light and never attract stress. This is due to the extrametricality of the final consonant. The notion of extrametricality is avoided in OT. Its effect may be achieved by a constraint that bans the association of a mora to the coda consonant of a final syllable. This constraint will ban the structure CV[μCμ]σ. This constraint is introduced in (16):

(16) *FinalCμ

A syllable-final consonant in a final syllable cannot be moraic.

This constraint will necessarily be ranked over a faithfulness constraint that seeks to preserve input moras in the output. This constraint is introduced in (17) from Prince and Smolensky (1993):

(17) MAX-IO(μ)

An underlying mora must be attached to syllable structure.

The interaction of the constraint to derive the stress pattern in /ma.'haa.kim/ is exemplified in (18):
(18)

<table>
<thead>
<tr>
<th>Input: mahaakim</th>
<th>FtBIN</th>
<th>*FinalC</th>
<th>σ</th>
<th>MAX-IO(µ)</th>
<th>WSP</th>
<th>EDGEMOST</th>
<th>NF</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. 'ma.(haa.kim)</td>
<td></td>
<td></td>
<td>*</td>
<td></td>
<td>σ #</td>
<td>*'F</td>
<td></td>
</tr>
<tr>
<td>b. ma.haa('kiµmu)</td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><em>'F</em>σ</td>
<td></td>
</tr>
</tbody>
</table>

Both candidates satisfy FtBIN: candidate (18a) has a disyllabic foot and (18b) has a bimoraic foot. (18a) wins the competition since it satisfies the higher ranked *FinalC|σ. From now on in the discussion, final CVC syllables will be treated as light syllables without reference to the constraints responsible. The constraints will be referred to only when their presence is crucial to the discussion.

The treatment of HHL forms in words such as /xaal.ˈtim.hum/ ‘their ring’ follows from the domination of WSP over EDGEMOST, as tableau (19) shows:

(19)

<table>
<thead>
<tr>
<th>Input: xaalimhum</th>
<th>FtBIN</th>
<th>WSP</th>
<th>EDGEMOST</th>
<th>NF</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. 'xaal(ˈtim.hum)</td>
<td></td>
<td>σ #</td>
<td>*'F</td>
<td></td>
</tr>
<tr>
<td>b. ('xaal)tim.hum</td>
<td>σσ! #</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. xaal(ˈtim.hum)</td>
<td>*!</td>
<td></td>
<td><em>'F</em>σ</td>
<td></td>
</tr>
</tbody>
</table>

The optimal candidate is (19a). Its closest rival is (19b). Both candidates satisfy the high ranking FtBIN and WSP. Candidate (19a) wins the competition due to the dictates of EDGEMOST. The stressed syllable in (19a) is separated from the edge of the word by only one syllable while (19b) is separated from the edge of the word by two syllables and is thus excluded from the competition. Candidate (19c) is out of the game due to a fatal violation of the higher ranked WSP since stress falls on a light syllable.

Going back to disyllabic words that comprise two light syllables LL such as /fihiµm/ ‘he understood’. Such forms have stress on the initial syllable in violation of EDGEMOST. This example has the output form as ('fi.him) which violates EDGEMOST by having a syllable between the initial stressed syllable and the right edge of the word. We already know that a
hypothesised output like fi('him) is ruled out by the constraint against
monosyllabic or monomoraic feet, namely FtBIN. The problem is in a
hypothesised output of the form (fi.'him), which satisfies FtBIN and should
be selected over (fi.'him) by the dictates of Edgmost. This hypothesised
output has stress on the right edge of the word. We have mentioned earlier
that prosodic feet in JA are trochaic, and it is this constraint on foot form
that rules (fi.'him) out and selects (fi.'him) instead. The ‘trochaic feet’
constraint is formulated in (20), and its power to choose (fi.'him) over
(f.i.'him) is exemplified in (21).

(20) RH-TYPE = T

Feet in JA have initial prominence

(21)

<table>
<thead>
<tr>
<th>Input: fihim</th>
<th>RH-TYPE= T</th>
<th>FtBIN</th>
<th>WSP</th>
<th>Edgmost</th>
<th>NF</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. fi('him)</td>
<td></td>
<td></td>
<td></td>
<td>σ #</td>
<td>*'F</td>
</tr>
<tr>
<td>b. (fi.'him)</td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
<td>*'F *'σ</td>
</tr>
<tr>
<td>c. fi('him)</td>
<td></td>
<td></td>
<td></td>
<td>*!</td>
<td></td>
</tr>
</tbody>
</table>

According to (21), candidate (21a) wins over (21b) since the latter has an
iambic foot rather than a trochaic foot. RH-TYPE = T will not be invoked
unless crucial to the discussion. It will be taken to hold for all analyses.
WSP is vacuously satisfied by both constraints since none of them has a
heavy syllable to be evaluated for stress assignment.

As with other forms with a heavy syllable, the analysis of HLL forms
as in /mak.ta.bi/ ‘my office’ follows from the high ranking of WSP which
necessarily dominates Edgmost and NF as tableau (22) shows:

(22)

<table>
<thead>
<tr>
<th>Input: maktabi</th>
<th>FtBIN</th>
<th>WSP</th>
<th>Edgmost</th>
<th>NF</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. mak.ta.bi</td>
<td></td>
<td></td>
<td>σσ #</td>
<td></td>
</tr>
<tr>
<td>b. mak.ta.bi</td>
<td>*!</td>
<td></td>
<td>σ #</td>
<td>*'F</td>
</tr>
</tbody>
</table>
Candidate (22a) surfaces as the optimal output since it complies with the higher ranked WSP, which is violated by (22b). A candidate like /(mak) (ta.bi)/ is ruled out by the hierarchy in (13). Note that in (22a), the stressed foot is disyllabic but tri-moraic. A potential candidate like /(mak)ta bi/ which is as harmonic as (22a) to the constraint hierarchy established so far is nevertheless ruled out by the requirements of Parse-Syl or by a Lapse constraint discussed in section 2.3.

2.2 Splitting EDGEMOST

Trisyllabic forms LLL like /ba.ra.ka/ ‘a blessing’ prove problematic given the ranking of constraints established so far. In order to allow a rightmost heavy syllable in a form like HHH to receive stress in JA, it was imperative for Edgemo to be ranked higher than NF, as was shown in (11) above. Given these facts, it would be impossible to account for the antepenultimate stress in forms like 'LLL since such forms require NF to be ranked higher than Edgemo. Tableau (23) clarifies the argument:

(23)

<table>
<thead>
<tr>
<th>Input: baraka</th>
<th>FtBIN</th>
<th>WSP</th>
<th>Edgemo</th>
<th>NF</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. &quot;(ba.ra)ka&quot;</td>
<td></td>
<td>σσ ! #</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. &quot;ba(′ra.ka)&quot;</td>
<td></td>
<td>σ #</td>
<td></td>
<td>*F</td>
</tr>
</tbody>
</table>

According to (23), candidate (23b) will surface as the optimal output. This is incorrect conclusion since the actual surface form is (23a) marked here with the sad face. The problem could be solved by reversing the order of Edgemo and NF. As mentioned earlier, the constraint ranking in (23) is imperative in order to derive correct stress patterns in forms like HHH.

To solve the ranking paradox encountered above, we propose separate Edgemo constraints for heavy and light syllables. A constraint demanding heavy stressed syllables to be rightmost in a word will have to dominate NF, while a constraint that requires light stressed syllables to be rightmost in a word will have to be dominated by NF. This might be a justifiable split of Edgemo since Arabic is a weight-sensitive language and it should be reasonable for the language to make direct reference to heavy syllables.
Accordingly, Edgemost will be treated as a family of constraints that includes (24) and (25) below:

(24) EDGEMOST (‘H; R; Word)

A stressed heavy syllable lies at the right edge of a word.

(25) EDGEMOST (‘L; R; Word)

A stressed light syllable lies at the right edge of a word.

The dominance relationship between (24) and (25) on the one hand and NF on the other is expressed in (26):

(26) EDGEMOST (‘H; R; Word) >> NF >> EDGEMOST (‘L; R; Word)\(^\underline{12}\)

The interaction of the constraints in (26) deriving stress patterns in HHH and LLL forms is expressed in (27) and (28) respectively:

(27)  

<table>
<thead>
<tr>
<th>Input: mirtabkiin</th>
<th>Edgemost (‘H;R;Word)</th>
<th>NF</th>
<th>Edgemost (‘L;R;Word)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. /hand/ mir.tab(‘kiin)</td>
<td>*F *’σ</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. mir(‘tab)kiin</td>
<td>σ! #</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. (‘mir)tab.kiin</td>
<td>σ! σ #</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In (27), candidate (27a) surfaces as the optimal output since it has a stressed heavy syllable at the right edge of the word. Its poor performance on NF is irrelevant given that the other two candidates violate a higher ranked constraint. Edgemost (‘L; R; Word) is vacuously satisfied by all candidates since none of them has a light stressed syllable to be evaluated by this constraint.

\(^{12}\) Edgemost (‘H; R; Word) is ranked higher than Edgemost (‘H; L; Word) since the language is right-side oriented.
In (28), candidate (28a) surfaces as the optimal output since its competitor violates a higher ranked constraint. Both candidates vacuously satisfy EDGEMOST ('H; R; Word) since neither has a heavy syllable to be evaluated by this constraint. The merit of splitting the edgемost constraint into two separate constraints is evident in tableau (28).

### 2.3 Words with more than three syllables

In JA, a word may consist of up to five syllables. We will first take a look at words with the structure HLLL such as / muh.'ta.ra.ma/ ‘respectable (fem.)’. The antepenultimate syllable receives stress in violation of WSP, which would have assigned stress to the first heavy syllable. The constraint ranking introduced so far fails to produce the actual stress pattern in this and similar examples. According to WSP, the structure HLLL should be parsed as ('HL)LL. What we need then is a constraint that would rule such parsing. We have previously mentioned that stress in JA may not be assigned to any pre-antepenultimate syllable. This constraint comes in violation of WSP which implies that whatever the constraint responsible for ruling out ('HL)LL, it must be ranked over WSP. The constraint we are looking for to account for the apparent paradox encountered above was introduced by Selkirk (1984a) as Lapse and by Hayes (1995) as Persistent Footing. These terms were then discussed by Green and Kenstowicz (1995) and introduced as the constraint LAPSE.

(29) LAPSE

> Two successive unparsed syllables are disfavored.

Kager (1994, 1996) further elaborates on this notion and introduces Parse-2 as a constraint that avoids adjacent unparsed stress units in a word where
multiple feet are erected. Al-Mohanna (1998) divides \textsc{PARSE}-2 into two constraints, namely \textsc{PARSE}-2(I/F) defined in (30) and (31) respectively.

(30) \textsc{PARSE}-2-I

Parsable stress units in \textbf{initial} sequences should be parsed by a foot.

(31) \textsc{PARSE}-2-F

Parsable stress units in \textbf{final} sequences should be parsed by a foot.

The function of \textsc{PARSE}-2-I is to disallow successive unparsed syllables at the left edge of a word, while \textsc{PARSE}-2-F disallows successive unparsed syllables at the right edge of a word.

The active constraint in JA is \textsc{PARSE}-2-F. In essence, this constraint bans the structure ('σσ)σσ since the last two syllables are unparsed by foot boundary. The effect of this constraint is exemplified in (32):

(32)

<table>
<thead>
<tr>
<th>Input: muhtarama</th>
<th>\textsc{PARSE}-2-F</th>
<th>WSP</th>
<th>NF</th>
<th>\textsc{EDGEMOST('L;R; Word)}</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. $^\infty$muh('tara)ma</td>
<td>*</td>
<td></td>
<td></td>
<td>σ σ #</td>
</tr>
<tr>
<td>b. ('muh.ta)rama</td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. muh.ta('ra.ma)</td>
<td>*</td>
<td>*F!</td>
<td></td>
<td>σ #</td>
</tr>
</tbody>
</table>

The optimal candidate is (32a) which wins over its two rivals despite the fact that it violates WSP. The determining factor turns out to be \textsc{PARSE}-2-F which is violated by candidate (32b) while (32c) violates NF.

The constraint ranking so far is sufficient to derive correct stress patterns in words with five syllables such as the form HHLLL in a word like /mis.taʕ.'ma.ra.ti/ ‘my colony’ as shown in (33):

...
(33)

<table>
<thead>
<tr>
<th>Input: mistaɁmarati</th>
<th>PARSE-2-F</th>
<th>WSP</th>
<th>EDGEMOST('H; R; Word)</th>
<th>NF</th>
<th>EDGEMOST('L; R; Word)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. ʰmis.taɁ('ma.ra)ti</td>
<td>*</td>
<td></td>
<td>σσ #</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b.  mis.taɁ.ma(ra.ti)</td>
<td>*</td>
<td>*'F!</td>
<td>σ #</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The optimal candidate is (33a) which is identical to (33b) in satisfying higher ranked PARSE-2-F and violating WSP. (33a) wins the competition on the NF constraint which is violated by (33b). A candidate like / mis. ('taɁ. ma).ra.ti/ is ruled out by the higher ranked PARSE-2-F.

2.4 Default-to-the-Opposite-Side stress pattern

Kenstowicz (1994), Hayes (1995), and Walker (1996) discuss DOS stress patterns and conclude that a total of eleven languages feature this stress pattern. In nine of these languages, the default side for stress in words consisting of only light syllables is the left side while in the other two languages, the default side is the right side.\(^{13}\) In an attempt to re-analyze DOS stress patterns, Gordon (2000: 103) notes that certain DOS languages place secondary stress on heavy syllables not receiving primary stress, (Prince 1983; Hayes 1995; Bakovic 1998). In other languages, the default stress pattern is better analyzed as intonational prominence rather than stress. Finally, there is a small set of languages including Arabic for which stress data is either incomplete or conflicting and neither clearly fits the default-to-opposite pattern nor is clearly amenable to re-analysis in terms similar to those relevant for other default-to-opposite stress systems.

Classical Arabic is a very familiar case of DOS stress pattern (McCarthy 1979a). His analysis is rather controversial (Abdo 1969; Al-Sughayer 1990;\(^{14}\) Angoujard 1990). Accordingly, Arabic varieties have never been categorized as DOS or DSS systems.

\(^{13}\) For a detailed account of these languages, consult Gordon (2000).

\(^{14}\) Abdo (1969) and Al-Sughayer (1990) argue that in words with only light syllables, stress falls on the ante-penultimate syllable.
My attempt to categorize JA\textsuperscript{15} is based on an analysis of the interaction between \textsc{Edgemost} and \textsc{Nonfinality} in the language. When higher ranked constraints are equally satisfied or violated, violating NF by having a stressed heavy syllable in final position is tolerated while having a final stressed foot made up of two light syllables is not. Accordingly, \textsc{Edgemost} was split into two constraints; one demanding heavy stressed syllables to be rightmost in a word and the other demanding light stressed syllables to be rightmost. The first dominates NF while the second is dominated by it. In the language as well, \textsc{Parse} is also edge oriented. Two unparsed syllables at the right edge of a word are not tolerated while permitted at the left edge of a word and thus \textsc{Parse-2-F} was introduced. Both \textsc{Edgemost} constraints refer to the right edge of a word and so does \textsc{Parse-2-F}. The language prefers stressing the rightmost heavy syllable; thus \textsc{Edgemost} ('H; R; Word) is ranked higher than NF. \textsc{Parse-2-F} is ranked higher than WSP and \textsc{Edgemost} ('H; R; Word). The constraint hierarchy responsible for stress assignment in JA is introduced in (34).

\begin{equation}
\text{Stress in JA} \\
\text{FTBIN , PARSE-2-F >> WSP >> EDGEMOST ('H; R; Word) >> PARSE-SYL} \\
\text{NF >> EDGEMOST('L;R; Word)}
\end{equation}

The language prefers placing stressed syllables as close to the right edge as possible regardless of their weight. Higher ranked \textsc{Parse-2-F} together with \textsc{FtBin} force stress to occur on a light antepenultimate syllable in H('LL)L structures since ('HL)LL and ('H)LLL violate \textsc{Parse-2-F}, HL('LL) satisfies \textsc{Parse-2-F} and fares as well as the optimal candidate as to WSP but violates NF. In words with no heavy syllables, \textsc{Parse-2-F} and NF force stress to occur on the antepenultimate syllable as in L('LL)L since ('LL)L violates \textsc{Parse-2-F}, ('LLL)L violates \textsc{FtBin}, and LL('LL) violates NF which is satisfied by the optimal candidate. A closer look at the constraint interaction in the language reveals that \textsc{Edgemost} ('L; R; Word) is never responsible for optimizing a candidate and is thus ranked very low in the

\begin{footnotesize}
\textsuperscript{15} I believe the argument may be extended to many varieties of Arabic including Classical Arabic. This is an endeavor that will not be undertaken in the present study.
\end{footnotesize}
hierarchy. In the absence of a stressable heavy syllable, the higher ranked constraints will optimize the correct candidate without ever being evaluated by $\text{EDGEMOST ('L; R; Word)}$. Thus categorizing JA or any other language for that matter as having a Default-to-the-Opposite-Side (DOS) stress pattern must entail that a constraint demanding stressed light syllables to be leftmost in a word, i.e. $\text{EDGEMOST ('L; L; Word)}$ should be ranked higher than a constraint demanding such syllables to be rightmost in a word i.e., $\text{EDGEMOST ('L; L; Word)}$ (section 3). This is not the case in JA. Accordingly, we propose categorizing JA and similar languages as employing a Default-to-the-Same-Side (DSS) stress pattern based on the fact that heavy syllables target the right edge of the word.

3. **EDGEMOST and the typology of weight-(in)sensitive languages**

Treatment of $\text{EDGEMOST}$ as a weight sensitive constraint produces four competing constraints (35). This results in twenty four possible rankings (36) producing four distinct weight-sensitive stress systems (37) all of which are typologically attested (Hayes 1995).

(35) **EDGEMOST**

a. $\text{EDGEMOST ('L; L; Word) \quad \text{LM('L)}}$

A stressed light syllable lies at the left edge of a word.

b. $\text{EDGEMOST ('L; R; Word) \quad \text{RM('L)}}$

A stressed light syllable lies at the right edge of a word.

c. $\text{EDGEMOST ('H; L; Word) \quad \text{LM('H)}}$

A stressed heavy syllable lies at the left edge of a word.

d. $\text{EDGEMOST ('H; R; Word) \quad \text{RM('H)}}$

A stressed heavy syllable lies at the right edge of a word.

16 All examples used in this section are cited in Hayes (1995) unless otherwise stated.
(36) Interaction of EDGEMOST constraints

<table>
<thead>
<tr>
<th>Hierarchy</th>
<th>EDGEMOST</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. RM('H)&gt;&gt; RM('L) &gt;&gt; LM('H) &gt;&gt; LM('L)</td>
<td>Right</td>
<td>Same side</td>
</tr>
<tr>
<td>2. RM('H)&gt;&gt; RM('L) &gt;&gt; LM('L) &gt;&gt; LM('H)</td>
<td>Right</td>
<td>Same side</td>
</tr>
<tr>
<td>3. RM('H)&gt;&gt; LM('H) &gt;&gt; RM('L) &gt;&gt; LM('L)</td>
<td>Right</td>
<td>Same side</td>
</tr>
<tr>
<td>4. RM('H)&gt;&gt; LM('H) &gt;&gt; LM('L) &gt;&gt; RM('L)</td>
<td>Right</td>
<td>Opposite side</td>
</tr>
<tr>
<td>5. RM('H)&gt;&gt; LM('L) &gt;&gt; RM('L) &gt;&gt; LM('H)</td>
<td>Right</td>
<td>Opposite side</td>
</tr>
<tr>
<td>6. RM('L)&gt;&gt; RM('H) &gt;&gt; LM('H) &gt;&gt; LM('L)</td>
<td>Right</td>
<td>Same side</td>
</tr>
<tr>
<td>7. RM('L)&gt;&gt; RM('H) &gt;&gt; LM('L) &gt;&gt; LM('H)</td>
<td>Right</td>
<td>Same side</td>
</tr>
<tr>
<td>8. RM('L)&gt;&gt; RM('L) &gt;&gt; LM('H) &gt;&gt; LM('H)</td>
<td>Right</td>
<td>Same side</td>
</tr>
<tr>
<td>9. RM('L)&gt;&gt; LM('L) &gt;&gt; RM('H) &gt;&gt; LM('H)</td>
<td>Right</td>
<td>Same side</td>
</tr>
<tr>
<td>10. LM('L)&gt;&gt; RM('H) &gt;&gt; LM('H) &gt;&gt; RM('L)</td>
<td>Right</td>
<td>Opposite side</td>
</tr>
<tr>
<td>11. LM('L)&gt;&gt; RM('H) &gt;&gt; RM('L) &gt;&gt; LM('H)</td>
<td>Right</td>
<td>Opposite side</td>
</tr>
<tr>
<td>12. LM('L)&gt;&gt; RM('L) &gt;&gt; RM('H) &gt;&gt; LM('H)</td>
<td>Right</td>
<td>Opposite side</td>
</tr>
<tr>
<td>13. LM('H)&gt;&gt; LM('L) &gt;&gt; RM('H) &gt;&gt; RM('L)</td>
<td>Left</td>
<td>Same side</td>
</tr>
<tr>
<td>14. LM('L)&gt;&gt; LM('L) &gt;&gt; RM('L) &gt;&gt; RM('H)</td>
<td>Left</td>
<td>Same side</td>
</tr>
<tr>
<td>15. LM('H)&gt;&gt; RM('H) &gt;&gt; LM('L) &gt;&gt; RM('L)</td>
<td>Left</td>
<td>Same side</td>
</tr>
<tr>
<td>16. LM('H)&gt;&gt; RM('H) &gt;&gt; RM('L) &gt;&gt; LM('L)</td>
<td>Left</td>
<td>Opposite side</td>
</tr>
<tr>
<td>17. LM('H)&gt;&gt; RM('L) &gt;&gt; RM('H) &gt;&gt; LM('L)</td>
<td>Left</td>
<td>Opposite side</td>
</tr>
<tr>
<td>18. LM('H)&gt;&gt; LM('L) &gt;&gt; LM('L) &gt;&gt; RM('H)</td>
<td>Left</td>
<td>Opposite side</td>
</tr>
<tr>
<td>19. LM('L)&gt;&gt; RM('L) &gt;&gt; LM('H) &gt;&gt; RM('H)</td>
<td>Left</td>
<td>Same side</td>
</tr>
<tr>
<td>20. LM('L)&gt;&gt; LM('H) &gt;&gt; RM('H) &gt;&gt; RM('L)</td>
<td>Left</td>
<td>Same side</td>
</tr>
<tr>
<td>21. LM('L)&gt;&gt; LM('H) &gt;&gt; RM('L) &gt;&gt; RM('H)</td>
<td>Left</td>
<td>Same side</td>
</tr>
<tr>
<td>22. RM('L)&gt;&gt; LM('L) &gt;&gt; LM('H) &gt;&gt; RM('H)</td>
<td>Left</td>
<td>Opposite side</td>
</tr>
<tr>
<td>23. RM('L)&gt;&gt; LM('H) &gt;&gt; RM('H) &gt;&gt; LM('L)</td>
<td>Left</td>
<td>Opposite side</td>
</tr>
<tr>
<td>24. RM('L)&gt;&gt; LM('H) &gt;&gt; LM('L) &gt;&gt; RM('H)</td>
<td>Left</td>
<td>Opposite side</td>
</tr>
</tbody>
</table>
Four weight-sensitive stress patterns

a. Right-side with default to the same side (Aguacatec and Western Cheremis)
b. Right side with default to the opposite side (Chuvash, Huasteco, and Selkup)
c. Left side with default to the same side (Amele, Sanskrit, and Russian)
d. Left side with default to the opposite side (Komi and Kwakiutl)

In order to determine the type of weight-sensitive stress pattern of a particular language, the hierarchies in (38) and (39) are proposed to account for right side and left side languages respectively.

(38) Right side languages

\[ \text{RM('H)} >> \text{LM('H)} \]

(39) Left side languages

\[ \text{LM('H)} >> \text{RM('H)} \]

The relative ranking of RM('L) and LM('L) is irrelevant in determining edge orientation of a heavy stressed syllable. However, these two constraints are responsible for identifying the location of default stress. Accordingly, Default-to-the-Same-Side (DSS) stress languages must involve the sub-hierarchies in (40) and (41) for rightmost and leftmost languages respectively while Default-to-the-Opposite-Side (DOS) languages involve the sub-hierarchies in (42) and (43) for rightmost and leftmost languages respectively.

(40) Stress the rightmost heavy syllables, otherwise stress the rightmost syllable

\[ \text{RM('H)} >> \text{LM('H)} \text{ and } \text{RM('L)} >> \text{LM('L)} \]
(41) Stress the leftmost heavy syllable, otherwise stress the leftmost syllable

LM('H) >> RM('H) and
LM('L) >> RM('L)

(42) Stress the rightmost heavy syllable, otherwise stress the leftmost syllable

RM('H) >> LM('H) and
LM('L) >> RM('L)

(43) Stress the leftmost heavy syllable, otherwise stress the rightmost syllable

LM('H) >> RM('H)
RM('L) >> LM('L)

The hierarchies in (40–43) represent what may be termed picture-perfect DSS or DOS stress systems which implies that these hierarchies are ranked very high in the language in question.\(^{17}\)

In JA, RM('H) is ranked higher than LM('H) (26) which indicates that the language is right-side oriented (38). However, the relative ranking of LM('L) and RM('L) could not be determined and thus categorizing the language as DSS or DOS based on (40) or (42) is not possible. This leaves us with two options. Categorizing JA as a weight-sensitive language without a specified default stress position or as a DSS language, based on the fact that heavy syllables target the right side and so does PARSE-2-F.

Weight-insensitivity on the other hand is a result of ranking WSP lower than all EDGEMOST constraints if both rightmost constraints are ranked higher than both leftmost constraints (44) or vice versa (45) to produce rightmost and leftmost languages respectively.

\(^{17}\) WSP is ranked higher because these are weight-sensitive languages.
(44) Weight-insensitive rightmost systems Uzbek (Walker 1996)

RM('H), RM('L) >> LM('H), LM('L), WSP

(45) Weight-insensitive leftmost systems Tinrin (Walker 1996)

LM('H), LM('L) >> RM('H), RM('L), WSP

Ranking NF higher than the constraints in (44) produces penultimate stress while ranking PARSE-2-F higher produces antepenultimate stress. Finally, the notion of weight-sensitive EDGEMOST helps in accounting for a wide variety of stress systems. The validity of the sub-hierarchies in (40–43) for the categorization of DSS and DOS stress systems is an endeavor that will be left for further research.

4. Conclusion

Facts in JA show that arguing for a weight-sensitive EDGEMOST constraint is empirically justified and may be extended to account for stress patterns in a variety of languages providing additional typological support for the constraint. The proposal provides a straightforward account of various attested stress patterns. Weight-insensitivity is directly related to one of the hierarchies introduced earlier in (44) and (45) while weight-sensitivity is accounted for by the high ranking of WSP. Default stress position is accounted for by the ranking of RM('L) and LM('L) relative to each other and to other stress-related constraints. Of particular importance is the fact that DSS stress systems must involve the sub-hierarchies in (40) and (41) while DOS systems must involve the sub-hierarchies in (42) and (43). According to these hierarchies, stress systems are categorized. In JA, none of the hierarchies above was fully established. The language is categorized as having a DSS stress system based on the fact that heavy stressed syllables target the right edge of a word and PARSE-2-F makes reference to the right edge of the word as well.
References


—— (1993b) *Prosodic Morphology 1: Constraint interaction and satisfaction*. MS, University of Massachusetts Amherst/Rutgers University.


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Language Choice in Mobile Text Messages among Jordanian University Students

Abstract

This paper examines the linguistic structure and sociolinguistic functions of Arabic-English code-switching in mobile text messages as used by a group of Jordanian university students. It also aims at investigating the distribution of the switched elements by syntactic category. The corpus was collected from 46 male and female undergraduate and post-graduate students. Qualitative as well as quantitative analyses were carried out by the researchers. The major findings of the study revealed that there are a number of technical elements that might be responsible for the wide use of English or switching between English and Arabic “with Arabic Roman scripts” in mobile text messaging. Qualitative data analysis indicated that CS could be brought about and shaped by the dynamics of the relationship of the speaker–addressee and by cultural features embedded in the Arabic language. The analysis also showed that CS in this particular means of communication functions as a communicative strategy for facilitating communication by lowering language barriers as well as by consolidating cultural identity. Moreover, it has been noticed that the process appears to be conditioned, among other factors, by the sex of the writer. The findings of this study chart changes in language choice practices ushered in by the advent of a new medium of communication.

1. Introduction and background

1.1 Preliminaries

Mobile technology has spread rapidly throughout the world faster than any other communication technology, and is now widely used everywhere. The basic concept of mobile phones began in 1947 when researchers started developing car phones, but it was not until around 1982 that mobile phones, as we know them, were first used. The Short Message Service (SMS) was developed within the mobile phone industry in the early 1990’s but it did not become popular until about 1998 (Crystal 2001).
SMS, as defined within the GSM digital mobile phone standard, is a service which enables its users to send short text messages from one mobile phone to another, or to a mobile phone via the Internet (Hard af Segerstad 2002: 187). Communication through SMS service is one mode of communication referred to as computer mediated communication (CMC). CMC is divided into two types: first, the synchronous CMC, whereby the communication occurs “in real time” (Crystal 2001: 11), such as Real Time Chat and Internet Relay Chat (IRC). The second type is asynchronous CMC, whereby communication occurs “in postponed time” (Crystal 2001: 11) such as SMS and e-mails. This latter type does not require the participants to be online and available at the same time or place in order to receive and send messages (Hard af Segerstad 2002; Baron et al. 2005; December 2005; Goggin 2004).

The mobile did not immediately become “a device for the masses”, and it was not widely spread in Jordan until the end of 1990’s. Within a span of 10 years, from 1991 to 2003, the mobile telephony has moved from being the technology for a privileged few to essentially a mainstream technology (Castelles et al. 2006).

1.2 Review of related literature

The emergence of CMC has motivated a real dichotomy among researchers as whether to consider CMC as a written or spoken form of language. While Baron (2000: 248) gives a metaphor to CMC as “an emerging language centaur, part speech, part writing”, Crystal (2001) suggests that CMC is more than just a hybrid of speech and writing. He assumes that although CMC displays properties of both mediums, it holds features that neither one of these mediums have. Crystal suggests that it must be seen as a new species of communication and he calls it a “third medium”. Moreover, a number of scholars (e.g., Androutsopoulos 2006; Siebenhaar 2006; Yeh 2004; Sue 2003; Lobet-Maris 2003; Puro 2003; Lin 2000) show how the new technology has immediate linguistic consequences. Crystal (2001) contends that the technical restriction of 160 characters per message has motivated the use of new forms of language, such as the use of short forms that basically have two types: acronyms and abbreviations. Speaking of the effect of computer-mediated communication on language use, Warschauer et al. (2002) argue that one important and the most feared consequence of the use of new technology is the global use of English to such a degree that it would replace other languages. To deal with this
problem, speakers of other languages have developed new forms of writing which adapt to their languages using the Roman scripts (Warschauer et al. 2002).

In a number of previous works (e.g., Blom & Gumperz 1972; Castells et al. 2006; Sue 2003) it has been observed that in certain situations, English is used alternatively with other languages in what is known as “code-switching” (Myers-Scottton 1993). Grosjean (1982: 145) defines code-switching as “the alternate use of two or more languages in the same utterance or conversation”. Some scholars differentiate between two types of mixed discourse: “code-switching” and “code-mixing” (Auer 1999; Kachru 1978; 1983). Myers-Scottton (1993: 85), who introduces the Compliment Phrase (CP) as the unit of analysis, notes that a number of scholars, notably Kachru (1978; 1983), make this terminological distinction, but she considers the term “code-mixing” not to be terribly useful and instead prefers to use intra-CP versus inter-CP code-switching (CS). Myers-Scottton (1993) objects to the use of the term “code-mixing” because it implies CS is unconstrained and lacks structure. She (1998) argues that because the CP can be defined more precisely than either the sentence or the clause, it is the best unit for discussing the grammatical structuring of CS.

Though many authors have dealt with the processes of code-switching, code-mixing and borrowing, not all of them have provided clear-cut distinctions for such phenomena (Romaine 1989; Myers-Scottton 1990; 1993; Poplack 1988). Code-switching and borrowing are explained (Halmari 1997: 17–18; Pahta 2004: 79) as a continuum in progression in which code-switching precedes borrowing in time and is more restricted in its use (individual vs. societal). In Pahta’s (2004: 79) words: “The distinction between the two may seem straightforward in theory: switching involves the use of two languages in one utterance, whereas the term ‘borrowing’ is used of embedded elements that have been integrated into the host language” (reported in Crespo & Moskowich, 2006: 51). Since this paper deals with language choice in mobile text messaging, we will adopt the term “code-switching” as an umbrella term to refer to any occurrence of alternating between Arabic and English.

Previous research (e.g., Castells et al. 2006; Bautista 1999; 2004; Sue 2003; Myer-Scottton 1993) has named common factors that affect an individual’s reasoning for code-switching. Among these are: 1) environmental settings, 2) audience, 3) conversations with embarrassing or
uncomfortable topics, and 4) picking up “cues” from others that serve as an invitation to speak both languages (reported in Benitze 2008).

Functional studies of CS have focused on the reasons why bilingual speakers do engage in CS, in describing the social context in which such utterances are produced, the social functions they attempt to serve, and the sociolinguistic factors triggering this kind of behavior (e.g., Chung 2006; Castells et al. 2006; Sue 2003; Al-Khatib & Farghal 1999; Auer 1999; Adendorff 1996; Myers-Scotton 1995; 1998; Mustafa & Al-Khatib 1994; Gumperz & Hernandez-Chaves 1978). Nowadays, with the emergence of new techniques of communication such as the Internet and mobile phones, studies of CS have shifted their attention to investigate how the process occurs through these new media of communication (e.g., Benitze 2008; Castells et al. 2006; Sue 2003; Paolillo 1996; Baron 2000; Durham 2003; Kung 2004).

As far as the Arab World is concerned, there has also been some interest in studying CS in CMC. In Egypt, Warschauer et al. (2002), for example, examine the use of English and Arabic in online communication by a group of young professionals. The study indicates that English is used predominantly in web use and in formal e-mail communication, whereas a Romanized version of Egyptian Arabic is used extensively in informal e-mail and online chats. They ascribe the anticipated results to four factors: “general dominance of English in the professional milieu, lack of Arabic software standards, computer and internet use learned in English environments and early adopters’ fluency in English”. Similarly, another study on the ASCII-ized Arabic (AA), (i.e., a form of language in which ASCII “American Standard Code for Information Interchange” symbols are used to represent Arabic in Instant Messaging (IM) and other electronic written communication), was carried out by Palfreyman and al Khalil (2003). The corpus shows that “approximately” 25% of participants use mainly Arabic script in IM, 25% AA, and 50% English. As Palfreyman and al Khalil put it “in the present corpus there was a fair amount of code-switching (changing mid-utterance or mid-sentence from one language to another) and code-mixing (using words or phrases from one language within sentences in the other language).” This mixing of varieties correlates with different functions and topics, with Arabic being used for more formulaic phrases such as greeting, and English for topics such as university courses.
2. The current study

2.1 Objectives and scope of the study

Although previous studies have looked at different sociolinguistic aspects of text messaging, little work has been done on mobile phones and code-switching, especially when used for text messaging. Because code-switching in mobile text messaging tends to be more conscious than code-switching in speech, code-switching in this particular means of communication is expected to bring about a new functional distribution between English and Arabic. This study investigates language choice in mobile text messages among Jordanian university students from a sociolinguistic perspective. Specifically, an attempt will be made in this investigation to see what linguistic choices are available to students when writing their text messages. It also seeks to answer the following questions: How frequently are English and Arabic used in mobile text messages? What technical elements may contribute to facilitate or hinder the process of switching between these two languages? What communicative functions are performed by switching to either code? To what extent does the sex of the speaker affect language choice? And finally, to see whether SMS has any effect on the type of syntactic patterns employed by the students, we will try to examine the distribution of the switched items in the collected data by syntactic category. The underlying hypothesis is that the students’ writing will display social functions similar to those found in oral code-switching research, given that this type of text serves as a means of interaction among bilingual university students.

2.2 Methodology and the corpus

The corpus of this study was collected from 46 students studying at different Jordanian universities: Jordan University, Yarmouk University, University of Science and Technology and Petra University. There were 17 males and 29 females ranging in age from 17 to 26 years. The sample composed of 39 undergraduate and 7 graduate students, all of whom are native speakers of Arabic. But it should be noted here that due to their educational background, all of the subjects have learned English as a
foreign language and use the language as a medium of instruction in their universities.¹

In an attempt to better understand the nature of the text messages and their contents the text-building mechanisms were analyzed and interpreted in relation to the sociocultural background of the message writers. Unless the scripts cannot be deciphered, they will be presented to the readers of this paper exactly as written by the students.

From the outset, we intended to use messages written by both male and female students, in order to examine the effect of gender on the type of strategies used. A total of 403 messages were collected from the participants. More than 150 messages were eliminated from the corpus for various technical reasons. Also, to have a nearly equal number of messages from both sex groups, only 100 messages were randomly selected from those provided by female students. Because females were more cooperative than males, they provided us with twice as many messages as males. In total 181 messages were used for the purpose of this investigation; 100 written by females and 81 by males. All names and any other information that may identify the participants’ identity were removed.

Furthermore, a mixed method approach to data collection was employed using both a self-report questionnaire and key informant interviews. The questionnaire was fashioned after that used by Warschauer et al. (2002). However, the questionnaire was modified in a way so as to

¹ During the second half of the twentieth century, the explosion in business and communications technology has revolutionized the field of teaching English as a second language, in particular, and led to an increased interest in developing the most effective ways of improving the ability of students in learning this language. With the introduction of new media and technology to the Arab world, today, more than ever, computer-based cognitive tools have been intentionally adapted or developed to function as intellectual partners to enable Arab students learn English as a second language and facilitate the process of communication with the outside world. As a result, most Jordanians have realized that bilingualism of this type is important in international trade and politics, and as such it is something usual nowadays to find many of the younger and middle-aged Jordanians speak more than one language. As is the case in many other countries in the region, in Jordan all students who finish the public secondary school education must have had at least eight years of instruction in English as a school subject. English has become compulsory in all elementary, preparatory, secondary Jordanian private and public schooling and university education as well. A number of public and private universities have very exacting standards where all other subjects are taught in English, though some of them are less fussy about the type of material being taught or the background of their teaching staff (see Al-Khatib 2007).
better serve the purpose of this study. The questionnaire was designed to elicit data on both language use and language attitude. The interviews were also conducted by the researchers with a narrowed down group (i.e., 46 subjects) so as to get some information on what language is used for what purposes.

Data analysis was carried out both quantitatively and qualitatively. Percentages were utilized to show how frequent English and Arabic elements are used in the text messages. A qualitative analysis was also carried out so as to highlight the communicative functions performed by using the two codes. Building on the work of earlier researchers on similar phenomena like Appel and Muysken (1987) and Bader (1995), this article will analyze the collected data according to categorization of functions. Bader (1995) employed a system of five categories for categorizing the process of switching to Arabic in the speech of French, Italian, and Russian nationals living in Jordan. This system involves: “Greetings” which refers to the Arabic words/phrases that are related to greetings and asking about health conditions; “Religious Occasions” which involves “greetings and wish exchanges during religious holidays”; “Social Occasions” which include Arabic expressions used in different social occasions; “Culture Terms” that convey connotations related to Jordanian society and culture; and “Quoting Somebody” when quoting what someone has said.

Before moving on any further, it is worth mentioning how “code-switches” were scored. That is, how we determined whether the text was primarily in Arabic as a base language or primarily in English. Only one main element was taken into consideration to determine whether switching takes place from Arabic to English or vice versa. This element is “bulkiness”. By “bulkiness” we mean if the bulk of the text was written in Arabic, the switch then will be in the direction of English and if it is in English the reverse is true. “Bulkiness” is measured by counting the number of occurrences of Arabic words, phrases and/or sentences in each text against those used from English collectively and working out a percentage score for the instances of each language. The language which scores higher percentage would be treated as the base language.

In addition, to make sure that the results of this study are the by-product of differences in language choice rather than technical constraints on mobile computing system, our questionnaire included a question on the type of keypad (English or Arabic) that the subjects have on their mobile phones. All of them without exception have reported that they have both Arabic and English keypads. It is also worthwhile to mention that in order
to write a message or some words in Arabic (i.e., Arabic alphabets) the whole mobile system has to be converted to the Arabic interface, otherwise the mobile users have no choice but to use the system as is and switch between Latinized Arabic and English. This is why the great majority of switches take place between Latinized Arabic, or more precisely ASCII-ized Arabic and English.

3. Results and discussion

3.1 Analysis of code-switching structures

Throughout our analysis of Arabic-English code-switching in the texts, the following patterns of use have been established:

1. The analysis of the data demonstrated that more than 95% of the Arabic/English texts (i.e. texts written in both languages) use Roman script for the Arabic scripts. It has also been observed that the respondents tended to use Arabic/English texts more often than totally English and totally Arabic texts, and totally English texts more than totally Arabic texts as Table (1) shows:

<table>
<thead>
<tr>
<th>Type of text</th>
<th>Σ</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Totally Arabic</td>
<td>49</td>
<td>27</td>
</tr>
<tr>
<td>Totally English</td>
<td>64</td>
<td>34</td>
</tr>
<tr>
<td>English/Arabic texts</td>
<td>68</td>
<td>39</td>
</tr>
<tr>
<td>Total number of messages</td>
<td>181</td>
<td>100</td>
</tr>
</tbody>
</table>

The results in table (1) suggest that the respondents consider using English exclusively or both languages in the written texts essential for communicating information to their recipients. In fact, they were aware of this practice. Most of them have reported that it is much easier for them to express themselves in the two languages than in either language and in English than in Arabic.
2. Upon closer examination of the distribution of written forms of Arabic in the data, we observed that Arabic with Roman scripts is utilized much more often than Arabic with Arabic scripts. More specifically, Table (2) shows that the subjects still find it easier to communicate their ideas in messages written in Arabic with Roman scripts than in Arabic scripts.

Table 2. Distribution of written forms of Arabic messages in the collected data.

<table>
<thead>
<tr>
<th>Language</th>
<th>Σ</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arabic with Roman scripts</td>
<td>30</td>
<td>61</td>
</tr>
<tr>
<td>Arabic with Arabic scripts</td>
<td>19</td>
<td>39</td>
</tr>
<tr>
<td>Total number of messages</td>
<td>49</td>
<td>100</td>
</tr>
</tbody>
</table>

These figures confirm the responses given by the students to a question concerning the type of script they use when they prefer to write in Arabic. The great majority of them, particularly the female group of students, responded that it is much easier and quicker to write in either English or Roman scripts than in Arabic.

3. When we examined the distribution of the type of language used in the texts by word/phrase, as seen in (Table 3) below, we found that there is a uniform rise in the percentage scores of the three patterns of use. The highest score goes to the English lexical items (54%); the lowest pertains to the Arabic with Arabic scripts (9%); and the Arabic with Roman scripts comes second in the order of scores (37%). These findings can be seen as another evidence of the fact that English is having a far-reaching effect on the students’ linguistic behavior. Putting it differently, this indicates that English has become an integral part of the professional repertoire of the students. This could be due to the fact that English is the medium of instruction at the university; all classes, exams and assignments are given in English. In addition, the students are constantly exposed to the language through the use of the Internet and other means of communication.
Table 3. Distribution of the type of language used in texts by word.

<table>
<thead>
<tr>
<th>Language</th>
<th>Σ</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arabic with Arabic scripts</td>
<td>185</td>
<td>9</td>
</tr>
<tr>
<td>Arabic with Roman scripts</td>
<td>786</td>
<td>37</td>
</tr>
<tr>
<td>Totally English</td>
<td>1146</td>
<td>54</td>
</tr>
<tr>
<td>Total number of words/phrase</td>
<td>2117</td>
<td>100</td>
</tr>
</tbody>
</table>

These results could be explained on the ground that Roman letters are supported by what is known as the “ASCII” which was used in the first protocols devised to carry data on the net. Those protocols were developed for the English alphabet and users were forced to use them (Crystal 1998). It is worth mentioning that this form of Romanized Arabic did not exist before the advent of the Internet, and it can be noticed that there is a heavy use of this new form of written communication among students to such a degree that the traditional way of writing Arabic is counted out.

4. An examination of code-choice by sex, as seen in table (4) below, demonstrates that females have a stronger tendency than males to use code-switching, and males, by contrast, have a stronger tendency to use Arabic totally than English totally or mixed elements.

Table 4. Distribution of code-choice (i.e. alternation between Arabic and English in the text messages) by sex.

<table>
<thead>
<tr>
<th>Language</th>
<th>Females</th>
<th></th>
<th>Males</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Σ</td>
<td>%</td>
<td>Σ</td>
<td>%</td>
</tr>
<tr>
<td>Totally Arabic</td>
<td>22</td>
<td>22</td>
<td>27</td>
<td>33</td>
</tr>
<tr>
<td>Totally English</td>
<td>34</td>
<td>34</td>
<td>30</td>
<td>37</td>
</tr>
<tr>
<td>Arabic and English</td>
<td>44</td>
<td>44</td>
<td>24</td>
<td>30</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>81</td>
<td>100</td>
</tr>
</tbody>
</table>

It is clearly evident that females tended to code-switch between the two languages more frequently (44%) than males (30%). The same pattern of differentiation can also be traced between the two sex groups in terms of
their use of Arabic scripts. Males tend to use Arabic scripts (33%) more often than females (22%). It is also noticed that messages written totally in English were favored by the two sex groups almost synonymously, (37%) and (34%) by males and females respectively.

Bearing in mind the fact that both males and females are almost equally fluent in English, the findings of the current study are consistent with those of Colley and Todd (2002), among others, who noted gender differences in which females and males were found to display different patterns of language use. They spoke of gender differences in the Japanese sample, with women using graphical accents more than three times more on average than their male counterparts. Although there is not a big difference between the two sex groups with regard to their use of either totally Arabic or totally English texts, the actual difference that is worth explaining here is their switching between Arabic and English (i.e., 14%). Smith (1979: 117), for example, argues that “the evaluative connotations of speech cannot be assessed independently of the people that use them”. He contends that men and women do not apply the same evaluative criteria in judging what is prestigious (reported in Al-Khatib 1995a: 143). Lakoff (1975), from another vantage point, assumes that women’s language represents an overall conventional politeness. Her theories on women’s language suggest that females use a language style that reflects diffidence, shyness, and lower self-confidence, indicating a lack of commitment or strong opinion (Eckert & McConnell-Ginet 2003). One device is euphemism, where a person uses words such as “fudge” or “heck” instead of profanity (reported in Huffaker & Calvert 2005: 5). Having said that, one might argue that the factors on which the meaning of these occurrences might be taken to depend are the concerns for “prestige” and “using English for euphemistic purposes”. That is, it is highly likely that female students tend to switch to English more than their male counterparts as a mark of education and prestige and at the same time for euphemistic purposes.

5. As we proceed in our analysis of the distribution of the switched elements by syntactic category, we notice the majority of the switches in our data at the level of single nouns, followed by phrases, and then clauses, as shown in Table (5).
Table 5. Distribution of switched elements by syntactic category.

<table>
<thead>
<tr>
<th>Syntactic category</th>
<th>Number of switches</th>
<th>% of total switches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single nouns</td>
<td>157</td>
<td>34</td>
</tr>
<tr>
<td>Phrases</td>
<td>99</td>
<td>21</td>
</tr>
<tr>
<td>clauses</td>
<td>57</td>
<td>12</td>
</tr>
<tr>
<td>Single adjectives</td>
<td>42</td>
<td>9</td>
</tr>
<tr>
<td>Conjunctions</td>
<td>40</td>
<td>8</td>
</tr>
<tr>
<td>Articles</td>
<td>35</td>
<td>7</td>
</tr>
<tr>
<td>Pronouns</td>
<td>22</td>
<td>5</td>
</tr>
<tr>
<td>Single adverbs</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Single verbs</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>prepositions</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>468</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Table (5) demonstrates that 34% of the total switches are single nouns, 21% phrases, and only 12% are clauses. It is also evident that single verbs and prepositions are rarely used by the students (1% each). Similarly, pronouns and single adverbs are infrequently switched (5% and 2% respectively). These findings appear to be in agreement with those of Mustafa and Al-Khatib (1994) who observed an almost similar distribution of the mixed elements by syntactic category in the speech of a group of university professors using the two languages (i.e., Arabic and English) as a means of instruction in science lectures. It should be noted here that, as far as this study is concerned, some of the above listed expressions are written in the form of acronyms and abbreviations.

### 3.2 Factors motivating the students to use or switch to English

Data analysis has shown that there are a number of technical elements that might be responsible for the wide use of English or switching between English and Arabic (with Arabic Roman scripts) in mobile text messaging. Among these are the following:
3.2.1 Ease and swiftness of writing

Mobile users prefer to send mobile text messages because they are quicker, cheaper, and easier to use (Hard af Segerstad 2002). Time and the principle of least effort are important factors in the process. The subjects of this study have reported that for these same reasons they tend to employ English as a medium of communication when writing their mobile messages. One technical reason for using English is because the text is entered with the so-called “multi tap” or “multi press” technique. The interviewees indicated that English letters on the mobile keypad are fewer than Arabic letters, so it is less time-consuming for them to use English. This explanation is further supported by the fact that very few reservations were expressed by some respondents toward using English. For instance, one respondent reported “I use English because I have more experience in typing in English than in Arabic, so it would be easier for me to use English.” He also added that “some of the mobile systems have to be converted completely to Arabic in order to write a message. Therefore, the effort and time needed for writing a text message in English would be drastically reduced, and this is why I prefer to write in English.” This finding appears to be in line with the claim raised by Bautista (1999: 230) when he suggested that “within this discourse mode, a reason can sometimes be found for why a particular switch occurs, and who has called this reason “communicative efficiency” – that is, switching to the other code provides the fastest, easiest, most convenient way of saying something with the least waste of time, effort, and resources.”

3.2.2 Limited space in Arabic messages

Moreover, data analysis has shown that students in general find it more convenient to write in English than in Arabic. Hard af Segerstad (2002: 187) remarks that “Each Short message is up to 160 characters in length when Latin alphabets are used and 70 characters in length when non-Latin alphabets such as Arabic and Chinese are used.” For this additional reason students are quite aware that in their busy lives sending a message in English is less expensive both in terms of time and money than sending it in Arabic. More than 80% of the subjects appear to be aware of this fact and as such some of them indicated that two messages in Arabic can be written in one message in English or in Roman scripts in order to express
the same idea, and what can be expressed in two messages in English has to be expressed in four messages and so on. Therefore they are more likely to use English than Arabic in writing their messages.

Additionally, an examination of the data shows that the average message for Jordanian college students is close to 60 characters. These results appear to be in line with those of Thurlow and Brown (2003) who found that the average message for the UK college students is 65 characters. Students in a third world country like Jordan cannot afford to pay costly mobile phone bills, and instead the majority of them depend on pre-paid cards, where charges for voice calling or sending SMS messages are deducted from the debit account. SMS is generally much cheaper than voice calls. This payment method, according to Hard af Segerstad (2002), keeps the user in control of the money spent on telecommunication.

3.3 Analysis of code-switching functions

As mentioned earlier, previous research indicated that code-switching is not an end in itself, rather it can serve quite a range of communicative functions in bilingual interaction. Appel and Muysken (1987: 120) contend that “it is by no means certain that code switching has the same functions within each community”. In this present study, each code was found to serve a particular type of communicative functions.

3.3.1 Functions served by switching from English to Arabic

The following discussion is based mainly on various cases of switching from English as a base language to Arabic unless otherwise noted.

3.3.1.1 Socio-cultural and religious functions

As in the case of a group of Western nationals – American, British, French and Italian – living in the northern part of Jordan (see Bader 2003; Bader & Mahadin 1996), the subjects of this study tend to code-switch to Arabic when using culturally relevant words and phrases. For instance, they are found to employ in their texts a great deal of words and phrases that reflect subtle culture nuances like inshalla ‘God willing’, ya rab ‘God willing’, Allah yes3idek/yes3idak ‘May God bless you’, enshalla tkoun/tkouni b5air ‘God willing, you are ok’, ma bitqaser/ma bitqasri ‘you are always there to provide help’, 5alas ‘ok then’, betmoon/betmooni, ‘I am at your service’,
salamat ‘you are welcomed’, bisalim 3alieki ‘s/he sends her/his regards’, mabrouk ‘May you have a blessed occasion’, 7amdila 3asalaameh ‘Thanks be to God for your safety’. It is highly likely that by using such culturally-bound expressions the message writers often express emotional attitudes that cannot be expressed in English. This type of switching, as described by Merritt et al. (1992) as well as Holmes (1992), serves “affective functions”, where the speaker attempts to use a spontaneous expression of emotion and emotional attitude to convey a particular emotional message. For illustration we give the following example which is taken from an exchange between two English graduate female students:

(1)  A: hi W [B’s first name initials] how r u? hope u done well in the comprehensive exam ya rab [God willing]. Listen (X) needs some information 4m u, can I give him ur mob number or nt?

B: do I know him?! F u trust him ok no problem. Thx god the exam was very good I’ll pass enshalla [God willing]. shukran la3awatfik [thanks for your kind wishing]. Wht about ur thesis?

We notice here that these two messages were written in English, where switching to Arabic occurred only when the writers used such expressions as yarab, inshallah and shukran la3awatfik. It has been observed that the great majority of the subjects appear to be aware of the importance of using these expressions for facilitating intra-cultural communication. Commenting on the importance of using such expressions in their messages, one respondent put it this way: “(...) we inherited such expressions from our ancestors. They have become an important part of our linguistic repertoire; therefore, I cannot say anything without saying Inshallah [‘God willing’].” Another respondent pointed out that “such expressions are an important part of our culture, so we cannot express our feelings toward each other without using them.”

Another area where the subjects were found to code-switch to Arabic is upon exchanging wishes on such religious occasions as the beginning of Ramadan (the Holy month of fasting), Eid il-Fitr (Moslem holiday marking the end of Ramadan), Eid il-Adha (Moslem holiday marking the end of the pilgrimage season to Mecca), and on other social occasions as well such as recovery from illness, returning from a long journey, engagement, wedding, graduation from school and so on.
3.3.1.2 Greetings

Jordanians highly value greetings and the way they are exchanged. Greetings in Jordanian society are not to be viewed as merely a usage of certain norms. Rather, they are a social norm governed by the situation in which the greeter says what is expected by the one being greeted. The patterning of the greetings, inviting or complimenting formula is found to be closely connected with the hierarchical gradation and status differences, on the one hand, and with the strategies of interaction, on the other hand (Al-Khatib 2006; Farghal & Al-Khatib 2001).

As far as this study is concerned, there was real evidence that students tend to switch from English to Arabic upon greeting each other. Moreover, it has been observed that the function of a greeting is ultimately derived from a certain communicative intent or the purpose for which the two parties are engaged in interaction. A closer examination of the text messages which are mainly written in English reveals that a huge number of Arabic expressions of greeting are exchanged by the subjects. Among the many expressions that were used are: the Islamic greeting Asalaamu Aleikum ‘peace be upon you’, a short version of it, which is sometimes used by some people on text messages Salaam meaning ‘Peace’, ahlan ‘hello/you are welcomed’, keefak/keefek ‘how are you?’, and shou 3amel/3amleh ‘how are you doing?’. These expressions, as Bader (2003) argues, are semantically and culturally more appropriate to be used than their English equivalents. Also, he adds that “Arabic is well-known for the abundance of words and expressions related to [this] field.” This category serves a “Directive function” as Appel and Muysken (1987) put it, or an “emblematic” or “affective” function according to Holmes (1992). The following two messages, exchanged between two students (a male and a female), are illustrative:

(2) A: mornin H [B’s first name initial], keefek [how are you], sorry for sending now but am printing the section. eash e7’tsar PTSS? [what PTSS stands for?]

B: Ahlan [hello] G [B’s first name initial]...PTSS: predetermined time standard system

In asking some of the respondents about why they prefer to greet each other in Arabic, a male respondent reported “I personally do that to convert the feeling of coldness into that of warmth; maybe because they are more emotionally expressive than their English counterparts.” Another
respondent said “I think Arabic is more appropriate to be used in greetings than English.” Furthermore, the relatively high percentage of use of such Arabic expressions of greetings may be explained by the values of religion and culture (i.e., Arabic being the language of the Holy Qur’an), which are perhaps linked to the importance of Arabic and self-esteem. One respondent who was enthusiastic about the function of greetings in Arabic put it this way “(...) No, Arabic is the language of the Holy Qur’an, the language of our ancestors, and the language which shapes and is shaped by our culture, therefore, we should greet each other in this language.”

3.3.1.3 Quoting someone

Grosjean (1982; 2007) indicates that one of the motivations for code-switching is quoting what someone has said. Bader (2003) finds many instances of code-switching to quote someone in his data. The following are a few quotes that illustrate the types of switches to Arabic the respondents made:

(3)  

A: [literally (virtuous sister), please bring Saqir’s book with you tomorrow]

B: ☺ this z the 1st time someone calls me “AL2O5T ALFADILAH”…☺ lol. Anyway, don’t worry, I wont 4get 2 bring the book 2mr. Take care.

Notice that student B switched to Arabic only when she wanted to quote what student A has said to her, “AL2O5T ALFADILAH”.

In the example (3), the switch involves the words that speaker B is claiming the quoted person said. In this way, the switch, as Holmes (1992) put it, acts as a set of quotation marks. A re-analysis of data showed that this category only represented 5% of the total number of switches. Some instances of them are direct while others are indirect quotations. Our data also showed that some of such patterns of switches are used to quote a proverb or a well-known saying in Arabic. In most cases the base language was English and the quotations were in Arabic or Latinized-Arabic. This is what Appel and Muysken (1987: 119) refer to as the “directive” function of switching, whereas Holmes (1992) view it as switching for “referential” purposes.
3.3.2 Functions served by switching to English

English was also found to serve certain communicative functions which differ tremendously from those served by Arabic. The functions of code-switching to English will be discussed under three main headings: prestige, use of academic and technical terms, and euphemism. All of the following cases of switching, unless noted otherwise, are examples of switching from Arabic to English.

3.3.2.1 Prestige

The difference between a prestigious language and a non-prestigious one heavily relies on key qualities that relate to the users of the language. University students are usually aware that in certain situations they can be more favorably valued by their interlocutors if they use more prestigious forms in their speech. English has a very special status among the educated people. It is the language that can be used only by those who are highly educated (the educated elite) and who, by virtue of their educational attainment, are ranked highly on the social strata of Jordanian society (Al-Khatib & Farghal 1999). This shows that there is unequivocal social prestige attached to English, particularly among the highly educated group of speakers. As students believe that such use may enhance their prestige, they tend to use a sizeable number of expressions from English in their text messages. Among these are the easiest and the shortest expressions related to greeting, thanking and apologizing. The following are ones of the most frequent expressions used by the text writers: *Hi, sorry, nighty ‘good night’, miss you, ok, take care (sweetie), please, thanks (a lot), thank you, bye, good luck, see you* and so on. This finding is in line with those of Hussein (1999), who anticipates similar results in his study of Jordanian university students’ attitudes towards code-switching between Arabic and English. What characterizes such expressions, he argues, is “their diffusion amongst the educated in Jordanian society to the extent that they have largely substituted their Arabic equivalents.” Consider the following example which shows how students switch to English as a mark of prestige:

(4) A: *Hi, keefik? Isn 3ndk m7adara bokra? Coz ana bokra nazleh 3aljam3a.* [how are you? do you have class tomorrow? [I am going to the university tomorrow]
An assessment of the subjects’ attitude toward using English expressions for acquiring prestige shows that a considerable number of them (90%) appear to be quite aware of the fact that they code-switch for this purpose. The subjects’ reaction to the attitude statement “whether using English expressions indicate prestige and modernization” indicate that the great majority of them (90%) agreed with the claim that English words do represent a kind of prestige in their text messages. Some of them, however, have reported that the real prestige can be acquired by using Arabic words rather than English. One subject, for example, put it this way “prestige-no, I don’t think so, but it seems we use such expressions to facilitate the process of communication.” Based on this result, it seems likely that the students exhibit a rather positive attitude toward code-switching, though they still view their native tongue (i.e., Arabic) as a prestigious language.

3.3.2.2 Academic and technical terms

Adendorff (1996: 389) sees code-switching as “a communicative resource” that enables teachers and students to accomplish a considerable number and wide range of social and educational objectives. He (1996: 400) contends that CS is “a form of sociolinguistic contextualizing behavior.” Tay (1989), Myers-Scotton (1995), and Adendorff (1996) have reported that CS serves a variety of functions in diverse domains. Code-switching is used as a communicative strategy between speakers, according to the switcher’s communicative intents. As far as this study is concerned, another common use of English words/phrases that emerged from our analysis is those pertaining to the field of science and technology or academic issues. The following are some of the many technical terms which were used by the students: modem, hardware, software, report, questions, papers, makeup, exams, chapter, sheet, and the names of courses such as physics, pharmacy and advanced electronics, dentistry, herbal medicine. This can be
attributed to the fact that lecturing in Jordanian universities is mostly given in English. Therefore, the English-based academic atmosphere in Jordanian universities urges students to use English terms whenever talking about university and academic issues. This category, once again, serves, as Appel and Muysken (1987) and Holmes (1992) put it, a referential function.

The following example bears witness to the wide use of academic and technical terms in the collected texts.

(5) A: **hi kefek ma3 lesh bedi a3’albek momken te7keeli l7ad ai unit el emte7an.**
    [hi, how are you? Sorry for bothering, can you tell me up to what unit would be covered in the exam?]

    B: they told me la7ad **sheet 15** [up to page 15]. w nas 2alole la mawdo3 **(amphetarine)** ana ra7 adros la **amphetarine**. Take care.
    [they told me till sheet 15. some people told me till the **(amphetarine)**, I will study to the **amphetarine**. Take care]

This strategy (i.e. using English academic and technical expressions) was used by subject B most probably because he did not know the corresponding terms in Arabic. This phenomenon was referred to by Grosjean (1987) as “the most available word phenomenon”. It is worthwhile to mention here that there is a vast body of literature from the debate between those who argue that most singly-occurring nouns, like the academic and technical terms the participants of this study use, are best analyzed as nonce loans (see Poplack 1988), and those who argue that code-switches and nonce loans ought to be treated in the same way (e.g., Myer-Scotton 1979). Even though there is a controversy concerning the status of these forms, we follow Myer-Scotton (1979) in categorizing such instances as CS. Thus, due to the frequent use of such terms by the students some of those students find it easier to use them than to think of their equivalents in Arabic. In this regard, Grosjean (1982) assumes that CS is triggered when a switcher cannot find a corresponding word or expression in one language or when the language being used does not have the appropriate lexical item, set phrase, or sentence.

### 3.3.2.3 Euphemism

An investigation of the collected texts shows that English words are used in certain cases for euphemistic purposes, or they are used to avoid fearful or unpleasant subjects. It is well-known that all cultures impose sanctions on
the discussion of certain issues by certain people in specific situations (see Al-Khatib 1995b). Therefore shifting from Arabic to English expressions may permit Jordanians to discuss taboo and/or offensive topics without embarrassment. English words such as *toilet, boyfriend, underwear, cancer, period* (i.e., menstrual period) are but a few examples of euphemism used by the text writers. This being the case, it can be argued that some English expressions may function as an important factor in prompting Jordanian students to use more expressions from English.

In the course of our interviews with the subjects, and due to the (unjustifiable) absence of an item related to euphemism on the questionnaire, more than thirty respondents of the students were orally asked about their opinion regarding the importance of euphemism in employing English words in the texts. The great majority of them (i.e., 78%) stressed that euphemism may play a central role in the process of making them use more words from English. As a matter of fact, a large number of the informants reported that they themselves – whether consciously or unconsciously – tend to use in their texts English words for euphemistic purposes. For instance, a female student said “I myself use English words as euphemisms. They seem to be inoffensive, especially when we talk about matters relevant to such issues as love, disease, body functions, etc.” For illustration consider the following example:

(6) Hi Aloush kefek? Yesterday I couldn’t come to the class la2inu kan 3ind *stomachache*! Bti3rafi, it’s the *period time*.

[Hi Aloush, how are you? Yesterday I could not come to the class because I had a bad *stomachache*! You know, it’s the *menstrual period time*].

4. Conclusion

We set out in this study to seek answers to a number of questions concerning language choice on mobile text messages. The study indicates that code-switching between English and Arabic is used overwhelmingly in mobile text messages and that a Romanized version of Jordanian Arabic is used along with English expressions extensively. The results of this study also demonstrated that there are a number of technical elements that might be responsible for the wide use of English or switching between Arabic and English. Among these are: ease and swiftness of writing in English and limited space in Arabic messages. Since code-switching is becoming increasingly common in more parts of the world, it is of the utmost
importance to understand how CS, as a communicative strategy, functions in this particular milieu. The results of this study reveal the fact that some participants exhibit the ability to move back and forth between their two codes depending on the suitability of their communicative needs. Many instances of code-switching in the data are found to serve various sociolinguistic functions. Switching to Arabic as an embedded language, for instance, was found to serve the functions of greeting, quoting someone (i.e., to highlight contextualized situations and quotations) and a number of other socio-religious functions. However, it has been observed that students do resort to English for a number of sociolinguistic reasons. That is, they use some lexical items from English as a mark of prestige, to fill gaps in the language or to serve the function of euphemism; using certain expressions from English in place of Arabic words that may offend or suggest something unpleasant to the reader. Moreover, it has been noticed that greetings and a number of other conversational routines seem to be linguistic elements which often trigger CS in both directions (i.e., both from Arabic to English and vice versa). Although a considerable number of such lexemes and phrases as *hi, nightly, goodby* can be seen as CS; some of them have now become an integral part of the linguistic repertoire of some of the students.

This study also demonstrated that the sex of the text writers has a role to play in the process. Females have a stronger tendency than males to use switches, and males, by contrast, have a stronger tendency to use Arabic totally than English totally or mixed elements.

Furthermore, the analysis presented in this study shows that code-switching is a structured and rule-governed process. Some syntactic categories are used much more than others; the distribution of the switches by syntactic category revealed that the majority of the switches take place at the level of single nouns, followed by phrases, and then clauses.

Finally, the emergence of new modes of communication like SMS over the past twenty years has increased practices of both code-switching and borrowing throughout the country. We argue then that when code-switching and borrowing become extensive, entirely new linguistic varieties may emerge.
References


Appendix I
A list of the numerals as used in Romanized Arabic along with their IPA equivalents.

<table>
<thead>
<tr>
<th>Numeral</th>
<th>IPA</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>h</td>
<td>7ilwe (beautiful)</td>
</tr>
<tr>
<td>7'</td>
<td>x</td>
<td>7'ali (my uncle)</td>
</tr>
<tr>
<td>3</td>
<td>ç</td>
<td>3aali (high)</td>
</tr>
<tr>
<td>3'</td>
<td>ġ</td>
<td>3'ali (expensive)</td>
</tr>
<tr>
<td>9</td>
<td>S</td>
<td>el9aba7 (morning)</td>
</tr>
<tr>
<td>9'</td>
<td>D</td>
<td>9'aa3 (lost)</td>
</tr>
<tr>
<td>6</td>
<td>T</td>
<td>6abi3 (stamp)</td>
</tr>
<tr>
<td>2</td>
<td>?</td>
<td>bi2uul (he says)</td>
</tr>
</tbody>
</table>

Appendix II
The Questionnaire

<table>
<thead>
<tr>
<th>Item</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Uncertain</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using English in mobile text messages enriches the Arabic language</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Using English in mobile text messages indicates prestige and civilization</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English should be used totally in mobile text messages</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Using English in mobile text messages can be seen as a good means to access Western civilization and technology</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Using English facilitates communication on this means of communication</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Using English in mobile text messages as a purposeful means of communication</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Using English indicates cultural colonization</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The Interview Questions

Personal Information
- What’s your name?
- In which university do you study?
- Which year?
- What is your major?

Language background
- What languages do you know? How well?
- Have you lived abroad? If yes, which country?
- What is the percentage of your study material given in Arabic vs. English (or other languages)?
- How about everyday life away from school, how much do you use Arabic vs. English (or other languages)?
- How would you compare your speaking/listening/reading/writing abilities in Arabic and English (or other languages)?

Mobile Use
- How long have you been using a mobile?
- How many messages do you approximately send and receive per day?
- To whom do you send usually, e.g., for friends, family, professors, or others?

SMS Language Use
- What language do you use in writing messages, English, Arabic in Arabic script, Arabic in Romanized scripts? Mark.
- Describe the circumstances in which you use particular languages? (formality vs. informality, with Jordanians or other Arabs, one language at a time or combined, etc.)
- If you use English in SMS messages, why do you use it when you can use Arabic?
- Does English vs. Arabic serve different purposes in your communications?
- For what purposes do you use each language?
- Does your mobile have the capacity to use Arabic script? If yes, do you think that would make a difference for you?
- If all mobile keypads were multilingual, do you think that would affect your language use on mobile?

Mobiles and other media
- Do you read newspapers regularly? Which ones? What language?
- Do you read magazines regularly? Which ones? What language?
- Do you read books regularly? What kind? What language?
- What kind of things do you write regularly (besides SMS messages)? What language?
- How does the use of English vs. Arabic on the mobile compare to the use of the two languages in other media (chat, e-mails, etc.)?
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The Low Vowel and Retraction in Stát'imcets: An Ultrasound Investigation

Abstract

Previous phonetic studies show a co-articulatory effect of retracted consonants on adjacent high vowels resulting in tongue-root retraction and tongue-body lowering. The present study uses ultrasound imaging to investigate whether an inherently low vowel would also show evidence for retraction or show opacity as observed cross-linguistically with other tongue root and tongue body phenomena. Focusing on the two retracted conditions claimed in previous studies (VC and CV sequences with retracted consonants), results of the present study show that compared to the position of the tongue-root in non-retracted contexts, the low vowel has a significantly more retracted tongue-root when it precedes retracted consonants. No significant difference in tongue-root position is observed between /a/ in a CV sequence with retracted consonants and /a/ in a non-retracted context. Thus even though the low vowel is not opaque to retraction in Stát'imcets, it retracts only when preceding consonants, not following retracted consonants.

1. Introduction

1.1 Retraction in Stát'imcets

Stát'imcets, also known as Lilooet Salish, is a critically endangered language spoken by less than a 100 people (Henry Davis p.c.) in an area of southwest Interior British Columbia, Canada. It belongs to the Northern Interior branch of the Salishan language family. The language has two major dialects, the Upper and Lower dialects, which differ in syntax,
phonology and lexicon (see van Eijk 1997 for further discussion on dialectal difference). Typical of all Interior Salish languages, St’át’imcets has a rich consonant inventory, with over 40 phonemes, 17 of which are retracted. By contrast, there are only 4 vowels in the language: /i/, /u/, /a/, and epenthetic /ə/.

The schwa is a predictable vowel with variable surface qualities that is epenthesised to break certain consonant clusters (Matthewson 1994) and to preserve the prosodic structure of the language (see Shahin 1997, 2002; van Eijk 1997; Namdaran 2006 for further discussion).

Retraction in St’át’imcets and other Interior Salish languages is fairly well investigated (see Namdaran 2006; McDowell 2004; Bessell 1992, 1998; Remnant 1990; Shahin 1995, 1997, 2002; and van Eijk 1997). Much of the previous research has focused on retraction in consonants, making a distinction between pharyngeal resonants (/ʕ/, /ʕʷ/, /ʕ’/, /ʕʷ’/) and uvular consonants (/q/, /qʷ/, /q’/, /qʷ’/; /χ/, /χʷ/) that are inherently retracted, and coronals (/tʃ/, /tʃ’t/, /ʃ/, /ʃ’, /l/ and Lower dialect interdental /ð/, /ð’/) that are produced with retraction as a secondary feature. Also established, is the fact that retraction in consonants has an effect on the articulation of neighbouring vowels. In detailed articulatory studies of retraction in St’át’imcets and Montana Salish, Namdaran (2006) and McDowell (2004) show that retraction in these languages results in a lower and backed tongue position of the underlying non-retracted high vowels /i/ and /u/. What happens to the inherently low and back vowel /a/ when it occurs in a retracting context in St’át’imcets, whether it is opaque to retraction or gets further lower, is a question that is still uninvestigated in any articulatory study. This is what the present study is designed to address.

In the rest of this section, a number of theoretical issues and hypotheses relevant to the study are discussed. Section 2 presents an ultrasound imaging experiment used to investigate low vowel retraction. It also reports and discusses the results of the study. Section 3 concludes the paper.

1.2 Vowel retraction in St’át’imcets and Interior Salish

Previous research (e.g. van Eijk 1997; Bessell 1992, 1998; Namdaran 2006) is unanimous on some aspects of vowel retraction in St’át’imcets. First, St’át’imcets is like other languages with retracted segments such as Arabic, in that vowel retraction is a co-articulatory effect from adjacent inherently retracted consonants. Second, retraction takes place as two
separate processes of assimilation. Local assimilation affects the quality of a vowel when it precedes a retracted consonant, non-local assimilation is triggered by retracted roots, targeting coronals and vowels that occur in suffixes following the retracted roots.

However, previous accounts differ on exactly what is involved in vowel retraction. Accounts of St’át’imcets and other Interior Salish languages (e.g. van Eijk 1997; Bessell 1992, 1998; Remnant 1990) describe the co-articulatory effects of retracted consonants on adjacent vowels as resulting in the lowering or backing of the tongue-root during the production of the vowels, or both processes. These accounts differ from that of Shahin (1997, 2002), who describes retraction as two distinct gestures involving not only the tongue-root, but also the tongue-dorsum. Shahin refers to these processes as “pharyngealisation” and “uvularisation” respectively. She argues, based on acoustic data, that “pharyngealisation” affects the vowels /i/, /u/, /a/, /ɔ/ when preceding post velar and retracted coronal consonants, as indicated by a medium rise in F1 and medium drop in F2. By contrast “uvularisation”, (signaled by a medium/large rise in F1 and a large drop in F2) affects the vowels /a/ and /ɔ/ when they precede retracted coronal consonants /ʃ/, /ɬ/, /ɬ’/. More recent acoustic and ultrasound studies on Montana Salish (McDowell 2004) and St’át’imcets (Namdaran 2006) respectively show that retracted vowels are produced with the tongue body moving towards the rear pharyngeal wall.

Different claims have also been made regarding the directionality of co-articulation of retracted consonants and vowels. Early research (van Eijk 1997; Shahin 1997, 2002) concluded that local vowel retraction in St’át’imcets is restricted only to vowels that precede retracted consonants (VC sequences); ruling out retraction for vowels that follow retracted consonants (CV sequences). However, acoustic and articulatory studies by Bessell (1997) indicate that St’át’imcets vowels can be retracted immediately following retracted consonants, even though the degree of retraction for vowels preceding retracted consonants is higher. Bessell’s study is based on a higher F1 (which correlates with the lowering of the tongue dorsum) and lower F2 (which correlates with the backing of the tongue dorsum) obtained for the vowels /i/, /u/, /a/, /ɔ/ following /q/ and /ʕ/ compared with the same values following the non-retracted consonants /p/, /t/, /k/, /ʔ/. These acoustic results are supported by Namdaran’s (2006) acoustic and ultrasound study. Results of her study show a symmetrical effect in St’át’imcets vowel retraction, “such that the effect seen at the offset point in VC sequences was also seen at the onset point in CV
sequences” (Namdaran 2006: 137). Namdaran’s study also found that the symmetry was more robust for the vowels /i, u/ adjacent to inherently retracted uvulars /q/, /ʕ/ and the vowel /u/ adjacent to retracted coronal /ʃ/.

Results of Namdaran (2006) are similar to that of Bessell’s. She found that /i, u/ have a higher degree of retraction when they occur in VC sequence with uvulars than when they occur in CV sequence. Being an ultrasound study with its strength in producing articulatory data of the tongue that is free from other confounds such as the effects of lip gesture, Namdaran’s study seems to produce the strongest evidence regarding the directionality for retraction in St’át’imcets.

Still uninvestigated is the behaviour of the low vowel /a/ in retraction contexts. To fill this gap, and as a contribution to the understanding of vowel retraction in St’át’imcets in general, the present study investigates the low vowel using ultrasound imaging.

1.3 The low vowel

The low vowel /a/ raises unique questions in the study of vowel retraction and other articulatory phenomena that affect tongue-root articulation. One such phenomenon that has received extensive discussion crosslinguistically is tongue-root advancement. Archangeli and Pulleyblank (1994) observe that in cross height harmony patterns, the low vowel may undergo, block, or be transparent to the spread of harmony. One explanation (e.g. Goad 1993) for languages in which the low vowel is opaque or transparent to the spread of harmony is that the low vowel cannot bear the phonological property of tongue-root advancement. In cases where such advancement is perceived, the vowel must be a phonologically non-low vowel. Kaye et al. (1985) also argue for the possibility of the low vowel having a phonetically advanced tongue-root that does not show advancement as a phonological feature.

Recent studies (e.g. Gick et al. 2006) however provide results to the contrary. Based on ultrasound and acoustic data, Gick et al. found that low vowels are phonological targets of tongue-root advancement, as they systematically show tongue-root advancement and retraction in accordance with the rules of harmony in Kinande, a Bantu language of the democratic Republic of Congo. Even though the present study does not investigate the phonological representation of low vowels in retracting environments, the question as to what happens to low vowels in contexts that trigger advancement/retraction is relevant because it is primarily a phonetic one.
One of the questions the results of Gick et al. (2006) raise is what the articulatory properties of the tongue root are for low vowels in a context where non-low vowels have been found to show systematic tongue-body gesture towards the rear pharyngeal wall (Namdaran 2006; McDowell 2004) and lowering and/or backing of the tongue-root (van Eijk 1997). Two conflicting hypotheses emerge in previous accounts of St’át’imcets (e.g. van Eijk 1997); related languages (McDowell 2004) and languages with related articulatory phenomena (Shahin 1997, 2002).

The first hypothesis is that /a/ lowers/retracts when adjacent to retracted consonants. In support of this hypothesis is the claim by Shahin and van Eijk that /a/ retracts and lowers to [ɒ] when preceding retracting consonants. Ghazeli’s (1977) claim that tongue backing occurs in Tunisian Arabic also supports this hypothesis. These accounts predict that the low vowel is not opaque to retraction, as it undergoes the same process in retracting conditions as non-low vowels in St’át’imcets.

The second hypothesis makes the opposite claim; that St’át’imcets /a/ advances in contexts where other vowels are found to retract. This is predicted by McDowell’s (2004) acoustic study of Montana Salish which reports a raising F2 for /a/ when adjacent to retracted laterals /l/, /ɬ̩/, /ɬ/, and /tɬ’/. The results suggest that the tongue position advances in these contexts. By comparing the position of the tongue-root in the production of /a/ in retracting contexts to those in non-retracting contexts, the present study tests these hypotheses.

Finally, this study will test the directionality hypothesis. Namdaran (2006) found evidence for retraction in high vowels, both in VC and CV sequences, even though the co-articulatory effect in the CV sequence was not as robust as that of the VC sequence. If, like the high vowels, /a/ retracts in VC sequence, it is quite likely that it would also retract in CV sequences, as found for high vowels in Namdaran’s study, even if to a lesser degree. On the other hand, if /a/ does not retract in VC sequence, the prediction is that it would not retract when following retracted consonant. Consistent with the prediction that /a/ retracts before retracted consonants; the present study predicts that /a/ will also retract following retracted consonants. Table (1) summarises the hypotheses tested in this study. Section 2 presents the ultrasound imaging experiment used to test these hypotheses.
2. Experiment

2.1 Hypothesis

Results of Namdaran (2006), the only articulatory study of vowel retraction effects in St’át’imcets, show that movement of the tongue-root towards the lower pharyngeal wall is the largest gesture for the vowels [i] and [u] when they occur in retraction contexts, even though the lowering of the tongue-body is also observed. The present study extends this finding by testing for tongue-root retraction for the low vowel /a/.

<table>
<thead>
<tr>
<th>hypothesis</th>
<th>prediction</th>
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</thead>
<tbody>
<tr>
<td>1. Vowel retraction affects low vowels in the same way as it affects non-low vowels.</td>
<td>In retracting contexts, /a/ has a more backed tongue-root compared to plain context.</td>
</tr>
<tr>
<td>2. Retraction affects /a/ both when it precedes and when it follows a retracted consonant, although it may be more retracted preceding than following retracted consonants.</td>
<td>Compared to a plain context, /a/ has a more backed tongue-root both preceding and following a retracted consonant.</td>
</tr>
<tr>
<td>3. St’át’imcets /a/ advances in contexts where other vowels are found to retract.</td>
<td>In retracting contexts, the position of the tongue-root for /a/ is more anterior than in non-retracting contexts.</td>
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</tbody>
</table>

2.2 Methods

2.2.1 Subject

One female native speaker of the Lower dialect of St’át’imcets in her mid-seventies participated in the study. Testing more speakers from both dialects of the language would have produced a more representative data sample. However, due to several constraints, including the limited resources available, the relatively new technology involved and the paucity of the few remaining fluent speaker available in the Vancouver area, I was unable to include more speakers for this study.
2.2.2 Stimuli

The stimuli were designed to elicit the low vowel in retracting as well as in non-retracting contexts. Preliminary data were verified with the subject to ensure that she was familiar with the words and pronounced them with the relevant desired contexts. Most of the words she was not familiar with were from the Upper Dialect. The transcription was also verified by an expert on the language before any word was included in the analysis.

The retracting condition consisted of words in which /a/ preceded or followed the plain uvular stop /q/ or the plain uvular/pharyngeal approximant /ʕ/, shown in (2). The non-retracting condition placed the low vowel between labials and alveolars to minimise the consonantal effect on the tongue-root gesture (1). Stress was also controlled for, by ensuring that all tokens of the low vowel were stressed. The words were then randomised with distracters and presented to the subject in English.

(1) Non-retracted condition
   
   \textit{papt} ‘always’
   \textit{pálaʔ} ‘one’

(2) Retracted condition

   a. /a/ /__ q
      i. \textit{ʃjáqʃjaʔ} ‘woman’
      ii. \textit{máqin} ‘hair’
      iii. \textit{máqaʔ} ‘snow’
   
   b. /a/ /q__
      iv. \textit{ʃqáʔd̪ʔ} ‘tired’
      v. \textit{ʃqáʔʃeʃdaʔ} ‘father’
   
   c. /a/ /__ʃ
      vi. \textit{pɔʔʃpáʃ} ‘grayish’
      vii. \textit{mɔʔmáʃ} ‘light /bright’
2.2.3 Procedure

All the data were collected in the Interdisciplinary Speech Research Laboratory of the University of British Columbia. The subject was seated on a solid chair, while the English translations of the stimuli were read out to her. She was instructed to embed a St’át’imcets translation of the stimuli in the phrase: waʔtʃætʃ tʃút, “we say ___” a carrier phrase adopted from Namdaran (2006).

The ultrasound data were collected using a Sonosite Titan High-resolution portable ultrasound machine with a C11/8–5 MHz transducer at a standard rate of 29.97 frames per second (about 33 Hz). The transducer was held by the subject, who was instructed not to move her hand or head. The signal was visually monitored throughout the experiment for any head or hand movement. Any token for which any movement was observed or suspected to have occurred, or which did not show the image of the tongue clearly was re-recorded. After removing errorful data, 70 tokens were used for the analysis: 12 tokens in non-retracted condition (preceding/following a labial); 13 tokens preceding a uvular, 13 tokens preceding a uvular pharyngeal, 17 tokens following a uvular, 15 tokens following a uvular pharyngeal.

The ultrasound video was recorded directly onto a Dell laptop computer using Adobe Premier, via an advanced digital video converter 110 Canopus connected to the computer. Audio recording was done simultaneously using a Shure SM63LB unidirectional microphone fixed to a stand in front of the subject and connected to the Canopus via a DMP3 dual microphone pre-amplifier, ensuring both video and audio signals were properly synchronized. The mid-point frame for each vowel token was then extracted from the video. A straight line touching the lowest points in the ultrasound transducer arc was used as the base for obtaining tongue-root values. Measurement was done with the use of ImageJ (http://rsb.info.nih.gov/ij/), a software that measures images and pictures in

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2 In Namdaran (2006), the carrier phrase ends with ɬtæ/ɬti ɬuxʷælmíxʷtʃæʼ in Uxʷælmíxʷtʃæ. This part of the phrase was dropped because the participant had problems translating the English equivalent.
pixels. The measurement line was drawn intersecting the horizontal line at an angle of 90 degrees to the lowest point in the tongue-root. Figure 1 has sample images showing the difference of the distance between the tongue root position and the base line for /a/ in retracted as well as non-retracted conditions.

a) /a/ /ʕ/

b) /a/ in a non-retracted condition

Figure 1. Tracing of midsagittal ultrasound images of St’át’imcets /a/. Frame (a) shows the mid point of /a/ when it precedes /ʕ/. Frame (b) shows /a/ when it occurs in a non-retracting condition. The longer tongue-root measurement line in (a) indicates a more retracted tongue root compared with (b).
2.3 Results

A comparison of /a/ preceding a retracted consonant to /a/ in a non-retracting condition shows significant difference in the position of the tongue-root. The tongue-root is about 11 pixels more retracted when /a/ precedes a retracted consonant (ANOVA: $F(1, 37) = 1148.15; p < 0.0001$). A scatterplot for this is shown in Figure 2(a).

(a) Low vowel in a retracted condition (preceding ʕ/q) versus /a/ in a plain condition.

(b) Low vowel in a retracted condition (following ʕ/q) versus /a/ in a plain condition.
(c) Low vowel in three conditions: following/preceding a labial, preceding a pharyngeal, and preceding a uvular.

Figure 2. Scatterplots of tongue-root values for all tests. Long horizontal lines in diamonds indicate mean values for each vowel and short horizontal lines indicate upper and lower ends of 95% confidence intervals. Higher mean values indicate a higher degree of tongue-root retraction.

In a comparison between /a/ following retracted consonants and /a/ in a non-retracted condition, the significance level depends on the consonant. When both uvulars and uvular pharyngeals are pooled, no significant
difference is observed between the two conditions, as the scatterplot in Figure 2(b) shows. When the two retracted consonant are separated, /a// phar__ is significantly different from /a// lab__ and /a// uv__ (ANOVA: F (2, 67) = 871.791; p < 0.0001). A comparison for each pair using student’s t-test further shows a significant difference between them. /a// phar__ and /a//uv__ (p < 0.0001), /a// phar__ /a// lab__ (p < 0.0001). However, there is no significant difference between /a// uv__ and /a// lab__ This is shown in Figure 2(c).

A similar pattern is observed in a comparison between the three retracted conditions: /a// __Ret, /a// Ret__, and /a// plain. /a// __ Ret is significantly more retracted than each of /a//Ret__ and /a// plain (p < 0.0001); whereas no significant difference is observed between /a// __Ret and /a// plain. A scatterplot for this is shown in Figure 2(d). Table 2 summarises results of all the comparisons.

<table>
<thead>
<tr>
<th>Syllable contexts</th>
<th>Mean difference in pixels</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>phar__ &gt; uv__</td>
<td>10.64</td>
<td>p &lt; 0.0001</td>
</tr>
<tr>
<td>phar__ &gt; lab__</td>
<td>11.25</td>
<td>p &lt; 0.0001</td>
</tr>
<tr>
<td>uv &gt; lab__</td>
<td>0.60</td>
<td>NS</td>
</tr>
<tr>
<td>Retracted/ directional contexts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>__Ret &gt; plain</td>
<td>10.86</td>
<td>p &lt; 0.0001</td>
</tr>
<tr>
<td>__ Ret &gt; Ret__</td>
<td>9.65</td>
<td>p &lt; 0.0001</td>
</tr>
<tr>
<td>Ret __ vrs. plain</td>
<td>1.2</td>
<td>N.S.</td>
</tr>
</tbody>
</table>

2.4 Discussion

The results of the tests provide evidence that low vowels are not opaque to retraction in St’át’imcets. They confirm previous analysis (van Eijk 1997; Bessell 1992, 1998; Remnant 1990) that /a/ undergoes the same effects as high vowels in retracting contexts, and that vowel retraction involves the backing of the tongue-root. Furthermore, the results agree with Shahin’s (1997, 2002) acoustic study that shows that retraction involves a tongue-
root gesture which is triggered when preceding a pharyngeal, an effect she refers to as “pharyngealisation”.

However, the present study does not provide evidence for the bi-directionality of the co-articulatory effect of retracted consonants on adjacent vowels. Using tongue-root position, the most reliable and consistent distinguishing gesture between plain and retracted vowels, as an indication of this co-articulatory effect, the hypothesis that low vowels in CV sequence with retracted consonants undergo retraction is not borne out.

3. Conclusions

The present study contributes to the understanding of vowel retraction in St’át’ímets and Salish languages in a number of ways. First, being the only articulatory study to focus on the low vowel in St’át’ímets, it has evaluated previous claims that are based on impressionistic judgements of what happens to /a/ in retraction contexts (e.g. van Eijk 1997) and those that are based on indirect acoustic evidence (e.g. Shahin 1997, 2002). Second, it fills a gap in Namdaran’s (2006) extensive study of retraction in St’át’ímets which does not investigate the low vowel.

The study is also of interest to crosslinguistic investigations into the phonetics and phonology of vowels. In particular, it contributes to a greater understanding of tongue-root phenomena by showing evidence for the lack of opacity of the low vowel to tongue-root retraction, similar to what has been observed for tongue-root advancement (see Gick et al. 2006). This has implications for aspects of vowel phonologies such as vowel inventories and the conception of vowel features such as height and vowel harmony.

Some aspects of low vowel retractions in St’át’ímets which have not been investigated here still deserve future investigation. First, future study may include speakers of the Upper dialect, although consistent with previous phonetic studies, results of this dialect are not expected to show any significant difference from those of the Lower dialect. Second, future investigation of the position of the tongue-body, which is found to be lowered as part of the co-articulatory effects on high vowels [i] and [u] (Namdaran 2006), will show if an inherently low vowel will also undergo the same effect. Finally, while the results here is sufficient to conclude that low vowels do not undergo tongue-root retraction following retracted consonants, future studies need to compare the positions of the tongue-body for tokens in the different test conditions to determine whether the
tongue-body is lowered in either (CV or VC) sequences, as found for high vowels.

References


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Abstract

The study presented in this article deals with the order of the verbal predicate (V) and its nominal core arguments (A- and P-argument) in declarative transitive clauses in Finnish Sign Language (FinSL). A central finding of the study was that at the macro level of FinSL transitive clauses are not ordered in one unambiguous way, but at least three structural combinations of the verbal and its core arguments are possible: AVP, APV, and PAV. The type of clause was found to affect sign order in that isolated clauses only occurred with the orders AVP and APV, whereas textual clauses also manifested the order PAV, or even involved omission of the core arguments. At the micro level, however, sign order in FinSL showed regular patterns similar to those found in other sign languages: (i) A-argument was always expressed before V, and there was also a strong tendency to express A-argument before P-argument; (ii) verbal initial structures were not used; and (iii) verbals including a classifier morpheme – i.e. verbals on the basis of which FinSL could be identified as a head-marking language – were placed at the end of the sentence. The article also discusses the extent to which the clause is an appropriate unit to be used in the future description of FinSL.

1. Introduction

This article deals with the sign order (cf. word order) of transitive clauses in Finnish Sign Language (FinSL). The main research question to be answered is whether the two-placed verbal predicate (V) and the nominal elements\(^2\) referring to its semantic arguments – the core arguments (A- and

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\(^1\) I wish to thank Päivi Rainò and Matti Leiwo for reading and commenting on the various proofs of the manuscript. I also wish to thank the two anonymous referees of the journal for their valuable comments.

\(^2\) This article is based on previous research that has shown that FinSL signs group into two broad lexico-grammatical categories, *nominals* and *verbals* (Rissanen 1985: 29–35, 1998). It should be noted that not all researchers have used these terms in their writings. For example, Takkinen (2000), Itkonen (2001), and Veitonen (2004) speak of *verbs*
P-argument) – are ordered in some specific manner in FinSL declarative transitive clauses; and if so, how? Sign order in FinSL transitive clauses has not been investigated systematically before, yet internationally the order of signs in transitive clauses has been a prominent topic of research ever since the 1970’s (see Section 1.1). Consequently, the present paper aims both to fill an obvious gap in the linguistic study of FinSL and to relate FinSL to more general discussion concerning the sign order of different sign languages. Implicitly, the findings of the study provide material for more general typological research as well.

The theoretical framework of the present study is functionally and typologically motivated Basic Linguistic Theory (Dryer 2001, 2006). As noted by Dryer (2001), Basic Linguistic Theory is an informal (as opposed to formal) descriptive framework widely used by linguists both to describe and compare grammars of independent languages. Since the emphasis of Basic Linguistic Theory is on description, I consider it to be a fitting framework for the study of undocumented linguistic phenomena, such as the order of signs in FinSL. In its descriptivity, Basic Linguistic Theory also accords well with the overall FinSL research tradition (see Jantunen 2008b), which has been primarily descriptive in its nature.

The arguments concerning the order of signs in FinSL are based on different types of data, presented and classified in more detail in Section 2. The main reason for the use of different data sets (e.g. different types of isolated clauses as well as textual clauses) is to address the effect the nature of the data is known to have on findings as to sign order, that is, the fact that sign order appears more variant in more textual settings (for a recent discussion, see Johnston et al. 2007), something which has not usually been explicitly stated in sign order studies (cf. Section 1.1). A more ontological reason for using more than one type of data is the conviction that the use of multiple data enables one to get a more extensive overall picture of the phenomenon investigated than the use of only one type of data.

Despite the fact that the main focus here is on the syntactic description of FinSL, this paper also addresses more general methodological and theoretical issues. These include, for example, the above-mentioned effect the nature of the data has on research into sign order, as well as the instead of verbals. Personally, I consider this practice somewhat misleading since (e.g.) the category of verbs is narrower than that of verbals. The latter includes, for example, also the stative type of characterising signs (e.g. ANGRY; for transcription conventions used in this paper, see Appendix 1), as well as semantically more phrasal-like signs (i.e. Type 3 verbals; see Sections 1.3 and 4).
question whether the clause is an appropriate unit for – or an existing unit in – the description of FinSL syntax. These issues stem directly from the empirical and inductive basis of the present study.

1.1 Review of differing perspectives on the sign order of transitive structures

Although sign order in FinSL transitive clauses has not been researched systematically before, a few observations on the subject have been presented. In the first linguistic study on FinSL, Rissanen (1985: 126–127) implied that the order patient – agent – verbal was most typical. Takkinen (2000: 57–58), on the other hand, stated that the unmarked order of FinSL transitive structures is subject – verb – object. Itkonen (2001: 372) followed Rissanen and suggested the order patient – agent – verb as the basic sign order in FinSL. The most recent view comes from Veitonen (2004), who claimed that existing orders in textual transitive FinSL structures containing a speech act verb are agent – verb – patient (id., 48) and patient – agent – verb (id., 52), though other orders occur as well (id., 56–58). Overall, I take the suggested orders to display an interesting categorical variation that itself calls for further investigation.

It is worth mentioning that the claim, first made by Rissanen (1985), that FinSL transitive structures are ordered according to the scheme patient – agent – verbal, has had a special status in FinSL-related discussion in that the claimed order has been unofficially accepted as “the basic order of elements” in FinSL. However, it must be noted that the scientific basis supporting this claim is almost nonexistent. For example, with the partial exception of Veitonen, none of the researchers suggesting the order patient – agent – verbal have explicated the data or method they have used in identifying the order (cf. Section 1). The same goes for the order subject – verb – object suggested first by Takkinen (2000). Moreover, the syntactic domain in which the order is supposed to hold has not been specified by any of the researchers. That is, one cannot know if the order holds in the domain of the clause, which is the primary domain in word order studies in general (e.g. Dryer 2005: 330), or in some more complex domain, such as

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3 The grammatical functions subject and object have not been defined in FinSL so far, nor has the need to use these functions in FinSL been given serious thought. Takkinen (2000) does not specify what she means by the terms subject and object, but it is probable that she understands the concepts notionally.
the topic-comment structure that in FinSL consists of a clause-external left-detached topic phrase and a subsequent clausal comment (Jantunen 2007, manuscript; see also Section 1.2). In this study, the syntactic domain in which the sign order is identified is given special attention, and the issue is returned to in Section 1.2.

Internationally, views on the sign orders of transitive structures in sign languages have varied considerably. To put it simply, however, it could be said that generative grammar-oriented research into mainly American Sign Language, that is, ASL (e.g. Fischer 1975; Liddell 1980; Neidle et al. 2000; Friedman 1976) has considered the strict SVO-type order (i.e. Subject – Verb – Object) the norm, while other orders – for example, OSV – have been regarded as possible but always somehow marked (e.g. through topicalization). In contrast, functionally-oriented more textual studies have seen sign orders as less strict. For example, Coerts (1994) suggests that Dutch Sign Language does not have one unambiguous sign order, although she points out that the SOV type A1 A2 V order is frequent. Similarly, Engberg-Pedersen (2002) states that in Danish Sign Language both the SOV type APV order and the SVO type AVP order are typical, yet the textual context affects the order strongly. Interestingly, international sign order studies suggest that not only the type of data but also the scientific tradition has a role in determining the sign order found; for example, the claim that ASL has a strict SVO order follows perhaps naturally from the axiomatic word order assumptions of generative grammar, widely used as a theoretical basis in the study of ASL. The role the scientific tradition has in sign order research is returned to briefly in Section 5.2.

On the micro-level, the reversibility status of an expression and the type of the verb(al) (see Section 1.3) have been claimed to affect sign order, although differences can be found both between languages and researchers’ opinions (for an overview, see Sze 2003: 164–166). For example, it has been suggested for ASL that the sign order in non-reversible expressions (e.g. ‘A girl is watching TV’) is, due to semantic unambiguity, freer than that of reversible expressions (e.g. ‘A girl loves a boy’), and that the sign order thus functions to distinguish participant roles (e.g. Fischer 1975; Liddell 1980). On the other hand, it has also been

---

4 By reversible expressions I am referring to expressions containing a two-placed verbal predicate as well as two nominal core arguments which both share the same characteristics of animacy (e.g. ‘A girl loves a boy’). Structurally similar expressions where the degree of animacy of the core arguments is not uniform are non-reversible (e.g. ‘A girl is watching TV’).
claimed that, for example, verb(al)s containing a classifier morpheme would be positioned at the end of the expression (e.g. Liddell 1980; Sze 2003), and that certain verb(al)s (that I am calling Type 2 verbals) would allow more variation in sign order (e.g. Kegl 2004ab). These views on the effect the reversibility status of an expression and the verbal type may have on sign order are compared with the present FinSL data throughout Sections 3 and 4. The extent to which the sign order of FinSL in general agrees with cross-linguistic sign order findings is discussed in Section 5.

1.2 The notion of clause in this article

This article follows the general tradition of word order research in that the syntactic domain in which the sign order of FinSL is investigated is the clause (e.g. Dryer 2005). More specifically, the term clause, unless separately stated otherwise, is used in this article to refer to a syntactic unit that consists of a predicating element and its core argument(s), that is, nominal element(s) whose presence is required by the semantics of the predicate. Such a unit may also be termed, following Van Valin (2005), a core-only clause. Clauses may additionally contain also adverbial or prepositional phrases in adjunct function (i.e. peripheral elements in Van Valin's framework) but such clauses fall out of the scope of this study.

Since this article focuses on transitive clauses, the notion of clause may also be regarded as referring solely to structures which are built around the two-placed verbal predicate and which contain two core arguments. This is the definition of the transitive clause used in this article. The core arguments are called more specifically A- and P-arguments (e.g. Engberg-Pedersen 2002: 5; Dryer 2005: 330). The A-argument is a unit which refers to the more active participant (prototypically the agent) in the situation encoded by the two-placed predicate. The P-argument is a unit which refers to the more passive participant in the situation (prototypically the patient).

A prosodic well-formedness condition for declarative transitive clauses in FinSL is that there are no pauses between the different constituents of the clause (i.e. the verbal and the arguments A and P) (cf. Liddell 1980 for ASL; Johnston & Schembri 2006, 2007 for Australian Sign Language). If the first structural constituent is followed by a pause, the structure as a whole is not a clause but a more complex topic-comment structure in which the first constituent is a clause-external left-detached topic element (cf. Van Valin 2005: 6; Johnston & Schembri 2006, 2007:
In my previous work (Jantunen 2007, manuscript), I have argued that topic is a core notion in the description of FinSL syntax. More specifically, I have defined FinSL topic in the sense of Chafe (1976: 50) as a structural unit that sets a spatial, temporal or individual framework for the following main predication. This is the sense in which the notion of topic is used in this paper also.

It is not always clear how minimal transitive clauses can be distinguished from topic-comment structures that encode a transitive event and contain a complement-like topic (Jantunen, manuscript),⁵ that is, a prosodically detached agent- or patient-like NP that sets an individual framework for the following structurally incomplete comment clause (see Figure 1, and Example 2 in Section 3.1). This ambiguity is partly due to the fact that the concept of pause, crucial in identifying topic-comment structures, is largely relative in the study of signed languages. In this study, I have interpreted as pauses such periods of time where the articulator remains immobile for at least eight hundredths of a second, or more, and I have also considered the nod of the head as an indicator of a pause. The ambiguity in distinguishing transitive clauses from complement-like topic structures is further reinforced by the fact that FinSL seems to be, like Australian Sign Language (Johnston & Schembri 2006), at a stage of development where (by definition) clause-external topics are being grammaticalized into clause-internal subjects (for more, see Jantunen manuscript).

⁵ In addition to complement-like topics, Jantunen (manuscript) has identified other topic types in FinSL. The most typical of these is the adjunct-like topic that sets a spatial or temporal framework for the following full comment clause. An example of a topic-comment structure containing an adjunct-like topic is

(i) \[ \text{TOP[TODAY EVENING]} / \text{COM[INDEX-1 GO PUB]} \]

‘I’ll go to pub this evening’ (Suvi 42/1; translated from Suvi)

See also example 9a in Section 4. For transcription conventions, see Appendix 1.
Figure 1. Two ways of encoding a minimal transitive event in FinSL (for abbreviations, see Appendix 1).

Figure 1 shows schematically how a transitive situation can be encoded in FinSL by both a transitive clause and a topic-comment structure. The comment part in the topic-comment structure is interpreted as a structurally incomplete clause. Similar incomplete clausal structures occur also in texts as a result of core argument omission. This phenomenon is discussed further in Sections 3.2 and 5.3.

It should be noted that in Figure 1 the order of elements is only illustrative and does not represent any fixed pattern of the structures in question. For example, the verbal final order should not be taken to define or imply a topic-comment structure.

1.3 On verbal types in FinSL

When dealing with FinSL transitive clauses it is essential to know what types of verbals exist in FinSL since it has been suggested that the type of

---

6 In practice, a (minimal) situation with two participants can also be encoded in FinSL in other structural ways. One is the split sentence structure (Johnston & Schembri 2006), where a semantically transitive situation is encoded by two juxtaposed clauses. Another alternative is to divide the encoding responsibility between two lexical verbals. In the literature this phenomenon has been referred to by such terms as verb sandwich (Fischer & Janis 1990) and verb doubling (Johnston & Schembri 2006). The data collected for this study contains examples of both structures. However, because the focus of this study is only on prototypical single clauses the analysis of these structures is left for future research.
verbal affects sign order (see Section 1.1). In this article I am basing my view of FinSL verbals on a classification which I have proposed and justified in another work (Jantunen 2008a). In principle, my view of FinSL verbal types is based on Liddell (2003), and my central argument is that the verbals in FinSL are divided into three main categories on the basis of their morphemic-gestural structure (i.e. the pointing and descriptive potential of verbals, and their possible omission). The categories are: *Type 1 verbals*, containing only a morphemic component; gesturally pointing *Type 2 verbals*; and gesturally describing *Type 3 verbals* containing a classifier morpheme (i.e. handshape). Table 1 shows a summary of my conception of the verbal types in FinSL (for transcription conventions used in this paper, see Appendix 1).

Table 1. FinSL verbal types (Jantunen 2008a).

<table>
<thead>
<tr>
<th>Type 1</th>
<th>Type 2</th>
<th>Type 3₁</th>
<th>Type 3₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic composition</td>
<td>morphemic</td>
<td>morphemic-gestural</td>
<td>morphemic-gestural; consist at the morphemic level of a classifier morpheme (handshape) and an existential movement root (short straight movement)</td>
</tr>
<tr>
<td>Function of gestural component</td>
<td>indicates by pointing the participants in the situation encoded by the verbal</td>
<td>expresses the existence of an entity in a place by means of locative-topographic depiction</td>
<td>expresses causative or autonomous movement/motion of an entity by means of locative-topographic depiction</td>
</tr>
<tr>
<td>Examples</td>
<td>LOVE, KNOW, and LIKE</td>
<td>LOOK-AT, TEACH, and ASK</td>
<td>CL-G-EXIST-”location” ‘upright person is at some place’</td>
</tr>
</tbody>
</table>

It should be noted that although I am basing my view of FinSL verbal types on Liddell (2003), our views are not commensurable. The central difference between our views is related to the subcategorization of Type 3 verbals. In my classification I divide them into two rather than three categories: that is, while Liddell treats all signs drawing the size and shape of objects as descriptive verbs, I regard them as nominals, like Rissanen
(1998), or to be precise, as Size and Shape Specifiers or SASS'es (cf. Liddell 2003: 262; Rissanen 1998: 110–117). My decision is based on the fact that these signs are used as grammatical nominalizers in FinSL (Rissanen 1998: 110–111) and that they would also seem to lexicalize into nominals (id., 110).

2. The data and its processing

All the arguments and conclusions concerning FinSL sign order presented in this article are based on material that has been acquired both by elicitation tests and by examining existing linguistic material. The tests included an argument puzzle and a picture production and selection test, the former being a new type of test specially devised for the present study, the latter a variant of the more commonly used picture elicitation test (see Sze 2003). The already existing data for analysis were collected from Suvi (The Online Dictionary of FinSL) and from course material produced at the University of Jyväskylä.

As noted by Johnston et al. (2007: 164), the majority of sign order studies have relied on elicited data. In order to make possible a broader comparison between FinSL and other sign languages, elicitation test data has been given an important role in the present study also. However, in addition to the elicited data, the present study also investigates sign order on the basis of different types of monologues (cf. the Suvi data and the course material, which together form most of the textual clause data discussed in Section 2.1.3). The purpose of using multidimensional data is both to take into account the effect the type of data has on sign order (cf. the fact that the order varies more in textual settings) and by doing so to get a more comprehensive picture of the sign order issue in FinSL in general (see Section 1).7

The different data and the methods used to compile and classify them are presented in more detail in the following.

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7 A data type missing from the total material is the so-called natural dialogue (e.g. Johnston et al. 2007: 164). It is obvious that in future studies on FinSL sign order this type of data also has to be dealt with. However, for the success of the present study I do not consider the lack of natural dialogue to be a key issue: the main research question does not demand the use of natural dialogue, and the data used in the study is already more comprehensive than that used in sign order studies in general (ibid.).
2.1 Types of data

2.1.1 Data collected by means of the argument puzzle

The term argument puzzle here refers to a test for analysing the order of the two-placed Type 2 verbal predicate and its core arguments in transitive FinSL clauses that are (a) assumed to be neutral and unvaried in their prosody, (b) lack deictic elements and (c) are minimal in their structure. Consequently, considering criteria (a)–(c), the data obtained through the argument puzzle test forms the most laboratory-like set of data in this study. The purpose of the test was to collect data not influenced by textual factors and in which the ambiguity in differentiating transitive clauses and topic-comment structures is minimised (see Section 1.2). The test was carried out at the University of Jyväskylä in spring 2007, and four native FinSL signers took part in it.

The basis of the argument puzzle was formed by ten two-placed Type 2 verbal predicates and two nominal signs which represented the core arguments of the predicates. The verbal predicates were extracted from a printout obtained from Suvi, the internet version of the Suomalaisen viitomakielten perussanakirja (1998; The Basic Dictionary of Finnish Sign Language), by using the command ‘search for multidirectional signs’ (see Table 2). The nominals were the Suvi signs WOMAN (Suvi entry 289) and MAN (Suvi entry 1025). All twelve signs were printed out on paper which was then cut up into small cards.

Table 2. ‘Multidirectional’ verbals from Suvi used in the argument puzzle.

<table>
<thead>
<tr>
<th>The number of lexical entry/entries in Suvi</th>
<th>English gloss of the verbal</th>
</tr>
</thead>
<tbody>
<tr>
<td>213</td>
<td>COMFORT</td>
</tr>
<tr>
<td>292</td>
<td>NOTIFY</td>
</tr>
<tr>
<td>363/1045</td>
<td>BARK</td>
</tr>
<tr>
<td>694</td>
<td>PICK-ON</td>
</tr>
<tr>
<td>789</td>
<td>LOOK-AT</td>
</tr>
<tr>
<td>864</td>
<td>VIDEOTAPE</td>
</tr>
<tr>
<td>1049</td>
<td>FETCH</td>
</tr>
<tr>
<td>1080</td>
<td>NURTURE</td>
</tr>
<tr>
<td>1094</td>
<td>ARREST</td>
</tr>
<tr>
<td>1174/1175</td>
<td>TEACH</td>
</tr>
</tbody>
</table>
Ten schematic pictures of situations where ‘woman’ and ‘man’ participated were drawn up on the basis of the meanings of the verbals (see Table 3 for situations and Appendix 2 for examples of the pictures). In five of the situations, the more active participant was the ‘woman’, and in the other five situations it was the ‘man’. Cards were also prepared using the pictures of these situations.

In the test situation, each participant was given four cards in front of them on the table: cards with the signs WOMAN and MAN, a card with a verbal sign, and a card containing an illustration based on the situation the verbal denoted. The participants were first instructed to think about how they would sign the situation pictured on the card as quickly and briefly as possible by using just the three signs shown on the sign cards. After this, they were asked to place the sign cards in the order they thought would be the one by which the situation illustrated could be expressed in the most unambiguous way. The order of the sign cards was recorded in a table on a separate sheet of paper, after which all the cards were collected from each testee. The test was repeated with each participant ten times until each situation was dealt with. The pictures of ‘woman’ and ‘man’ were retained unchanged throughout the test, only the picture of the verbal sign and the card illustrating the corresponding situation being changed.

Table 3. The results of the argument puzzle.

<table>
<thead>
<tr>
<th>No.</th>
<th>Situation</th>
<th>AVP</th>
<th>APV</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>‘A man is watching a woman.’</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>2.</td>
<td>‘A man nurtures a woman.’</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>3.</td>
<td>‘A woman is picking on a man.’</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>4.</td>
<td>‘A man comforts a woman.’</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>5.</td>
<td>‘A woman is videotaping a man.’</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>6.</td>
<td>‘A woman arrests a man.’</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>7.</td>
<td>‘A man notifies a woman.’</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>8.</td>
<td>‘A woman teaches a man.’</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>9.</td>
<td>‘A woman barks to a man.’</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>10.</td>
<td>‘A man picks up a woman.’</td>
<td>4</td>
<td>-</td>
</tr>
</tbody>
</table>

Instances out of total 40: 37 3
The results of the argument puzzle are displayed in Table 3. In practice, the order AVP emerged clearly from the test as the preferred order (37 cases out of 40). In three cases the order was APV; this order occurred twice with the construction *a woman arrests a man* and once with the construction *a woman is videotaping a man*. In these cases, however, the testees pointed out that there was a danger of ambiguity of expression: for example, with the situation *a woman is videotaping a man* the interpretation ‘both the woman and the man are videotaping something’ cannot be fully excluded.

### 2.1.2 Data collected through picture elicitation

The videotaped material acquired by elicitation was collected by means of a picture production and selection test carried out in pairs at the University of Jyväskylä at the beginning of 2006. The test was followed by an interview based on the pictures used in the test. Test and interview material was collected from three pairs, but the material actually used only consisted of the test material produced by two of the pairs (Pairs 1 and 3) and the interview material of one pair (Pair 2). The reason for limiting the material in this way was, first of all, the desire to eliminate all cases in which the test picture was clearly described and explained (e.g. the cases where the signer did not sign his/her version of the desired situation but described the characters on the paper, for example, *in the right-hand corner of the paper there is a man who...*)). Thus the entire test material produced by Pair 2 was excluded from the study. Secondly, the aim in limiting the data was to prefer the actual test material. This is why the subsequent interview material of Pairs 1 and 3 was excluded and, in contrast, only material from the interview of Pair 2 was included in the research, the actual test material from Pair 2 having already been left out (see above). The expressions in the research material (37 cases) that could clearly be semantically connected back to the situations in the test pictures, as well as the immediate contexts of these expressions, were first glossed roughly by a native FinSL research assistant, using a method introduced by Paunu (1983). After this, the sequences in question were further annotated by the ELAN programme,\(^8\) which made it possible to consider, among other things, the prosody of the expressions in a very detailed manner.

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\(^8\) For more detailed information about ELAN (EUDICO Linguistic Annotator), see [http://www.lat-mpi.eu/tools/elan/](http://www.lat-mpi.eu/tools/elan/).
The elicitation test was originally created on the basis of a test used by Sze (2003) for Hong Kong Sign Language. Initially, it was planned that the material collected by means of the test should be used to analyze the basic sign order in FinSL, as well as the impact of the reversibility status of the expression and the type of verbal on sign order (Jantunen et al. 2006). Accordingly, eighteen FinSL verbals that could be perceived as transitive and that were distributed evenly between verbal types 1–3 were chosen for the test (see Table 4). For each verbal a ‘desired situation’ was created together with its reverse or proximate situation (see Table 5), all of which were then drawn in picture form (see Appendix 3 for examples). Altogether eighteen test pictures were produced, along with another set of eighteen pictures of reverse or proximate situations. The pictures representing reverse or proximate situations were used in the test as control pictures to measure the comprehension of the recipient.

Table 4. FinSL verbals chosen as the basis for the elicitation test.

<table>
<thead>
<tr>
<th>Type 1 verbals</th>
<th>Type 2 verbals</th>
<th>Type 3 verbals</th>
</tr>
</thead>
<tbody>
<tr>
<td>READ</td>
<td>TAKE</td>
<td>bh:CL-(V...)^-“jump upwards”^-1-2u</td>
</tr>
<tr>
<td></td>
<td></td>
<td>‘A four legged animal is jumping upwards on a flat surface.’</td>
</tr>
<tr>
<td>BUY</td>
<td>LOOK-AT</td>
<td>h1:CL-B^-“come to a stop”^-3-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>‘A rectangular-shaped moving object stops’</td>
</tr>
<tr>
<td>EAT</td>
<td>MOVE</td>
<td>h1:CL-Y^-“land on a surface”^-3u-h2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>h2:CL-B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>‘A flying object lands on a flat surface’</td>
</tr>
<tr>
<td>LOVE</td>
<td>TEACH</td>
<td>bh:CL-B^-“push forward”^-1-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>‘A living creature pushes a vertical surface’</td>
</tr>
<tr>
<td>SING</td>
<td>KISS</td>
<td>h1:CL-F^-“pick up”^-2d-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>‘A living creature picks up a tiny object’</td>
</tr>
<tr>
<td>VOTE</td>
<td>HIT</td>
<td>h1:CL-Ô^-“put down”^-1-2d</td>
</tr>
<tr>
<td></td>
<td></td>
<td>‘A living creature hands/puts down a flat object’</td>
</tr>
</tbody>
</table>

Each test was taken by two native FinSL signers, A and B (i.e. a pair). In addition, there was a non-native researcher present (the author of this article), responsible for videotaping and giving instructions. Participants A and B each had a set of eighteen sheets of paper stacked in front of them on the table. In the set given to A, each sheet had one picture illustrating the desired situation and each sheet had a different picture/situation. Each of B’s sheets of paper contained two pictures attached with Blu-tack®, one of which represented the same situation as the picture on A’s corresponding
sheet. The other picture represented its reverse or proximate situation. Each sheet had different pictures/situations. The sheets of paper were placed on the table with the picture side facing down. Person A was instructed to look at the picture on the topmost sheet and to memorize the situation it represented. After this, A was asked to sign the situation to person B. B, in turn, was instructed to take off and lay aside the picture on his topmost sheet that he/she thought represented the situation expressed by A. This task was repeated until all of the eighteen sheets had been dealt with.

Table 5. Desired situations and their reverse/proximate situations created for the elicitation test.

<table>
<thead>
<tr>
<th>Desired situations followed by their reverse or proximate situations encoded by:</th>
<th>Type 1 verbals</th>
<th>Type 2 verbals</th>
<th>Type 3 verbals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-reversibles:</td>
<td>Non-reversibles:</td>
<td>Autonomous movement/motion:</td>
<td></td>
</tr>
<tr>
<td>A girl is reading a book – A boy is reading a book</td>
<td>A girl takes a key – A boy takes a key</td>
<td>A bunny is jumping up the hill – A bunny sits and watches a flower</td>
<td></td>
</tr>
<tr>
<td>A boy buys an apple – A boy buys a banana</td>
<td>A woman is watching TV – A woman is watching a ball</td>
<td>A car stops near the house – A car stops near a group of people</td>
<td></td>
</tr>
<tr>
<td>A woman is eating pizza – A woman is eating apple</td>
<td>A woman moves to Turku – A woman moves to Italy</td>
<td>A helicopter lands on a roof top – An UFO lands on a roof top</td>
<td></td>
</tr>
<tr>
<td>Reversibles:</td>
<td>Reversibles:</td>
<td>Causative movement/motion:</td>
<td></td>
</tr>
<tr>
<td>A man loves a woman – A woman loves a man</td>
<td>A woman is teaching a boy – A boy is teaching a woman</td>
<td>A man pushes a car – A man pushes a refrigeranator</td>
<td></td>
</tr>
<tr>
<td>A boy sings to a girl – A girl sings to a boy</td>
<td>A boy kisses a girl – A girl kisses a boy</td>
<td>A girl picks up a berry – A boy picks up a berry</td>
<td></td>
</tr>
<tr>
<td>A man votes a donkey – A donkey votes a man</td>
<td>A burglar hits a man – A man hits a burglar</td>
<td>A boy puts down a book – A boy puts down a shoe</td>
<td></td>
</tr>
</tbody>
</table>

In the interview after the test, the non-native researcher showed B the pictures on the basis of which A had produced his expressions. B was then told to sign his own view of the situation represented by each picture. The aim was, in addition to eliciting material from the more passive party in the original test, to test how the presence of a Finnish-speaking interviewer might influence the sign order.

2.1.3 Text material

Besides the above-mentioned test material, the arguments and conclusions in this article on the sign order of FinSL transitive clauses are also based on
inherently more textual data collected from two further sources.\footnote{The terms \textit{text} and \textit{textual} are used in this paper in their abstract sense to refer to (transliterated material extracted from) discourse contexts larger than a single clause. The use of the term text in this sense follows the more general FinSL research tradition initiated by Rissanen (1985: 3).} The more extensive of these two sets of data is a sample of 32 verbal-centered expressions compiled from the mini texts of \textit{Suvi} (the Online Dictionary of FinSL). The other, smaller set of text material is a twenty-second excerpt of signed everyday-style narrative. Qualitatively, both data sets represent a type of monologue, the data from \textit{Suvi} being more rehearsed than the everyday-style narrative.

The mini texts from \textit{Suvi} were collected by going through the example sentences\footnote{\textit{Suomalaisen viittomakielen perussanakirja} (1998; The Basic Dictionary of Finnish Sign Language) and its internet version \textit{Suvi} (The Online Dictionary of FinSL) are made up of a total of 1 219 dictionary entries which altogether include c. 5 000 signed mini texts. These mini texts are perhaps somewhat misleadingly also called \textit{example sentences.}} in articles 1–65 of the Suomalaisen viittomakielen perussanakirja (1998) and by picking the cases that clearly included one- or two-placed verbals. All the collected expressions were glossed manually from a video using the method introduced by Paunu (1983).

The excerpt of signed text used as the second set of material was a twenty-second extract from an everyday-style travel narrative monologue. The material was originally produced by a native signer to serve as practice material on Finnish Sign Language courses SVKS111 and SVKS112 at the University of Jyväskylä. For the purposes of this research, the material was annotated using ELAN.

### 2.2 Classification of the data

The data used in this article is distributed along the continuum \textit{isolated clauses} – \textit{textual clauses}. The term isolated clauses refers to clauses that are independent (in the sense that they ‘have not been extracted from a larger linguistic mass’) and in the extreme cases even laboratory-like (cf. Givón 2001: 16). Isolated clauses are not merely abstractions created by a linguist but belong to the repertoire of any native signer, for example, in educational domains. The term textual clauses is used to refer to clauses which are extracted from larger texts, that is, from linguistic domains larger
than a single clause. Figure 2 illustrates roughly the positioning of all the sets of data used here on this continuum.

![Figure 2](image)

**Figure 2.** Sets of data used in this study positioned roughly on the continuum isolated clauses – textual clauses.

In practice, the category of isolated clauses consists of clauses collected through tests (the argument puzzle and picture elicitation test), although the material collected through picture elicitation also includes textual clauses. Because of the context created by the interview situation, the material elicited in the interview falls largely into the category of textual clauses, yet it also includes cases that can be clearly analyzed as isolated clauses. The material from *Suvi* contains mostly textual clauses but, like the interview material, also includes expressions that can be classified as isolated clauses. The travel narrative monologue includes only textual clauses.

The principal distribution of the material into isolated and textual clauses provides the basis for further analysis of the transitive clauses containing Type 1 and 2 verbals in this study (see Section 3). Expressions built around Type 3 verbals also have their place on the continuum of isolated and textual instances but these expressions are addressed as a category of their own (in Section 4). One of the reasons why expressions built around Type 3 verbals are not treated together with Type 1 and 2 verbals is that it is not yet fully known exactly how many placed predicates these verbals are and how many core arguments we should thus expect the clauses around them to have (see, for example, Benedicto et al. 2007). The syntactic behavior of Type 3 verbals, presented in Section 4, further motivates this decision.\(^{11}\)

It should be noted that although the material used in the study has been collected from several sources, and although it is so far the most

\(^{11}\) A further reason to treat Type 3 verbal-centered expressions separately is that they seem to inherently imply topic-comment structures. Hence, for example, the preference for the use of the term *expression* instead of clause.
comprehensive set of data that has been used to study FinSL sign order, it still remains too narrow for making statistical generalizations. Thus, in the following sections FinSL sign order is not analyzed numerically.

3. FinSL transitive clauses including Type 1 and Type 2 verbals

The following presents the most important findings on how a two-placed verbal predicate of Type 1 or Type 2 and its core arguments were organized in the isolated clauses (3.1) and textual clauses (3.2) of the data.

3.1 Isolated clauses

According to the data, the A-argument is expressed before the V and P-argument without exception in FinSL declarative transitive clauses that are isolated and include a verbal of Type 1 or 2. The verbal in these clauses is positioned either between the arguments or at the end of the clause. Thus, in practice, the order of isolated transitive clauses in FinSL is either AVP or APV (cf. Engberg-Pedersen’s 2002 analysis of Danish Sign Language). For example (for coding and transcription conventions, see Appendix 1):  

\[
\begin{align*}
1. & \text{ a. } [A[\text{MAN}]] V[\text{LOOK-AT}] P[\text{WOMAN}] \\
& \text{ ‘A man is watching a woman.’ (argument puzzle, 1)} \\
2. & \text{ b. } [A[\text{WOMAN}]] V[\text{VIDEOTAPE}] P[\text{MAN}] \\
& \text{ ‘A woman is videotaping a man.’ (argument puzzle, 5)} \\
3. & \text{ c. } [A[\text{WOMAN}] P[\text{MAN}]] V[\text{ARREST}] \\
& \text{ ‘A woman arrests a man.’ (argument puzzle, 6)} \\
4. & \text{ d. } [A[\text{BOY}]] P[\text{APPLE}] V[\text{BUY}] \\
& \text{ ‘A boy buys an apple.’ (elicitation test, 5)} \\
5. & \text{ e. } [A[\text{GIRL}]] P[\text{TV}] V[\text{LOOK-AT}] \\
& \text{ ‘A girl is watching TV.’ (elicitation test, 9)}
\end{align*}
\]

\[\text{12}
\]

In (1), Type 2 verbals occur in their lexical form, that is, they are not gesturally directed towards a specific location.
Clauses (1a)–(1c) represent prosodically neutral laboratory clauses corresponding to situations 1, 5 and 6 in the argument puzzle. Clauses (1d)–(1f), in turn, have been obtained by elicitation and exhibit variation in prosody. The prosodic characteristics of clause (1d) are a very fast signing tempo as well as a prominent position of the eyes and eyebrows associated with the first sign (i.e. eyes widened and eyebrows raised) and a subsequent quick blink of the eyes, marking the constituent boundary (Jantunen 2007; for ASL, see Wilbur 2000: 228). Similarly, clause (1e) is characterized by fast tempo. However, in contrast to clause (1d), the first element of clause (1e) is not associated with a prominent position of the eyes and the eyebrows but, during the sign GIRL, the head is bent slightly towards the non-dominant hand; the position of the head is neutralized between the signs GIRL and TV. The clearest prosodic characteristic of clause (1f), obtained in the interview following the elicitation test, is that the signer stresses the verbal sign in the middle.

Contrary to what might be expected on the basis of, for example, Rissanen’s (1985) and Itkonen’s (2001) statements on FinSL sign order (cf. the order patient – agent – verbal discussed in Section 1.1), there were no clauses beginning with the P-argument in the data of the isolated clauses. The data did seem to include clauses beginning with the P-argument but, on the basis of their prosody, i.e. primarily on the basis of the pause following the initial constituent, they were interpreted as topic-comment structures (see Section 1.2). The topic in these structures was a complement-like unit setting an individual framework and sharing patient-like characteristics (for more details, see Jantunen manuscript). An example of such an expression is given in (2):

\[
\text{TOP}\, [\text{KEY INDEX-4d}] \, / \, _{A}[\text{WOMAN}] \, \forall[\text{TAKE-4d-1}]
\]

‘A woman picks up a key.’ (elicitation test, 32)

In general, the data used in this article does not support the view that the type of verbal (1 or 2) or the reversibility status of the expression itself motivates the order of the transitive clauses in FinSL (cf. Fischer 1975; Liddell 1980; Sze 2003; cf. also Rissanen 1985: 126–127, who presumes that ‘multidirectional verbals’, corresponding to verbals of Type 2 (and 3), would be positioned at the end of the transitive structure). Instead, pointing
elements realized as free units (in contrast to the pointing Type 2 verbals) seem to have a role as definers of the sign order: isolated clauses without pointing elements, where both arguments are animate (i.e. in reversible expressions), strongly favor the order AVP (see the results of the argument puzzle in Table 3). The preference for the order AVP probably has to do with the functions of pointing in FinSL, as well as with the iconic relationship that is claimed to prevail between the order AVP and real-world situations. Pointing is used grammatically in FinSL, for example, to indicate the participants in a situation (cf. below; see also Rissanen 1998: 105–110, 117–121). Thus, if the use of pointing is restricted artificially, distinguishing between the participant roles remains largely to be done through sign order. For this purpose, the order AVP can be considered ideal, since it has been claimed to correspond best to the temporal-logical structure of a situation in the real world (i.e. actor > act > patient; see Itkonen 2001: 14; cf. also Givón 2001: 35). 13

On the basis of the material it would seem that even the order APV can – probably case and signer specifically – distinguish between the participant roles in reversible isolated transitive clauses which lack pointing elements (cf. the three APV orders in the argument puzzle, one of which is presented in 1c). However, in such cases it is probable that the initial constituent of a clause (the A-argument) is marked prosodically by the prominent position of the eyes and the eyebrows (eyes widened and eyebrows raised; cf. example 1d). In FinSL, this feature also marks the topic, but since prosodic marking in these cases is not associated with the unit detached to the left from the clause by a pause, it is interpreted as a grammatical (prosodic) marker of the subject (Jantunen manuscript).

In practice, however, the order APV is rare in reversible isolated transitive clauses lacking a pointing element (cf. the argument puzzle). The reason for this is ultimately its ambiguity in distinguishing the participant roles: as regards the order APV, the interpretation ‘both x and y are doing something’ cannot be completely excluded. In contrast, in reversible clauses which include a pointing element the APV order is more typical, for example:

13 Furthermore, the order AVP would seem to belong to a register close to the Finnish language (cf. Engberg-Pedersen 2002: 16, 33). This interpretation is supported by the fact that this order was slightly preferred in the interview, carried out by a Finnish-speaking researcher, after the elicitation test.
In (3), the semi-bound pointing index with the palm (B-INDEX) associated with the P-argument indicates the patient referent, i.e. the object of the action. In the light of the present data, it is interesting that if a transitive clause includes any pointing elements, they seem to be connected precisely with the P-argument (indicating the patient); the pointing elements linked to the seemingly A-argument-like topic function as topic markers in FinSL (see Jantunen 2007, manuscript; Rissanen 1985, 1998; cf. example 2).

In general, the clause in (3) is prosodically somewhat halting, because of the signers’ hesitation. The initial constituent of the clause involves a prominent position of the eyes and eyebrows.

3.2 Textual clauses

On the basis of the text material, we can conclude that the orders AVP and APV identified in isolated transitive clauses are generally also found in more textual transitive clauses. Example (4) illustrates a transitive clause with the order AVP right at the beginning of a text:

(4) [A[INDEX-1] v[ENROL] p[KNOW+CONTEST]] v INDEX-1 COME-IN /
     ANSWER / INDEX-1 LOOK-ONE-BY-ONE-2u-d v...
     ‘I took part in a quiz and when I was later looking at my answers…’ (Suvi 51/2; translated from Suvi)

In (5), the transitive clause with the order APV is inside the text:

(5) EARLIER INDEX-1 YOUNG / [A[INDEX-1] p[MOTORCYCLE] v[RIDE-MOTORCYCLE-fast]] v...
     ‘When I was young I was riding my motorcycle…’ (Suvi 25/2; translated from Suvi)

In practice, the text material confirms the results obtained from the investigation of isolated clauses concerning the central role of the orders

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14 In practice, the referent representing the patient does not have to be physically present but it can also be located in conceptual space (for more details, see Liddell 2003).
AVP and APV in FinSL, both occurring relatively frequently in the textual data. In addition, the investigation of text clauses also contributes unquestionable added value to research into FinSL sign order, enabling us to further identify a third structure of transitive clauses, PAV, not found in isolated clauses. This structure corresponds, in my view, to the patient – agent – verbal structure proposed by Rissanen (1985), Itkonen (2001) and Veitonen (2004). However, on the basis of the present data, the order can only be assigned a marginal role in FinSL, since in contrast to the orders AVP and APV, clauses with the order PAV were rare in the textual data. The sequence at the beginning of the following text is an example of a clause with the order PAV:\(^{15}\)

(6) \[p[BOOK] \_A[INDEX-1] \_v[SEARCH]\] \^1 FIND / SIGH-ON-RELIEF \^1 YES LAST PIECE \^1 GOOD FORTUNE

‘I was desperately searching for a book, and fortunately I found it eventually.’

(Suvi 46/1; translated from Suvi)

As regards the order of the verbal predicate and its core arguments, textual clauses allow more variation than isolated clauses. One significant reason for this can be considered to be the fact that in text both the linguistic and non-linguistic contexts offer more clues for, for example, making a distinction between the different participant roles. Moreover, the analysis of the textual clauses suggests that in the everyday use of FinSL sign order is not perhaps the most important factor affecting the functioning of language and language understanding. This conclusion is supported by the finding that one or even both of the core arguments can be omitted in textual clauses (cf. Engberg-Pedersen 2006; Johnston & Schembri 2007: 208). The following example from the travel narrative monologue illustrates this phenomenon (the symbol “>” indicates that the hand moves sideways retaining the configuration of the previous letter; the letter S in square brackets is an unrealized handalphabet):

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\(^{15}\) The clause demonstrated in (6) is actually a slightly marked one since the non-dominant hand perservates in the utterance as a \textit{fragment buoy} (Liddell 2003: 248) after the P-argument.
The text excerpt in (7) includes three verbals that can be classified as (at least) two-placed predicates: FLY-PLANE, STAY-IN, and MEET; out of these, the verbal MEET is found in two different forms. Interestingly, in the text the argument structure of none of the verbals is manifested as syntactically maximal: of the arguments of verbal FLY-PLANE, only the A-argument (INDEX-1) is realized; with the verbals STAY-IN and MEET, the A-argument is in turn omitted. 16

4. Structures containing a Type 3 verbal

In FinSL, information on the semantic arguments of the predicate is automatically encoded in Type 3 verbals (cf. Rissanen 1998: 139; cf. also Benedicto et al. 2007). In practice, the arguments are marked by classifier morphemes that in signed languages are realised by handshapes (for more details on the classifier handshapes in FinSL, see Rissanen 1985: 96–99, 1998: 117–121, 176–203; Takkinen 2002: 121, 2008: 24–26). The classifier handshapes in FinSL are divided into two subcategories, termed the whole-entity classifier (e.g. the handshape representing the cabin and wings of an airplane in the verbal CL-Y-“fly in a whirling manner” ‘an airplane flies in a whirling manner’) and the handling classifier (e.g. the handshape in the verbal CL-F-“move in careful manner” ‘to move a pea-like tiny object in a careful manner’, which reflects the way a tiny object is usually grasped by humans). Of these, the whole-entity classifiers always refer to the first argument of the predicate (cf. the A-argument), whereas the handling classifiers refer to the second argument (cf. the P-argument).

On the basis of the ability of Type 3 verbals to mark the arguments, FinSL can be considered a head-marking language, typologically resembling, for example, Navajo and Trotzil (Nichols 1986; Van Valin...

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16 Due to the small number of bound morphemes, as well as the tendency to omit core arguments, excellently illustrated by the travel monologue, FinSL can be classified in my opinion as a compositionally associative language, as described by Gil (2008).
2005: 16–19). Compare the following examples (8) and (9) from Trotzil and FinSL, respectively (the Trotzil example is from Van Valin 2005: 16):

(8) a. ?i-Ø-s-pet  lokel  ?antz  ti  tul-e.
   ASP-3ABS-3ERG-carry  away  woman  DEF  rabbit-DEF
   ‘The rabbit carried away the woman.’

b. ?i-Ø-s-pet.
   ASP-3ABS-3ERG-carry
   ‘He/she carried him/her/it.’

(9) a. STONE+SASS-(B^)-“upward flat surface”-1-2u / BUNNY bh:CL-(V...)-“jump upward a flat surface”-1-2u
   ‘A bunny is jumping up the hill.’ (elicitation test, 6)

b. bh:CL-(V...)-“jump upward a flat surface”-1-2u
   ‘A four legged animal is jumping upwards on a flat surface.’

An essential characteristic of strong head-marking languages, such as Trotzil, is that free morphemes, which in terms of traditional grammar function as verb complements, can be omitted from the clause (see 8b, where the words for ‘woman’ and ‘bunny’ are omitted at the lexical level). The well-formedness of a clause does not suffer from this, since the verb as such contains references to the referents of these omitted words (Van Valin 2005: 16–19). Example (9) illustrates how the same applies to FinSL: the core argument referring to the ‘bunny’ need not be expressed lexically to achieve well-formedness, since the whole-entity classifier contained in the verbal expresses this argument automatically. However, for the sake of semantic unambiguity, expressing the core argument

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17 In practice, languages form a continuum in terms of whether they mark the arguments in the dependent member (dependent-marking languages) or in the head (head-marking languages) (Nichols 1986: 68–69). For example, Navajo and Trotzil are strongly head-marking languages, whereas Russian is a strongly dependent-marking language. Nichols (1986) regards Finnish as a split-marking language, and Quechua, for example, as a double-marking language.

18 Van Valin (2005: 16–19) claims that pronominal bound morphemes linked to the head, i.e. the verb are complements/core arguments of the verb per se, whereas free nominal units occurring with the verb are solely optional elements specifying the meaning of the arguments.
lexically may be necessary, which also applies to Trotzil (cf. example 8). The expression ‘mountain’ in front of clause (9a) is an adjunct-like topic setting a spatial-locative framework (Jantunen manuscript).

In general, I analyze Type 3 verbals in FinSL as head-marking verbals. Syntactically, these verbals would seem to have a special status in FinSL. The material collected by the elicitation test gives reason to claim – along the lines of international research (e.g. Liddell 1980; Sze 2003) – that structures containing a Type 3 verbal, i.e. a verbal including a classifier handshape, are without exception verbal final. On the basis of the material, a corresponding strict organizational principle cannot be identified in FinSL structures that contain a verbal of Type 1 or 2.

A more specific, yet still very preliminary, finding related to the sign order of expressions containing a Type 3 verbal in FinSL would seem to be a tendency to place the nominal constituent referring to the first semantic argument of the predicate immediately before the verbal including a whole-entity classifier. Examples:

(10) a. HOUSE-2 ! CAR CL-B-“comes to a stop”-3-2
    ‘Car stops near the house.’ (elicitation test, 2)

    b. MAN CL-G-EXIST-2 ! WOMAN+B-INDEX-2 ! SING
    ‘A man sings to a woman.’ (elicitation test, 11)

In contrast, the sequence referring to the second argument would seem to show a tendency to be placed immediately before the verbal containing a handling classifier:

(11) a. BOY ! BOOK+bh:SASS-(B^)-“half of a rectangular”-2 h1:CL-(B^)-“set down”-1-2d
    ‘A boy sets down a book.’ (elicitation test, 7)

    b. GIRL ! TINY+BERRY CL-(L...)-“pick up”-2d-1
    ‘A girl picks up a tiny berry.’ (elicitation test, 14)

However, as already stated, the above-mentioned remarks concerning the relationship between the arguments and the types of classifiers (in Examples 10 and 11) must be regarded as preliminary observations only. A more detailed analysis of the issue would require much wider material.
5. General discussion

5.1 On the regularity of FinSL sign order

Are the two-placed verbal predicate and its core arguments organized in FinSL declarative transitive clauses in some specific manner? Judging by the material analyzed in the study, transitive clauses in FinSL do not have any certain unambiguous sign order: the verbal and its core arguments can, in general, be organized in at least three alternative ways: AVP, APV and PAV. Isolated clauses only occurred with the orders AVP and APV. These orders were frequent also in textual clauses, which also exhibited the order beginning with the P-argument, that is, the order PAV. In textual clauses it was also typical to omit core arguments completely. This phenomenon was probably enabled by the more extensive linguistic and non-linguistic context.

The present study provides evidence against the belief common in the field of FinSL that the PAV-type of patient – agent – verbal order is the only possible order of elements in FinSL (see Rissanen 1985, Itkonen 2001 and Veitonen 2004 in Section 1.1). In fact, the present study suggests that the order PAV has only a marginal role in FinSL clauses because, by comparison with the relative frequency of the orders AVP and APV in texts, its occurrence was relatively infrequent. However, in order to address this question properly, a more comprehensive set of textual data is needed. Moreover, the fact that it is not typical in the domain of the clause does not mean that the patient – agent – verbal type of order does not have a role in more complex topic-comment structures – in fact this is to some extent even implied by the data (cf. the fact that orders seemingly beginning with the P-argument were identified in terms of a topic-comment structure where the topic is a complement-like topic containing features of a patient; for more details, see Jantunen manuscript).

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19 In comparison to Greenberg's (1966) original six-way word order typology (SOV, SVO, VSO, VOS, OVS, OSV), only transitive clauses organized according to the principles SOV (APV), SVO (AVP) and OSV (PAV) were found in FinSL in this study. There seem to be no orders in FinSL corresponding to Greenberg’s types VSO (VAP) and VOS (VPA) (cf. comments on clauses beginning with a verbal in the later body text). However, there are implications that an OVS-style PVA order could occur in the textual clauses. To analyze the issue in more detail, wider data is needed.

20 A more theoretical question relating to this issue is whether the patient-resembling complement-like topic should be called patient or simply a topic. In my previous work...
Although the two-placed verbal predicate and its core arguments are not organized in a single uniform manner in FinSL, nonetheless FinSL sign order cannot be considered completely free. First of all, as the widest micro-level generalization concerning FinSL transitive structures, it can be concluded that the A-argument was always expressed before the verbal in the data. Second, as regards isolated transitive clauses containing a verbal of Type 1 or 2, it can be stated that the A-argument occurred always before the P-argument. There were no instances in the material of isolated clauses of an order with a clause beginning with the P-argument. Third, also as regards isolated transitive clauses built around Type 1 and 2 verbals, it can be concluded that the position of the verbal in FinSL clauses is not arbitrary. In the material, the verbal was always placed either between the arguments or at the end of the clause, never at the beginning of the clause. Fourth, the order AVP seems to be the only unambiguous order in prosodically neutral isolated declarative transitive clauses which are built around Type 2 verbals, are reversible, and lack pointing elements (cf. Rissanen 1985: 126). However, contrary to what Fischer (1975) and Liddell (1980) claim to be the case with ASL, reversibility as such would not seem to determine sign order in FinSL.

The position of the verbal in FinSL clause-like expressions including Type 3 head-marking verbals seems to be fixed. In the material analyzed such expressions ended in verbals without exception. Judging by the material, the other types of verbals (1 and 2) do not have as direct an effect on sign order in FinSL (cf. Kegl 2004ab, according to whom verbs in ASL identified as FinSL Type 2 verbals allow a freer order).

5.2 FinSL in relation to other sign languages

In general – and especially as regards the main features in the organization of transitive clauses – FinSL would seem to resemble the other sign languages...
languages studied so far – to a remarkably high degree. First: just like, for example, ASL (Fischer 1975; Liddell 1980; Neidle et al. 2000), Australian Sign Language (Johnston & Schembri 2007: 202–208), Dutch Sign Language (Coerts 1994) and Danish Sign Language (Engberg-Pedersen 2002), FinSL, too, places the unit identifiable as the A-argument before the V, and strongly tends to express this unit also before the unit identifiable as the P-argument. Second: just as the other sign languages studied so far, FinSL also avoids structures beginning with V (e.g. Liddell 1980; Engberg-Pedersen 2002: 10; Johnston & Schembri 2007: 202–208). Third: just as in ASL (e.g. Liddell 1980) and in Hong Kong Sign Language (Sze 2003), FinSL places Type 3 head marking verbals containing a classifier at the end of the corresponding expression.

It is evident that FinSL shares its core sign-order related structural features with other sign languages. In other words, we can generalize and say that the linearization principles of FinSL correspond to the linearization principles of other sign languages in their core parts. In spite of this, however, views on the sign orders of different sign languages (and on the sign order of one and the same sign language; see following section) seem to vary considerably. For example, while this article stresses that transitive clauses in FinSL do not have one certain unambiguous principle of sign organization, it is claimed that, for instance, ASL is organized primarily according to the AVP style SVO principle (see Fischer 1975; Liddell 1980; Neidle et al. 2000). Is FinSL then, after all, a different language from ASL in terms of sign order?

As a partial answer to this question, already implied in Section 1.1, I do not want to suggest here that the differences between my view on sign order in FinSL and other views on (e.g.) ASL actually imply fundamental differences in the structure of FinSL and ASL, but rather that they have to do with different scientific traditions (see also the next section which deals with how the data affects views on the strictness of sign order). Research into ASL has traditionally been closely linked with the formal generativistic tradition, whereas the view I have presented in this article is, based on the general assumptions of Basic Linguistic Theory, more functional and typological in nature. It is a well known fact that the assumptions regarding word and sign order held by these two different linguistic orientations are different (cf. Comrie 1989: 1–5; on the more general discussion, see also Penke & Rosenbach 2004). Let me clarify my argument with a brief mental experiment: if the results on the FinSL sign order presented in this article were placed within a generativistic
framework, it could be claimed that even FinSL is a language preferring the AVP order of the SVO style. This is due to the fact that the order AVP was clearly favoured in the argument puzzle and that the clauses investigated in the test (i.e. prosodically neutral minimal reversible transitive clauses consisting of full lexical NPs) have the status of prototypical clause structures within the generativistic framework (e.g. Fischer 1975: 5). On the other hand, the argument can also be justified by the fact that the sign order has been recognized to vary even in ASL, largely in the same manner as I have suggested regarding FinSL (e.g. Fischer 1975; Liddell 1980; Neidle et al. 2000). In spite of this, however, the generativistic tradition still presumes (irrespective of the orientation and its versions; cf. Chomsky’s original view from 1965 and the later minimalistic views) that the variation goes back to one universal deep structure. In the end the question of the effect the scientific tradition has on research into sign order is an empirical one and calls for a specific study.

It should be noted that the structure of transitive clauses that has been characterized as fundamental above is often referred to as basic sign order (basic word order in spoken languages). However, in this article, the term basic sign order is not used. The reason for this is that, within the present functionally oriented framework, the status of an order as the basic order must be established by, for example, quantitative investigation and different criteria of markedness (e.g. Hawkins 1983: 12–16; Givón 2001: 37–41). The material used in this article is too limited to allow such an investigation.

5.3 Methodological and theoretical implications for the future study of FinSL

The present study provides further support for the argument that the type of data has a role in determining findings as to the order of elements in a clause (e.g. Johnston et al. 2007). In this study, clauses have been distributed along a continuum between isolated clauses and textual clauses. This classification of the data proved to be a significant methodological factor and it should thus be taken into account in future research into FinSL sign order. In absolutely isolated clauses, the order of the verbal predicate and its core arguments turned out to be largely regular (cf. the order AVP in the argument puzzle), whereas the number of alternative orders increased as the clauses became more textual (cf. the fact that the order PAV was only found in the material consisting of textual clauses and that the core
arguments are not necessarily even expressed in textual clauses). Classifying the material into isolated clauses and textual clauses also explains why studies have yielded diverging results on the sign order of even one and the same language. Fischer (1975) and Friedman (1976) provide a classic example of this: Fischer claims, primarily on the basis of an analysis of isolated clauses, that the basic sign order in ASL is SVO, whereas Friedman, basing her research on text material, claims that the sign order of ASL is free (cf. previous section and Section 1.1).

The omission of the core arguments in the text material is an important phenomenon in FinSL, just as, for example, in Danish Sign Language (Engberg-Pedersen 2006) and Australian Sign Language (Johnston & Sch Flem 2007: 208). As has been stated in Section 3.2, this phenomenon probably indicates that sign order is not, after all, a central factor in the functioning and understanding of FinSL. Furthermore, omitting the core argument or arguments may also have implications for a more fundamental issue regarding the clause and its role in FinSL: if the basic structure of the clause in FinSL is very unstable to begin with (as the text material indicates; cf. varying sign order and core argument omission), it may be that the clause (as the notion has been defined in this article, see Section 1.2) should not be given a central role in the description of FinSL syntax. If this line of reasoning is taken to its logical conclusion, it means that in the future analysis of FinSL syntax it might prove fruitful to abandon the traditional clause-centered line of thinking altogether and to consider FinSL from a whole different perspective.

What would such a perspective be? One relevant option that I would like to suggest is provided by Brazil (1995) who argues for the prosody-based linear surface-level analysis of spoken language syntax. His guiding assumption is that in speech elements are put together in piecemeal fashion in real time and accordingly the analysis of spoken language syntax must be based on conceptual machinery that reflects this (id., 21). The clause as a part of a sentence is in Brazil's framework ultimately a written language-based hierarchical unit that does not serve best the linear analysis of speech. Instead, units identifiable as syllables and intonation phrases can be considered as more fitting candidates for this purpose.

Brazil's founding idea is both innovative and easily adaptable to the study of FinSL, and even sign language syntax in general, for signing shares most of the prototypical characteristics of speech. It may even be that the piecemeal production of elements mentioned by Brazil is emphasized in signing, since it is not at all atypical to find signing that
resembles sequences of simple single signs without any cohesive prosodic features. A positive consequence of adopting Brazil’s main idea in the study of (Fin)SL would be the fact that these important non-manual prosodic characteristics would inherently receive more attention. In the end, not even the requirement for the syllable-like unit would be an obstacle: syllables exist in signing, also in FinSL (e.g. Jantunen & Takkinen forthcoming).

Apart from the arguments concerning clause internal features such as varying sign order and the phenomenon of core argument omission, the suggested non-centrality of the clause in the description of FinSL syntax can be argued for even from a more external perspective. By this I refer to the pantomimic and gestural features that are an inherent part of many signed utterances. For example, in (12) it is not the clause, or any other linguistic unit (in the traditional sense) directly linked to it, which expresses the thematic information ‘text or paragraphs on the computer screen’; in fact, the P-argument that could be supposed to express this meaning is omitted from the transitive clause [INDEX-1 LOOK-AT-2u-2d], resulting in an incomplete clausal structure AV. Instead, the meaning is constructed mentally on the basis of the text initial topic ‘computer’ – limiting the typing process to the domain of computers and not, for example, to the domain of typewriters – and the pantomimic act in which the signer imagines the computer screen in front of her.

(12) [TOP[KNOWLEDGE+MACHINE] / COM[[INDEX-1 WRITE-KEYBOARD]] / 
[A[INDEX-1 \[LOOK-AT-2u-2d]]] / BETTER ...
‘As I read the text that I had written on the screen I noticed that [the two paragraphs were better in an opposite order...]’ (Suvi 4/2; translated from Suvi)

Important pantomimic aspects of signing, crucial both in understanding the fine details of the intended message and also in creating textual cohesion, are currently not captured effectively by any of the mainstream syntactic theories, whether they rely on the unit clause or some other traditional syntactic unit (e.g. the sentence). However, more cognitively oriented frameworks, such as that of Liddell (2003), which builds on Cognitive Grammar (e.g. Langacker 1986) and Mental Space Theory (Fauconnier 1994), are capable of addressing these features. Consequently, in order to describe FinSL syntax from the most objective and data-oriented
perspective, combining Brazil's linear “syntax of speech” approach and, for example, Liddell's cognitive framework might be useful.

As a final note, it must be emphasised that to say the clause may not be a core notion in the description of FinSL syntax is not to say that the clause is not an existing unit in FinSL syntax. The clearest justification for this claim is the fact that there were clearly structurally perfect clauses in FinSL in both the test and text material. Moreover, it may well be that in the course of the diachronic development of FinSL the role of the clause is becoming reinforced. It has been suggested even in this article (see Section 1.2; for more, see Jantunen manuscript) that certain topical units (i.e. complement-like topics) are being grammaticalized into grammatical subjects in FinSL. On a broader scale, this means automatically that also independent topic-comment structures encoding the transitive situation are being grammaticalized into transitive clauses. A similar process seems to have been discovered in Australian Sign Language (Johnston and Schembri 2006)

6. Conclusion

This article has investigated sign order in FinSL declarative transitive clauses and shown that the two-placed verbal predicate and its core arguments (A- and P-argument) are not organized in a single specific way and the orders AVP, APV and PAV are all found. However, the order beginning with the P-argument was not found in isolated clauses and only occurred marginally in textual clauses in which a typical phenomenon was the omission of core arguments.

The present article constitutes the first systematic study of the sign order of FinSL transitive structures. As a methodological contribution to research into sign order, a distinction has been made between isolated clauses and textual clauses. On the basis of the results obtained, this distinction would seem to be central in FinSL. As a typological contribution, this article has shown that FinSL can be regarded at least partly as a head-marking language resembling, for example, Trotzil and Navajo and that the core organizational principles of FinSL transitive clauses correspond to the linearization principles documented in other sign languages. As a more theoretical point, the article has suggested that in the end traditional clause-centered description might not serve best in the study of FinSL syntax. Rather, a combination of prosodically motivated linear surface analysis and cognitive analysis is suggested.
In view of the narrow range of the material used in this study, it was not possible to study sign order on the basis of numerical frequency. Evidently a core challenge in FinSL research is the creation of a wider corpus. This corpus could not only serve as the basis of further research into sign order but also provide a deeper foundation for linguistic research into FinSL in general. Internationally, the value of sign corpus work has already been recognized and there are a number of corpus projects already underway (e.g. Crasborn et al. 2007; Crasborn et al. 2008).

References


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Appendix 1.

Coding and transcription conventions used in this paper.

Manual behavior in signs

**ANGRY**  Signs are referred to, according to the standard convention in sign language research, as glosses which are to be understood as rough translations of signs core meaning. Notation in capitals.

**LOOK-AT**  A hyphen is used when a single sign is glossed with more than one (English) word.

**KNOW+CONTEST**  Consecutive signs in compounds are indicated by plus signs.

**HOUSE-2**  A gloss followed by a hyphenated number identifies a directional sign, i.e, that the sign is either directed to a certain location or produced at a certain location. Spatial locations are drawn from the Figure 3 below from Rissanen (1985: 18). The numbers may be followed by the letters $u$ and $d$, indicating the upper ('up') and lower ('down') level of articulation, respectively.

![Figure 3. Locations in signing space (from Rissanen 1985: 18).](image)
INDEX-1  A pointing made with index finger. If the number following the gloss is 1, the pointing is directed towards the signer and it indicates the first person. Any other number indicates that the pointing is directed towards the corresponding location in Figure 3.

B-INDEX-2  A pointing that is made with the flat palm up handshape. Handshape symbols, listed in Figure 4, are based on Rissanen (1985: 68–69).

CL-G-  A notation in the beginning of the gloss proper indicating that the corresponding sign contains a classifier handshape. Handshape symbols are listed in Figure 4.

SASS-(B^)-  A notation indicating that the corresponding sign is a size and shape specifying grammatical nominalizer. Handshape symbols are listed in Figure 4. The gloss is followed by a part describing sign's movement.

-"come to a stop"-3-2  The end part of the gloss in Type 3 signs describing the signs' movement. The written sequence in between the quotation marks describes the overall manner of the movement. Numbers indicate the change in the location of the hand in the signing space (see Figure 3).

bh:  Both hands; used if the sign is two-handed and has a symmetrical movement.

h1/h2:  Dominant hand or non-dominant hand, respectively. For right handed signers, the dominant hand is usually the right hand and the left hand is non-dominant. For left handed signer, the point of reference is the left hand.
Nonmanual/temporal behavior in signs

/ The symbol of pause.

' Change in prosody, i.e., in nonmanual behavior.

Abreviations relating to the analysis

Pred Predicate; usually a verb(al) but may also be a nominal element.

Arg Semantic argument of the predicate.

CA Core argument (i.e. complement).

V Verb or verbal, depending on the theoretical orientation.

A A unit referring to the more active participant (prototypically the agent) in the situation encoded by the two-placed predicate (cf. S).

P A unit referring to the more passive participant in the situation encoded by the two-placed predicate (prototypically the patient; cf. O).

S Grammatical or notional subject.

O Grammatical or notional object.

TOP Topic.

COM Comment.
Figure 4. FinSL handshape symbols (from Rissanen 1985: 68–69).
Appendix 2.

Examples of situation describing paper card pictures used in the argument puzzle.

'A man is watching a woman.'

'A woman is picking on a man.'

'A woman teaches a man.'

'A man picks up a woman.'
Appendix 3.

Examples of pictures used in the elicitation test/interview.

**Desired situation and its reverse situation**

![Image of a boy kissing a girl and a girl kissing a boy]

'A boy kisses a girl.'  
'A girl kisses a boy.'

**Desired situation and its proximate situation**

![Image of a man pushing a car and a man pushing a refrigerator]

'A man pushes a car.'  
'A man pushes a refrigerator.'
Noriko Matsumoto

Bridges between Cognitive Linguistics and Second Language Pedagogy: The Case of Corpora and Their Potential

Abstract

Cognitive linguistics offers a way out of the dilemma between helpful, productive linguistics and helpless, unproductive linguistics in second language pedagogy. This paper applies cognitive linguistics insights to grammatical instruction of the verb find and its complementation in communicative activities, searching for descriptively adequate, intuitively acceptable, and easily accessible accounts of how the verb find functions and how widely various uses of the verb find are systematically related to one another. This paper also claims that the potential of learner corpora and the concept of entrenchment in cognitive linguistics make a positive contribution to grammatical instruction. In second language pedagogy, a data-driven analysis on the basis of both a learner corpus and a native speaker corpus is essential to explain the concept of entrenchment. Consequently, this paper shows some significant results in the data-driven analysis with respect to not only complementation patterns of the verb find that Japanese-speaking learners of English use, but also those that native speakers of English use.

1. Introduction

Second language pedagogy is a truly multidisciplinary endeavor, because a matter of pedagogy is a matter of linguistics as well as a matter of acquisition. Every linguist does recognize how essential every experience and substantial knowledge in the area of language pedagogy is. However, the issue as to whether or not much research that we linguists have carried out is helpful or productive has sharply divided the linguists. Generative linguistics has focused on pure scholarship for its own sake. The only motivation is a desire to understand language much better. This tradition is most clearly represented by Noam Chomsky, who denies that linguistics has, can have, or indeed should have any relevance to language teaching.
(see e.g., Olson et al. 1991). On the other hand, cognitive linguistics has claimed that the practical benefits are partly evident, because any major innovation in linguistic theory is bound, sooner or later, to have an impact on the teaching of grammar in foreign language pedagogy (see e.g. Achard & Niemeier 2004; Langacker 2001; Radden & Dirven 2007; Taylor 1993). One of the motivations is a desire to improve language teaching at school to some extent. The aim of this paper is to defend the latter idea, which implies that linguistics contributes substantially to language teaching, although this paper will not of course indicate that every part of academic research has a clear payoff in terms of practical benefits. Specifically, this paper will apply cognitive linguistic insights to grammatical instruction of the verb find and its complementation in communicative activities on the basis of the corpus-based approach, that is to say, the usage-based approach.

2. Cognitive linguistics

In order to provide my approach in this paper with an appropriate context, it is necessary first to discuss cognitive linguistics. Cognitive linguistics originally emerged in the 1970s and arose out of dissatisfaction with dominant formal approaches to language at that time. Some researchers such as Fillmore (1975), Lakoff & Thompson (1975), and Rosch (1975) rejected the dominant ideas that syntax is separate from other aspects of language, and that language is separate from cognition. Moreover, cognitive linguistics has always been strongly influenced by theories and findings from the other cognitive sciences, particularly cognitive psychology and Gestalt psychology. Cognitive linguistics therefore acknowledges that language is part of, dependent on, and influenced by human cognition, including human perception and categorization, and that language develops and changes through human interaction and experiences in the world (see e.g., Fillmore 1975; Lakoff 1987; Langacker 1987; Talmy 2000a, 2000b).

Cognitive linguistics practice could be roughly divided into two main areas of research: cognitive semantics and cognitive grammar. Although the study of cognitive semantics and the one of cognitive grammar are occasionally separate in practice, their domains of inquiry are tightly linked. Cognitive semantics is concerned with modeling the human mind as much as it is concerned with investigating linguistic semantics. Cognitive semantics is not a single unified framework. However, Evans et
al. (2007) point out that there are four guiding principles characterizing cognitive semantics: (i) conceptual structure is embodied; (ii) semantic structure is conceptual structure; (iii) semantic representation is encyclopedic; and (iv) semantic construction is conceptualization. Some significant theories and approaches in cognitive semantics best exemplify the four guiding principles. In this paper, one of the significant theories and approaches in cognitive semantics, cognitive lexical semantics approach is important. Cognitive lexical semantics takes the position that lexical items are conceptual categories. A word represents a category of distinct related meanings. In particular, Lakoff (1987) argues that a lexical item represents a type of complex category, which he calls a radical category. Therefore, word meanings are stored in the mental lexicon as highly complex structured categories of meanings.

Cognitive grammar is concerned with modeling the language system rather than the nature of mind itself. This means that meaning is central to cognitive grammar. Cognitive grammar assumes cognitive semantics and builds a model of grammar which is consistent with the assumptions and findings of research in cognitive semantics. In addition to this, the two guiding principles of cognitive grammar are (i) the symbolic thesis, and (ii) the usage-based thesis. The symbolic thesis holds that the fundamental unit of grammar is a form-meaning pairing, that is to say, a symbolic unit. All linguistic forms, from single morphemes to words, phrases, idioms, clauses, and sentences, contribute to and express meaning. The usage-based thesis is primarily concerned with the characterization of language as it is spoken and understood, as well as with the dynamics of its use. Langacker (1987: 494) states that the usage-based thesis constitutes a

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1 The significant theories and approaches include image-schema theory, encyclopedic semantics approach, categorization and Idealized Cognitive Models (ICMs) approach, cognitive lexical semantics approach, conceptual metaphor theory, conceptual metonymy approach, Mental Spaces theory, and conceptual blending theory.

2 The usage-based thesis is central not only to cognitive grammar but also to language acquisition which takes a cognitive linguistic perspective. Tomasello (2000a: 237–238) argues that usage-based models constitute strong theoretical frameworks for the description of child language acquisition because they do not demand that a child’s grammar be identical to the adult system. In a usage-based model, the goal of child language acquisition research is to characterize the steps by which the child’s inventory of conventionalized units comes to resemble the adult’s. It predominantly involves the investigation of the development of the cognitive abilities that allow children to eventually master the adult system.
non-reductive approach to linguistic structure. The goal of a usage-based thesis is to depict the complexity of language use.

3. Applying cognitive grammar to pedagogical grammar

Cognitive linguistics claims that the learner’s interlanguage resembles a child’s grammar where it is composed of an assortment of eclectic constructions at various levels of systematicity, abstraction, and productivity. Second language learners are attempting to master the specific array of symbolic units that represents the linguistic conventions of the target language. In a developing second language system, the target units are in direct competition with the native ones because they both represent alternative ways of construing the same reality. Second language learning can be viewed as a gradual process by which the target system gains increasingly more differentiation and autonomy from the native one, because mental experience must be organized so as to conform to the conceptual structures symbolized by the available symbolic units. Thus, it should be emphasized here that learning a foreign language will involve not only learning the forms of the language but also simultaneously learning the conceptual structures associated with these forms.

The nature and purpose of pedagogical grammar requires that it focus on learning problems. The function of pedagogical grammar is to promote the learner’s insight into the foreign language system. In essence, promoting the learner’s insight means reducing the perceived arbitrariness of the foreign language system. For this reason, it is not enough to merely inform the learner that a particular element belongs to a given formal category. Also, it is not enough to merely state that such-and-such an expression is grammatically correct while other word formations are grammatically incorrect. Especially, grammatical instruction in communicative methodologies has been at the core of the pedagogical literature. The central concern is the perceived discrepancy between communicative competence and accuracy in language use. Most teachers agree that communicative activities should constitute the most important focus of the foreign language lesson, and that students’ enthusiasm to express themselves should not be stifled by undue expectations placed upon accurate grammatical production. Accordingly, the grammatical instruction in communicative approaches constitutes one of the hardest pedagogical challenges that foreign language teachers, especially non-native teachers face, because obviously the nature of grammatical
instruction depends critically on each teacher’s view of the nature of rules and overall organizations of the target system, as well as his/her beliefs about the specificity of grammatical knowledge to language acquisition. However, the potential of learner corpora in a data-driven learning approach explicitly makes a positive, objective contribution to such grammatical instruction.

Learner corpora are strongly related to the usage-based thesis. Learner corpora could be applied to pedagogical material in at least three different ways: (i) they can help to decide what features should be particularly emphasized in teaching or even lead to the introduction of so far neglected elements; (ii) results from learner corpus studies can give indications on how to teach certain features; and (iii) results on developmental sequences can help to determine in what order language features should be taught. In other words, the more direct and probably more important way is to use a learner corpus to identify what is particularly difficult for a certain group of learners. The more indirect and more problematic way is to derive insights about second language acquisition from learner corpus analyses and to draw implications for teaching and possibly textbook writing from these insights.

In a corpus-based approach, that is to say, a usage-based approach to language, the concept of entrenchment is well known. ‘Entrenchment pertains to how frequently a structure has been involved and thus to the thoroughness of its mastery and the ease of its subsequent activation’ (Langacker 1991: 45). Entrenchment is interrelated with input. Specifically, entrenchment can be identified by an adjustment of the connection weights and can be brought about by the occurrence of a specific pattern of activation which renders more likely the occurrence of the same or a similar pattern. In cognitive linguistics, linguistic constructions are seen as being abstracted from usage events by the reinforcement of recurring commonalities. In second language acquisition, the role of entrenchment has been widely accepted as one of the most decisive factors in acquiring a second language. It is thus significant to pay attention to individual occurrences of linguistic items and at the same time to collect numerical data about types of construction. In second language pedagogy, a data-driven analysis on the basis of both a learner

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3 Tomasello (2000b: 70) points out that an important aspect of first language learning is some form of imitative learning and that ‘it is also important that children seem to have special difficulties in going beyond what they have heard when they have heard it multiple times, that is, when it is entrenched.’
corpus and a native speaker corpus is essential to explain the concept of entrenchment.

This paper focuses on both complementation patterns of the verb *find* that Japanese-speaking learners of English use and those that native speakers of English use, and shows some significant results in the data-driven analysis on the basis of both one learner speaking corpus and one native speakers’ speaking corpus. Obviously, native speaker corpora are indeed useful for the improvement of language teaching. They are useful mainly because they can reveal what native speakers of the language in question typically write or say either in general or in a certain situation better than native speaker intuition. In deciding what content we should teach, we teachers not only need to focus on patterns revealed in the data shown in native-speaker corpora as showing target frequencies, but also need to focus on the data shown in learner corpora as showing learning gaps and relative stages in mastery. For second language teaching, nevertheless, it is not only essential to know what native speakers typically write or say, but also what the typical difficulties of the learners of a certain language, or rather of certain groups of learners of a certain language are.

4. **The verb *find***

The reason why this paper focuses on the verb *find* is two-fold. One is that every Japanese-speaking learner of English knows the verb *find*. The other is that most of Japanese-speaking learners of English are not fully aware of the fact that the familiar verb *find* can take various types of complements, which gives rise to a situation where there are remarkably few Japanese-speaking learners of English who have a good command of *find*. This paper will defuse such an uncomfortable situation by focusing on the complementation patterns of *find* on the basis of both one Japanese-speaking learner corpus and one native speaker corpus.

In order to give my approach an appropriate context, it is necessary to explain the various complementation patterns of the verb *find* syntactically and semantically. Roughly speaking, *find* can take nine syntactic patterns, as in (1).

(1)  
   a. *find* + NP  
   b. *find* + NP + NP  
   c. *find* + that-COMP
d. find + that-deleted-COMP

e. find + wh-COMP

f. find + NP + ADJ
g. find + NP + to be

h. be found (passive)
i. find out

Semantically, find is mainly divided into ten areas, as in (2)–(11), but the various meanings of find are not always easy to keep apart.

(2) GET BY SEARCHING

a. I can’t find the car keys.
b. Can you find me my bag?
c. The child was eventually found safe and well.

(3) SEE BY CHANCE

a. Look what I’ve found!
b. I didn’t expect to come home and find him gone.

(4) DISCOVER STATE OF SOMEONE/SOMETHING

a. She woke to find a man by her bed.
b. He tried the door and found it unlocked.
c. She looked at her glass and was amazed to find it was empty.

(5) DO SOMETHING WITHOUT MEANING TO

a. She woke up and found herself in a hospital bed.
b. We came home and found him asleep on the sofa.
c. I was disappointed to find that they had left already.
d. He found he was shivering.

(6) LEARN SOMETHING BY STUDY

a. I managed to find a solution to the problem.
b. Can you find me a hotel?
c. His study found that married men and women had similar spending patterns.

(7) THINK/FEEL

a. Will Gary and Gail find happiness together?
b. She finds it a strain to meet new people.
c. *She found the work very dull.*

(8) **EXPERIENCE**
   a. *You might find that his work improves now he’s at a new school.*
   b. *I find people are often surprised at how little it costs.*
   c. *We found the beds very comfortable.*
   d. *I found the people to be charming and very friendly.*

(9) **EXIST IN A PLACE**
   *You’ll find this style of architecture all over the town.*

(10) **GET ENOUGH MONEY/TIME ETC**
    *He’s struggling to find the time, the support, and the resource to do all this.*

(11) **IN A COURT OF LAW:** to make an official decision in a court of law
    *The jury found him guilty of manslaughter.*

The ten semantic areas correlate in interesting ways with the syntactic patterns where *find* can occur, as shown in Table 1.

**Table 1.** Semantic areas correlating with syntactic patterns where *find* can occur.

<table>
<thead>
<tr>
<th>Semantics</th>
<th>NP</th>
<th>NP+NP</th>
<th>that-COMP</th>
<th>that-deleted</th>
<th>NP+ADJ</th>
<th>NP+to be</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. GET BY SEARCHING</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td></td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>2. SEE BY CHANCE</td>
<td>○</td>
<td></td>
<td></td>
<td></td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>3. DISCOVER STATE OF SOMETHING/SOMEONE</td>
<td>○</td>
<td></td>
<td>○</td>
<td>○</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. DO SOMETHING WITHOUT MEANING TO</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td></td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>5. LEARN SOMETHING BY STUDY</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td></td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>6. THINK/FEEL</td>
<td>○</td>
<td></td>
<td></td>
<td></td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>7. EXPERIENCE</td>
<td>○</td>
<td></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>8. EXIST IN A PLACE</td>
<td>○</td>
<td></td>
<td></td>
<td></td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>9. GET ENOUGH MONEY/TIME ETC</td>
<td>○</td>
<td></td>
<td></td>
<td></td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>10. IN A COURT OF LAW</td>
<td>○</td>
<td></td>
<td></td>
<td></td>
<td>○</td>
<td></td>
</tr>
</tbody>
</table>

In this section, it is pivotal to demonstrate the complexities of the complementation patterns of *find*, that is to say, the ones of various *find*-constructions. A construction is defined here as follows: A construction constitutes a conventional form-meaning pairing. Within the functional and the cognitive paradigm, it is generally accepted that if one
verb can be followed by more than one type of complement, there must be semantic differences among the sentences with different pragmatic effects. Most previous studies have attempted to derive each semantic characterization from the different type of complement associated with it. Borkin (1973, 1984), for example, provides examples of such differences, as in (12).

(12) a. *I find that this chair is uncomfortable.*
    b. *I find this chair to be uncomfortable.*
    c. *I find this chair uncomfortable.*

(Borkin 1973: 46)

Each sentence in (12) has the same propositions that the chair is uncomfortable; however, the differences among them are closely linked to ‘whether or not a complement represents a fact based on experience or, rather, describes the experience itself’ (Borkin 1984: 79). According to Borkin (1984), (12a) might be used for a judgment based on indirect evidence through asking people or learning the results of consumer reaction tests, but (12c) implies that *I* myself actually sit on the chair and directly experience the discomfort. (12b) might be used in either circumstance. Verspoor (2000), agreeing with Borkin, modifies her explanation. To explicate the distinctions among (12), she applies the concept of level of consciousness, which Edelman (1989) demonstrates, to the linguistic analysis of English complementation, as summarized in Table 2.

<table>
<thead>
<tr>
<th>Verspoor’s level</th>
<th>level 1</th>
<th>level 2</th>
<th>level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>level of consciousness which Edelman demonstrates</td>
<td>perceptual categorization</td>
<td>primary consciousness</td>
<td>higher order consciousness</td>
</tr>
<tr>
<td>interaction between conceptualizer and object</td>
<td>direct</td>
<td>rational / indirect</td>
<td>symbolical</td>
</tr>
<tr>
<td>time/space of object</td>
<td>here / now</td>
<td>not here / not now</td>
<td>not here / not now</td>
</tr>
<tr>
<td>complement</td>
<td>bare infinitive</td>
<td>to-infinitive</td>
<td><em>that</em>-complement</td>
</tr>
</tbody>
</table>

The differences in meaning among the three different sentences in (12) are instances of gradient phenomena which signify a shift from a relatively objective to a more subjective construal. However, it should be recognized that the previous accounts yield two further questions about the
relations between constructions and the lexical item \textit{find}. First, the \textit{find+that-COMP}, the \textit{find+NP+to be+ADJ}, and the \textit{find+NP+ADJ} constructions are not all the constructions that the verb \textit{find} can take. In addition to these three constructions, \textit{find} can take various types of constructions, as illustrated in Table 1. Second, the previous accounts cannot explain semantic differences among the following sentences, as in (13). Each sentence in (13) has the same syntactic pattern, that is to say, the \textit{find+NP+ADJ} construction, but each sentence including the same lexical item \textit{find} in (13) conveys a different meaning.

\begin{enumerate}
\item I found the drawer open.
\item The jury found him guilty.
\item You’ll find it exciting.
\end{enumerate}

What is crucial here is the appropriate status of various types of constructions that the verb \textit{find} can take. Moreover, it is necessary to explicate what the nature of such constructions is. This following subsection will explore the relations between the constructions that \textit{find} can take and the lexical item \textit{find}.

4.1 The \textit{find+that-COMP} and the \textit{find+that-deleted-COMP} constructions

This paper has to explain the \textit{that}-complement on a different level from the other complements. It does not merely denote events or states, but rather denotes a mental representation in the form of a proposition with any fixed time sequence between the main clause and the complement. The complementizer \textit{that} conveys some conceptual distance.\footnote{As Lakoff and Johnson (1980: 128) point out, English has the conventional metaphor \textquote{CLOSENESS IS STRENGTH OF EFFECT.} The closer the position of the subject is to the one of the object or of the adjective, the stronger the relationship between them is. The effect of syntax is to indicate the bond among the words; therefore, Haiman (1984) demonstrates that closeness indicates the strength of that effect, as in (i) and (ii). 
(i) The linguistic distance between expressions corresponds to the conceptual distance between them.
(ii) The linguistic separateness of an expression corresponds to the conceptual independence of the object or event which it represents (Haiman 1984: 782–783).} In (14), the
relationship between the subject of the verb *find* and the *that*-complement is increasingly attenuated as the number of words between them increases.

(14) I find that this chair is uncomfortable.

As Langacker (1991: 450) mentions, the conception imputed to the subject is abstract because the *that*-complement is a finite clause. In the case of a finite clause, the situation is construed more objectively. Specifically, Langacker points out that the number of particular grammatical elements reflects the semantic contrasts between indirect and direct experience. The more grammatical elements the complement has, the more abstract and propositional the conceptual import of the complement is, as in (15). The most indirect relationship between Susan and the experience of discomfort is partly ascribable to the conceptual distance conveyed by the complementizer *that*, as in (15).

(15) Susan found that the bed was uncomfortable.  

(Langacker 1991: 450)

However, Langacker’s view is not adequate to explain *that*-deleted constructions. Some linguists have proposed explanations for the fact that the complementizer *that* is sometimes missing and sometimes present (see e.g. Bolinger 1972; Borkin 1984; Elsness 1984), and the verbs used in most studies are *think* and *guess*. It is surprising that few linguists treat the verb *find* to explain *that*-deleted constructions. With respect to the verb *find*, *that*-deleted constructions can occur in the semantic areas of DISCOVER STATE OF SOMEONE OR SOMETHING, as in (4c), repeated here as (16), DO SOMETHING WITHOUT MEANING TO, as in (5d), repeated here as (17), and EXPERIENCE, as in (8b), repeated here as (18).

(16) DISCOVER STATE OF SOMEONE OR SOMETHING
   
   She looked at her glass and was amazed to find it was empty.

(17) DO SOMETHING WITHOUT MEANING TO
   
   He found he was shivering.

(18) EXPERIENCE
   
   I find people are often surprised at how little it costs.
This indicates that the that-deleted construction retains more epistemic construal than the that-construction, and that when the distinction between main and complement clauses is eroded, the omission of that is a strong concomitant (Thompson & Mulac 1991b). It should be emphasized here that there are no that-deleted constructions in the semantic area of LEARN SOMETHING BY STUDY. To put it another way, that-constructions are always needed in the LEARN SOMETHING BY STUDY area, as in (19), because the epistemic construal cannot occur in the LEARN SOMETHING BY STUDY area.

(19) a. A post mortem examination found that she died from asphyxiation.
    b. Often I find that anger and resentment are at the bottom of the problem.

(Collins COBUILD 2001)

The shift from the that-construction to the that-deleted construction is often regarded as grammaticalization. The typical example is the verb think, as in (20).

(20) a. I think that we are definitely moving towards being more technological.
    b. I think exercise is really beneficial to anybody.
    c. It's just your point of view ... what you like to do in your spare time I think.

(Thompson & Mulac 1991a: 315)

(20a) consists of the main clause I think and a subordinate clause introduced by that. (20b) is fairly similar, but the only difference is that the complementizer that has been omitted. Yet this explanation does not apply for (20c). This suggests that I think functions as a kind of additional commentary, comparable to an adverbial like maybe. Once this adverbial interpretation has been established for (20c), there is no reason why it should not be extended to (20b) as well. As a result, we may now understand both (20b) and (20c) as consisting of a main clause plus the adverbial phrase I think, which is placed either at the beginning or at the end.

Though superficially the difference among (20) is not particularly great, the effects in terms of linguistic theory are quite significant. Instead of interpreting (20b) and (20c) as slight syntactic variations of the basic pattern in which I think represents the main clause, we are faced with a
grammaticalization process which completely reverses the weight of the sentence constituents. The phrase *I think* is turned into an adverbial, and a subordinate clause in (20a) assumes the status of main clause in (20b) and (20c). If we try to identify the driving force behind this, we find that this change is most probably motivated by the requirements of discourse. Grammaticalization along these lines has thus been subsumed under the ‘discourse-to-morphosyntactic perspective’ (Traugott & Heine 1991: 3). However, this explanation cannot apply for the verb *find*, because the verb *find* does not undergo sentence lifting, or *slifting*, as Ross (1973: 136) calls it, as in (21).

(21) *It pays to be honest I find.

This point indicates a significant difference between the verb *think* and the verb *find*, although *find* is sometimes treated as an equivalent of the verb *think*.

4.2 The ‘NP+*find*+to be+ADJ’ construction

The ‘*to be*’ complement construction, as in (22), can occur only in the semantic area of EXPERIENCE.

(22) *I find this chair to be uncomfortable.*

As Langacker (1991) points out, (22) suggests an overall judgment that goes beyond immediate experience, because the verb *be* implies that *I* myself conceive of the chair’s uncomfortableness as extending through some span of time. The grammatical element *to* conveys that there is no specification of temporal coincidence.

Similarly, (23a) is acceptable because the speaker can directly report a perceptual experience of someone else only as extending through some span of time. (23b) is not acceptable because we cannot construe a perceptual experience of someone else directly and immediately.

(23) a. *I find sewing to be refreshing to Jane.*  
    b. *I find sewing refreshing to Jane.* (Borkin 1984: 79)
Moreover, Wierzbicka (1988: 136) notes the contrast, as in (24), but she does not explain the fact that whereas (24b) seems quite normal, (24a) does not.

(24)  a. *He found her to be Mexican.
      b. He found her to be intelligent.  (Wierzbicka 1988: 136)

Now this paper can answer this. The statement ‘she is Mexican’ is far less likely to be a conclusion which one draws from dealing with a person, or to be a judgment on the basis of experience. It is the sort of information that one is usually told outright by the person concerned or by someone else. However, as Duffley (1992: 153) points out, if Mexican is interpreted as evoking a type of personality which one see in someone by their behavior, then (25) seems less strange.

(25)  He found her to be very Mexican.

Needless to say, in this case, we need some span of time to judge.

4.3 The ‘find+NP+ADJ’ construction

This subsection discusses three subtypes of the ‘find+NP+ADJ’ constructions. Each subtype involves a different semantic relationship, although it shows the same syntactic pattern. Such a relationship is apparently not predictable from the meanings of the adjective and the verb find. The main focus of this subsection is the relation among the three subtypes.

First, as in (26), the ‘find+NP+ADJ’ construction in the semantic areas expressing a particular kind of objective judgment is an amalgam of two types of sentences, which present both at the same time and at the same place.

(26)  a. I found the drawer open.
      b. I found him alive.
      c. I found him asleep on the sofa.
At the moment that the subject actually finds the object, the subject has to recognize what happens to it, that is to say, the situation that the adjective describes. For instance, (26c) asserts two things: I found him on the sofa and he was asleep on the sofa then. These two sentences are an example of a non-integrated sequence of situations. English allows the same content to be expressed with one sentence, as in (26c), which represents an integrated conceptual structure. \(^5\) Similarly, (27) expresses a particular kind of official judgment. (27) is also an amalgam of two sentences, as in (28).

(27) *The jury found the prisoner guilty.*

(28) *The jury found the prisoner guilty. The jury’s statement established the prisoner’s guilt.*

In this case, *find* means ‘to decide someone to be’ and in fact, *find*, which is used in the performative meaning, has a performative and resultative force; thus, this construction itself may convey the causative meaning. (29) shows that causation-direction strengthening can go a step further to an extreme.

(29) *We find the defendant guilty.*

This is a typical example in which to say is to perform. The speaker *we* alters the external status or condition of an object *the defendant* only by making the utterance because the person performing the speech act has to have the authority to do so. There is an important constraint on the use of *find*, where only a certain person, namely a judge or a jury member, is qualified to use this utterance.

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\(^5\) The corresponding question sentence, as in (i), does not necessarily mean that you assume that I did actually find him. The question is used when you want to know both whether I found him and whether he was alive. An acceptable affirmative answer would be (iia) and (iib). You would not be satisfied with either (iiic) or (iid). These examples confirm that this construction can be construed as an integrated conceptual structure.

(i) *Did you find him alive?*
(ii) a. *Did you find him alive? Yes, I saw him and he was alive then.*
   b. *Did you find him alive? Yes, I did.*
   c. *Did you find him alive? Yes, I saw him.*
   d. *Did you find him alive? Yes, he was alive.*
Example (30) has the same syntactic form as (31), but the semantic shift from (30a) to (30c) is completely different from the one from (31a) to (31c).

(30) a. The judge found that the defendant was guilty on 30 counts.
   b. The judge found the defendant to be guilty on 30 counts.
   c. The judge found the defendant guilty on 30 counts. (Borkin 1984: 81)

(31) a. I find that this chair is uncomfortable.
   b. I find this chair to be uncomfortable.
   c. I find this chair uncomfortable. (Borkin 1973: 46)

Whereas the semantic shift in (31) occurs only in the semantic area of EXPERIENCE, the one in (30) occurs in three different areas. According to Borkin (1984), (30b) and (30c) express a judicial decision, whereas (30a) can only be reported as a non-juridical speech act. Thus, (30a) occurs in the semantic area of LEARN SOMETHING BY STUDY, (30b) of EXPERIENCE, and (30c) of IN A COURT OF LAW. The semantic shift in (30) takes place across different semantic areas, that is to say, from LEARN SOMETHING BY STUDY, EXPERIENCE to IN A COURT OF LAW.

Second, (32) expresses a particular kind of ascription. It should be noted here that (32) is subtly different from the others so far discussed.

(32) a. I found the chair comfortable.
   b. She found the work very dull.

(32) does not actually assume that the object possesses the property ascribed to it by the adjective, either before or after the action indicated by the verb. (32) expresses subjective judgment rather than objective judgment, as in (26) and (27) mentioned above.

Third, there are cases where the ‘find+NP+ADJ’ construction refers not to a definite or limited object, but requires an inference to be interpreted correctly, as in (33).

(33) You’ll find it exciting.
Example (33) expresses the speaker’s reaction to something or someone, that is to say, a speaker-based function. Syntactically, the object is it or that, and semantically, it is not clear whether it is exciting or not after or before the action indicated by the verb, as in (34) and (35).

(34) King: Eva Marie, you made the famous “North by Northwest.” We’re going to be seeing a clip from that later. What was he like to work for?  
Eva Marie: I found it very interesting because I had made “Waterfront” with Kazan and had worked with Actors Studio people, studied there, and he was completely different… (LKL, Aug. 25, 2003)

(35) King: Is it difficult to direct yourself?  
Costner: I don’t find that difficult. I traditionally have given myself fewer takes, but I know going in. I do things a little backwards than the rest of the community right now… (LKL, Aug. 9, 2003)

In Eva Marie’s reply, as in (34), the word it has no definite antecedent in the preceding speech, but we understand her meaning through inference. In (35), however, the antecedent of the word that is more definite.

To summarize this section, linguistic meaning is the result of integration of linguistic prompts at the conceptual level. Linguistic meaning is equated with multifaceted and multilayered conceptualization, although language can be represented only in linear order. To put it another way, linguistic meaning can ultimately be traced back to how we actually experience our world. This section demonstrates that various types of find-constructions are intricately interrelated in our conceptualization.

5. The analysis of NICT JLE Corpus

To explore both the complementation patterns of the verb find that Japanese-speaking learners of English use and those that native speakers of English use, this paper uses two kinds of corpora, the NICT JLE Corpus as one learner speaking corpus, and the CNN Larry King Live Corpus as one native speakers’ speaking corpus. 1281 subjects as Japanese-speaking

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6 LKL means the CNN Larry King Live Corpus.

7 The NICT JLE Corpus (The National Institute of Information and Communications Technology Japanese Learner English Corpus) was developed in Japan in 2004 by NICT (National Institute of Information and Communications Technology). The NICT
learners of English in the NICT JLE Corpus are divided into three groups, on the basis of SST (Standard Speaking Test), as shown in Table 3.⁸

Table 3. The number of subjects in the NICT JLE Corpus

<table>
<thead>
<tr>
<th>GROUP 1</th>
<th>GROUP 2</th>
<th>GROUP 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>level 1</td>
<td>level 2</td>
<td>level 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>the number of subjects</td>
<td>3 (1.2%)</td>
<td>35 (13.5%)</td>
</tr>
<tr>
<td></td>
<td>260 (20.3%)</td>
<td>848 (66.2%)</td>
</tr>
</tbody>
</table>

Each group obviously has a different degree of understanding of the complementation patterns of the verb *find*, and at the same time it is shown what learners at each level need to learn. We teachers decide what we should teach our students at each level, and the contents that we select should never be arbitrary and biased. For teachers, especially non-native teachers, they should be based on the well-established reasons through the corpora.

First, learners at an elementary level, that is to say, Group 1, use the ‘*find*+NP’ construction very frequently. However, learners at Group 1 can barely use other *find*-constructions such as the ‘*find*+that-COMP’ and the ‘*find*+NP+ADJ’ constructions, as shown in Table 4 and Table 5.

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JLE Corpus is a speaking corpus and involves about 325-hour data from 1281 Japanese subjects (643 males and 638 females) and 20 native speakers of English. The CNN Larry King Live Corpus is a self-produced corpus and includes all the scripts from Jan.1, 2004 to Dec. 31, 2004. It is downloaded from the website of INTERATNATIONAL CNN.COM (http://edition.cnn.com/). CNN Larry King Live is the CNN’s longest-running interview program.

⁸ SST was jointly developed by ACTFL (American Council on the Teaching of Foreign Languages) and a Japanese company ALC. SST is based on OPI (Oral Proficiency Interview) developed by ACTFL and follows ACTFL Proficiency Guidelines. SST is an interview-style test, and it is designed to test the speaking ability of Japanese-speaking learners of English.
Table 4. Percentage of various *find*-constructions in the NICT JLE Corpus and the CNN Larry King Live Corpus (actual frequencies in parentheses).

<table>
<thead>
<tr>
<th></th>
<th>NICT GROUP 1 (level 1-3)</th>
<th>NICT GROUP 2 (level 4-6)</th>
<th>NICT GROUP 3 (level 7-9)</th>
<th>NICT SUM (level 1-9)</th>
<th>NICT NATIVE SPEAKER</th>
<th>CNN Larry King Live (Jan.1, 2004–Dec.31, 2004)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>find</em>+NP</td>
<td>83.3% (30)</td>
<td>73.8% (593)</td>
<td>78.2% (158)</td>
<td>75.0% (781)</td>
<td>79.1% (53)</td>
<td>50.1% (1005)</td>
</tr>
<tr>
<td><em>find</em>+NP+NP</td>
<td>0 (0)</td>
<td>0.1% (1)</td>
<td>0.5% (1)</td>
<td>0.2% (2)</td>
<td>0 (0)</td>
<td>0.7% (14)</td>
</tr>
<tr>
<td><em>find</em>+that-COMP</td>
<td>0 (0)</td>
<td>4.0% (32)</td>
<td>5.5% (11)</td>
<td>4.2% (44)</td>
<td>1.5% (1)</td>
<td>3.6% (72)</td>
</tr>
<tr>
<td><em>find</em>+that-deleted COMP</td>
<td>5.6% (2)</td>
<td>9.8% (79)</td>
<td>2.5% (5)</td>
<td>8.2% (85)</td>
<td>1.5% (1)</td>
<td>1.4% (27)</td>
</tr>
<tr>
<td><em>find</em>+wh-COMP</td>
<td>2.8% (1)</td>
<td>0.5% (4)</td>
<td>0.5% (1)</td>
<td>0.6% (6)</td>
<td>1.5% (1)</td>
<td>0.5% (10)</td>
</tr>
<tr>
<td><em>find</em>+NP+ADJ</td>
<td>0 (0)</td>
<td>1.0% (8)</td>
<td>2.5% (5)</td>
<td>1.2% (13)</td>
<td>4.5% (3)</td>
<td>8.0% (160)</td>
</tr>
<tr>
<td><em>find</em>+NP+to be</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>1.5% (1)</td>
<td>0.7% (14)</td>
</tr>
<tr>
<td>be found (passive)</td>
<td>0.3% (2)</td>
<td>0 (0)</td>
<td>0.2% (2)</td>
<td>0 (0)</td>
<td>11.3% (226)</td>
<td></td>
</tr>
<tr>
<td><em>find</em> out</td>
<td>0 (0)</td>
<td>5.9% (47)</td>
<td>6.9% (14)</td>
<td>5.9% (61)</td>
<td>10.4% (7)</td>
<td>16.7% (336)</td>
</tr>
<tr>
<td>ungrammatical</td>
<td>0 (0)</td>
<td>1.7% (14)</td>
<td>2.5% (5)</td>
<td>1.8% (19)</td>
<td>0 (0)</td>
<td>2.0% (41)</td>
</tr>
<tr>
<td><em>find</em>+NP-deletion (ungrammatical)</td>
<td>8.3% (3)</td>
<td>2.9% (23)</td>
<td>1.0% (2)</td>
<td>2.7% (28)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Not otherwise classified</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>5.1% (102)</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>100% (36)</td>
<td>100% (803)</td>
<td>100% (202)</td>
<td>100% (1041)</td>
<td>100% (67)</td>
<td>100% (2007)</td>
</tr>
</tbody>
</table>

We should also teach certain constructions in addition to the ‘*find*+NP’ construction to the Group 1 students. This paper has chosen the expression ‘*find something difficult, easy, or interesting,*’ as in (36), because *Longman Wordwise Dictionary* (2001) contains this expression.\(^9\)

\(^9\) *Longman Wordwise Dictionary* provides new practical solutions for students at pre-intermediate, by focusing on the 2000 key words. According to *Longman Wordwise Dictionary* (2001: vi), if students learn 2000 basic words of English, they will be able to understand 80% of the English language.
Table 5. Percentage of various find-constructions in the NICT JLE Corpus (actual frequencies in parentheses).

<table>
<thead>
<tr>
<th>GROUP 1</th>
<th>GROUP 2</th>
<th>GROUP 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>level 1</td>
<td>level 2</td>
</tr>
<tr>
<td>the number of subjects</td>
<td>3</td>
<td>35</td>
</tr>
<tr>
<td>find+NP</td>
<td>0</td>
<td>(0)</td>
</tr>
<tr>
<td>find+NP+NP</td>
<td>0</td>
<td>(0)</td>
</tr>
<tr>
<td>find+NP+that-COMP</td>
<td>0</td>
<td>(0)</td>
</tr>
<tr>
<td>find+NP-deleted COMP</td>
<td>0</td>
<td>(0)</td>
</tr>
<tr>
<td>find+wh-COMP</td>
<td>0</td>
<td>(0)</td>
</tr>
<tr>
<td>find+NP+ADJ</td>
<td>0</td>
<td>(0)</td>
</tr>
<tr>
<td>find+NP+to be</td>
<td>0</td>
<td>(0)</td>
</tr>
<tr>
<td>be found (passive)</td>
<td>0</td>
<td>(0)</td>
</tr>
<tr>
<td>find out</td>
<td>0</td>
<td>(0)</td>
</tr>
<tr>
<td>ungrammatical</td>
<td>0</td>
<td>(0)</td>
</tr>
<tr>
<td>find+NP-deleted (ungrammatical)</td>
<td>0</td>
<td>(0)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>0</td>
<td>(0)</td>
</tr>
</tbody>
</table>

(36) *I find math very difficult.*

This expression means THINK OR FEEL. To express what I think or feel is very important in a communicative activity. The CNN Larry King Live Corpus shows that native speakers of English use this construction, as in (37).

(37) *Don’t forget, on Monday night, a very special guest. We can’t announce it until early Monday morning, sometime after midnight Sunday night. But I think you’ll find it very interesting.*

(LKL, July 9, 2004)

Such an expression can also be used to express the speaker’s reaction to something or someone. In sum, the learners in Group 1 need to learn both
the ‘find+NP’ construction and the expression ‘find something difficult, easy or interesting.’

Next, learners at an intermediate level, that is to say, Group 2, tend to overuse both the ‘find+that-COMP’ and the ‘find+that-deleted-COMP’ constructions, as in (38).

(38) a. One day last week she found that she have no food. (level 4)
b. A girl found there was a cat. (level 4)

In fact, the verb *find* can take both the *that*-complement and the *that*-deleted constructions, but they are semantically complicated, as mentioned in the previous section. It is doubtful whether learners in Group 2 understand under what circumstances they should use the two constructions. The learners of Group 2 also have a greater tendency to understand that the meaning of *find* is GET BY SEARCHING. In other words, it appears that the learners in Group 2 cannot comprehend that *find* has different kinds of meanings.

**Table 6.** Temporal relationships between the main verb and the subclausal verb in the NICT JLE Corpus (*that*-C = *that*-COMP, *that*-D = *that*-deleted-COMP).

<table>
<thead>
<tr>
<th>Level</th>
<th>present-present</th>
<th>past-past</th>
<th>present-past</th>
<th>past-present</th>
<th>not otherwise classified</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>that-C</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>that-D</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>that-C</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>that-D</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>that-C</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>that-D</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>that-C</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>that-D</td>
<td>1</td>
<td>0</td>
<td>21</td>
<td>1</td>
<td>33</td>
</tr>
<tr>
<td>5</td>
<td>that-C</td>
<td>3</td>
<td>19</td>
<td>0</td>
<td>9</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>that-D</td>
<td>19</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>6</td>
<td>that-C</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>that-D</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>that-C</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>that-D</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>that-C</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>that-D</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>that-C</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>that-D</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>
As regards Group 2, as shown in Table 6 (above), we have to teach temporal relationships between the main verb and the subclausal verb because the temporal relationship is used strangely by Japanese-speaking learners of English, as in (39).

(39) a. *She finds that there was a final sale in the department store.  (level 5)
    b. *She found that there is no foods in refrigerator.  (level 4)

We should also teach the semantic areas where the ‘find+that-COMP’ construction can occur. Correctly speaking, the ‘find+that-COMP’ construction can occur in the area of DO SOMETHING WITHOUT MEANING TO, LEARN SOMETHING BY STUDY, and EXPERIENCE, as shown in Table 1. However, we do not have to teach the usages in all the areas. Especially, we should teach the ‘find+that-COMP’ in the area of LEARN SOMETHING BY STUDY where the ‘find+that-deleted-COMP’ construction never occurs, that is to say, where only the “find+that-COMP” construction can occur, as in (40).

(40) Well, if you read "Heal Your Headache", you'll find that there is a list of all of the potential dietary triggers.  (LKL, Aug. 1, 2004)

To sum up, the contents that we should teach the Group 2 leaners are two-fold. One is that the contents that the Group 1 learners have to acquire, that is to say, the ‘find+NP’ construction and the expression ‘find something difficult, easy or interesting.’ The other is what the Group 2 learners have to acquire: the ‘find+that-COMP’ construction in the area of LEARN SOMETHING BY STUDY and the temporal relationship between the main verb and the subclausal verb in the ‘find+that-COMP’ construction.

Finally, a remarkable feature of learners at an advanced level, that is to say, Group 3, is that they can use the ‘find+NP+ADJ’ construction that the learners in both Group 1 and Group 2 can barely utter, as in (41).

(41) a. But I sometimes find it very bitter.  (level 7)
    b. And I found that acting fun.  (level 8)
    c. But after train passed by, they found his suitcase undamaged.  (level 9)
The learners of Group 3 tend to comprehend that the verb *find* can take various types of complements and that it has different meanings. However, it is undeniable that the learners even at the advanced level may have difficulty grasping the complementation patterns of *find*, considering that *find* is a familiar verb. In Group 3, we should teach the learners what they need to learn and have not yet mastered. The reason is not due to inadequate skills, but to the situation where they have not been taught such expressions yet. We should teach the expression, *find yourself doing something* which means ‘to realize that you are doing something, even though you did not mean to,’ as in (42). Needless to say, *Longman Wordwise Dictionary* (2001) contains this expression.

(42) *He found himself laughing out loud during the film.*

As shown in Table 7, this type of expression never occurs in the NICT JLE Corpus, while it occurs in the NICT NATIVE Corpus, as in (43a), and the CNN Larry King Live corpus, as in (43b).

(43) a. *Like I find myself speaking more English, and then I say, “I should be speaking more Japanese.”* (NICT Native File 10.)
   b. *But I found myself getting really frustrated with some of the evidence.* (LKL, Dec. 18, 2004.)

It should be stressed here that Table 7 also shows that the subject is limited to *I*, *we*, and *you*.

**Table 7.** Actual frequencies of *find oneself doing something* in the NICT JLE Corpus, the NICT NATIVE SPEAKER Corpus, and the CNN Larry King Live Corpus.

<table>
<thead>
<tr>
<th>Expression</th>
<th>NICT JLE (level 1-9)</th>
<th>NICT NATIVE SPEAKER</th>
<th>CNN Larry King Live</th>
</tr>
</thead>
<tbody>
<tr>
<td>I find myself doing something</td>
<td>0</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>You find yourself/yourselves doing something</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>We find ourselves doing something</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>I found myself doing something</td>
<td>0</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>You found yourself/yourselves doing something</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

Moreover, as in Table 8, the CNN Larry King Live Corpus demonstrates that the adjective in the *‘what I find+ADJ+is’* construction is often
‘interesting.’ This expression is important in communicative activities. We could teach ‘what I find interesting is’ as one fixed expression to the learners of Group 3.

Table 8. Examples and collocate expressions of NP in five types of the ‘find+NP+ADJ’ construction in the CNN Larry King Live Corpus (actual frequencies in parentheses).

<table>
<thead>
<tr>
<th>NP</th>
<th>ADJ</th>
<th>examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>it (47)</td>
<td>interesting (8)</td>
<td>I found it very interesting because I had made “Waterfront” with Kazan and had worked with Actors Studio people, studied there, … (LKL, Oct. 10, 2004)</td>
</tr>
<tr>
<td></td>
<td>difficult (7)</td>
<td>I was in awe of him, and I found it difficult to talk to him, … (LKL, Jan. 2, 2004)</td>
</tr>
<tr>
<td></td>
<td>hard (5)</td>
<td>I find it hard to imagine the prosecution hasn’t leaked certain information in this case. (LKL, Nov. 9, 2004)</td>
</tr>
<tr>
<td>that (18)</td>
<td>hard (3)</td>
<td>So I find that a little bit hard to, actually, very hard to really believe that that is credible. (LKL, Apr. 6, 2004)</td>
</tr>
<tr>
<td>the defendant (12)</td>
<td>guilty (12)</td>
<td>We find the defendant guilty of burglary. (LKL, Aug. 11, 2004)</td>
</tr>
<tr>
<td>what (11)</td>
<td>interesting (8)</td>
<td>What I found interesting today is something Ted mentioned. (LKL, Aug. 11, 2004)</td>
</tr>
<tr>
<td>whichever (1)</td>
<td>interesting (1)</td>
<td>People can choose whichever ones they want, whichever ones they find interesting. (LKL, Mar. 7, 2004)</td>
</tr>
<tr>
<td>the thing(s) (3)</td>
<td>interesting (2)</td>
<td>The one thing that I find very interesting is that you hear a lot of talk of John Kerry and John Kerry’s character. (LKL, Sep. 2, 2004)</td>
</tr>
<tr>
<td>him (1)</td>
<td>attractive (1)</td>
<td>How somebody could get so frustrated and finally find a woman who actually finds him attractive… (LKL, Jan. 9, 2004)</td>
</tr>
<tr>
<td>to find+NP +ADJ (7)</td>
<td>it (2)</td>
<td>funny (1)</td>
</tr>
<tr>
<td>finding+NP +ADJ (1)</td>
<td>her (1)</td>
<td>alive (1)</td>
</tr>
</tbody>
</table>

We should also teach the Group 3 learners find the person guilty or innocent as one fixed expression. At the same time we could explain that the adjectives in the ‘be found ADJ’ construction tend to be the ones opposed in meaning, such as ‘guilty’ or ‘innocent’, ‘dead’ or ‘alive’, as shown in Table 9 (below).
Table 9. Frequencies of collocates of adjectives in the ‘find+NP+ADJ’ construction and the ‘be found+ADJ’ construction in the CNN Larry King Live corpus.

<table>
<thead>
<tr>
<th></th>
<th>the ‘find+NP+ADJ’ construction (160)</th>
<th>the ‘be found+ADJ’ construction (51)</th>
</tr>
</thead>
<tbody>
<tr>
<td>guilty</td>
<td>guilty (26)</td>
<td>guilty (29)</td>
</tr>
<tr>
<td>interesting</td>
<td>interesting (22)</td>
<td>innocent (6)</td>
</tr>
<tr>
<td>hard</td>
<td>hard (11)</td>
<td>alive (4)</td>
</tr>
<tr>
<td>difficult, fascinating</td>
<td>difficult, fascinating (7)</td>
<td>dead (4)</td>
</tr>
</tbody>
</table>

To summarize, Table 10 demonstrates the contents that each learner should learn at each level in communicative activities.

Table 10. The contents that each group should learn at each level in communicative activities.

<table>
<thead>
<tr>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>find+NP</td>
<td>find+NP</td>
<td>find+NP</td>
</tr>
<tr>
<td>find something easy/</td>
<td>find something easy/difficult/</td>
<td>find something easy/difficult/</td>
</tr>
<tr>
<td>difficult/interesting</td>
<td>interesting</td>
<td>interesting</td>
</tr>
<tr>
<td>find+that-complement in the semantic area of LEARN SOMETHING BY STUDY</td>
<td>find+that-complement in the semantic area of LEARN SOMETHING BY STUDY</td>
<td></td>
</tr>
<tr>
<td>the temporal relationship between the main verb and the subclausal verb</td>
<td>the temporal relationship between the main verb and the subclausal verb</td>
<td>find oneself doing something</td>
</tr>
<tr>
<td>What I find interesting is ---</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In other words, we have to select the contents that we should teach to the learners at various stages. The contents should be crucial to the communicative activities used. It should be borne in mind here that comprehension precedes production, that is to say, the learners cannot be expected to correctly use any expressions that they have never learned.

In second language pedagogy the first language plays an important role, and the more related the first language and second language are, the easier the learner finds it to learn the second language. In cognitive linguistics, in a developing second language system, the target units are in direct competition with the native ones because they both represent alternative ways of construing the same reality (Achard & Niemeier 2004). Second language learning can thus be viewed as a gradual process by which the target system gains increasingly more differentiation and autonomy from the native one. As we teach Japanese learners English, we Japanese teachers should consider the peculiarity that Japanese is not closely related to English. We have to develop a well-established teaching
system, for instance, reflecting the reality that Japanese learners do not have a good command of the very familiar verb *find*. As this paper has shown above, in deciding what content we should teach, we teachers not only need to focus on patterns revealed in the data shown in native-speaker corpora as showing target frequencies, but also need to focus on the data shown in learner corpora as showing learning gaps.

6. Concluding remarks

Linguists often regret that the methods used in language classrooms do not conform to those that they understand in the framework of linguistics, whereas language teachers, who need to explain to the learners why a foreign language should be as it is, complain that the linguists’ expertise is simply of little help concerning practical methods and classroom activities. This paper argues that concepts of cognitive linguistics such as entrenchment and the usage-based thesis offer a way out of such frustrations that both linguists and language teachers feel. This paper fully endorses the view that focusing on form is focusing on meaning. This paper, taking a cognitive linguistics approach, strongly emphasizes that meaning is the result of integration of linguistic prompts at the conceptual level. To put it another way, meaning is embodied, as it can ultimately be traced back to how we actually experience our world and the nature of our bodies, which in part constrains and delimits the nature of the world for us. Therefore, the role of meaning in determining the form of grammatical constructions provides an intuitively appealing way of teaching such constructions.

This paper claims that cognitive linguistics offers a way out of the dilemma between helpful, productive linguistics and helpless, unproductive linguistics in pedagogical grammar. It should be stressed here that grammatical knowledge does not constitute the absolute core of language learning, but merely represents one dimension of linguistic knowledge. Another benefit of using entrenchment and the usage-based thesis is as follows: real production data is analyzed, while prior many investigations into learner language have been based on more experimental data. Various aspects of pragmatics, including communication strategies, can also be studied much more easily with the production data. As a result, this paper has applied cognitive linguistics insights to grammatical instruction in foreign language pedagogy, searching for descriptively adequate, intuitively acceptable, and easily accessible formulations of the
verb *find*, and providing a descriptively adequate, intuitively acceptable, easily accessible account of how the verb *find* functions and how widely various uses of the word *find* are systematically related to one another.

As this paper hopes to have shown, learner corpora clearly make a significant contribution to language teaching. Most importantly, they can contribute towards the improvement of pedagogical material by revealing typical difficulties of certain groups of learners. This is of particular relevance to advanced learners, whose difficulties are often rather subtle and therefore not accessible by unsystematic observation. Other ways in which entrenchment and learner corpora can help improve pedagogical material are more indirect, for example, by identifying typical second language acquisition processes or by finding out what words or patterns are particularly useful, especially for certain groups of learners. Attributing both of the potential of learner corpora and the concept of entrenchment to the complementation patterns of the verb *find* will render more transparent the nature of its relationship to other types of verbs, such as *see, think, believe, feel*, and so on, and to other types of complementation patterns that such verbs could take. Although the constraints of space do not permit further discussion here, this paper raises problems behind current teaching methods and thereby opens up avenues for further investigation and further significant teaching techniques.

References


**Corpora**


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Retrieval of Spelling Variants in Nonstandard Texts –
Automated Support and Visualization

Abstract
This article describes ongoing research in the RSNSR¹ (Regelbasierte Suche in Textdatenbanken mit nichtstandardisierter Rechtschreibung, “Rule-based search in text databases with nonstandard orthography”) project. The focus of this project is making historical text documents digitally available; consequently, it examines the challenges for digitization procedures and subsequent retrieval operations, like fuzzy full-text search. Difficulties are posed by scans of low quality facsimiles, old font types, inconsistent transcriptions and especially typical optical character recognition (OCR) errors and spelling variation. This article discusses recent solutions to such problems, concentrating on stochastic string edit distance measures, so-called evidences and the avoidance of static dictionaries. By presenting visualization approaches for retrieval in and browsing of historical databases and nonstandard text documents, as well as a prototype for visual evaluation of distance measures, it proposes a progression of information visualization in linguistics.

1. Introduction

In 2001 the Institute of Computer Science and the Institute of German Language and Literary Studies at the University of Duisburg-Essen began work on a joint project, Projekt Nietzsche-CD, which is aimed to create a digital literature archive with the reception of the German philosopher Friedrich Nietzsche. It is embedded in the scope of various literature research projects within the bachelor’s/master’s program Applied Communication and Media Science.

The realization of such a digital literature archive includes several working fields: a collection of literature assets, a web-based communication interface, digitization software supporting German black letter fonts, database design and implementation, a user-friendly system

¹ We would like to thank the Deutsche Forschungsgemeinschaft for supporting this research.
interface, a search engine for text documents in nonstandard spelling, administrative tools and a digital rights management system (Biella 2005). Furthermore, the literature archive should utilize library-oriented data standards for archival storage. Since the project’s beginning numerous students from a variety of disciplines have participated in digitizing historical material dating from 1865 to 1945.

2. Digitization of historical documents

2.1 Optical character recognition

Even though the digitization of text documents is a standard procedure nowadays, it is still problematic. Since most of the photocopies of the documents were received by interlibrary loan, their quality is often less than moderate: shades, overexposure, skew and warping decrease optical character recognition (OCR) accuracy significantly. Even today the most reliable way to counter recognition errors is to manually revise the data.

Not only in the Project Nietzsche-CD but also in many other international projects, manual correction has to be limited due to restricted resources. Many retrodigitization projects focus on the constructional steps of the digitization process, which involve digitizing as well as tagging and aligning the text. For example, Compact Memory (www.compactmemory.de), a project working on the digitization of historical Jewish periodicals, combines an attractive interface with a respectable archive and is well used. But, as it is a publicly funded project, the operator cannot devote its resources to manually revising optical character recognition (OCR) errors in the digitized texts or to offering advanced search capabilities. A reliable search engine, however, is the means that makes the data fully accessible.

Users searching for the word Fruchtbarkeit ‘fertility’, for instance, will not be able to find a certain periodical from 1904 even though it clearly contains the word. Worse, they will not even realize that this text was missed. Because the full text aligned with the graphical representation of the text contains recognition errors, only the search for the misspelled word Piuchthaikeit instead of Fruchtbarkeit finds the correct page (cf. Figure 1). Misinterpretation of the graph <r> as <i> is very common because of the graphical similarities of the two characters. Even though there are many possible recognition errors, only about 75 occur regularly.
To make matters worse, many historical German documents were printed using German black letter fonts (Fraktur). These typefaces feature certain characteristics that are uncommon for modern fonts and pose a problem for standard OCR software. As shown in Table 1 typical recognition errors are likely to differ between different typefaces. While, for example, <ei> in Antiqua will hardly be misinterpreted as <ü>, such an error is probable in Fraktur or Textur where <ei> and <ü> are designed with similar characteristics.
Table 1. The various typeface designs have differing probabilities for recognition errors.

<table>
<thead>
<tr>
<th>Antiqua</th>
<th>Rotunda</th>
<th>Fraktur</th>
<th>TeXtor</th>
</tr>
</thead>
<tbody>
<tr>
<td>u-n</td>
<td>u-n</td>
<td>u-n</td>
<td>u-n</td>
</tr>
<tr>
<td>ei-ü</td>
<td>ei-ü</td>
<td>ei-ü</td>
<td>ei-ü</td>
</tr>
<tr>
<td>z-g</td>
<td>z-g</td>
<td>z-g</td>
<td>z-g</td>
</tr>
</tbody>
</table>

There are partial solutions for recognition errors in general and Fraktur in particular. A preprocessing module for binarization, component analysis, skew correction and de-warping of digital text documents has been developed (Mischke & Luther 2005). Analysis and preclassification of words and letters, localization with vertical bar patterns and the combination of different recognition approaches provide the high quality retrieval of keywords selected by literary scholars on Fraktur documents (Mischke 2007). Full text search operations are still highly problematic, even with elaborate algorithms, especially if the sources are of poor quality. The commercial product ABBYY FineReader XIX (Abbyy 2004) certainly yields good results but only with a costly license.

2.2 Spelling variation

While spellings caused by faulty character recognition are errors per se and OCR programs attempt to avoid them, spelling variation – whether intentional or unintentional – cannot be categorized so easily. It is worth mentioning that there seems to be no general definition of spelling variants yet, even though everybody seems to have an intuitive apprehension of its meaning. Many spelling variants we encounter today are the result of dialects or language varieties. Since dialects are mainly practiced orally, they are generally of minor importance in standard document retrieval. Comparison, classification and retrieval is done mostly on the basis of phonetic transcriptions (Nerbonne & Siedle 2005). Nevertheless, dialectal text production has always existed. Famous fictional examples are Lerner and Loewe’s *My Fair Lady* (cf. “Wouldn’t It Be Loverly?”) or Gerhart Hauptmann’s *Der Biberpelz*. Standard varieties feature not only spelling variants but whole new words. A dictionary of standard varieties of
German in Austria, Switzerland, Germany and other countries is available (Ammon et al. 2004).

In contrast to (synchronously) diatopic variation (through space), diachronic variation (over time) is often encountered when dealing with text production. For the greatest part of any language’s development, written resources represent the only source of linguistic information because spoken evidence simply does not survive. Thus, it is all the more astonishing that until the last century many linguists regarded the written form of language as secondary in the meaning of less relevant (cf. Fleischer 1966: 8). Luckily nowadays historical spelling variation is a well researched topic (cf. Elmentaler 2003).

Historical German spelling variants existed officially as long as German orthography was not standardized. The Second Orthographical Conference in Berlin announced formally binding regulations in 1901. But even today we have competing spellings as a result of resistance to the spelling reform of 1996, for example, Gesichtscreme, Gesichtskreme and Gesichtskrem ‘face cream’ and Potential and Potenzial ‘potential’. Such spellings may of course have different status. Even though all five spellings are indeed official (cf. Duden 2004), Gesichtskreme and Gesichtskrem are rarely used. But phenomena of historical and regional spelling variation are by no means an exclusively German problem. Similar problems are documented for numerous other European languages as well, including Dutch, English, French and Slovenian. Consequently, when performing search operations on nonstandardized texts, one needs to have profound knowledge of historical spelling variation for successful retrieval.

While variation in German was already limited in the 19th century, the frequency of variant spellings increases significantly with the age of the text documents². Texts on the outer limits of High German, for instance, may contain up to 60 percent nonstandard spelling tokens (Kempken et al. 2006, see below).

We define a spelling variant as an alternating signifier of a signified word variable – in de Saussure’s understanding – where both belong to the same word family. Therefore, both are identical in inflection and

² Unless otherwise noted, the following statistics are based on calculations from our manually collected database of spelling variation, which contains 12,697 entries. A thorough statistical analysis is given in section 8.
derivation. Morphology-based variation or variation in vocabulary can be understood as “variation in a broader sense”.

It is important to note that a spelling variant alternates only on the level of encoding, as an additional identifier. Thus, the standard spelling related to, for example, the singular accusative masculine *bankerotten* is not the lemma *bankrott* ‘bankrupt’ but *bankrotten* in identical declension. In older texts, an increasing number of obsolete words occur that might have a translation but no related standard spelling of the same word family; for instance, a 15th-century German text featured the word *bemelcht*, which was used in the sense of ‘referred to as’.

Even more important than the percentage of spelling variants in a text document is the form of their variation. In the 19th century only a few major letter replacements occur, including

- `<k> - <c>`, *Punktion* – *Punctuation* ‘punctuation’
- `<t> - <th>`: *teilen* – *theilen* ‘(to) separate’
- `<ä> - <ae>`: *Änderung* – *Aenderung* ‘change’
- `<ie> - <i>`: *ignorieren* – *ignorieren* ‘(to) ignore’

Even though the average number of letter replacement operations per word increases only slightly from ~1.3 in the 19th century to ~1.8 in the 14th century, the possible replacements are multiplied. Koller, for example, identified nine different substitutions for `<i>` in Early High German Texts (cf. Table 2). Comparing the most frequent letter replacements in historical texts, it can be seen that between 1800 and 1900 about 80 different replacements were commonly applied. Between 1700 and 1800, there were 145; between 1600 and 1700, 167; between 1500 and 1600, 214; and, between 1200 and 1500, 295. This shows that the degree of variation – the possible spellings a historical writer could choose from – increases significantly with the age of the text.

Additionally, the maximally occurring number of replacements per word also increases considerably. In 19th-century texts, the variation maxima, that is, the words with the most replacements, vary between two and five operations per word (for example, *räsonierendes* – *raisonnirendes* ‘arguing’) with an average of ~3.41. In the 18th century this average value climbs to four, and in the 17th century words occur with eight or more replaced letters (*domprobst* – *thuembröbst* ‘cathedral provost’).
Table 2. Examples of letter replacements in Early New High German (Koller, 1989, Source: Munske, 1997).

<table>
<thead>
<tr>
<th>Graphemes</th>
<th>Letter replacements</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;i&gt;</td>
<td>&lt;ie&gt; &lt;ieh&gt; &lt;ih&gt; &lt;j&gt;</td>
</tr>
<tr>
<td>%</td>
<td>64.7 3.9 0.1 0.2 16.5 0.1 6.3 8.3 0.1</td>
</tr>
<tr>
<td>Examples: ir, ihr, jr, jhr, Ýr (rounded values)</td>
<td></td>
</tr>
<tr>
<td>&lt;t&gt;</td>
<td>&lt;u&gt; &lt;v&gt; &lt;f&gt; &lt;ff&gt;</td>
</tr>
<tr>
<td>%</td>
<td>0.3 22.6 55.5 21.4 0.2</td>
</tr>
<tr>
<td>Examples: fux, vux, pulver, pulfer, brif, briff</td>
<td></td>
</tr>
<tr>
<td>&lt;u&gt;</td>
<td>&lt;uh&gt; &lt;ue&gt; &lt;u&gt; &lt;v&gt;</td>
</tr>
<tr>
<td>%</td>
<td>48.9 0.3 0.2 0.2 37.7 12.7</td>
</tr>
<tr>
<td>Examples: und, vnd, wnd, guet, güt, fuhr, für</td>
<td></td>
</tr>
</tbody>
</table>

To determine where this progressivity in variation comes from one has to take a closer look at text production in bygone times. The following example is taken from the work Gründlicher Bericht Von einem vngewohnlichen Newen Stern (De Stella Nova, 1604) by the German astronomer Johannes Kepler (1561–1630).

Demnach nunmehr zwey vnd dreyssig (zweiunddreißig ‘thirty-two’) Jahr/ das die Astronomi etwas newes (Neues ‘new’)/ zuvor in allen Büchern/ so viel deren auff vns (auf uns ‘on us’)/ gelanget (gelangt ‘arrived at’)/ vnermeldetes wunderwerckh (unvermeldetes wunderwerk ‘unreported marvel’) am Himmel befinden/ das nemlich (nämlich ‘namely’) ein newer (neuer ‘new’) sehr grosser (großer ‘large’) heller gläntzender Sterne (glänzender Stern ‘brilliant star’) vnder (unter ‘under’) die höchste Sphaeram vnd vbewegliche (und unbewegliche ‘and fixed’) sterne in sydere Cassiopeae vnd (und ‘and’) der Jacobsstrassen (Jacobsstraßen ‘Jacob’s Street’ [as the Milky Way was also known]) oder via lactea einkhommnen (eingekommen ‘came in’)/ alda (all da ,there’) in die 16. Monat lang an einem ort still gestanden/ vnd entlich widerumb (und endlich wiederum ‘and finally again’) verschwunden ist (...) 3

The simplest forms of spelling variation in Kepler’s text occur because of phonetic similarity of graphemes (nämlich – nemlich ‘namely’, endlich – entlich ‘finally’) and are a logical result of a lack of standardization. The older the texts are, the more frequent are the representations of slightly different pronunciations (wiederum – widerumb ‘again’). While some forms of variation are still quite common for German native speakers

3 Nonstandard spellings are underlined; standard spellings and translations are in brackets.
because they still appear in family names (zwei – zwey ‘zwei’ as in the name Meyer) or poetry (gelangt – gelanget ‘arrived at’), other forms are completely obsolete in the modern standard. Good examples are variants featuring grapheme-phoneme correspondences that are invalid today. For instance, the <ew> in newes ‘new’ corresponds to /oi/; today, this phoneme is represented by the grapheme <eu>. Similarly, <v> in vnd ‘and’ corresponds to /u/, the modern <u>.

Another example of obsolete spellings is Barocke Letternhäufelung (Baroque letter accumulation). The aesthetic principle of orthography (Maas 2000: 48) aims to embellish the type face. The word Hoheit ‘highness’ is a compound of hohe ‘high’ and heit ‘being’ and should therefore be spelled Hohheit, but the aesthetic principle perceives the accumulation of <h> as unpleasant. Contradictory perceptions of this principle in different times are not overly surprising. In the 17th century Barocke Letternhäufelung was a method of decorating words as Kepler does in wunderwerckh (instead of the standard Wunderwerk ‘marvel’).

As mentioned above, spelling variation can be found in other European languages as well. Koolen et al. (2006: 409) state that spelling in Middelnederlands, a form of historical Dutch spoken during the Middle Ages, was based on pronunciation, which again varied in different regions of the Netherlands. Dutch became more uniform in the 17th century but was still a “collection of dialects” (Vandenbussche 2002), spelling variants like heyligh (standard: heilig ‘holy’) prevailed. Various systems of orthography continued to change spellings throughout the 19th and 20th centuries (cf. Table 3). In 1996, for example, rules for the composition of words were changed, and pannekoek became pannenkoek ‘pancake’.

<table>
<thead>
<tr>
<th>Phonemes</th>
<th>Des Roches 1761</th>
<th>Siegenbeek 1804</th>
<th>Behaegel 1817</th>
<th>Commission 1844</th>
<th>de Vries &amp; te Winkel 1864</th>
</tr>
</thead>
<tbody>
<tr>
<td>[i:]</td>
<td>&lt;ie&gt;</td>
<td>&lt;ie&gt;</td>
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<td></td>
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<td>&lt;ui&gt;</td>
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<td>&lt;uij&gt;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Medieval French texts pose similar problems. O’Rourke et al. (1997) give the example of the name of a chief villain spelled variously *Hoiaus, Hoiax, Hoiel* and *Oiaus* in the poems they edited. Rayson, Archer and Smith collected a list of 45,805 English spelling variants from 17th-century newspapers, the Oxford English Dictionary and 18th- and 19th-century fiction (Rayson et al. 2005). As in French, Dutch and German, there often is a considerable amount of variation (*maintenance – mayntaynaunce*).

A case that does not occur in Kepler’s text is obsolete graphs, that is, letters not within the modern German alphabet, like the digraph<sup>4</sup> Ṣ. Early New High German texts regularly use <Ṣ> in the period of passage between the Middle High German diphthong <uo> and the New High German monophthong <u>.

2.3 Manual transcription

This leads directly to the third kind of variation we will focus on, after OCR errors and spelling variation. Because the Latin alphabet was used for the spelling of German words, specific digraphs had to be employed for the identification of non-Latin sounds. When those words are transcribed in the process of digitization, diacritics in particular pose problems. At least from

---

<sup>4</sup> Following Elmentaler (2003), graphs consisting of a single letter are labeled monographs, and two letters (such as <eu>) or a letter and a diacritical mark (like <Ṣ>) are labeled digraphs.
a historical linguist’s point of view, the worst thing to do is to simply omit the diacritic (for example, transcribing zuů as zu ‘to’) and thus lose a historical variant. Changing zuů to zuo improves the situation only slightly because the digraph <uo> also exists in historical texts. To transcribe it as zu^o, as programmers often paraphrase the square of a number (n^2 = n^2), is quite common and preserves the information of the diacritical mark. It involves a logographical form, however, that is independent of the German language. Furthermore, the circumflex <^> is not uncommon in recognition errors as a misinterpretation of <v> or <w> (for example, worden ^oiden ‘was’, von ^on ‘of’). The best solution would be to use the current Unicode Standard, Version 5.0 (http://www.unicode.org). The digraph <â> is defined in the chart Latin Extended A as 016F; it can also be built using the Combining Diacritical Marks in range 0300–036F with the codes 0075 (u) + 0366 (°). Those codes can – and often have to – be used in HTML texts as well; while there is the entity definition &aring; for <â>, &uring is not interpreted. But even Unicode poses problems because the codes – especially combined codes – are often interpreted incorrectly. The MS Internet Explorer 7.0 omits many diacritics, and Mozilla Firefox 1.5 displays graph and diacritical marks consecutively (cf. Figure 2).

<table>
<thead>
<tr>
<th>Internet Explorer</th>
<th>Firefox</th>
</tr>
</thead>
</table>
To summarize the perceptions of sections 2.1–2.3, the words of a nonstandard text document are separated into

a) words without a related standard spelling in the understanding of our definition (cf. Section 2.2),

b) variant spellings (which include all types of variation, even recognition errors) and

c) standard spellings.

There are cases in which it is difficult to assign words to one of these classes. The Middle High German word *knicht* seems to be a spelling variant of *Knecht* ‘servant’, and the two words are indeed etymologically related. However, the correct translation of *knicht* is *Ritter* ‘Knight’ and, thus, it belongs in class (a).

All variant spellings have one important issue in common: They are related to a standard spelling by more than just their meaning. Their concrete characteristics can be manifold regarding their type (for instance graphical or phonological) or cause of variation (such as dialect or historical development): they may even cover deliberate variation, like Leetspeak. While words without related standard spellings are, of course, interesting, the processing of variant spellings is the most challenging issue algorithmically.

To summarize our insights regarding the problems of recognition errors, spelling variants and varying transcriptions the older the text, the more frequently the following issues occur:

1) The total number of letter replacements increases because of the original’s older font types and poor states of preservation, the lack of standardization and the involvement of obsolete letters.

2) The maximum number of replacement operations per word increases (that is, variants become increasingly different from standard spellings).

3) Therefore, the number of possible variants relating to a single standard spelling increases.

4) As a result, search tasks on nonstandard texts become increasingly difficult and require specific handling.
3. The RSNSR project

The RSNSR (Rule-based search in text databases with nonstandard orthography) project, which was funded by the German Research Foundation (DFG), was initiated in 2005 to provide a reliable and flexible full-text search engine for the documents of a prior project, the Projekt Nietzsche-CD (cf. Figure 3), and similar material. It was our intention not to rely on dictionaries – an approach that is different from most capacious glossary projects, such as the digitization of the famous Deutsches Wörterbuch (DWB) by Jacob and Wilhelm Grimm, which is maintained by the University of Trier in Germany (Christmann & Schares 2003).

Making use of extensive wordlists surely has its advantages, especially in processing speed. But even though corpora and dictionaries of many millions of words in standard spelling exist, they will never be complete because German is an inflecting language making extensive use of composition and is, therefore, by definition infinite. Dictionaries of historical words are much rarer and much smaller – even though the possibilities for variation are enormous. Through this avoidance of wordlists, we expect an increased recall ratio, especially with documents of highly varied spelling. Furthermore, the additional expenditure of manually adding word-relations is eliminated.

While at first it focused on data from 1865 to 1945, the RSNSR project soon started to broaden its perspective, reaching further back in time. In order to have a basis to work on, we manually collected pairs of standard and variant spellings from historical texts. Provided with metadata about their origin (time, location) and type (caused by OCR, not caused by OCR), we called the pairs evidences because they bear evidence of variation. In the same way, we built a collection of synchronic spelling variants. The texts from which we extracted the evidences came to us courtesy of the Bibliotheca Augustana, Compact Memory, Digitales Archiv Hessen-Darmstadt and documentArchiv.de.

Our constantly growing database of evidences currently features 12,697 entries from 107 different texts. These originate from all over the German-speaking area and date from 1293 to 1919. The spelling variants therefore cover diachronic language development, diatopic variation, differences in transcription and evidences of OCR errors. Among the latter are variants from antiqua as well as black letter sources.
**Figure 3.** The improved interface of the second edition of the online Nietzsche search engine.
With the information gathered from this database and our algorithms in development, a search engine is no longer our only goal; new ways of displaying the results of a search query allow for additional information and overview. We used the renowned Java package for information visualization called Prefuse (http://prefuse.org). Information Visualization is a fairly new field of research and is rapidly evolving. A well established definition of information visualization is “the use of computer-supported, interactive, visual representations of abstract data to amplify cognition” (Card et al. 1999).

When performing fuzzy search operations, the classic ranking of results we know from our daily Web searching via Google may no longer be the best visualization of results. When searching for “imprisoned”, which variant spelling is the “better” result, *imprison'd* or *imprisonde*? Both occur in historical English documents of the same era. Even though computers can be employed to ease retrieval tasks, should it be for a machine to decide what the user is looking for? Figure 5 shows an interface for retrieval on historical documents. It focuses on the different kinds of spelling variation rather than on the documents themselves. Users can explore the trees to the right of the spelling variants to see who used those spellings when and where.

![Figure 4. An experimental search interface for tasks involving variant spellings.](image)

For browsing databases of nonstandard spellings, like historical dictionaries, even more overview is needed. Since all spellings are already in a database, their relations can be preprocessed, in contrast to browsing
arbitrary texts. Figure 6 shows the browse of a portion of our database. It is fully zoomable and dragable and features a lens function (seen on the five enlarged spellings). The forces pushing spellings apart or pulling them together are fully adjustable. With this configuration, the browser shows all entries in the database, whether standard or variant spelling, aligned by a simple Levenshtein distance measure (see below). The user can explore the vicinity of interesting words (here, for example, spelling variants of *tausend* ‘thousand’, which are similar to variants of *tugend* ‘virtue’).

**Figure 5.** A simple browser for historical databases.

Similar in origin to the interface in Figure 5, the Word Explorer prototype (cf. Figure 7) allows the examination of spellings with high variance and multiple connections. It distinguishes between a standard spelling (in the center of the “stars”) and the spelling variants (surrounding the standard spellings). Even though string edit distances are not represented, the numeric values are displayed when spellings are selected. In this example
the variants of the infinitive *wollen* ‘(to) want’, its simple past form *wollte* ‘wanted’ and the second person plural *wollt* ‘(you) want’ are displayed. Here, users of this interface will see that the spelling variant *wölle* can be both a variant of *wollen* and of *wollte*.

**Figure 6.** Interface of the Word Explorer prototype for examination of spellings with high variance and multiple connections.

Visualizations like the ones presented in Figures 5–7 can be very useful in literature information systems (LIS). Furthermore, we are certain that our algorithms can also be employed for automatic text categorization alongside authorship attribution methods, like stylometrics, the analysis of a text’s internal statistics (Holmes, 1998) and entropy coding (Benedetto et al. 2003). This topic is currently being researched. (Semi-)automatic evidence retrieval in combination with automatic correction of recognition errors has been investigated (Wedershoven 2007). The detection of nonstandard spellings in a text is a rather simple matter of comparison with large dictionaries and inflection tables (such as Deutscher Wortschatz or Canoo). All spellings not found in those databases are potential spelling variants. It is much more complicated to find the correct standard spelling corresponding to a spelling variant or recognition error. Even though related to retrieval on nonstandard texts (input: standard – output: spelling variant), the methods cannot be transferred without adaptation. In some cases, it is even harder to decide whether a spelling variant was caused by historical/regional variation or misrecognition. A spelling *ungcrn* (*ungern* ‘reluctantly’) is most certainly a recognition error caused by the graphical
similarity of <e> and <c>, but vngern can be both, because <u> is often replaced by <v> in old texts.

Knowledge derived from analyses of large databases of recognition errors can help with the decision. Pollock and Zamora, for example, reported that in only 3.3 percent of the 50,000 words they examined was the first letter misrecognized (Pollock & Zamora 1983). For historical spellings, however, this finding does not apply; when we examined our database, we found that 13.7 percent of misrecognitions occurred in the first letter.

4. Generation of spelling variants using manual rules

In our research we examined two contrary approaches:

- The generation of possible spelling variants. A fraction of the spellings generated correspond to known historical spelling variants. These variants are called “established spellings”.
- The measurement of word distance using string edit distances.

In the first stage of the project, we started with the manual composition of rules. Linguistic replacement rules are successfully used in a variety of programs, such as VARD (VARiant Detector), an existing English system (Rayson et al. 2005).

Using Sun’s regular expressions formalism⁶ (java.util.regex) with minor extensions to ease the input of linguistic data, we built 68 replacement rules. These consist of 62 different sequences and, in parts, historical n-graphs (like <a>, <äu> and <eau>). In contrast to the first edition of the online Nietzsche Archive mentioned above, these rules are fully able to support context sensitivity. The rule %K% #ö|eu# [tb], for example, can be interpreted as “If a consonant sound (%K%) on the left and <t> or <b> on the right ([tb]) surrounds an o-umlaut (ö), then replace the <ö> with <eu> (ö|eu)”.

Figure 8 shows the derivation tree of a typical variant generation algorithm. The gray nodes are spellings not found in our database. Of course, this tree is a simplified example, even though the nodes with dates in the brackets are existing spelling variants taken from our database. In

⁶ http://java.sun.com/docs/books/tutorial/essential/regex/
reality there are 19 different documents containing the spelling zwey, not just one. There also are other variants of zwei ‘two’, like zwoo, not listed here. We even discovered the interesting fact that the spelling zweyen is not only a variant of zwei but also a variant of the inflected standard form zweien, which itself is a variant spelling of zwei.

Figure 7. Example of a derivation tree for the standard spelling zwei ‘two’. The numbers in brackets depict selected dates of documents using the variant spellings shown. Gray nodes are hypothetical variants not yet found in historical documents.

Looking at the example, we can see the main cases we encounter in variant generation:

- Not all spellings generated by the rules are found in our database. Even though this is exactly what we want, because – as mentioned above – a database will never contain all possible spelling variants, even simple rules build an enormous number of new variants. It is possible that most of these do not occur in any existing text.
- A large number of redundant spellings are produced on different paths.
5. Displaying generation rules with treemaps

In Kempken et al. (2007) we presented a treemap approach to displaying details of such single word derivations. The treemap visualization serves five purposes:

− It allows the detection of relevant rule sequences. A sequence of rules is considered relevant if it leads to an actual historical spelling (established spelling). Irrelevant sequences should be pointed out in parallel.
− It makes it easy to find permutations of rules that produce the same spellings.
− It discerns patterns to describe characteristics of nonstandard orthography (depending on location and period).
− It enables the derivation of upper bounds for the length of relevant rule sequences.
− It provides a means of accessing extensive amounts of information about one spelling.

Johnson and Shneiderman (1991) developed the treemap algorithm in 1991 for visualizing hierarchical data structures. Their original slice-and-dice approach defines a 2D-space–filling technique for mapping a hierarchical structure into nested rectangles: A rectangular area is recursively subdivided into a set of smaller rectangles alternating between vertical and horizontal subdivision. Each rectangle represents a node of the tree and the enclosed subrectangles correspond to all descendants of this node. The subdivided areas can be given specific size, color or texture. In this way, it is possible to display additional properties of the corresponding tree node. Since his original algorithm was introduced, many have tried to make the treemap approach more effective in visualizing an information hierarchy through such methods as using other space-filling techniques or extra navigation help on the tree structure. Shneiderman (2006) gives an overview of different implementations and applications of the treemap visualization approach. That treemaps are not limited to a few thousand items was proven by Fekete and Plaisant (2002).

For the construction of a treemap of spelling variants, we derive candidates for historical spellings from a current standard spelling by
recursive application of rules. In each step, one or more new spellings for the next step are produced, as shown in Figure 8.

Each derivation node is therefore described by three key properties: the original spellings, the applied rule and the newly produced spellings. Due to the recursive nature of the process, the original spellings are always the ones produced in the previous step. In order to optimize the rule set, we analyzed the rules involved in the derivation process, taking into account the following key aspects:

− **Applicability.** The application of a given rule is restricted to a specific context. The less restrictive this constraint is, the more spellings a rule can be applied to. Hence, the applicability of a rule depends on its context.

− **Productivity.** One rule may produce more than one derived spelling. As rules are always applied to all variants contained in a node, the number of spellings produced also relies on the rule’s applicability. Thus, both account for its productivity. A certain rule set may produce established spellings, that is, spellings found in historical texts. Minimal subsets with this property should be identified.

− **Commutativity.** Another interesting aspect is commutativity. In some cases, two or more rules may be applied independently. For example, consider a rule A that is applied to an original spelling. Another rule B may afterwards be used to transform all of the results of A and yield new spellings. If this process can be reversed in such a way that rule B is applied first, rule A is applicable to all the results and the results of both are constant, the order of rule application is no longer important, and the rules are considered commutative. If this property can be proven for a set of rules, the derivation process can be sped up significantly. After the results of the application order A-B are determined, the results of B-A no longer need to be derived but can be looked up. Of course, this feature of a rule set has to be proven by using the formal rule definition, but a firm visualization may provide important clues as to which rules may be commutative.

− **Redundancy.** One rule may foil the results produced by another. For instance, one rule may insert an additional <e> whereas another rule removes it. Thus, the application of either leads to no new variants. It is also possible that for the same spelling to be produced on different paths (for example, *zwayn* via *zwey* or *zwai*, as in the example above).
Analogous to the considerations above, the derivation process can be curtailed in such cases. Thus, one goal of the optimization process is to identify redundant rules and prevent useless work, by such means as restricting rules to a more specific context.

- **Dependency.** A rule may not be applicable to original standard spellings but require the previous use of another rule. Subsequently, it can be applied only to the results of the previous rule. As a result, spelling variants are produced in different levels of the tree (for instance, *zwej* in level 1 and *zweene* in level 4). Additionally, inner nodes as well as leaf nodes can contain relevant variants, but it is also thinkable that some inner nodes are just transitions.

We implemented a Java application that uses the treemap approach to show the key aspects of rules involved in the treelike derivation process in an interactive presentation. The productivity of a rule is indicated by the size of the corresponding shape. The squarifying algorithm (Bruls 2000) arranges the rectangles according to their hierarchical order.

We have designed several views to point out different aspects of the derivation process. The color assignment for the views without special coloring (see below) was defined corresponding to Table 4. Since selection presupposes derivation, all nodal states can be represented by this color scheme. Light green and orange apply only to redundancy visualization. The color is assigned according to three attributes:

- **Established.** If any of the spellings associated with a certain rectangle has actually been found in a historical text, we consider this spelling established. The corresponding form is highlighted.
- **Selected.** In most of our visualization approaches, the user is able to define constraints on the derivation process. Hence, only a subset of all rectangles is selected. The selected subset is expressed by a different color.
- **Redundant.** If any of the spellings associated with a rectangle can be otherwise derived, that is, if it is already contained in the selected subset, it is considered redundant.
Table 4. Color scheme for treemap visualization.

<table>
<thead>
<tr>
<th>Color / Meaning</th>
<th>Established</th>
<th>Selected</th>
<th>Redundant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gray</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>White</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Yellow</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Light green</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Orange</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Dark green</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

The potential of our treemap visualization approach can be seen in the following two examples. A typical screenshot of the implemented tool is shown in Figure 9. Here, the user is able to interactively select a subset of the rules. The nodes that can be derived using this subset are highlighted in yellow or green if the respective spelling is established. Additionally, all the spellings that can be derived with this subset – whether established or not – are highlighted in orange or dark green respectively. The main advantage of this approach is that the user may interactively select a rule subset and redundant rule applications are immediately highlighted according to the selected scheme. Hence, a typical rule set optimization task is to find a minimal rule subset such that all established spellings are accentuated either in light or in dark green, meaning the spellings (not necessarily the nodes) can be derived using just this subset.
Figure 8. Redundancy view with some rules selected.

The mixed rainbow view is another of eight available views and is depicted in Figure 10. Each rule is assigned a color, and the color of a rectangle is then determined by the mean value of the colors of the affected rules. Hence, the influence of particular rules in the overall derivation process can be displayed in parallel. Of course, mapping the rule combination into the RGB color space can only provide an impression of the rule set’s structure. Even color spaces with higher degrees of freedom can represent the information only marginally better.
However, the design of a rule set for the period from 1803 to 1806, which was based on only 338 pairs of evidences, took about three days to create. Dawn Archer spent more than a year creating the letter replacements for VARD. Koolen et al. (2006: 409) recount similar experiences for historical Dutch. If an approach is to be applicable in inhomogeneous scenarios, the manual construction of replacement rules is simply not affordable. At the same time, manual rule derivation is prone to human error. This is especially true once the rule set exceeds certain limits, where unexpected side effects become more and more likely. As a result, automatic approaches became of interest.

6. **Distance measures**

Comparing different spellings of the same word often gives rise to the question which spellings are more similar than others. Similarity and difference can both be expressed as a function of distance. However the distance between words is not fixed. Is *aufwändig* more similar to
aufwendig ‘elaborate’\textsuperscript{7} than Ingenieur is to Ingenieur ‘engineer’? While most today’s native German speakers would agree that it is, a time traveler from 1750 quite certainly would not, because the perception of grapheme-phoneme correspondences in the 18\textsuperscript{th} century was different than it is today (cf. Section 2.2). Distance measures help to answer such questions by calculating the distance between two words. String edit distance is defined as the minimum number of character replacements, insertions and deletions required to transform the one string into the other. In 1965 Vladimir Levenshtein presented a recursive algorithm for calculating edit distance. A more efficient way is to use a dynamic programming approach, as described by Wagner and Fischer (1974). String edit distance is widely used in a variety of applications as it can be determined efficiently and delivers good results. Another type of string distance measure relies on the comparison of the n-grams derived from each of the strings. The term n-gram denotes a continuing sequence of n characters. Using padding tokens, \((L + n - 1)\) subsequences can be extracted from a particular string, where \(L\) denotes the length of the actual string. Usually, sets of bigrams or trigrams are compared. There are several possible ways of deriving a nonnegative number that represents the distance (Erikson 1997). In our experiments, we used the following formula. In contrast to the other algorithms, it does not denote a distance but a similarity measure for the two strings \(x\) and \(y\), where \(B_x\) denotes the set of bigrams derived from string \(x\) and \(B_y\) those derived from string \(y\), respectively:

\[
sim(x, y) = \frac{2|B_x \cap B_y|}{|B_x| + |B_y|}
\]

Zobel and Dart (1996) presented the Editex algorithm as a new phonetic matching technique. This algorithm combines the properties of string edit distances with letter-grouping strategies used in well known phonetic indexing algorithms like Soundex (Knuth 1973) or Phonix (Gatt 1990). By doing so, they achieved superior results for tasks of phonetic matching. Ristad and Yianilos (1998) suggest a stochastic interpretation of string distances. They model them according to the probability of individual operations needed to transform one string into the other. These operations

\textsuperscript{7} Both aufwändig and aufwendig are standard spellings in modern German.
are equivalent to the character replacements, insertions and deletions used to define the string edit distance. Additionally, the probability of identity operations (such as \(<a>\) to \(<a>\)) is taken into account.

Distance measures such as stochastic distance are commonly used in dialectrometry to calculate the distance or similarity between different dialect variants (Heeringa et al. 2006: 51). That is especially so because distance measures are fuzzy by definition. Most standard information retrieval systems build up an index of occurring terms, allowing the user to quickly find all documents containing the words he queried for. As mentioned above, an exact search may not yield good results for historical texts. An adequate distance measure operating on spelling variants provides arbitrary degrees of search fuzziness within a reasonable retrieval time. Standard fuzzy search, though, is of limited use as it does not take linguistic features into account. For example, if the user queries for the German term \(\text{urteil} \) ‘judgment’, the Levenshtein algorithm does not differentiate between the existing variant \(\text{urtheil} \) and, for instance, \(*\text{ubrteil} \) with respect to the string distance. A measure that takes heed of linguistic connections will be able to determine the actual variant from a list of candidates.

We developed a framework for arbitrary distance measures, i.e. all concepts that define a distance between two objects. The measure we normally use in the FlexMetric framework is a measure that was derived from stochastic distance by scaling the probability distribution to a cost table. It combines the simplicity of a dynamic programming algorithm with the flexibility of defining arbitrary costs for each possible character transformation. The basic idea is very similar to the concept behind the string edit distance. The only difference is that, rather than the number of transformations, the costs for the individual operations are taken into account. The costs for the least expensive sequence of operations required to transform the one string into the other define the distance between the two strings. The cheapest sequence can be calculated using a dynamic programming algorithm resembling the one used for evaluating the string edit distance.

Distance measures can be used in other stages of a query as well and, therefore, in more than one module of the engine:

- **Ranking of Boolean results.** Retrieval in historical text documents is possible starting from a given query term, using automatically or
manually constructed rules that generate spelling variants. The variants produced are used for Boolean retrieval, returning unclassified results. Afterwards, a distance measure is required to rank the results according to their distance from the term queried.

- **Transformation.** Historical spelling variants can be automatically transformed into their modern counterparts. The distance measure is used to identify the correct spelling in a modern dictionary.

- **Reflection.** The differences between a historical or regional spelling variant and its modern equivalent are often hard to evaluate, even for native speakers. An adequate distance measure is a means of mapping linguistic distinctions on a single number. The visualization of word distances supports the reflection that language is in a state of constant change.

### 6.1 Training of distance measures

As mentioned above, we implemented a stochastic distance measure for trainability. In the course of three months, we collected nearly 13,000 string pairs of spelling variants and their standard spellings. Within those pairs is hidden the extent to which spelling variants differ from spellings in modern orthography. All single letter replacements in our database can be modeled by $\theta = 39 \times 39$ operations with replacement costs (German alphabet, umlauts, ß and some historical combined diacritical marks). To train a distance measure, we use our database as a sample set $X = x_1, \ldots, x_n$ and maximize the estimator $\hat{\theta}$ until we find an optimal set of operations to model the sample: that is, we calculate the maximum likelihood function

$$L(\hat{\theta}) = \max_{\hat{\theta}} f(x_1, \ldots, x_n | \theta).$$

Of course, even 13,000 samples contain not nearly enough information to represent all the forms of variation that might occur. For this reason, we postulate a set of missing data, $Y$, which – added to the known sample – creates the complete data set $X \cup Y$. Furthermore, we can assume a joint relationship between $X$ and $Y$ (Bilmes 1998). The so-called expectation-maximization algorithm (Dempster 1977) alternates between the estimation of $Y$ given constant $X$ and $\theta^i$ and the maximization of $\theta^{i+1}$ given constant $Y$ and $\theta^i$. After numerous iterations, the algorithm reaches a (local) maximum and an optimal set of letter replacement operations.
The amount of support such distance measures can provide depends on their practicability in the particular context of historical spelling variants. Given not only trained measures but the abundance of different metrics and edit distances available, a thorough evaluation is needed.

7. Evaluation of distance measures

The main problem in judging the quality of string distance measures lies in comparing their applicability for different tasks. It is obvious that a distance measure that has been specifically trained to detect certain linguistic deviations can no longer yield objective results when used to quantify a relation between spellings as it necessarily evaluates the familiar deviation with lower costs, leading to a shorter distance. Thus, if, for instance, the measure is used to build up a genealogical tree of spelling variants of the same term, it inherently prefers relations it was specifically trained for. This effect leads to unusable results. In order to avoid this conflict, we have to concentrate on evaluating the potential of the various algorithms for the following text retrieval task: the user queries for the modern spelling, and all documents containing the query term or a historical variant are returned as results. Hence, a synthetic information retrieval system (IRS) has to be constructed consisting of a document collection, a retrieval function, and a set of queries along with relevance judgments.

The structure of the data itself can also significantly influence the outcome of an evaluation. One important factor is word length. If the dataset consists of many small words, the average distance will increase, because even a single letter replacement changes a high percentage of the word’s recognizability. Also, if a distance measure is sensitive to word length, differences in length between the standard and the variant spelling can yield diverse results. In the 17th and 18th centuries, for example, extensive use was made of derivational suffixes. Whereas nowadays the adjective ‘strict’ is used, in 1650 Hans Michael Moscherosch wrote ‘strictly commanded to give’). Figure 11, based on our collection of historical evidences, clearly shows the increased word length of the spelling variants in those centuries. Normalization by length appears to be a solution to differences in word length, but, as Heeringa et al. (2006) show, it only perverts the measures. Normalization optimizes for minimum normalized
length of the replacement path rather than minimum replacement costs (Heeringa et al. 2006: 54).

![Figure 10. Comparison of the word lengths of standard spellings and spelling variants from 1200 to 1900.](image)

The standard information retrieval methods for measuring performance are precision (proportion of retrieved and relevant documents to all documents retrieved) and recall (proportion of retrieved and relevant documents to all relevant documents). In our case, it is certain that a relevant counterpart exists for every query; that is, for every historical spelling there is a matching standard spelling. Also, using distance measures, every entry in the database is retrieved, and its distance to the query calculated. Therefore, retrieved and relevant documents are equal and so are precision and recall. As a result, we use precision at $n$ ($P@n$). This measure is often used in cases where, instead of Boolean retrieval, a ranking of documents is returned, for example, in Web retrieval. Precision at 10 means that relevant documents are retrieved within the ten documents with the highest ranking.

An evaluation required us to strike a balance on what we hoped to achieve. We could either build a strictly controlled setup with a few hundred items or a much larger setup with less control. The advantage of the explicit results of the first version is greatly reduced by their narrow area of application. Since we are dealing with natural language data and
unknown types of variation, we suspect that too small an evaluation will yield results with limited value to practical applications.

To build a collection of 3,156 searchable terms and spelling variants, we used our evidence database and a manually maintained dictionary of 217,000 contemporary German words derived from the free spelling-correction tool Excalibur. The historical word forms found by the Information Retrieval System (IRS) are added to the dictionary, whereas the corresponding modern terms are removed. In this way, we try to raise the probability that no other relevant documents (that is, spelling variants) are collected. With an annotated corpus there is no problem at all, but without such a thoroughly tagged collection or manual inspection (of more than half a billion results!), it is impossible to be completely sure about the relevance of its entries. Looking back at the example of Kepler’s text given above, we can see the spelling variant Sterne related to the first person singular standard spelling Stern ‘star’. Unfortunately, Sterne is also the first person plural standard spelling ‘stars’ of the same word paradigm. Therefore, even if a distance measure is functioning perfectly and attests very low costs to the insertion of <e> (Stern → Sterne), the string identity (Sterne → Sterne) will always be cheaper, because the collection has no information about the word’s grammatical number. As a result, the outcome of our evaluation heavily depends on the size and structure of the collection. Rather than the total numbers themselves, it is their relation that is of interest. Using a dictionary of 217,000 words is a balance between the 80,000-word OpenOffice dictionary and a combined dictionary of more than five million words we could also have used.

Table 5. Results of a comparison of distance measures.

<table>
<thead>
<tr>
<th>Measure</th>
<th>P@1</th>
<th>P@2</th>
<th>P@3</th>
<th>P@4</th>
<th>P@5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bigram evaluation</td>
<td>24.5</td>
<td>35.6</td>
<td>42.6</td>
<td>48.2</td>
<td>54.4</td>
</tr>
<tr>
<td>Editex</td>
<td>43.3</td>
<td>55.2</td>
<td>63.4</td>
<td>69.2</td>
<td>72.6</td>
</tr>
<tr>
<td>Levenshtein</td>
<td>22.9</td>
<td>36.6</td>
<td>47.1</td>
<td>53.4</td>
<td>58.9</td>
</tr>
<tr>
<td>Scaled stochastic measure</td>
<td>38.6</td>
<td>58.2</td>
<td>65.7</td>
<td>70.8</td>
<td>75.0</td>
</tr>
<tr>
<td>Stochastic measure</td>
<td>46.7</td>
<td>65.3</td>
<td>74.7</td>
<td>79.6</td>
<td>83.1</td>
</tr>
</tbody>
</table>

The results of the evaluation (cf. Kempken et al. 2006) show that the Levenshtein distance and the n-gram algorithm yield comparable results. This was to be expected as both of them evaluate a deviation regardless of its context or the affected characters. The Editex algorithm, the stochastic measure and its logarithmically scaled version deliver superior results. While Editex takes into account linguistic aspects due to its letter-grouping
strategy, the stochastic measures are trained on real linguistic data. This is definitely an advantage when dealing with historical data or recognition errors, where letter-groups can change. If one recalls the example at the beginning of Section 6 (\textit{Ingenieur} vs. \textit{Ingenieur} ‘engineer’), for an 18\textsuperscript{th} century document, the graphemes \textit{<i>} and \textit{<j>} should both belong to the same letter group; however, in Editex \textit{<i>} belongs to group 1 and \textit{<j>} to group 6 (Zobel and Dart 1996). The results of the stochastic measure are better than those of the scaled version, even though both rely on the same algorithm.

\begin{tabular}{|l|}
  \hline
  Ährenkranz  \\
  Ältestenrat  \\
  Ämter  \\
  Ämterverteilung  \\
  Ändern  \\
  Änderung  \\
  Änderungsantrag  \\
  Änderungsgesetz  \\
  Änderungsindex  \\
  \hline
\end{tabular}

\textbf{Figure 11.} Measures using dynamic programming can use previously calculated prefixes (underlined) to increase processing speed.

The main difference lies in their conceptual complexity; the scaled stochastic measure uses a cost measure that was derived from the stochastic measure. Whereas the stochastic distance measure needs an evaluation of the probability distribution for each term pair, the scaled version uses a derived cost measure in a simple dynamic programming algorithm. Hence, it allows intuitive optimizations like re-using previously calculated values (cf. Figure 11) for 1:\textit{n} comparisons, which alone increases processing speed by more than 50 percent. For single queries such an enhancement is of minor importance, but increased speed allows for calculations that were previously out of reach. The evaluation described in Section 9 requires more than 9 billion word-by-word comparisons and still takes about half an hour. Furthermore, the derived cost measure is more likely to be understood and optimized by a human user for such purposes as linguistic analysis. Since it uses a table of replacement costs, the user can simply lower or raise costs for selected operations, while, in a probability distribution, any change influences all other values because the probabilities have to add up to 1.
We can draw the following conclusions:

− The better adapted an algorithm is to specific phenomena in the domain of historical spellings, the better the retrieval results that can be expected from it.
− The paramount results of a trained distance measure can be transferred to a simpler evaluation algorithm with a ~12 percent loss in quality but more than 50 percent of gain in speed.

8. Improvement of the stochastic measure using clustered training data

As we have seen, spelling variation increases with the age of the text. But the more inhomogeneous the training data becomes, the harder it is to train reliable measures with it. The characteristics of a certain period (such as the Barocke Letternhäufelung mentioned above) are diluted by the variation of others. However, clustering the evidences using the document’s metadata allows more homogeneous training sets to be built. Yet the question remains: What is the size of an optimal training set? Too small a set might not reflect enough features, whereas too large a set can subdue the details. Our tests suggested training sets of about 4,500 evidences.

We defined two classes, timeframe and location, to deduce a semantic clustering. Their subcategories are based on commonly accepted stages and regions. As we learned through personal communication during a recent seminar on digital historical corpora, the DDTA project, an initiative of numerous renowned German language experts, proposed similar categories. Timeframe depicts four significant stages in the development of the German language:

− Late Middle High German (1250–1350)
− Older Early New High German (1350–1450)
− Later Early New High German (1450–1650)
− New High German (1650–1900)

Location is divided according to the region:

− Upper German (south of the Speyer line),
Central German (south of the Benrath line but north of the Speyer line) and Low German (north of the Benrath line)

At the same time, category indicates OCR/Non-OCR errors.

Since, at the moment, we do not have enough evidences to fill all 12 clusters with 4,500 training entries, we have to reduce the clusters to the most significant ones. But the information of timeframe and location is immanent in all evidences and cannot be “extracted” separately. We examined the influence of the parameters time and location on the variability of spellings, or – to be more precise – the influence of time in contrast to all other parameters (except OCR and transcription). The 54 text documents used to create these data were selected randomly given the limited choice of available texts. They include chronicles, judicial documents, fiction, cookbooks and newspaper articles.

We manually examined 54 historical documents containing 74,781 words, including 13,135 variant tokens. Due to the length of some documents, we had to use excerpts.

Every occurrence of a spelling variant (cf. definition in Section 2.2, no OCR errors) was counted as a variant token.

Proper nouns and non German segments (esp. Latin) were removed prior to calculation.

**Table 6.** The manually collected list of variant token amounts in historical German text documents.

<table>
<thead>
<tr>
<th>Document</th>
<th>Year</th>
<th># Words</th>
<th># Var. tokens</th>
<th>Words : tokens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bayrischer Landfrieden</td>
<td>1293</td>
<td>1182</td>
<td>573</td>
<td>48%</td>
</tr>
<tr>
<td>Mainauer Naturlehre</td>
<td>1300</td>
<td>871</td>
<td>568</td>
<td>65%</td>
</tr>
<tr>
<td>Das Buch von guther Speise (Auszug)</td>
<td>1350</td>
<td>841</td>
<td>514</td>
<td>61%</td>
</tr>
<tr>
<td>Wilhelm Durandus: Rationale</td>
<td>1384</td>
<td>1296</td>
<td>526</td>
<td>41%</td>
</tr>
<tr>
<td>Johannes von Tepl - Der Ackermann</td>
<td>1401</td>
<td>886</td>
<td>535</td>
<td>60%</td>
</tr>
<tr>
<td>Meister Ingold - Das püchlein vom guldin spiel</td>
<td>1432</td>
<td>1006</td>
<td>462</td>
<td>46%</td>
</tr>
<tr>
<td>Die Auslegung vber den pater noster</td>
<td>1441</td>
<td>992</td>
<td>583</td>
<td>59%</td>
</tr>
<tr>
<td>Das Helmaspergersche Notariatsinstrument</td>
<td>1455</td>
<td>1526</td>
<td>598</td>
<td>39%</td>
</tr>
<tr>
<td>PillenreuthMystik</td>
<td>1463</td>
<td>1428</td>
<td>679</td>
<td>48%</td>
</tr>
<tr>
<td>Titel</td>
<td>Jahr</td>
<td>Seiten</td>
<td>Übersicht</td>
<td>Prozent</td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td>------</td>
<td>--------</td>
<td>-----------</td>
<td>---------</td>
</tr>
<tr>
<td>Übergabe der Stadt an die Schweizer</td>
<td>1499</td>
<td>659</td>
<td>238</td>
<td>36%</td>
</tr>
<tr>
<td>König Maximilian an die Bünde</td>
<td>1499</td>
<td>665</td>
<td>312</td>
<td>47%</td>
</tr>
<tr>
<td>Heinrich Hug - über den Schwabenkrieg</td>
<td>1499</td>
<td>464</td>
<td>205</td>
<td>44%</td>
</tr>
<tr>
<td>Tübinger Vertrag</td>
<td>1514</td>
<td>534</td>
<td>205</td>
<td>38%</td>
</tr>
<tr>
<td>Rede Bischof Friedrich Nausea</td>
<td>1527</td>
<td>163</td>
<td>71</td>
<td>44%</td>
</tr>
<tr>
<td>Gründungsurkundes des Hospitals Hofheim</td>
<td>1535</td>
<td>357</td>
<td>126</td>
<td>35%</td>
</tr>
<tr>
<td>König Maximilian an die Bünde</td>
<td>1499</td>
<td>175</td>
<td>77</td>
<td>44%</td>
</tr>
<tr>
<td>Reichskammergerichtsordnung</td>
<td>1555</td>
<td>1306</td>
<td>400</td>
<td>31%</td>
</tr>
<tr>
<td>Sigismund von Herberstein - Moscovia, Hauptstadt der Reissen</td>
<td>1557</td>
<td>879</td>
<td>406</td>
<td>46%</td>
</tr>
<tr>
<td>Anekdoten der Zimmerischen Chronik</td>
<td>1560</td>
<td>178</td>
<td>52</td>
<td>29%</td>
</tr>
<tr>
<td>Landgraf Philipp an seine Getreuen</td>
<td>1560</td>
<td>129</td>
<td>51</td>
<td>40%</td>
</tr>
<tr>
<td>Chronik des Grafen von Zimmern</td>
<td>1564</td>
<td>551</td>
<td>175</td>
<td>32%</td>
</tr>
<tr>
<td>Der Krieg in der Geschlechterchronik Eisenberger</td>
<td>1568</td>
<td>691</td>
<td>232</td>
<td>34%</td>
</tr>
<tr>
<td>Beauftragung des Superintendenten Johannes Angelus</td>
<td>1578</td>
<td>197</td>
<td>65</td>
<td>33%</td>
</tr>
<tr>
<td>Mängelrügen des Johannes Angelus</td>
<td>1579</td>
<td>230</td>
<td>96</td>
<td>42%</td>
</tr>
<tr>
<td>Vom Hasen Wildpret</td>
<td>1581</td>
<td>1201</td>
<td>455</td>
<td>38%</td>
</tr>
<tr>
<td>Gründlicher Bericht von einem vngewohnlichen newen Stern</td>
<td>1604</td>
<td>1539</td>
<td>451</td>
<td>29%</td>
</tr>
<tr>
<td>Kleine Salzburgische Chronik</td>
<td>1624</td>
<td>342</td>
<td>114</td>
<td>33%</td>
</tr>
<tr>
<td>Berliner Zeitung 1626</td>
<td>1626</td>
<td>701</td>
<td>204</td>
<td>29%</td>
</tr>
<tr>
<td>Hans Michael Moscherosch Gesichte</td>
<td>1650</td>
<td>1415</td>
<td>353</td>
<td>25%</td>
</tr>
<tr>
<td>Christoph Schorer Chronik Memmingen</td>
<td>1660</td>
<td>2438</td>
<td>724</td>
<td>30%</td>
</tr>
<tr>
<td>Leibniz: Societät und Wirtschaft</td>
<td>1671</td>
<td>1081</td>
<td>232</td>
<td>21%</td>
</tr>
<tr>
<td>Christian Thomasius: 3. Monat oder Martius</td>
<td>1688</td>
<td>1019</td>
<td>141</td>
<td>14%</td>
</tr>
<tr>
<td>Lehrzeugnis eines Apothekerjehilfen</td>
<td>1691</td>
<td>209</td>
<td>63</td>
<td>30%</td>
</tr>
<tr>
<td>Brief von Landgraf Ernst Ludwig</td>
<td>1715</td>
<td>384</td>
<td>61</td>
<td>16%</td>
</tr>
<tr>
<td>Briefwechsel zwischen Landgraf Ernst</td>
<td>1715</td>
<td>254</td>
<td>55</td>
<td>22%</td>
</tr>
<tr>
<td>Beschluss des Landtags vom 16. Mai 1722</td>
<td>1722</td>
<td>485</td>
<td>101</td>
<td>21%</td>
</tr>
<tr>
<td>Berlinische Privilegirte Zeitung</td>
<td>1748</td>
<td>1884</td>
<td>211</td>
<td>11%</td>
</tr>
<tr>
<td>Neuer Lehrbegriff der Bewegung und Ruhe</td>
<td>1758</td>
<td>3935</td>
<td>122</td>
<td>3%</td>
</tr>
<tr>
<td>Berlinische Privilegirte Zeitung</td>
<td>1761</td>
<td>2039</td>
<td>186</td>
<td>9%</td>
</tr>
<tr>
<td>Karschin - Brief an Michaelis</td>
<td>1763</td>
<td>693</td>
<td>96</td>
<td>14%</td>
</tr>
<tr>
<td>Reglement der Berliner Kunstkademie</td>
<td>1776</td>
<td>804</td>
<td>75</td>
<td>9%</td>
</tr>
<tr>
<td>Zum ewigen Frieden</td>
<td>1795</td>
<td>4297</td>
<td>182</td>
<td>4%</td>
</tr>
<tr>
<td>Kaiserliche Ratifikation des Reichsgutachtens</td>
<td>1803</td>
<td>989</td>
<td>55</td>
<td>6%</td>
</tr>
<tr>
<td>Reichsdeputationshauptschluss</td>
<td>1803</td>
<td>3807</td>
<td>315</td>
<td>8%</td>
</tr>
<tr>
<td>Bedingungen, unter welchen die in der Rheinbundsakten angewiesen</td>
<td>1806</td>
<td>675</td>
<td>48</td>
<td>7%</td>
</tr>
</tbody>
</table>
Besitzungen
Vertrag zwischen dem Bevollmächtigten Sr. Majestät des Kaisers der Franzosen 1806 3482 161 5%
Hessenverfassung 1820 1260 88 7%
Sachsenverfassung 1831 1147 81 7%
Der Luftschiffer Blanchard 1850 502 10 2%
Die Ähnlichkeit der Locomotive mit einem Thiere 1858 634 30 5%
Philosopie und Erfahrung - Eine Antrittsrede 1861 3799 171 5%
Welt als Vorstellung 1870 4336 174 4%
Die Grenzen der sinnlichen Wahrnehmung 1876 7822 272 3%
Ueber den Einfluss des Gefühls auf die Thätigkeit der Phantasie. 1900 4402 155 4%
subtotal 74,781 13,135

| Figure 12. The residuals are normally distributed. |
Given this variety, the homogeneity of the result is astounding. As can be seen in Table 6 and Figure 13, the number of spelling variant tokens (every occurrence of identical variants is counted separately) increases steadily from 2–4 percent in 1850–1900 to 65 percent in 1300. The figure already suggests a (negative) correlation between date of origin and number of spelling variants in a document. Calculating the Pearson correlation coefficient with $X = (x_1, x_2, ..., x_n)$ being the dates of origin, $Y = (y_1, y_2, ..., y_n)$ the percentage of spelling variants and $(\bar{x}, \bar{y})$ the centroid of the data, we get a very strong decreasing linear relationship of $r \approx -0.95145$.

Since the distribution of the residuals is normal (cf. Figure 12), it is feasible to suppose a linear data regression $\hat{y}_i = \alpha + \beta x_i$. Figure 13 shows the calculated y-regression model with $\alpha = 2.0182$ and $\beta = -0.00106$. Regarding the coefficient of determination, it is possible to explain 90.52 percent of the sample’s variance, while the F-test with $q_{dist} = 9.5539 > q_F(1, 50, 95\%) = 4.03$ yields a relation between sample and model of greater than 95 percent significance. Minimizing to $X$, that is, the dates of origin, instead of $Y$, we can calculate $\hat{x}_i$ accordingly. The

**Figure 13.** Number of spelling variant tokens found in 54 historical German texts between 1293 and 1900.
regression \( \hat{x}_i = -847.02 + 1864.33 x_i \) allows for the prediction of a document’s date where the number of variant tokens is known. Its standard error of estimate \( \hat{\sigma}_{xy} = 49.85 \) accounts for \( \sim 50 \) years of error between the data and our estimation. The upper and lower bounds of the 95 percent confidence interval for \( \hat{x} \) are calculated by

\[
\hat{x} \pm t_{(1-\alpha/2)} \cdot 49.85 \cdot \left( \frac{1}{54} \cdot (x_i - 1635) \right)
\]

and range from \( \pm 32.14 \) years in 1300 to \( \pm 13.71 \) years in 1626 and \( \pm 23.50 \) years in 1850. To compare these findings to synchronous variation, we need a definition of temporal equality since we do not have enough documents from identical years. If we define a difference in the temporal origin of documents of less than one generation (that is, 25 years) as equality, it is possible to calculate empirical variance \( \bar{\sigma}^2 \) as well as standard deviation \( \bar{\sigma} \) for the occurring groups (cf. Table 7 and Figure 14). Using the given data and requiring a minimal group size of four items, we get seventeen groups of equal documents with four to eight members. The maximal standard deviation of 6.966 percent in the 16th century is noticeable but still surprisingly low. By the 19th century, synchronic factors (\( \bar{\sigma} < 1.6 \% \)) become negligible.

Our findings suggest that time indeed has a bigger influence on variation than synchronic factors. Therefore, metrics trained on diachronically clustered data should be superior to synchronic metrics.

Table 7. Empirical variance and standard deviation of synchronic document groups.

<table>
<thead>
<tr>
<th>Groups of document</th>
<th>( \bar{\sigma}^2 )</th>
<th>( \bar{\sigma} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years</td>
<td>#</td>
<td>%</td>
</tr>
<tr>
<td>1499-1514</td>
<td>4</td>
<td>25.055</td>
</tr>
<tr>
<td>1535-1560</td>
<td>6</td>
<td>48.528</td>
</tr>
<tr>
<td>1548-1568</td>
<td>7</td>
<td>46.313</td>
</tr>
<tr>
<td>1555-1579</td>
<td>8</td>
<td>36.621</td>
</tr>
<tr>
<td>1557-1581</td>
<td>8</td>
<td>32.679</td>
</tr>
<tr>
<td>1560-1581</td>
<td>7</td>
<td>20.654</td>
</tr>
<tr>
<td>1560-1581</td>
<td>6</td>
<td>16.301</td>
</tr>
<tr>
<td>1564-1581</td>
<td>5</td>
<td>17.135</td>
</tr>
<tr>
<td>1568-1581</td>
<td>4</td>
<td>16.734</td>
</tr>
<tr>
<td>1748-1763</td>
<td>4</td>
<td>20.934</td>
</tr>
<tr>
<td>1758-1776</td>
<td>4</td>
<td>19.463</td>
</tr>
<tr>
<td>1795-1820</td>
<td>6</td>
<td>2.494</td>
</tr>
<tr>
<td></td>
<td>1803-1820</td>
<td>1806-1831</td>
</tr>
<tr>
<td>------</td>
<td>-----------</td>
<td>-----------</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>2.039</td>
<td>2.343</td>
</tr>
<tr>
<td></td>
<td>1.428</td>
<td>1.531</td>
</tr>
</tbody>
</table>

**Figure 14.** Standard deviation of synchronic document groups.

It is interesting to notice that the diachronic standard deviation corresponds to general linguistic expectations. With the exception of the first group of synchronic documents, $\delta$ is (strictly) monotonically decreasing until 1564. Only in 1795 does it again reach the level that the prior slope suggested. This period (1564–1795) correlates noticeably with the Baroque, from ~1575–1770, a period well-known for its extensive spelling variation (‘Barocke Letternhäufelung’, cf. 2.2).

9. **Visualization as a means to ease evaluation**

Clustering data and using the clusters for the training of stochastic distance measures produces many different measures. Their relevance to the required retrieval tasks has to be evaluated separately. To speed up and ease the evaluation process, we propose options for visual support. The prototype we have developed is but one example of these options and is
meant to encourage scientists to benefit from visual information representation.

While planning the prototype, we also kept Shneiderman’s paradigm in mind: “Overview first, zoom and filter details on demand” (Shneiderman 1996). We employed multidimensional scaling (MDS) to display abstract distance in 2D space (see below). Interactivity is gained with the ability to select and remove spellings from the calculations, lower or raise cutoff frequencies and filters and even change replacement costs with instantaneous effect (see below). This led to a user interface separated into three main views:

- The **Histogram** allows an overview of thousands of data items. The selection of a certain portion of data triggers MDS and table views (cf. Figure 13).
- **Multidimensional Scaling** (MDS) functions as a detail view. Such visualization is used to display sets of several dozen to a few hundred items (cf. Figure 14).
- The **Table View** can display different levels of detail (cf. Figure 15).
- **Treemaps** (cf. Section 6) are another way to display details of single word derivations as an add-on for table views. We have not yet embedded them in our prototype for metric evaluation.

To acquire a first impression of how a spelling distance performs on a set of evidences, we calculate the distance between a spelling variant and the entries in a dictionary as described above, with one difference:

$$p @ n' = p @ n - \sum_{i=1}^{n-1} (p @ i)$$

The histogram provides a good representation of the overall performance of a spelling distance given for a set of test data. If a large number of spellings are found in the acceptable ranking range, if there are noticeable isolated outliers or if the values are spread widely over the whole interval, the user will quickly notice. In addition, histograms can be useful as tools for comparing different spelling distances. Usually, multiple histograms are viewed one after another or arranged next to each other. While this might be enough to perceive considerable differences in distributions, small-scale variations may pass unnoticed. An easy solution to this problem is to
arrange the different histograms in a combined display area where the relevant subinterval bars are lined up next to one another and made distinguishable by color or texture.

![Histogram comparison of three different distance measures.](image)

**Figure 15.** Histogram comparison of three different distance measures.

The *MDS view* displays smaller subsets, thus allowing further refinement while providing additional information detail. MDS is a class of statistical methods that has its roots in psychological research. The main application of such techniques is to assign the elements of an item set to a spatial configuration in such a way that it represents the elements’ relationships with as little distortion as possible. In this context, MDS can be used to arrange spellings in a two-dimensional space according to their spelling distances from one another. Every available dimension reduces the need for distortion but increases the difficulty of interpretation. Two or three dimensions are a good trade-off. This allows for an intuitive display of distances and clusters of spelling variants. It also makes it possible to discover distance anomalies. If this representation is provided with filtering features, it can be used to select subsets of elements quickly and comfortably. These subsets can then be displayed in detailed information views that would be too cluttered with greater numbers of items.
The task of this view is not to reconstruct the calculated distance perfectly but to uncover characteristics of the spelling distances and spelling sets used. These characteristics, such as clusters and outliers, usually outweigh the distortion that results from the conflict between the exact calculated distances between the items and their 2D spatial arrangement. This visualization approach is applicable to a wide variety of spelling distances as long as they provide a quantitative measurement of two spellings. There are no assumptions made about the distance value except that small values represent a high degree of similarity.

*Tabular views* display detailed results or interactively modify the replacement costs of the distance measure in use.
In Pilz et al. (2007a), we describe a cross-language comparison of English and German spelling variation. We noticed that – presumably because of their kinship – distance measures trained on German data can be successfully used to search historical English databases. Since a stochastic distance measure represents the variation of the data it was trained on, it can be employed to measure the degree of correlation between two data sets. The German distance measure that delivers the best results on English data should yield the most similar data to the English text. Since a manual comparison of multiple measures varying in number of training data and their origin (in our case, the time period) can cost a lot of time and work, it is an ideal setting for use of the Metric Evaluation Tool. We determined that German training data from the 13th to the 15th century is best suited to represent spelling variation in Shakespearean English. For more and more thorough examples, please see Pilz et al. (2007b).

10. Conclusion

In this paper we described the challenges one faces when digitizing printed text material. We especially examined the problems caused by OCR, transcription and the spelling variation involved with historical documents. The RSNSR project has been researching this topic for two and a half years now. Working with an archive for the reception of Friedrich Nietzsche as well as with fellow researchers from Great Britain and the Netherlands, we have developed a Java framework for fuzzy full-text retrieval on nonstandard texts based on letter replacement rules as well as string edit distances. Its two main purposes are to grant professional researchers and interested amateurs easier access to the store of knowledge residing in historical text documents and to support the deployment of such texts by means of computer science. Our particular goals are an – as far as possible
automatic process chain of evidence collection, training of stochastic distance measures and successful retrieval. The framework was applied to two search engines and also used in various prototypes of information visualization interfaces for retrieval, browsing and detailed examination of historical data. A by-product of our research was the Metric Evaluation Tool, another example of how information visualization can significantly ease the daily work of a researcher. We are therefore proposing increased usage of automation and visualization in linguistic research.

References


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Michaela Pörn

Psychophysical and Physical Causative Emotion Verbs in Finnish: The Temporal Structure of Causative Emotion Verb + Infinitive 1-Constructions within Conceptual Semantics

Abstract

The purpose of this article is to illustrate the differences between psychophysical (e.g. heikottaa, ‘feel weak’) and physical (e.g. janottaa, ‘be thirsty’) causative emotion verbs in Finnish by studying the factors that determine the temporal structure of the causative emotion verb + infinitive 1-construction. The focus, in other words, is whether the situation expressed by the infinitive 1 verb lasts as long as the situation expressed by the matrix verb, or whether the situation expressed by the infinitive 1 verb precedes or follows the situation expressed by the matrix verb. Moreover, the article shows why clauses such as Minua janottaa kävellä kotiin (‘It makes me thirsty to walk home’) do not sound natural in Finnish. It is shown that the temporal structure of a well-formed causative emotion verb + infinitive 1-construction is determined by the properties of both the infinitive 1 (the aspect of the verb) and the matrix verb (the semantics of the verb). Formal rules of grammar for the temporal structure of causative emotion verb + adjunct-constructions are constructed based on the framework conceptual semantics.

1. Introduction

This article deals with the differences between psychophysical and physical causative emotion verbs in Finnish (e.g. heikottaa, ‘feel weak’; janottaa, ‘be thirsty’) by studying the temporal structure of the causative emotion verb + infinitive 1-construction. I use the term infinitive 1 to mean the first infinitive form in Finnish. In traditional Finnish grammar there are morphologically four or five different infinitives (see e.g. Siro 1964; J. Leino 2003: 99–111).

The Finnish causative emotion verbs (fi. tunnekausatiivi, see e.g. Siiroinen 2001; Pörn 2004, 2007) differ from the curative causatives (fi.

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1 I would like to thank Urpo Nikanne, Geda Paulsen and Jaakko Leino for valuable discussions about problems related to this topic. I am also grateful to Rolf Palmberg for his corrections of the language of this article.
kuratiivikausatiivit, e.g. rakennuttaa, ‘to cause/make to build’) or factitives (the latter term is used in NS, the Modern Finnish Dictionary, see e.g. Kytömäki 1978 and 1989; Paulsen forthcoming), because they are syntactically of special character. The (most) central element in their argument structure is a human entity as the experiencer of the state of emotion that is syntactically not expressed as subject but as object, as Mattia in (1):

(1) *Matti-a pelo-tta-a.*
    Matti-PART be.afraid-CAUS-3SG.PRES
    ‘Matti is scared.’

Syntactically the Finnish causative emotion verb may also occur in connection with an element that expresses the cause for the state of emotion. This element can be expressed in the syntax as subject, as työ in (2):

(2) *Matti-a pelo-tta-a työ.*
    Matti-PART be.afraid-CAUS-3SG.PRES job.NOM
    ‘The job scares Matti.’

The clause in (2) is interpreted as follows: ‘The job causes that Matti feels scared’, i.e. the causing situation is the job, which is expressed in the syntax as subject, whereas the caused situation is the state of emotion, which is expressed in the syntax by the causative emotion verb *pelottaa*, ‘be afraid’. The temporal structure refers to the relationship in time between the causing and the caused situation.

The cause for the state of emotion or the causing situation can also be expressed as an adjunct clause or a clause complement in a subordinate clause, for example as a *kun* (‘when’) - clause (3), *että* (‘that’) - clause (4) and infinitive 1 complement (5):

(3) *Matti-a pelo-tta-a, kun hän mene-e*
    Matti-PART be.afraid-CAUS-3SG.PRES CONJ-when he-NOM go-3SG.PRES
    *töi-hin.*
    job.PLUR-ILLAT
    ‘Matti is scared *when* he goes to work.’

---

2 Adopting Jackendoff’s (2007) terminology, I use the term *situation* for both events and states.
PSYCHOPHYSICAL AND PHYSICAL CAUSATIVE EMOTION VERBS IN FINNISH

In Pörn (2004) it is shown that the causative emotion verbs are divided into two groups: compulsorily causative verbs (e.g. kaduttaa ‘regret’) and optionally causative verbs (e.g. janottaa ‘be thirsty’). For example in the clause Mattia janottaa (‘Matti is thirsty’), the state of emotion is understandable as such, and you do not have to assume there is a cause for the state of emotion. In the clause Mattia kaduttaa (‘Matti regrets’), on the other hand, you have to assume there is a cause for the state of emotion although it is not expressed in the syntax. The clause is semantically odd without a cause. Moreover, Pörn (2004) formally describes how the lexical differences of these groups of verbs reflect the interpretation of the clause complements (mentioned in sentences above) in the framework of conceptual semantics (see e.g. Jackendoff 1983, 1990; Nikanne 1990, 1995, 1997a–b, 2000).

In Pörn (2004) it is stated that the compulsorily causative verbs express mental emotions (e.g. kaduttaa ‘regret’), whereas the optionally causative verbs express psychophysical emotions (e.g. heikottaa ‘feel weak’) and physical emotions (e.g. janottaa ‘be thirsty’). The differences between compulsorily and optionally causative emotion verbs in connection with the infinitive 1 complement appear in such a way that the clause is generally semantically acceptable in connection with compulsorily causative verbs, as in (6), whereas the clause can be semantically odd in connection with optionally causative verbs. In Pörn (2004) it is shown that the infinitive 1 complement can be connected to psychophysical verbs, as in (7), but not to physical verbs, as in (8).

(4) Matti-a pelo-tta-a, ettää hän
Matti-PART be.afraid-CAUS-3SG.PRES CONJ-that he-NOM
mene-e töi-hin.
go-3SG.PRES job.PLUR-ILLAT
'Matti is scared that he might go to work.'

Matti-PART be.afraid-CAUS-3SG.PRES go-INF1 job.PLUR-ILLAT
'Matti is scared to go to work.'

(6) Matti-a häve-ttäää kävel-lää.
Matti-PART be.ashamed-CAUS-3SG.PRES walk-INF1
'Matti feels ashamed to walk.'
(7) Matti-a heiko-tta-a kävel-lä.
Matti-PART be.weak-CAUS-3SG.PRES walk-INF1
‘Matti feels weak to walk.’

(8) *Matti-a jano-tta-a kävel-lä.
Matti-PART be.thirsty-CAUS-3SG.PRES walk-INF1
‘It makes Matti thirsty to walk.’

This article provides answers to the following questions: (1) What are the factors that determine the temporal structure of the causative emotion verb + infinitive 1-construction? (2) What rules of grammar do clauses, such as (8), violate? To be able to explain semantically odd clauses, a cognitive grammar model that describes the interface between the lexical conceptual structure and the syntactic structure of the verb is needed. Therefore the theory adopted is conceptual semantics, which is based on formalization in its theory building and treating language as part of an integrated theory of mind (see section 2). The aim of this article is to construct formal rules of grammar for the temporal structure of the causative emotion verb + infinitive 1-construction.

The organization of the article is as follows: Section 2 is a brief summary of the theory of conceptual semantics as is relevant to the aims of this article. Section 3 shows the differences between psychophysical and physical verbs by explaining the factors that determine the temporal structure of the causative emotion verb + infinitive 1-construction. Section 4 concludes the article.

2. The Finnish causative emotion verbs in Conceptual Semantics

The goal of the theory of conceptual semantics is to find the optimal way of describing the human cognitive system in a way that explicitly explains the interface between different cognitive systems related to language. Conceptual representation of a word or Lexical Conceptual Structure (LCS) is understood as the level of understanding linguistic information, a link between the linguistic representations such as phonology, syntax and other cognitive domains (spatial, social, haptic knowledge etc.). (See e.g. Nikanne 1997a, 2006.) As Nikanne (1997c: 157–158) points out, it has been more or less a standard assumption in generative grammar that the interface between syntax and conceptual structure is a trivial one-to-one mapping from syntax to semantics, and thus the syntactic structures are assumed to contain plenty of semantic information about event structure
and thematic roles. Because the syntax and the semantics are separate representations, syntactico-semantic linking is a conceptual necessity (see e.g. Chomsky 1993, 1995; Jackendoff 1990; Nikanne 1997c: 158). In the framework of conceptual semantics, however, there is no trivial one-to-one mapping between syntax and conceptual structure. This article deals with the differences between psychophysical and physical causative emotion verbs in Finnish (e.g. *heikottaa* ‘feel weak’; *janottaa* ‘be thirsty’) by studying the temporal structure of the causative emotion verb + infinitive 1-construction. I use the term *infinitive 1* to mean the first infinitive form in Finnish. In traditional Finnish grammar there are morphologically four or five different infinitives (see e.g. Siro 1964; Leino 2003: 99–111).

In conceptual semantics, each constituent of a sentence is one of the major ontological conceptual categories, such as Thing, Event, State, Action, Place, Path, Property, and Amount (Jackendoff 1990: 22). In Jackendoff (2007) the categories Event and State are revised to appear as Situation. There are two major tiers in conceptual structure: the *thematic tier* and the *action tier* which operate with thematic roles (Agent, Theme, Location etc.) and action roles (Actor, Undergoer). The *action tier* is not relevant for the description of the causative emotion verb + infinitive 1-construction, and therefore it is left outside this article. The focus is on the structure of the thematic tier.

The thematic roles are determined in the conceptual structure. The lexicon is a part of the linking rule system. The conceptual structure is organized according to three zones that determine the order of the semantic functions (CAUSE, GO, TO, FROM etc.; see e.g. Jackendoff 1990; Nikanne 1990, 1995, 1997b). The organisation of the zones in table 1 is given by Nikanne (1997b: 83):
Table 1. Zones and semantic functions.

According to Jackendoff (1990), there are on a separate tier semantic fields that describe the cognitive backgrounds in which the events take place. The semantic fields Spatial, Mental, Physical, Temporal, Possessive, Identificational, and Existential are spread over the functions of zones 1 and 2, but not zone 3. Zone 3 has its own semantic fields. The most common ones are Physical, Social and Logical. (For the principles in zone 3, see Nikanne 1990: 100–122.) The state of emotion expressed by the causative emotion verb is described in the Mental, Psychophysical or Physical field (see section 3).

The causative emotion verbs have three potential syntactic arguments, because the LCS of the verb contains three functions: CAUSE, STAY and AT. The lexical function chain (f-chain) of the verb selects an Agent for CAUSE, a Theme for STAY, and a Place for AT. The Place is not expressed in the syntax, but it is implicit (see 10a). The selection is marked with arrows in the formal description.

As mentioned in section 1, the Finnish causative emotion verbs are divided into two groups: compulsorily causative (kaduttaa ‘regret’) and optionally causative (janottaa ‘be thirsty’) verbs. The LCS of the optionally causative verbs includes an optional CAUSE-function, whereas the LCS of the compulsorily causative verbs includes a compulsory CAUSE-function that has an optionally implicit cause argument. The implicitness index is marked with brackets that express optionality:

<table>
<thead>
<tr>
<th>ZONE 3 (causative zone)</th>
<th>ZONE 2 (thematic zone)</th>
<th>ZONE 1 (location zone)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAUSE</td>
<td>GO</td>
<td>AT, ON, IN, UNDER,…</td>
</tr>
<tr>
<td></td>
<td>BE</td>
<td>(place-functions)</td>
</tr>
<tr>
<td>INCII</td>
<td>STAY</td>
<td>TO, TOWARD, FROM, VIA,</td>
</tr>
<tr>
<td></td>
<td>EXT</td>
<td>AWAY-FROM (path-functions)</td>
</tr>
<tr>
<td></td>
<td>CONF</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MOVE</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Agent</th>
<th>Theme</th>
<th>Location, Goal, Source, Route</th>
</tr>
</thead>
</table>
LCS of optionally causative verbs: LCS of compulsory causative verbs:

\[
\begin{array}{c}
\text{[...]}^{l} \\
\uparrow \\
<\text{CAUSE}> \rightarrow \text{STAY} \rightarrow \text{AT}
\end{array}
\begin{array}{c}
\text{[...]}^{c>}
\\
\uparrow
\\
\text{CAUSE} \rightarrow \text{STAY} \rightarrow \text{AT}
\end{array}
\]

The CAUSE-function of the optionally causative verbs can be either present or absent. If the CAUSE-function is absent, the state of emotion expressed by the verb, can exist without a particular cause (10a). The CAUSE-function of the compulsorily causative emotion verbs, on the other hand, is always present, which means that some cause is always presumed. Although the cause is not expressed in the syntax, for example as subject (Mattia kaduttaa työnsä ‘Matti regrets his job’), it still exists implicitly (10b):

(10a)
Optionally causative verb:  
Matti-a₂ jano-tta-a₁.
Matti-PART be.thirsty-CAUS-3SG.PRES
‘Matti is thirsty.’

MATTI₂ FEELING²
↑
STAY₁ → AT₁

(10b)
Compulsorily causative verb:  
Matti-a₂ kadu-tta-a₁.
Matti-PART regret-CAUS-3SG.PRES
‘Matti is sorry.’

MATTI₂ FEELING²
↑
STAY₁ → AT₁

When describing the coindexing of the lexical conceptual structure and the conceptual structure I apply the notation suggested by Nikanne (2000). The index marked with numbers points to the linking between the words in the syntactic clause and the conceptual structure. All parts of the conceptual structure and the syntactic structure that are marked with the same index correspond to the parts of the lexical conceptual structure of the word that are marked with the same index. For example in the clause (10a), all parts of the conceptual structure that are marked with the index 1, correspond to the LCS of the verb jannottaa. The Theme MATTI that is marked with the index 2, corresponds to Mattia that is marked with the same index in the syntax. (See Nikanne 2000: 81.)

Jackendoff (1987) assumes that the LCS of the verb also includes the temporal tier (T-tier). Adopting Michotte’s (1954) terminology, Jackendoff (1990: 138) distinguishes between two types of temporal effects on causation: Entrainment describes causation that lasts as long as the caused
event (e.g. *Matti dragged the car down the road*) and *Launching* is a causation that is related to the starting point of the caused event (e.g. *Matti threw the ball into the lake*). Nikanne (1990: 190) gives a formal description of temporal tier relations of the *Entrainment* and *Launching*. The temporal effects on causation in Jackendoff (1990: 138) and Nikanne (1990: 190) are based on situations expressed within matrix clauses. In Nikanne (1997a) the formal description of the temporal tier relations is developed further. Nikanne (1997a: 344) suggests a separate temporal tier, the *constructional T-tier* or *CT-tier* that relates the temporal tier of a matrix clause to that of an adjunct. According to the theory of conceptual semantics, the T-tier of the matrix clause and the T-tier of the adjunct are separately linked to the CT-tier. The CT-tier itself has no exact structure but is a schematic notion. It is characterized only by the correspondence to a linear time course (see Nikanne 1997a: 344–345).

The formal descriptions of the temporal tier relations are developed further in Pörn (2004, 2007). Pörn (2004: 32–36) gives a more explicit formalization of the temporal relationship between the matrix clause and the adjunct clause by defining explicitly the starting point and the final point of each situation (the matrix clause and the adjunct clause). The following abbreviations are used:

(11) $P_s(M) / (A)$ ‘The starting point of the T-tier of the Matrix clause/Adjunct clause’

and $P_f(M) / (A)$ ‘The final point of the T-tier of the Matrix clause/Adjunct clause’

According to the formalization above the *Entrainment* and *Launching* causations can be described as follows:

(12) *Entrainment*: $P_s(M) = P_s(A)$ and $P_f(M) = P_f(A)$ (‘is equal to’)

(13) *Launching*: $P_s(M) \geq P_f(A)$ (‘is later than or equal to’) or $P_s(A) \geq P_f(M)$ (‘is later than or equal to’)

The option possibility in the *Launching* causation is based on whether the matrix clause or the adjunct clause is interpreted as the causing situation. The formal description made by Pörn (2004) can also be used to describe the causal and temporal relations within the matrix clause (see Pörn 2007). In Pörn (2007: 352–355) the *Entrainment* is formally described as follows: $P_s(\text{zone 2-1}) = P_s(\text{zone 3})$ and $P_f(\text{zone 2-1}) = P_f(\text{zone 3})$. The starting point of the causing situation in zone 3 is equal to the starting point of the caused situation in core zones 2 and 1, and the final point of the causing situation in zone 3 is equal to the final point of the caused situation in core
zones 2 and 1. The Launching, on the other hand, is formally described as follows: $P_s \geq P_f$, which means that the starting point of the caused situation in zones 2 and 1 is later than or equal to the final point of the causing situation in zone 3. Thus, the causing situation precedes the caused situation.

In section 3 it is shown how the differences between psychophysical and physical causative emotion verbs in Finnish can be explained by studying the temporal structure of the construction with focus on the aspect of the infinitive 1 verb and the semantics of the matrix verb.

3. Causative emotion verb + infinitive 1 -construction

3.1 The aspect of the infinitive 1 verb

The Infinitive 1 complement differs from other subordinated clauses in connection with causative emotion verbs mainly because syntactically it always appears as subject. The infinitive 1 complement must always be linked to the cause argument in the argument structure of the verb. The infinitive 1 complement cannot, like the kun (‘when’) clause and the että (‘that’) clause, occur outside the argument structure of the verb, as an adjunct (see Pörn 2004: 130–153). Secondly, the subject referent of the infinitive 1 is the same as the object referent of the whole structure. For example in the clause Mattia hävettää kävellä ‘Matti feels ashamed to walk’, both the subject of the infinitive 1 verb kävellä (Matti kävelee ‘Matti walks’) and the object of the matrix verb hävettää (Mattia hävettää ‘Matti feels ashamed’) refer to the same person, to Matti. In this construction the subject of the infinitive 1 verb always has the same referent as the object of the matrix verb. This is formally described as a binding relation: $X^a \ldots \alpha$ means ‘$X^a$ binds $\alpha$’ (see 14).

The infinitive 1 complement differs from other subordinated clauses or clause complements also regarding the temporal structure of the clause. In the causative emotion verb + infinitive 1 -construction the situations can on the one hand be simultaneous (Entrainment), as in (14). This means that the causing situation, the walking, lasts as long as the caused situation, the feeling of shame. On the other hand, the situation expressed by the matrix verb can precede the situation expressed by the infinitive 1 complement, as in (15): The caused situation, the feeling of shame, precedes the causing situation, the walking. Thus, the feeling of shame, cannot be caused by the concrete walking. It is only the thought of the upcoming concrete walking
that causes the feeling of shame. In Pörn (2004: 36) this temporal structure is therefore called *Hunch* (fi. *aavistus*) and it is formally described in (15). The starting point of the matrix verb is earlier than the starting point of the infinitive 1 complement.

(14) \[[Matti-a_2 \quad hāve-ττ-ā]_4 \quad kāvel-lā, \quad nyt]_6\]
Matti-PART be.ashamed-CAUS-3SG.PRES walk-INF1 now.ADV

‘Matti feels ashamed to walk now.’

\[
\begin{array}{c}
\text{α} \\
\uparrow \\
\text{f} > \text{1} \\
\uparrow \\
\text{CAUSE}_1 \rightarrow \\
\text{Physical} \\
\end{array} \\
\begin{array}{c}
\text{MATTI}_2 \\
\uparrow \\
\text{FEELING}_1 \\
\end{array}
\]

\[
\begin{array}{c}
\text{STAY}_1 \rightarrow \\
\text{AT}_1 \\
\text{Mental} \\
\end{array}
\]

*Entrainment*: \(P_s\) (zone 2-1) = \(P_s\) (zone 3) and \(P_f\) (zone 2-1) = \(P_f\) (zone 3)

(15) \[[Matti-a_2 \quad hāve-ττ-ā]_4 \quad \text{n}y\text{t}]_6\]
Matti-PART be.ashamed-CAUS-3SG.PRES now.ADV
\(kāvel-lā_3 \quad \text{huomenna}]_6\)
walk-INF1 tomorrow.ADV

‘Matti feels ashamed now to walk tomorrow.’

\[
\begin{array}{c}
\text{α} \\
\uparrow \\
\text{f} > \text{1} \\
\uparrow \\
\text{CAUSE}_1 \rightarrow \\
\text{Physical} \\
\end{array} \\
\begin{array}{c}
\text{MATTI}_2 \\
\uparrow \\
\text{FEELING}_1 \\
\end{array}
\]

\[
\begin{array}{c}
\text{STAY}_1 \rightarrow \\
\text{AT}_1 \\
\text{Mental} \\
\end{array}
\]

*Hunch*: \(P_s\) (zone 2-1) < \(P_s\) (zone 3)

The *Launching* or such a temporal structure where the situation expressed by the infinitive 1 complement precedes the situation expressed by the matrix verb is not possible in the causative emotion verb + infinitive 1 construction:
For example the meaning of the clause *Matti-a hävettää nyt se, että hän käveli kotiin eilen* (*Matti feels ashamed now that he walked home yesterday*), cannot be expressed by the causative emotion verb + infinitive 1-construction. The clause is anomalous. The infinitive 1 complement is syntactically more restricted than other subordinated clauses in connection with causative emotion verbs. This follows from the fact that a non-finite verb, like infinitive 1, cannot be conjugated in different tenses, as for example finite verbs in *kun* (*when*) and *että* (*that*)-clauses. Thus, the potential temporal structures of the causative emotion verb + infinitive 1-configuration are *Entrainment*: \( P_s (\text{zone 2-1}) = P_s (\text{zone 3}) \) and \( P_f (\text{zone 2-1}) = P_f (\text{zone 3}) \) and *Hunch*: \( P_s (\text{zone 2-1}) < P_s (\text{zone 3}) \).

The first question to be answered is: What are the factors that determine the temporal structure of the causative emotion verb + infinitive 1-construction? In the clauses (14) and (15), the temporal structure is determined by the temporal adverbs *nyt* (*now*) and *huomenna* (*tomorrow*). The temporal structure of the clause can also be determined by the aspect of the infinitive verb only. The aspect of the infinitive verb can be either an on-going situation, which is described as a region of time (R), as in the verb *kävellä* (*walk*) or a punctual situation, which is described as a point of time (P), as in the verb *lähteä* (*leave*). (C.f. the temporal description of the verb *lähteä* (*leave*) as a region of time described in Nikanne 1997a: 343–345.)

If the infinitive verb expresses an on-going situation, as *kävellä* (*walk*) in (17), the situations are strongly interpreted as simultaneous. The causing situation, the walking, lasts as long as the caused situation, the feeling of shame. If, on the other hand, the infinitive verb expresses a punctual situation, such as *lähteä* (*leave*) in (18), it is more probable that the clause has a reading in which the situation expressed by the matrix verb, i.e. the feeling of shame, precedes the situation expressed by the infinitive 1 complement, i.e. the leaving. The t-tier is as follows: The starting point of the matrix verb is earlier than the starting point of the infinitive verb. Thus, the caused situation precedes the caused. Therefore, it is only the thought of the upcoming leaving that causes the state of emotion, the feeling of shame.
I formally describe the principles for the temporal structure of the causative emotion verb + infinitive -construction using the following *Temporal structure* -rule, which is constructed based on the aspect of the infinitive verb.

**Rule 1: The temporal structure -rule:**
If condition (a) holds, then the temporal structure of the clause is *Entrainment*:

(a) T-tier (zone 3) is R
(a) \( \rightarrow \) *Entrainment*: \( P_s \) (zone 2-1) = \( P_s \) (zone 3) and \( P_f \) (zone 2-1) = \( P_f \) (zone 3)

(17) \([[[\text{Matti-a}_2, \text{h"a"ave-tt"a-"a}_1]_4, \text{k"avel-l"a}_5]_6.\]
Matti-PART be.ashamed-CAUS-3SG.PRES walk-INF1
‘[[Matti [feels ashamed]$_1$]$_4$ to walk$_5$]$_6$.’

\[
\begin{align*}
\begin{pmatrix}
\alpha \\
\uparrow \\
\text{f} > 1 \\
\uparrow \\
\text{CAUSE}_1 \rightarrow \\
\text{Physical}
\end{pmatrix}
& \begin{pmatrix}
\text{FEELING}^1 \\
\uparrow \\
\text{STAY}_1 \rightarrow \\
\text{Mental}
\end{pmatrix}
\end{align*}
\]

*Entrainment*: \( P_s \) (zone 2-1) = \( P_s \) (zone 3) and \( P_f \) (zone 2-1) = \( P_f \) (zone 3)

If condition (b) holds, then the temporal structure of the clause is *Hunch*:

(b) T-tier (zone 3) is P
(b) \( \rightarrow \) *Hunch*: \( P_s \) (zone 2-1) < \( P_s \) (zone 3)

(18) \([[[\text{Matti-a}_2, \text{h"a"ave-tt"a-"a}_1]_4, \text{l"a"hte-"a}_5]_6.\]
Matti-PART be.ashamed-CAUS-3SG.PRES leave-INF1
‘[[Matti [feels ashamed]$_1$]$_4$ to leave$_5$]$_6$.’
3.2 The semantics of the matrix verb

As shown in the preceding section the temporal structure of the causative emotion verb + infinitive 1-construction can be determined by the aspect of the infinitive 1 complement. In this section I will demonstrate that the temporal structure of the construction can also be determined by the semantics of the matrix verb. The second question to be answered is: Why does the clause Mattia janottaa kävellä kotiin ‘It makes Matti thirsty to walk home’, not sound natural in Finnish? What rule of grammar does it violate? We are aware of the fact that walking and other forms of physical exercise may cause thirst. Thus the clause Mattia janotti pitkä kävelymatka, ‘The long walk made Matti thirsty’, is semantically correct (20):

(19) *Matti-a jano-tta-a kävel-lä koti-in.
Matti-PART be.thirsty-CAUS-3SG.PRES walk-INF1 home.1SG-ILLAT
’It makes Matti thirsty to walk home.’

(20) Matti-a jano-tt-i pitkä kävelymatka.
Matti-PART be.thirsty-CAUS-3SG.PAST long.NOM walk.NOM
’The long walk made Matti thirsty.’

As can be seen in (19) and (20) the question about the clause anomaly in (19) does not concern the incompatibility between the meanings of the words, but rather the fact that the construction in question cannot be connected by the matrix verb janottaa (‘be thirsty’) and the infinitive 1 verb kävellä (‘walk’). A physical situation can cause another physical situation only if it precedes it. This means that the situation expressed by the infinitive 1 verb must precede the situation expressed by the matrix verb in (19). As already shown, this kind of temporal structure, i.e. Launching (16: *Mattia hävettää nyt kävellä kotiin eilen), is not possible.
Thus, one reason for this kind of clause anomaly is the syntactic restriction of the non-finite verb in the subordinated clause.

Another reason for this kind of clause anomaly is the fact that the temporal structure *Hunch* is not possible, either (see 22).

(21)  
\[
\text{Matti-a heiko-tta-a nous-ta.}  \\
\text{Matti-PART be.weak-CAUS-3SG.PRES get up-INF1}  \\
\text{‘Matti feels weak to get up.’}
\]

(22)  
\[
\text{*Matti-a yski-ttä-ä nous-ta.}  \\
\text{Matti-PART cough-CAUS-3SG.PRES get up-INF1}  \\
\text{‘Matti feels like coughing to get up.’}
\]

For example the clause *Mattia heikottaa nousa ylös* (‘Matti feels weak to get up’) probably has the reading that the state of weakness precedes the concrete rising. Thus, the coming physical situation, expressed by the infinitive 1 complement, cannot be interpreted as the cause for the state of emotion. It is only the thought of the upcoming physical situation that causes the state of emotion, i.e. it is the thought of the coming ‘getting up’ that causes the state of weakness. Because the state of weakness is caused only by the thought of the upcoming situation, the verb *heikottaa* (‘feel weak’) cannot be interpreted as purely physical. It must be interpreted as both physical and mental concurrently, or as psychophysical. The *Hunch* or such a temporal structure, where the situation expressed by the matrix verb precedes the situation expressed by the infinitive verb, requires that the causative emotion verb can be interpreted as mental.

If, on the other hand, the causative emotion verb expresses a purely physical state of emotion, as in the clause (22): *Mattia yskittää nousa ylös* (‘Matti feels like coughing to get up’), the clause is anomalous. This follows from the fact that a physical situation can cause another physical situation only if it precedes it. Thus, the causative emotion verb + infinitive 1-construction is semantically acceptable only in connection with mental or psychophysical, but not with purely physical causative emotion verbs. I formally describe the principles for a well-formed causative emotion verb + infinitive 1-construction using the following rule:

**Rule 2: The well-formed construction -rule:**

If conditions (c) and (d) hold, then the causative emotion verb + infinitive 1-construction is well-formed:

(c)  
\text{T-structure of the construction is: } \text{Entrainment}:
P_s (zone 2-1) = P_s (zone 3) and P_f (zone 2-1) = P_f (zone 3)
or
Hunch: P_s (zone 2-1) < P_s (zone 3)
(d) S-field (zone 2-1) is psychophysical or mental
(c) and (d) → well-formed construction

By connecting the temporal structure -rule and the well-formed construction -rule I formally describe the principles for the factors that determine the temporal structure of a well-formed construction as follows:

Rule 3: The temporal structure of a well-formed construction -rule
The temporal structure of a well-formed causative emotion verb + infinitive 1 -construction is determined by the properties of both (zone 3) and (zones 2 and 1):

If conditions (a) and (d) hold, then the Entrainment is well-formed:

(a) T-tier (zone 3) is R
(d) S-field (zone 2-1) is psychophysical or mental
(a) and (d) → Entrainment: P_s (zone 2-1) = P_s (zone 3) and P_f (zone 2-1) = P_f (zone 3)

If conditions (b) and (d) hold, then the Hunch is well-formed:
T-tier (zone 3) is P
S-field (zone 2-1) is psychophysical or mental
(b) and (d) → Hunch: \( P_s \) (zone 2-1) \(<\ P_s \) (zone 3)

\[
(24) \quad [[[\text{Matti-}a_2 \text{ heiko-tta-}a_1]\_t, \text{nous-tas}]_6.]
\]
Matti-PART be.weak-CAUS-3SG.PRES get up-INF1
‘[[Matti, [feels weak], t to get up, t]’

\[
\begin{array}{c}
\text{CAUSE}_1 \rightarrow \\
\text{Physical} \\
\end{array}
\begin{array}{c}
\text{FEELING}_2 \\
\text{Psychophysical} \\
\end{array}
\]

\[
\begin{array}{c}
\text{STAY}_1 \rightarrow \\
\text{AT}_1 \\
\end{array}
\]

The answer to the question why clauses like Mattia janottaa kävellä kotiin (‘It makes Matti thirsty to walk home’) do not sound natural in Finnish, is that neither Launching nor Hunch are possible temporal structures in this kind of clauses. This is a consequence of both semantic and syntactic restrictions of the construction. One restriction concerns the semantics of the matrix verb (i.e. causative emotion verb). Because a physical situation can cause another physical situation only if it precedes it, the only possible temporal structure is Launching, i.e. the situation expressed by the infinitive 1 must precede the situation expressed by the matrix verb. Irrespective of the semantics of the matrix verb, this kind of temporal structure, i.e. Launching, is syntactically not possible in the causative emotion verb + infinitive 1 -construction, because the non-finite verb in the clause complement cannot occur in different tenses. Thus, another restriction is syntactical. The Hunch, which means that the caused situation precedes the causing, requires that the causative emotion verb can be interpreted as mental. Thus, the Hunch is not a possible temporal structure, either, in the clause above because of the semantics of the causative emotion verb.
4. Conclusions

Potential temporal structures in the causative emotion verb + infinitive 1 -construction are *Entrainment*: $P_s$ (zone 2-1) = $P_s$ (zone 3) and *Hunch*: $P_s$ (zone 2-1) $<$ $P_s$ (zone 3). According to the temporal structure -rule (*Rule 1*), the temporal structure is determined by the aspect of the infinitive verb. If the T-tier of the infinitive verb is a region of time (R) (*Mattia heikottaa kävellä* ‘Matti feels weak to walk’), then the temporal structure of the clause is *Entrainment*. If, on the other hand, the T-tier of the infinitive verb is a point of time (P) (*Mattia heikottaa nousta* ‘Matti feels weak to get up’), then the temporal structure is *Hunch*. Thus, in the temporal structure -rule it is presupposed that the semantic field of the matrix verb is mental (e.g. *hävettää* ‘feel ashamed’) or psychophysical (e.g. *heikottaa*, ‘feel weak’).

The well-formed construction -rule (*Rule 2*) shows that clauses like *Mattia janottaa kävellä kotiin* ‘It makes Matti thirsty to walk home’ and *Mattia yskittää nousta ylös* ‘Matti feels like coughing to get up’ are not acceptable, because the semantic field of the matrix verb in both sentences is physical. This semantic field of the matrix verb requires that the temporal structure of the clause is *Launching*, which is not possible in this construction (see *rule 1*). Thus, the two sentences above break the well-formed construction -rule (see *rule 2*). Finally, the temporal structure of a well-formed causative emotion verb + infinitive 1 -construction is determined by the properties of both the infinitive 1 verb and the matrix verb (see *rule 3*).

References


Paulsen, Geda (forthcoming) Temporal and causal relations of Finnish deverbal causatives.


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Multi-word Prediction for Legal English Context: A Study of Abbreviated Codes for Legal English Text Production

Abstract

Here, we investigate using strings of expressions longer than a single orthographic word in English word prediction in the legal English domain. The goal of the kind of prediction strategy, called multi-word prediction, is to speed up performance of humans in text production by means of word prediction. Accuracy of two prediction techniques was preliminarily estimated on a simulation without using human subjects with the lexicon of 7,009 multi-word units of legal English. The results show that the average of 70% of characters can be saved for the units in the lexicon in the best-case performance. An improvement in performance actually gained with a real text mainly depends on length and token frequency of units predicted. We also show how the length of multi-word units predicted appear to be related to the code lengths used in their prediction and how this finding can be utilized to practical advantage in multi-word prediction.

1. Introduction

Mainstream typing assistant systems based on word prediction (e.g. WordQ) are mainly word-based. Such application programs aim at speeding up the performance of humans in text production by attempting to save both the number of characters/keystrokes (effort savings), or time required to type the text in (time savings). Usually, these applications process only one word token at a time by means of single word prediction. Along with single word tokens, however, texts also contain longer, more or less fixed, multi-word units such as collocations, semi-fixed phrases, idioms, lexical bundles (Biber et al. 1999), etc., which could also be looked up as single units in word prediction, resulting in greater effort and time savings, at least in theory.

1 This article contains text that has previously been published in a doctoral dissertation available in Acta Universitatis Ouluensis Series. A full reference is given in references.
In the present study, we preliminarily investigate the potential of *multi-word prediction* for achieving an improvement in performance in English word prediction in a specific domain, legal English. The term multi-word prediction means here finding sequences of words consisting of two or more tokens using word-initial characters as codes (search keys, abbreviations) for their prediction. Although word prediction systems are not primarily made use of in this domain, legal English contains many formulaic multi-word units suitable for an initial estimation of the maximum utility of multi-word prediction under optimal conditions, that is, the best-case performance for the type of prediction methods proposed here.

An approach such as this to word prediction is motivated by the fact that, according to Jackendoff (1997: 156), a major part of language, in fact, consists of multi-word units of some sort: in English, for example, the number of such units equals that of single words in a person’s lexicon. This is additionally confirmed by the contents of on-line lexical resources such as WordNet 1.7, for instance, where 41% of the entries are multi-word units of some sort (Villavicencio et al. 2005). To our knowledge, the performance of prediction methods tested here may not yet be reported in the literature, although the CHAT system presented in Alm et al. (1992) can be regarded as a precursor of a multi-word predictor. Some aspects of multi-word prediction, called *phrase prediction*, were also investigated in Väyrynen (2005) and Väyrynen et al. (2007).

More specifically, we are investigating a prediction strategy in which a user can retrieve or access strings of expressions longer than a single orthographic (phonological) word from a pre-registered set of such units by using word-initial characters as codes for their prediction. The prediction mechanism proper for finding units of this kind is based on *abbreviation expansion*, where any combination of initial characters of some tokens of the multi-word unit (not necessarily adjacent to each other) can be used as a code to access the units predicted.

As language users we are familiar with such abbreviations as ASR for expressions such as *automatic speech recognition*. It is the same kind of abbreviations the use of which is proposed here for multi-word prediction. Whether people are actually using codes of this sort in lexical access or retrieval of multi-word units, or more importantly, could learn to use them in accessing units of this kind in word prediction, is a psycholinguistic, empirical question that remains to be tested in further research.
To illustrate, to look up a two-word unit such as legal tender, for instance, the following codes consisting of word-initial characters could be used in prediction: l,le; lt, let, lete, etc. Along with the number of such units in English, an approach of this kind to multi-word prediction is additionally motivated by the fact that abbreviation expansion is known to be one feature of text inputting methods (one of which is word prediction) that is appreciated most by professional writers. As a consequence, it can be an asset in a practical prediction system assisting text production, especially if the prediction technique proposed turns out to be realistic enough for practical use. The net gain to a user of a prediction system of this type is the savings of efforts in terms of characters/keystrokes saved and the resulting time savings when using multi-word prediction, rather than writing the same units without the help of word prediction.

As usual in word prediction, some time will always be spent on finding the correct prediction on the word list (prediction list), where units matching a given code will be suggested to the user. The list of five units is used most often in practical prediction systems to minimise the time spent on finding the correct prediction on the list, still yielding relatively good character savings.

When using single initial codes such as pp for parliament president, for instance, the number of homographic codes matching more than one unit depends on the number of such units in the lexicon. In theory, the maximum number of two-word units predictable with 26 character alphabet in English using only one word-initial character as a code is 676 (= 26^2). As seen in Table 1, there are 5,698 two-word units in our lexicon of some 7,000 multi-word units of legal English, only 179 of which can be predicted using only one initial character of the two adjacent tokens as a code, e.g. lt for legal tender. In practice, a longer code containing two or more initial characters will have to be used in prediction.

In the empirical part, the performance of two prediction methods was investigated: one in which a user can type the first character of each word in a multi-word unit (e.g. pp for parliament president) and another, where the user types two letters per word (e.g. papr for parliament president). In longer multi-word units, however, as in legal conceptual definition, for example, the first (few) word-initial characters of any token of the unit can be used as a code; thus, leco or lede, for instance, could be employed in the above example. It should be noted that this is a more flexible way to use abbreviations than the similar procedure of abbreviation expansion.
available in word processors, where the abbreviations used must be predetermined and remembered for their use in practice.

As usual in word prediction experiments, evaluations of the two prediction scenarios investigated here were conducted on a simulation with a pre-defined set of multi-word units in the legal English domain without using human subjects. The results of simulation experiments thus imitate the typing performance of a perfect user who knows the shortest abbreviation or code for accessing a given multi-word unit. This was done to find out the maximum theoretical utility of the prediction techniques proposed here first. After that, we can estimate its practical utility with real texts and users, left for further research.

It should be noted that in order to use a practical prediction system with a multi-word prediction utility, the user is not expected to know beforehand the best possible code for finding a given unit, nor the exact contents of the lexicon of such units, for that matter. A system of this kind can still be useful to its users, regardless of the fact that the practical accuracy of multi-word prediction will naturally be somewhat lower than its theoretical performance due to the usage of less than optimal codes.

The structure of the remaining part of the article is as follows: first, word prediction will briefly be introduced in general terms in the following section. Both traditional prediction methods and multi-word prediction will then be dealt with in more detail, including our assumptions about multi-word prediction as an alternative prediction technique. Section 3 is concerned with evaluation protocols in word prediction and their limitations, followed by the empirical evaluation of two multi-word prediction methods in the following section.

The main issue of our preliminary results of the prediction experiments with multi-word units reported here is how to generalize from pre-stored abbreviations for stock phrases to a much more flexible and ad hoc kind of abbreviation expansion for multi-word units. We also test how the length of multi-word units predicted appears to be related to the code lengths (Figure 1) and how this finding could be utilized to practical advantage in multi-word prediction.

2. Word prediction

Word prediction can be used to aid text production by people experiencing various sorts of disabilities or physical or sensory restrictions. It can,
However, be also useful for any writer, especially in devices that do not feature full-sized keyboards.

It is, however, likely that the multi-word prediction strategy proposed here is more suitable for users without disabilities or breakdowns in writing ability. As a new application area for multi-word prediction, Langlais et al. (2002) suggest using it as an embedded utility in a machine translation system. The greatest technological challenge in word prediction is caused by the fact that it is only the left context that is available for the prediction of a word token (or a longer unit) in a given context of use, which unfortunately, is often insufficient for prediction purposes.

Current prediction systems exploit a language model, which attempts to capture regularities in natural language in order to improve the performance of a variety of practical language technology applications, including word prediction. As in many fields of use in present language technology, machine translation, document classification, and information retrieval, to mention only a few (Rosenfeld 2000: 1), it is the so-called \( n \)-gram language models that are typically made use of also in word prediction. The \( n \)-gram stands for a sequence of \( n \) consecutive items, which can be letters, parts of speech, or words.

A key issue in language modelling is smoothing (see e.g. Chen & Goodman 1996), handling the problem of sparse data (characteristic of natural language) when creating language models. By means of smoothing, statistical \( n \)-gram language models can be made more robust to alleviate the problem of non-occurrence of all possible word \( n \)-grams (or multi-word units) in the training corpus no matter how large it is. Since some of our most widely used techniques of language modelling, simple \( n \)-gram language models for one, have already reached their maximum limit of performance (Rosenfeld 2000), some new ways will have to be found for improving the accuracy of our future word prediction systems further. One alternative prediction method worth investigation is thus the prediction of multi-word units.

In what follows, a typology of word prediction methods will be presented; a more detailed survey of them can be found in Garay-Vitoria and Abascal (2006): word tokens can traditionally be predicted in two ways: in word completion, tokens are predicted by typing in one or more initial characters to the code.

Possible word tokens appropriate for a given context of use can also be predicted on the basis of the linguistic context of \( n-1 \) preceding tokens using \( n \)-gram language models (Cook & Hussey 1995). The two prediction
methods described above are the basic, well-established prediction techniques used (and investigated most thoroughly) in practically all modern (statistical) word prediction systems. Multi-word prediction, in its turn, is a newer prediction method, less thoroughly investigated, especially as outlined here.

To improve the performance of prediction systems further, other additional prediction techniques can also be made use of in the same prediction system. These include the so-called recency of usage (recency of mention, recency promotion) (Carlberger 1998; Swiffin et al. 1987), in which a larger history of preceding words, say, 40 tokens is considered in prediction. This prediction method, modeling the tendency of previously used words to recur within a given word history in the text due to anaphora, for example, can be quite effective in practice. For example, in an English corpus Rosenfeld (1996) analyzed, the best predictor of identical lexical repetition turned out to be the word itself in 65% of the cases; in 90% of the cases, the word itself was among the six best predictors. According to him, word tokens having the same stem are also good predictors of each other.

Besides recency promotion, another prediction technique employed in commercial word prediction at present is (intelligent) abbreviation expansion (McCoy & Demasco 1995), where a user defines abbreviations in the system’s set of abbreviations in advance. Every time the user types an abbreviation such as goo for good morning, the system simply replaces it by the original text. The example above represents one type of multi-word prediction which uses n-gram language models, predicting the rest of the unit from its onset. Abbreviations such as ASR for automatic speech recognition can also be used in the traditional abbreviation expansion. It would be interesting to know how the performance of this kind of multi-word prediction and the one proposed here will differ in practice. As mentioned above, the drawback of this method is, however, that the abbreviations will have to be predefined in the prediction system and remembered by the user for their usage.

It should be noted that this is not the case regarding the prediction strategy proposed here, where any combination of word-initial characters of some tokens of a multi-word unit can be used as a code more flexibly.

As for the performance of word prediction systems in general, known as their prediction accuracy, results reported in the literature appear to vary, dependent on text type, prediction method (or a combination of them), and the test corpus used. To illustrate, according to Matiasek et al.
(2002: 1), the percentage of keystroke savings of state-of-the-art prediction systems can be as high as 75% with more than one prediction method in the same system. For WordQ predictor, the keystroke savings rates varied from 37% to 53% with three test texts, containing 116,578 word tokens in all (Nantais et al. 2001). In Wood’s Windmill system (1996), the same rates varied between 30.4% and 55.1%, depending on text type and prediction algorithm. As reported in the literature, about 50% of characters/keystrokes can be saved on average in statistical state-of-the-art prediction systems, which, of course, does not equal the time savings achievable in text production by means of word prediction, discussed in more detail below.

It should be noted that single word prediction can serve the purpose of multi-word prediction as well. As a result, any multi-word unit, legal tender, for one, can always be predicted by means of single word prediction, word by word, i.e. by predicting the word legal first and after that tender. Given the frequency of occurrence of multi-word units in language in general, it could be assumed that predicting such units as one unit will improve the accuracy of word prediction systems further. What is more, similar units could naturally be predicted in any domain in many languages, provided that they are available in the lexicon.

3. Evaluation protocols in word prediction and their limitations

In order to evaluate a word prediction system or new prediction technique, both qualitative and quantitative evaluation is required in practice with real users representing the target user group. The former can cover a detailed analysis of the text produced by means of word prediction, for example. Accuracy of a prediction system is usually evaluated quantitatively by means of global measures of performance such as savings in keystrokes or characters (Wester 2003: 16). More often than not, however, as in this study, the performance of a perfect user is simulated in practice to estimate the accuracy of a prediction system objectively.

Regardless of their shortcomings such as hiding rather than displaying the details of the functioning of the prediction system (Väyrynen et al. 2007), simulations of word prediction performance with respect to effort savings obtainable are widely used in word prediction experiments and are practically useful for system development. For many, the real purpose of word prediction boils down to time savings achievable in text production by means of word prediction, however. Unfortunately, time savings are difficult to determine in practice due to many user characteristics, and are
usually estimated as a factor proportional to keystroke savings. (Garay-Vitoria & Abascal 2006: 197.)

As mentioned above, the results of various prediction experiments available in the literature are not directly comparable to each other. As a result, only a rough comparison can be made in practice because of a diversity of prediction methods available and lack of a standard workbench. (Garay-Vitoria & Abascal 2006: 196–197.) Moreover, factors not directly related to the quality of word prediction may also affect the results achieved, including differences among languages or different performance measurements employed, for example (Palazuelos Cagigas 2001). Also, what should actually be measured generally depends on the prediction scenario envisaged.

Regarding the strategy of multi-word prediction proposed here, we investigate the following aspects of its performance:

(1) effect of the length of multi-word unit predicted on the number of units that can be predicted, using either one or two word-initial characters of some tokens of the units as a code (section 4.3);

(2) accuracy of multi-word prediction under optimal conditions for a perfect user given as the average percentage of characters saved for the multi-word units included in the lexicon of 7,009 units of legal English (section 4.3);

(3) effect of the physical cost of one keystroke on the percentage of characters saved on average when manually selecting the prediction mode for multi-word prediction in the interface of a hybrid prediction system, with a multi-word prediction utility along with single word prediction (section 4.3);

(4) how the token frequency of multi-word units in text appears to affect savings in characters achievable by means of multi-word prediction. This part of the study is in part based on the findings of Erman and Warren (2000), who attempted to quantify the proportion of a sample of text that is accounted for by multi-word-like entries (section 4.4).

Another alternative would be to investigate multi-word prediction using n-gram language models. In that case, the user would type in a few characters
from the onset of the first token of the unit, e.g. go for *Good Morning*, as a code for prediction. This kind of prediction strategy was investigated by Eng and Eisner (2004) in another special field, the radiology report domain. An approach such as this to multi-word prediction was not chosen, however, because, for one thing, only one or more initial characters of the first token of a multi-word unit are typically employed as a code in this prediction method. For another, using a code of this type would also increase the number of matching units for units with the same premodifier. To illustrate, in our lexicon of multi-word units, the contents of which will be introduced in section 4.1, the adjective *legal*, for instance, appears in no less than 113 two-word multi-word units as a premodifier. As a result, in this case, there would be 113 possible units matching the code *leg*, for instance, in *n*-gram based prediction. We therefore opted for a more flexible prediction method, allowing the usage of any combination of initial characters for predicting multi-word units.

The main purpose of the research carried out here is to justify further research on an alternative prediction strategy. Therefore, the initial estimations of the average percentages of character savings given in section 4.3 are made very roughly, their shortcomings including the blindness to the visual-cognitive loads of using multi-word prediction due to finding the correct unit on the word list and heavy reliance on a perfect user (see Table 3, given as Appendix 1). In the future, we attempt to make more realistic estimations of the performance of multi-word prediction and study different aspects of it more thoroughly with real texts and users.

4. Empirical evaluation of two methods of multi-word prediction

Here we attempt to preliminarily estimate the potential of multi-word prediction for improving word prediction performance in English word prediction. Found useful enough, it could then be made use of as an alternative/additional prediction method alongside more traditional prediction methods for single word prediction in a hybrid prediction system, with separate prediction techniques for both single word prediction and multi-word prediction.

As regards multi-word prediction, an attempt is made to answer the following three research questions: (1) how should the prediction list be ordered for the best possible performance with respect to effort savings in multi-word prediction, (2) what factors appear to affect the performance of multi-word prediction, (3) what sort of character savings can be obtained
under optimal conditions in multi-word prediction? The research questions (1) and (2) are interrelated, of course. As mentioned above, two techniques of multi-word prediction will be tested: first, using one initial character of some token of the multi-word unit, second, using two initial characters per word, respectively.

4.1 Lexicon

In general, a language can have a great potential for multi-word prediction, at least in theory. This, on the one hand, depends on the number and kind of multi-word units which actually appear in a predicted text, on the other, the coverage of the lexicon of such units employed in prediction, that is, whether or not it contains (ideally all) or the majority of the units predicted appearing in the text representing a given genre.

In the present study, a set of 7,009 multi-word units of legal English was collected for prediction experiments proper. In all, the data file contains 15,737 word tokens; the number of word types being 3,314. The items selected represent a small subset of single words and multi-word units included in the entire *English-Finnish Law Dictionary* by Joutsen (1985). The main selection criterion for the units included in the lexicon was their length with respect to the number of word tokens they contain, roughly corresponding to the length of such units in the text predicted, with most units being short ones (Biber et al. 1999: 597; Erman & Warren 2000). We also wanted to have a fairly large collection of such units. Table 1 shows the distribution of units in the lexicon by their length by means of the number of words they include.

<table>
<thead>
<tr>
<th>Number of word tokens in a multi-word unit</th>
<th>Number of multi-word units in the lexicon</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>5,698</td>
</tr>
<tr>
<td>3</td>
<td>1,015</td>
</tr>
<tr>
<td>4</td>
<td>217</td>
</tr>
<tr>
<td>5</td>
<td>55</td>
</tr>
<tr>
<td>6</td>
<td>18</td>
</tr>
<tr>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>7,009</td>
</tr>
</tbody>
</table>
As seen in Table 1, most units consist of only two tokens (81.3%). The mean length of the unit is 2.25 tokens. The units chosen average 16.32 characters, including the white space between the words of the unit. The data file is arranged alphabetically. It should be noted that the results of the prediction experiments with multi-word units reported on below are highly genre-specific, representing legal language. Results in other application areas would certainly be very different.

4.2 Procedure

In all prediction experiments with multi-word units, it is assumed that a perfect user always knows the best possible code, i.e. the minimum number of word-initial characters for predicting a given unit. This is to determine the maximum prediction accuracy obtainable in multi-word prediction with our lexicon of multi-word units. Findings given in Figure 1 and Table 2 therefore result from trying all relevant codes and selecting the one that works best. For that purpose, we wrote a special algorithm for testing all possible codes in the prediction of individual units and selecting the one that best of them for their prediction. However unrealistic the above assumption may be in practice it, nevertheless, shows the best-case performance for the two multi-word prediction techniques tested here. After that, we evaluate what kind of prediction accuracy could be achieved in that kind of word prediction method with a real text with respect to the token frequency of multi-word units in the text predicted (see, section 4.4).

As mentioned, the performance of a word prediction system is usually quantitatively evaluated in terms of the number of keystrokes/characters saved in typing of text. The percentage of characters saved in multi-word prediction can be calculated as follows: let us define

\[ c = \text{the number of characters needed to predict a multi-word unit, including the internal blanks between the word tokens of a unit;} \]
\[ L = \text{the length of the unit, including internal blanks;} \]
\[ t = \begin{cases} 1 & \text{for multi-word prediction} \\ 0 & \text{for word completion} \end{cases} \text{this is the one keystroke spent in} \]
\[ \text{switching from word completion in single word prediction to multi-word prediction.} \]

Thus, we get \[ s = 1 - \frac{c + 1 + t}{L + 1}. \]
The quotient in the expression above is the percentage of characters required to type a multi-word unit. The one in the numerator represents either the one keystroke used in the selection of the multi-word unit or the white space typed by the user when the system cannot predict any such unit. The one in the denominator takes the automatically added blank into account. For multi-word prediction, \( t \) adds the one keystroke which is needed to toggle on multi-word prediction mode.

### 4.3 Savings in characters in multi-word prediction

Before estimating the character savings achievable on average under optimal conditions in multi-word prediction, we first investigate how the length of a multi-word unit may affect the number of units that can be predicted with a given prediction method. Figure 1 shows how multi-word unit length affects the number of (un)predictable units with the word list (prediction list) of one and ten units. Since using a word list of five units is unlikely to give any new information, this size was not used at all.

![Figure 1](image1.png)

**Figure 1.** Effect of prediction list size and code type on the percent of multi-word units that cannot be predicted.

Figure 1 indicates the percentage of multi-word units that cannot be found with a given code. As seen, for shorter units of two word tokens only, for instance, 96.6% (5,502) cannot be predicted at all using only one word-initial character as the code with the prediction list of one token; 17 can be predicted using one initial character as the code; and 179 can be
found using two initial characters as the code (the exact figures are derived from a larger table, a fraction of which is given here in Figure 1).

As seen in Figure 1, both prediction methods can be used to predict all multi-word units longer than three tokens with the prediction list of ten units, for which the number of units that cannot be predicted is zero. It should be noted, however, that the average length of the code is about one character shorter for the prediction method of one initial character with this list. This is also true of the prediction case with the list of only one item. However, this method cannot find all units. Unfortunately, there are rather few units longer than four word tokens in our lexicon of multi-word units (79 in all). The results above are not therefore very reliable statistically because of the lack of longer units in the lexicon. On the other hand, the distribution of the length of the units in our lexicon of multi-word units is probably typical, in the sense that the number of shorter units is larger than that of longer ones, also corroborated by the findings of Erman & Warren (2000: 40).

Based on the findings of Figure 1, “a mix of search techniques” appears to be the most efficient prediction method with respect to the length of the multi-word unit predicted: the user needs to type two word-initial characters of the first one or two tokens of the unit for shorter units consisting of two or three tokens. For example, the code leco could be used for legal competence. In that case, the code length is either two or four characters, respectively. For units longer than three tokens, the user can type in just one initial character of the first three adjacent tokens of the unit, for example, lca for letter containing an order. A further advantage of mixing the two prediction techniques is that it will also maximize the prediction accuracy achievable in multi-word prediction, that is, the average percentage of characters saved.

What is more, the length of the code could also be employed as a cue providing information on the type of multi-word unit predicted: the even number of characters in the code for predicting two-word units, the odd number for units longer than two words, respectively. The effect of including a special prediction mechanism of this kind for longer units on prediction accuracy was not tested, however.

Table 2, given as Appendix 1, shows what kinds of theoretical character savings in percentage terms were achieved with our lexicon of multi-word units for the given units by using the best prediction list order. It turned out that the best percentage of character savings was obtained by
ordering the prediction list by the length of the unit in terms of the number of word tokens they contain, from the shortest to the longest.

Only some of the matching units found with a given code will be shown to the user on the prediction list. Here, the term prediction list means the entire list of multi-word units that are consistent with what the user has typed to the code; the one or ten items that the user actually sees on the list will be a subset of this list. The finding of the length of the unit predicted as the best arrangement principle of the prediction list is consistent with results of prediction experiments for single word prediction reported in the literature, in Swiffin et al. (1987), for instance. Only the results for the best ordering principle of the prediction list will therefore be given in Table 2.

It should be noted that the cost of an extra keystroke for selecting the multi-word prediction mode prior to the prediction of such units is considered in all results of the prediction experiments with multi-word units presented in Table 2. In practice, this cost will lower the percentage of character savings for units predicted somewhat: without this cost, the average percentage of character savings will be seven percent points higher, i.e. 77%, with the same lexicon of multi-word units.

A few statistics are given in Table 2 for the distribution of the results. The most relevant of them are probably the mean percentage of character savings and the median. For each of the 7,009 multi-word units tested, the character savings percentage was calculated individually. As seen, Table 2 contains four columns. The first of them is the name of the statistic. The second one, a perfect user, stands for the prediction method yielding the best percentage of character savings for a perfect user. In practice, the prediction of shorter two-word units is based on the use of two word-initial characters, while that of longer ones on one initial character of some tokens of the unit. The third and fourth columns give the name of the prediction technique by means of which a given unit is predicted; in practice, using either one or two initial characters of some tokens included in the unit.

The main results can be summarized as follows: in the best-case performance, the maximum percentage of character savings that can be achieved for the set of 7,009 multi-word units of legal English as tested here is 70% on average.
4.4 Savings in characters in multi-word prediction with a real text

When evaluating an alternative prediction method, its theoretical prediction accuracy is only one type of evaluation that can be made: we also need to estimate its practical utility with a real text somehow. As mentioned above, the practical utility of multi-word prediction crucially depends on the number of multi-word units that actually appear in a given text, i.e. their token frequency.

Erman and Warren (2000: 37), who attempted to quantify the proportion of a sample of text that is accounted for by multi-word-like units, suggest that about 52.3% of the written texts they investigated was made up of pre-fabricated units of varying kinds. Of the nineteen excerpts of texts that they analyzed, between 40% to 60% consisted of ready-made, idiosyncratic combinations of word tokens, that is, of multi-word units of different type. As shown below, a token frequency like that would increase the average percentage of character savings obtained by the two methods of multi-word prediction tested here somewhat over 10% for the whole text.

Based on the analyses of the distribution of the multi-word units in English texts, we can now provide preliminary answers to questions such as the following: What kind of percentage of character savings will be required for the improvement of the prediction accuracy of the whole text in multi-word prediction, say, by 5–10% with respect to the accuracy of traditional prediction methods for single word prediction when predicting the same text with them?

The extent to which multi-word prediction can improve the total percentage of character savings in a hybrid prediction system with a multi-word prediction utility along with single word prediction can be calculated very roughly with the formula given below using the following values:

(1) maximum frequency of occurrence of multi-word units in a given text is 50%. That is, 50% of the tokens of the text appear in multi-word units of some kind;

(2) average percentage of characters saved for the same sequences of words by means of single word prediction is 50%, while in multi-word prediction, the percentage of character savings is 70% on average.

The values above are based on the findings of the token frequency of multi-word units in English texts by Warren and Erman (2000) and accuracy of
traditional \((n\)-gram-based\) prediction methods for single word prediction (about 50\% character/keystroke savings), as reported in the literature.

The average percentage of character savings with a mixed prediction scheme of multi-word prediction and single word prediction (word completion) can now be roughly calculated by the following formula:

\[
s_c = s_p p + s_w (1 - p),
\]

where \(p\) is percentage of words in multi-word units; \(s_p\) is average percentage of character savings in multi-word prediction, and \(s_w\) is average percentage of character savings in single word prediction, respectively.

Common values for the performance of the multi-word prediction and methods of single word prediction as tested in this article are \(s_p = 70\%\) and \(s_w = 50\%\). The maximum \(p\) in a given text may be 50\%. Thus, we get \(s_c = 60\%\). As a result, the multi-word prediction technique can enhance the average character savings by additional 10\% for the whole text in comparison to single word prediction under the most favorable conditions, where the coverage of the lexicon is complete for a perfect user who knows the shortest code for the prediction of the multi-word units.

When attempting to evaluate the utility of a prediction method, along with its (theoretical) accuracy in an idealized situation, we should also know how it may perform in practice with a given lexicon and real text. To do that, factors that will undermine the prediction accuracy possible to achieve in theory will have to be considered with respect to the type of savings aimed at (effort savings, time savings, or both) and the physical and visual-cognitive costs of obtaining them in practice. Regarding the latter, metalinguistic skills or memory skills, for example, required in lexical access in multi-word prediction should be considered.

In any kind of prediction system, the lexicon coverage is always incomplete to begin with. As a result, not all units appearing in the text predicted will also be available in the lexicon. If the user tries to expand a non-existing multi-word unit, the cost of the failed prediction may exceed that of predicting the same unit by means of single word prediction, word by word. In this case, the user will have to erase the old code and type in a new one for single word prediction.

It is possible, however, to reduce the cost of failed predictions due to non-existent units in the lexicon by means of interface design: the box where the code is written in the interface of a hybrid prediction system with a multi-word prediction utility can be designed, such that a new code can
be typed over the old one directly, as in some Windows applications, without erasing it first. Here, the one keystroke normally spent on erasing the old code will now be saved; saving just one character or keystroke may seem insignificant, but it can actually improve the percentage of characters saved for a given word token or a longer unit more than ten percent points.

Moreover, the number of homographic codes finding both single words and multi-word units when both of them are available in the same lexicon is likely to increase with a realistically large lexicon with (tens of) thousands of items. The rough estimations given in Table 2 will therefore no longer hold. Using larger lexica in prediction affects similarly the accuracy of all prediction techniques, of course, increasing the number of homographic codes, requiring the usage of longer, more distinctive codes in prediction.

Unlike in traditional single word prediction, there is also a need to switch between multi-word prediction and single word prediction in a hybrid prediction system with a multi-word prediction utility according to the appearance of single words and multi-word units in the text predicted. Based on the exact form of the code, however, such a prediction system can also anticipate somewhat the type of unit the user actually is trying to predict and, in these cases, can select an appropriate prediction mode automatically. For example, the code lete for legal tender would match the onset of no English word, and, if available, only matching multi-word units would be found from the lexicon, while lem for legal matter would also match the onset of single words such as lemming, lemon, and lemur. The extent to which the selection of an appropriate prediction mode can in practice be done automatically with a given lexicon of multi-word units and single words depends on the number of homographic (overlapping) codes in single word prediction and multi-word prediction, which was preliminarily investigated in Väyrynen et al. (2007).

5. Discussion

In the present study, we have preliminarily estimated the potential of multi-word prediction for improving performance in English word prediction as the average percentage of character savings in the best-case performance. For our purposes, this is the most natural metric – despite its shortcomings – because we want to estimate the maximum utility of multi-word prediction under the most favorable conditions first before evaluating its
practical usefulness more thoroughly with real texts and real users in the future.

One important contribution of the present study is how the code length relates to the length of multi-word unit predicted and how a mix of two prediction techniques appears to be the most efficient prediction technique for such units. What is more, the type of code in terms of even or odd number of characters it contains also provides information on what kind of multi-word unit will be predicted (short two-word unit or longer unit), simultaneously maximising the percentage of character savings achievable in multi-word prediction as well.

Somewhat unsurprisingly, the token frequency of multi-word units, not their type frequency, crucially matters in prediction. As shown, to be practically useful, the token frequency of such units in the text predicted will have to be 50% for performance to improve by just 10%, i.e. 50% of the words of the text will have to appear in multi-word units of some type. On the other hand, as shown by Erman and Warren (2000), token frequencies of multi-word units like that do occur in English texts. As a result, word prediction performance can be improved by means of multi-word prediction, at least somewhat, also in practice.

Along with legal English, multi-word prediction can be useful in other domains of use as well. Results of a few prediction experiments in other special application areas available in the literature appear to confirm this. Eng and Eisner (2004), for instance, found that an automated phrase completion feature improved considerably keystroke savings when generating radiology reports by means of word prediction, with a special prediction mechanism for phrases (cf. Foster et al. 2002).

Despite their practical utility in terms of effort or time savings, ideally both, the user friendliness of any prediction method is also important. As Lesher (2002) points out, significant keystroke/character savings can be achieved by using complex coding schemes. Unfortunately, such schemes are often impractical for human use. It is therefore likely that the most efficient prediction techniques may not be the most user-friendly ones. As regards the multi-word prediction strategy proposed here, a key question is the ease with which the user can retrieve a multi-word unit from his or her mental lexicon and formulate an appropriate code for its prediction.

Since so much language consists of multi-word units of some kind, it is likely that some way of accessing them is available in the mind of the user. In practice, usability testing is required to find out how to access them in the most user-friendly way. After all, what it is expected in a prediction
system is that it will be a valid help for message composition, (ideally) resulting in both effort and time savings when using it. Increasing the cognitive cost required of users to obtain a little enhancement of keystroke/character savings is dangerous for the acceptance of the prediction method proposed.

Along with effort savings, time savings are also important in text production with the help of word prediction, as mentioned above. As well as using a smaller prediction list, greater time savings can be gained by maximizing the expected savings in multi-word prediction by preferring the prediction of longer units instead of (many) shorter ones (Foster et al. 2002: 149). Unfortunately, as shown above, statistically speaking, the former are fairly infrequent.

The manner in which the predictions are sorted on the prediction list may also be relevant from the viewpoint of the time savings achievable in word prediction, for many the real purpose of word prediction (as it is for the maximal character savings achievable in multi-word prediction). Koester and Levine (1998) suggest that the reading of predicted tokens in sequence is less time consuming when the tokens are alphabetically ordered instead of being arranged by frequencies. One keystroke, of course, will always be spent on selecting the correct multi-word unit from the list no matter how the list is ordered.

As pointed out above, the results of the prediction experiments with multi-word units reported here represent the average percentage of characters saved in the best-case performance for a perfect user. The actual performance of a predictor with real users with real texts will always be lower than its theoretical accuracy, of course. This is partly because the user cannot always know the best possible code for finding a given unit, especially in a large lexicon. However, the length of multi-word unit appears to correlate quite well with the type of code that can be used for its prediction.

A prediction system with a multi-word prediction utility could contain a table similar to Table 1, showing the distribution of different units available in the lexicon with instructions for how to access them in the best possible way in prediction. This way, the percentage of character and/or time savings could be maximized. It should be noted that no statistical measures were used to rank the multi-word units predicted, only experiments with a few ordering principles of the prediction lists were carried out here. As a result, Table 2 only evaluates the theoretical character savings for the given multi-word units.
Given that the results of our prediction experiments with two multi-word prediction techniques are preliminary, possible avenues for further research include the following: (1) extent to which the multi-word prediction mode can be selected automatically based on the form of the code used in a hybrid prediction system with a multi-word prediction utility along with single word prediction; an attempt was made to answer that question in part in Väyrynen et al. (2007) already; (2) quantification of the difference in performance between the n-gram-based prediction method for multi-word units and the kind of multi-word prediction proposed here with the same test corpus, (3) issues of user interface and user-friendliness of different multi-word prediction techniques and the visual-cognitive loads involved in their usage with real users and texts.

6. Conclusions

In the present study, the potential of multi-word prediction for improving word prediction performance in English word prediction was investigated in the legal English domain. We showed that the two prediction techniques preliminarily tested here can improve the average percentage of character savings about 20% in comparison to single word prediction for a perfect user in the best-case performance. The character or time savings actually gained in practice with a real text crucially depend on the length and token frequency of multi-word units which appear in the text predicted and the way predictions are presented on the prediction list. We also commented on what kind of prediction list order can be used in multi-word prediction with respect to the effort and time savings possible to achieve and how the length of predicted units appears to be related to the code lengths used in prediction and how this correlation can be made use of to practical advantage in multi-word prediction.

References


Palazuelos-Cagigas, Sira E.; Aguilera-Navarro, Santiago; Rodrigo-Mateos, José L.;
Godino-Llorente, Juan I. & Martin-Sánchez, José L. (1999) Considerations on the
automatic evaluation of word prediction systems. In Filip T. Loncke, John
Clibbens, Helen H. Arvidson & Lyle L. Lloyd (eds.), Augmentative and
Alternative Communication: New Directions in Research and Practice, pp. 92–
Herman Moisl & Harold Somers (eds.), Handbook of Natural Language
Rosenfeld, Ronald (1996) A maximum entropy approach to adaptive statistical language
——— (2000) Two decades of statistical language modeling: Where do we go from
predictive communication aid for the physically handicapped. In Proceedings of
the Tenth Annual Conference on Rehabilitation Technology, pp. 124–126.
Villavicencio, Aline; Bond, Francis; Korhonen, Anna & McCarthy, Diana (2005)
Introduction to the special issue on multiword expressions: Having a crack at a
Väyrynen, Pertti (2005) Perspectives on the Utility of Linguistic Knowledge in English
Väyrynen, Pertti; Noponen, Kai & Seppänen, Tapio (2007) Analysing performance in a
word prediction system with multiple prediction methods. Computer Speech and
University, Department of Linguistics: Master’s Thesis.
Appendix

Table 2. Percentages of characters saved by ordering the multi-word units on the basis of the number of words separated by a blank, from the shortest to the longest.

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Perfect user</th>
<th>One word-initial character</th>
<th>Two word-initial characters</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>One multi-word unit</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min&gt;max</td>
<td>57.1%</td>
<td>0%</td>
<td>57.1%</td>
</tr>
<tr>
<td>Mdn</td>
<td>57.1%</td>
<td>0%</td>
<td>57.1%</td>
</tr>
<tr>
<td>M</td>
<td>42.8%</td>
<td>13.6%</td>
<td>41.1%</td>
</tr>
<tr>
<td>Average deviation</td>
<td>29.7%</td>
<td>22.3%</td>
<td>28.6%</td>
</tr>
<tr>
<td>SD</td>
<td>32.1%</td>
<td>29.1%</td>
<td>30.9%</td>
</tr>
<tr>
<td>Number of multi-word units not predicted</td>
<td>2,416</td>
<td>5,746</td>
<td>2,426</td>
</tr>
<tr>
<td><strong>Five multi-word units</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mdn</td>
<td>68.8%</td>
<td>0%</td>
<td>64.7%</td>
</tr>
<tr>
<td>M</td>
<td>64.9%</td>
<td>31.5%</td>
<td>61.0%</td>
</tr>
<tr>
<td>Average deviation</td>
<td>11.4%</td>
<td>36.5%</td>
<td>10.9%</td>
</tr>
<tr>
<td>SD</td>
<td>17.8%</td>
<td>37.2%</td>
<td>17.1%</td>
</tr>
<tr>
<td>Number of multi-word units not predicted</td>
<td>363</td>
<td>4,061</td>
<td>380</td>
</tr>
<tr>
<td><strong>Ten multi-word units</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mdn</td>
<td>72.2%</td>
<td>69.2%</td>
<td>66.7%</td>
</tr>
<tr>
<td>M</td>
<td>70.0%</td>
<td>44.8%</td>
<td>64.4%</td>
</tr>
<tr>
<td>Average deviation</td>
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<td>36.1%</td>
<td>8.7%</td>
</tr>
<tr>
<td>SD</td>
<td>12.4%</td>
<td>37.1%</td>
<td>13.0%</td>
</tr>
<tr>
<td>Number of multi-word units not predicted</td>
<td>109</td>
<td>2,823</td>
<td>141</td>
</tr>
</tbody>
</table>

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Résumé

Dans cet article nous allons revoir les définitions d’argument et d’adjoint, ainsi que les critères communément utilisés pour les différencier, que ce soit d’une perspective syntaxique que sémantique. Le problème se centrera spécialement sur le fait de décider du caractère actanciel des constituants non nucléaires dans la sémantique du verbe, constituants qui restent néanmoins étroitement liés à celle-ci. Il faut porter notre attention sur un nouveau paramètre dont il faut tenir compte lorsque l’on traite ces cas : le degré de fréquence d’apparition de ces constituants dans un corpus.

1. Introduction

On peut affirmer que parmi les différentes théories linguistiques il est communément dit et accepté que les arguments sont les constituants que requiert le verbe pour exprimer son signifié, tandis que les adjoints n’expriment pas de relation sémantique avec le verbe inhérente à sa propre sémantique.

Le problème de définition repose sur la question : comment interpréter le terme requérir ? En premier lieu, si cette reconnaissance implique une présence obligatoire au niveau de la syntaxe, les constituants de la phrase qui sont candidats au statut d’argument seraient peu nombreux. Si l’on accepte le fait que la présence d’un argument n’est pas obligatoire, alors la difficulté réside à faire la distinction entre les arguments optionnels et les arguments adjoints.

En second lieu, si cette reconnaissance est d’ordre sémantique, les limites qui permettent de dire quels sont les constituants verbaux qui ont une relation avec le signifié du verbe sont difficiles à établir dans certains

\footnote{1 Cet article s’inscrit dans l’ensemble des publications qui résultent du projet subventionné par le Ministère d’Education et Science ayant pour référence HUM2007–65267.}

cas. En effet, parfois certains constituants maintiennent un rapport sémantique étroit mais non indispensable avec le prédicat qu’ils complèmentent. C’est pourquoi la différenciation entre arguments centraux et arguments périphériques a parfois été établie (Fillmore 2003 ; Rojo 1983).

La question que nous nous posons est donc la suivante : doit-on réellement tenir compte de tous ces constituants au moment de consigner la structure argumentale des prédicats lors de leur entrée dans le lexique ?

Différentes études réalisées sur ce sujet ont révélé des évidences formelles au dé-là de la présence syntaxique des constituants afin de distinguer entre argument et adjoint. Néanmoins, comme nous le verrons dans la sous partie 2 ces évidences ne sont pas suffisantes. Il existe une option qui consiste à recourir aux différents examens édités sur la décomposition du signifié verbal ou bien à des examens qui combinent aussi bien la syntaxe que la sémantique. Dans ces cas non plus, les résultats ne sont pas entièrement satisfaissants (cf. sous titre 3).

La pratique en linguistique du corpus en ce qui concerne la différenciation entre arguments et adjoints montre que le problème soulevé au niveau théorique se maintient sur le plan de la mise en application. Ainsi, il existe différents projets d’annotation syntactico-sémantique dont l’une des différentes tâches menées à terme est celle d’identification des arguments dans les énoncés consignés. C’est le cas de Propbank et Framenet, pour la langue anglaise, et ADESSE, Framenet espagnol et SenSem pour la langue espagnole. Cependant nous sommes amenés à remarquer que dans tous ces projets, il existe un manque de critères bien définis au moment de prendre des décisions à ce sujet.

Le projet Propbank (Palmer et al. 2005), qui est la suite du projet Pen Tree Bank, a mené à terme l’annotation des constituants des rôles sémantiques figurant dans la phrase. Néanmoins, tels qu’ils le déclarent, leur intention n’est pas celle d’adopter une théorie linguistique en ce qui concerne la distinction entre arguments et adjoints, qu’ils dénomment modificateurs. Bien qu’ils établissent cette différence les critères utilisés pour l’établir ne sont pas clairs. Un numéro est donné aux arguments pour distinguer la fonction syntaxique. Ainsi, l’agent prototype est consigné comme l’argument 0, le thème ou patient est l’argument 1 et ainsi de suite. Certains constituants consignés comme Arg 3 sont considérés argumentaux de par leur apparition très fréquente. En plus de ces arguments numérotés,

roleset, et qui sont déclarés pour chaque verbe, les constituants restants qui apparaissent dans la phrase se consignent comme arguments modificateurs, et représentent sémantiquement des concepts primitifs tels que le lieu, le temps et la manière. Néanmoins, lors de la mise en pratique, on ne sait pas comment sont consignés les arguments qui n’expriment ni le lieu, ni le temps, ni la manière et dont la fréquence d’apparition est faible, comme l’instrument du verbe “construire” (construire) (cf. sous partie 4).  

Dans le projet Framenet (Subirats & Petruck 2003), on identifie et décrit les schémas sémantiques des verbes, qui sont des représentations schématiques des structures conceptuelles de ceux-ci. Le critère pour déterminer l’éventail argumental est principalement sémantique. Chaque schéma est dénommé et décrit par des rôles sémantiques exclusivement spécifiques à ce schéma et consigné sur une étiquette. La méthodologie de travail est la suivante. On détermine tout d’abord les différents schémas conceptuels et on les caractérise en fonction de leurs rôles spécifiques. En second lieu, on propose des listes de mots qui apparemment correspondent à ce schéma. Ensuite, on extrait du corpus les exemples de l’ensemble de la liste et on décrit les propriétés syntaxiques et sémantiques de ceux-ci, selon les phrases, de façon à ce que, pour chaque verbe on détermine sa valence verbale. Enfin, en dernier lieu on procède à la sélection d’exemples représentatifs pour chaque unité lexicale et on consigne les constituants avec l’information syntaxique et sémantique.

En ce qui concerne la distinction entre argument et adjoint dans le projet ADESSE (García de Miguel et al. 2005), les décisions qui ont été prises sur le projet précédent pour le développement de la Base de Données Syntaxiques (Rojo 2001) se sont maintenues. Par conséquence, les constituants qui sont considérés actanciels sont consignés sémantiquement. Dans tous les cas, tel qu’ils l’admettent (García de Miguel 2007), les critères n’ont pas été définis à priori pour décider du statut argumental des constituants des phrases consignées.

Dans le projet SenSem (Alonso et al. 2005), on a assumé que seuls sont des arguments les constituants exigés syntaxiquement et sémantiquement par le noyau verbal et en ce qui concerne le reste, ce ne sont que des adjoints. La décision en ce qui réfère au nombre et au type

3 Nous avons consulté l’annotation de ce verbe en anglais (“build”) dans le corpus de Propbank (http://www.cs.rochester.edu/~gildea/PropBank/Sort/) mais il n’apparaît aucun exemple dans lequel s’exprime ce constituant (accès : 27.06.2008).
4 Par exemple, pour le schéma de transfert, les éléments sont le donneur, le thème et le récepteur (recipient).
d’arguments s’est faite a priori pour chaque sens verbal. Pendant le processus d’annotation on a révisé, s’il a été nécessaire, les décisions prises antérieurement. Néanmoins, une réflexion plus générale s’impose afin de traiter de façon uniforme tous les cas posés.

Dans cet article nous nous proposons de montrer que la fréquence peut être une donnée d’intérêt au moment de décider de l’argumentalité des constituants. Nous partons du point de vue que les syntagmes qui exercent un rôle argumental devraient être fréquents, mêmes s’ils sont optionnels. Nous partons de la supposition que les constituants qui sont argumentaux et qui expriment la sémantique du verbe doivent avoir une représentation importante lors de la syntaxe. Nous comprenons alors, ainsi, que si la fréquence d’apparition est faible la relation sémantique entre le verbe et le constituant n’est pas très étroite. Par conséquent, nous ne sommes probablement pas face à un élément argumental.

Nous avons sélectionné un ensemble de constituants qui ont été choisis parce qu’ils sont spécialement problématiques. Dans la sous partie 4, nous comparerons les résultats obtenus à partir de la fréquence d’apparition de ces éléments selon les données d’un corpus tiré de l’espagnol. Nous présenterons les avantages et les inconvénients que l’utilisation du paramètre de fréquence dans l’identification de la structure argumentale d’un verbe implique. Dans la cinquième partie nous exposerons les conclusions finales du travail que nous avons mené.\(^5\)

2. **Examens syntaxiques**

Nous avons sélectionné six examens de type syntaxique à partir de leur importance dans la bibliographie consultée. Nous allons les décrire dans cette partie dans le but d’élucider le degré d’application et d’utilité de ceux-ci. Les six examens peuvent se diviser en deux groupes : ceux qui sont mis relation avec la possibilité ou la nécessité d’exprimer des constituants (sous partie 2.1) et ceux qui se basent sur la mise en application des transformations (sous partie 2.2).

\(^5\) Toutes les propositions utilisées dans cet article pour exemplifier des arguments présentés on été extraites du corpus SenSem, à l’exception de quand on indique le contraire.
2.1 L’expression des constituants : l’obligation, l’optionalité et la répétition

Si un constituant est obligatoire, il est nécessairement argumental. Dans le cas ou le constituant est optionnel, il y a différentes propositions pour déterminer son argumentalité, ce que nous verrons par la suite.

2.1.1 Obligation vs. optionalité

Comme on le sait déjà, dans les cas ou les constituants doivent être obligatoirement exprimés, ceux-ci sont impérativement considérés comme des arguments, cela, indépendamment de leur catégorie morphosyntaxique. Bien qu’en espagnol le sujet puisse être élimé, il y a toujours un référent du discours ou un référent extralinguistique évident (sauf dans le cas des verbes impersonnels), ce qui fait que ce constituant est obligatoirement considéré comme argumental.

De plus, dans certains cas, lorsque le constituant exprime l’instrument ou le moyen, il peut aussi avoir le rôle de sujet. C’est le cas des verbes “abrir” (ouvrir) et “denunciar” (dénoncer), respectivement.

(1) **Ruiz-Gallardón, cuyo discurso abrirá el congreso del PP, se mostró convencido de que los populares recuperarán la confianza de las urnas.** (Ruiz Gallardon, dont le discours ouvrira le congrès du PP, s’est montré convaincu que les partisans du Parti Populaire récupéreront la confiance pour voter.)

(2) **Si esta elección es tan general, como denuncian los estudios de audiencia, creo que el hecho debe de tener alguna razón lógica.** (Si ce choix est si général, comme le dénoncent les études d’audience, je crois que ce fait doit avoir une raison logique.)

Nous considérons, comme Levin 1993, que quand ces instruments n’apparaissent pas en position de sujet ils doivent également être considérés comme argumentaux (3, 4). Par contre, d’autres auteurs (García de Miguel 1995) pensent le contraire.

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Dans ce sens, nous nous éloignons de la distinction traditionnelle entre actants et circonstants basée sur la catégorie, en considérant que les premiers sont exprimés par des substantifs et les deuxièmes par des adverbes et des équivalents (Tesnière 1959).
3) Mstislav Rostropovich abrió con el Réquiem de guerra de Benjamin Britten esta muestra, que cerrará Jordi Savall el 1 de julio. (Mstislav Rostropovich a ouvert avec le Réquiem de guerre de Benjamin Britten ce festival, que Jordi Savall fera le 1er juillet.)


Il y a d’autres fonctions syntaxiques qui, selon le verbe, doivent toujours être exprimées. C’est le cas de la majorité des objets directs des verbes de changement d’état dans les phrases actives (5).

5) Este individuo y Miguel B. G. se fugaron el pasado 25 de mayo de Can Brians mientras arreglaban el jardín exterior de la cárcel. (Cet individu et Miguel B. G. ont fuit le 25 mai dernier de Can Brians pendant qu’on arrangeait le jardin extérieur de la prison.)

La même chose se produit avec ceux que l’on appelle objets prépositionnels ou objets de régime, comme avec le verbe “depender” (dépendre),7 ou avec certains constituants qui expriment le lieu. C’est le cas pour certains verbes dénommés verbes de trajectoire, tels les verbes “residir” (habiter, 7a) ou “acudir” (venir, 7b). On voit également quelques fois, par exemple pour le verbe “actuar” (actuer, 8), que les compléments adverbiaux qui expriment la manière sont obligatoires.

6) Los daños que pueden causar los virus informáticos dependen, en primer lugar, de su capacidad de dañar la información almacenada en un ordenador. (Les dommages que peuvent causer les virus informatiques dépendent, en premier lieu, de leur capacité à endommager l’information stockée dans un ordinateur.)

7a. Probanza nació en Zamora, pero reside desde hace 30 años en Vitoria. (Probanza est née à Zamora, mais il habite depuis 30 ans à Vitoria.)

b. Sin embargo, sólo un centenar de personas acudieron a estos recintos. (Cependant, une centaine de personnes seulement, sont venues dans ces installations.)

Dans les cas où ces verbes omettent ce complément (Demonte 1991) celui-ci est implicite de façon référentielle, comme nous l’avons vu dans le cas du sujet.
Il ne faut pas oublier de signaler que l’espagnol est une langue qui n’a pas un système clitique aussi élaboré que dans d’autres langues romanes. En espagnol, en effet, il est possible d’élider des arguments sans avoir besoin de les substituer par des pronoms, même si sémantiquement ils sont présents de façon référentielle. Ainsi par exemple, dans une phrase comme à l’exemple (9), même si syntaxiquement il se produit une éision de l’objet prépositionnel, en réalité il s’agit d’une omission de même nature que celle du sujet. Il y a ici un référent du discours ou un référent extralinguistique évident. \(^8\) Dans ce genre d’omission, comme le signale Gutiérrez (1997), on élide le fonctif mais non la fonction, ce qui fait que seul le plan du signifiant se voit touché et non celui du signifié ni le fonctionnel.

\(^9\) Dans ce cas, en récupérant le contexte de la nouvelle, on obtient l’élément élidé dans la phrase précédente : “El establecimiento de la fórmula del copago para gravar a las rentas más altas a la hora de adquirir medicamentos puede tener su lógica. Sobre todo si sirve…” (L’établissement de la formule du co-paiement pour graver les rentes les plus élevées au moment d’acquérir des médicaments peut avoir sa logique. Surtout si cela sert…)
Lorsque nous utilisons le terme *optionalité* nous ne faisons pas référence à l’acceptation du phénomène de l’ellipse, mais à un autre phénomène qui implique la généralisation de l’élément élidé, c’est-à-dire, l’absence d’un référent exact. On a appelé ce phénomène *infraspécification* (Vázquez et al. 2000) et il a été différencié du phénomène de l’ellipse (Fillmore 1986 ; Gutiérrez 1997). L’exemple type concerne certains objets directs et dans ce cas on parle d’*usage absolu* :

(10) a. De la Cruz explicó que, desde que fueron capturados, los retenidos solamente *habían comido arroz*. (De la Cruz a expliqué que, depuis qu’ils furent capturés, les détenus n’avaient mangé que du riz.)

b. Los padres de Víctor *estaban comiendo* en un restaurante del Port Olímpic. (Les parents de Victor étaient en train de manger dans un restaurant du Port Olympique.)

Cet élargissement du critère proposé par García de Miguel (1995) semble parfaitement fonctionner pour ce qui concerne la fonction d’objet direct (5), puisqu’un constituant qui joue cette fonction est toujours considéré argumental, même si l’usage absolu reste possible (10). Néanmoins, dans le cas des compléments des exemples (7) et (8), si nous admettions que dans les deux cas la fonction est celle de complément circonstanciel, ceci impliquerait que tous les compléments qui réalisent cette fonction seraient argumentaux. Cela s’éloigne assez de la réalité. C’est précisément cette fonction grammaticale qu’acquiert les adjoints aussi bien pour exprimer le lieu dans des verbes tels que “escribir” (écrire, ou l’expression de la manière pour les prédicats comme “vender” (vendre, 12).
(11) Está escribiendo **un diario en prisión**. (Il est en train d’écrire un journal intime en prison.)

(12) ...**los que venden directamente al consumidor**... (ceux qui vendent directement au consommateur)

Un autre exemple clair est celui des objets indirects. Il est évident, comme on l’observe dans les exemples suivants, qu’on ne peut pas les considérer tous comme argumentaux (Gutiérrez 1999). Ainsi semble-t-il que nous ne pourrions considérer comme tels que les cas de l’exemple (13a) mais pas les cas de (13b).

(13) a. **El texto acordado invita a los gobiernos a que concedan permisos de paternidad.** (Le texte établi invite les gouvernements à ce qu’ils concèdent des permis de paternité.)

b. **Resulta que se habría muerto el gato de una enfermedad fulminante, y decidieron enterrarlo en el jardín.** (Il s’avère que leur chat était mort d’une maladie fulminante, et ils décidèrent de l’enterrer dans le jardin.)

### 2.1.3 Sous-spéécification

D’autres auteurs, comme Levin (2005), considère qu’une condition inhérente à un argument serait qu’il ne puisse apparaître plus d’une fois dans la phrase. Il faut tenir compte du fait que lorsque l’on se réfère au processus de sous-spéécification, il serait possible qu’un argument soit plus d’une fois représenté. Ce processus se produit de façon habituelle avec les constituants qui expriment le lieu ou le temps. Ce dernier est représenté dans l’exemple (14).

(14) **El espectáculo comienza el viernes a las 21h.** (Le spectacle commence vendredi à 21 heures.)

En ce qui concerne ce phénomène, il faut citer aussi le cas des dénommés **shadow arguments** (Pustejovsky 1995). Ce sont des arguments optionnels clairement argumentaux d’autant plus qu’ils sont inclus formellement dans le verbe par un procédé morphologique de dérivation. Un exemple en est celui du verbe “vivir” (vivre), qui présente une relation morphologique avec “vida” (vie). Dans ces cas cet argument ne peut apparaître que sous la
forme de constituant s’il apparaît sous-spécifié (à savoir, si l’objet s’exprime à partir d’un hyponyme (15a) ou s’il s’accompagne d’un complément qui le spécifie (15b)).

(15) a. La ciudad de Lleida volvió a vivir este fin de semana la fiesta de origen popular más multitudinaria que se celebra en la capital del Segrià. (La ville de Lleida à de nouveau vécut ce week-end la fête populaire la plus fréquentée qui se célèbre dans la capitale du Segrià.)

b. Sin vida estoy por vivir la vida que estoy viviendo.12 (Sans vie je suis disposé à vivre la vie que je suis en train de vivre.)

Il faut dire que la frontière entre ces cas et celui appelé d’usage absolu n’est pas justifiée (Vázquez et al. 2000). Ainsi, dans les exemples comme ceux de “comer” (manger) que nous avons traité précédemment (10) nous sommes aussi face à un phénomène de sous-spécification : le terme “arroz” (riz) est un hyponyme de “comida” (nourriture) et celui-ci marque une relation morphologique avec le verbe. Dans tous les cas, il est question d’arguments susceptibles d’être omis comme constituants vu que le verbe les inclus lexicalement et donc, s’ils s’utilisent, ils doivent être sous-spécifiés.

2.2 Mise en application des transformations

Dans ce qui suit, nous allons présenter trois des examens que Gutiérrez (1999) considère valables pour pouvoir décider du caractère argumental des constituants. Ces trois études ont en commun le fait qu’ils se basent sur des transformations : à partir de la phrase dans laquelle apparaissent le verbe et ses compléments des substitutions ou des dérivations sont appliquées.

12 Exemple extrait du corpus de l’Espagnol : www.corpusdelespanol.org (accès : 30.06.08).
2.2.1 La proforme “hacerlo” (le faire)

D’après ce critère, si on remplace le verbe et les compléments par la proforme “hacerlo” (le faire), nous considèrerons argumentaux les constituants qui ne peuvent pas co-apparaître avec celle-ci :

(16)  a. Hay un proverbio chino que dice: “Dadle un caballo a un hombre que dice la verdad, porque lo va a necesitar para huir”. (Il y a un proverbe chinois qui dit : « Donnez un cheval à un homme qui dit la vérité, parce qu’il en aura besoin pour fuir ».)

b. Hacedlo. (Faîtes-le.)

c. *Hacedlo un caballo. (*Faîtes-le un cheval.)

d. *Hacedlo a un hombre que dice la verdad. (*Faîtes-le à un homme qui dit la vérité.)

Cet examen, comme l’auteur l’avertit, présente des problèmes d’application vu que seuls les verbes agents peuvent s’y soumettre. Bien que le nombre de verbes qui appartiennent à cet ensemble soit considérable, un important sous-ensemble de prédicats restera en dehors, par exemple, tous les verbes de sentiment.

2.2.2 Dérivés verbaux

Le point de départ de Gutiérrez (1999) dans ce cas est que, comme les dérivés verbaux conservent la valence des verbes, ils admettront comme compléments les mêmes arguments que le verbe, et aucun autre.

(17) a. Morán (...) agradeció el “esfuerzo de contención” hecho por los dirigentes del guerrismo. (Morán ... remercia l’effort de contrôle fait par les dirigeants du “guerrismo”.)

b. El agradecimiento de Morán por el “esfuerzo de contención” hecho por los dirigentes del guerrismo. (Le remerciement de Morán pour l’effort de contrôle fait par les dirigeants du “guerrismo”.)
Cet examen, tel que le reconnaît l’auteur, est limité par le fait que les verbes n’ont pas tous des correspondances nominales. De plus, nous aimerions ajouter qu’il semble que d’autres compléments qui prévisiblement ne sont pas argumentaux peuvent s’exprimer à côté d’un nom déverbal indépendamment de son caractère argumental. C’est ce qui arrive dans la phrase suivante, où le substantif admet aussi la présence d’un syntagme prépositionnel (SP) qui indique le lieu :

(18) *El agradecimiento* de Morán *en el miting* por el “esfuerzo de contención” hecho por los dirigentes del guerrismo. (Le remerciement de Morán lors du meeting pour l’“effort de contrôle” fait par les dirigeants du “guerrismo”.)

2.2.3 Les participes

D’après cet examen, lorsque l’on forme une construction avec le participe du verbe, le même nombre d’arguments se maintient.

(19) a. *La Iglesia quiere que le financien las obras*. (L’église veut qu’on lui finance les travaux.)

b. *Las obras financiadas a la Iglesia*. (Les travaux financés pour l’Église.)

Cet examen concret ne peut être utilisé dans tous les cas. En effet, parfois la construction du participe est impossible car le verbe en question n’a pas d’objet direct pour devenir le sujet de celle construction. Ainsi, cette étude ne pourrait pas s’appliquer dans une phrase comme dans l’exemple (20), dans le but d’élucider si le SP introduit par la préposition “por” (par), de caractère optionnel, doit être considéré ou non comme argumental.

(20) *Volvemos al “village” por el embarcadero de los saludos*. (Nous retournons au “village” par l’embarcadère de bienvenue.)

13 Nous présentons le nom précédé du participe pour obtenir une construction de participe absolu à fin d’avoir une phrase plus acceptable, même si elle n’est pas la construction type.

14 Les verbes intransitifs de type ergatif, comme “llegar” (arriver), peuvent participer à cette construction vu le caractère d’argument interne de son sujet.
D’autres fois, même s’il existe un objet direct, la construction du participe qui en résulte semble assez forcée, comme on peut l’observer à l’exemple (21) :

(21) a. *Le consiguieron enseguida renombre*. (Ils lui ont aussitôt obtenu un renom.)

b. *Renombre conseguido enseguida (a él).* (Renom obtenu aussitôt (à lui.).)

### 2.2.4 Considérations générales

La critique des examens présentés va au delà de ce qui a été exposé au niveau individuel. Lorsqu’on applique toutes ces transformations à des constituants douteux par rapport à leur statut argumental, de même qu’à des constituants dont le statut est clair, les résultats que l’on obtient dans les deux cas sont normalement les mêmes.

Ainsi, si on applique l’examen du dérivé nominal à un constituant qui exprime le moyen dans une phrase comportant le verbe “viajar” (voyager), nous observons que celui-ci, qui peut être argumental par son importance sémantique dans la scène, l’est effectivement (22b). Mais nous obtenons le même résultat quand on applique la même règle à un adverbe de manière qui accompagne un verbe comme “accéder” (accéder, 23b), ou à priori il semble que la manière de réaliser l’action ne doit pas être considérée argumentale.¹⁵

(22) a. *En la embarcación viajaban 43 varones, que pasaron a disposición de la Policía Nacional.* (Dans l’embarcation voyageaient 43 hommes qui sont passés à disposition de la Police Nationale.)

b. *El viaje en embarcación.* (Le voyage en embarcation.)

(23) a. *La atracción, que funcionará hasta el 15 de septiembre, tendrá una superficie de 42 metros cuadrados y podrá albergar a un máximo de 75 personas, que podrán acceder a ella gratuitamente.* (L’attraction, qui fonctionnera jusqu’au 15 septembre, aura une superficie de 42 mètres carrés et pourra accueillir un maximum de 75 personnes, qui pourront y accéder gratuitement.)

b. *El acceso a la atracción gratuitamente.* (L’accès à l’attraction gratuitement.)

¹⁵ Les mêmes résultats s’obtiennent en appliquant l’étude du participe à d’autres verbes, puisque dans les exemples présentés la construction de participe n’est pas possible.
Il ne faut pas oublier de signaler que ces critères, non seulement ne sont pas efficaces lorsque l’on doit différencier un argument d’un adjoint de forme individuelle (nous venons de le voir dans le cas de la démonstration de la dérivation nominale), sinon qu’en plus ils peuvent présenter entre eux des contradictions une fois étudiés les résultats obtenus lors de l’application de chacun d’eux. Ainsi par exemple, l’examen de la proforme “hacerlo” (le faire) donne des résultats négatifs par rapport à l’argumentalité dans les deux types de compléments cités. En effet, tel qu’on peut l’observer à l’exemple (24), une fois réalisée la substitution, cette proforme ne remplace en aucun des deux cas les compléments en question, ce qui implique qu’ils devraient être considérés comme non argumentals.

(24) a. Lo hacían en la embarcación. (Ils le faisaient sur l’embarcation.)

b. … un máximo de 75 personas, que lo harán gratuitamente. (un maximum de 75 personnes, qui le feront gratuitement.)

3. Examens sémantiques

Nous avons pu vérifier que les critères syntaxiques ne sont pas suffisants et que, dans certains cas, ils ne servent pas pour différencier les arguments et les adjoints. C’est pour cette raison qu’il est nécessaire de disposer d’examens d’une autre nature qui nous permettraient de vérifier le caractère argumental du reste des compléments.

Nous verrons que la différence entre arguments et adjoints par rapport à des critères sémantiques n’est pas exempte de problèmes, surtout parce que les résultats obtenus dans certaines propositions peuvent être remis en question. Dans cette section, nous allons revoir quatre examens que nous avons réunis dans la bibliographie et nous allons observer quels sont leurs avantages et leurs inconvénients. Nous allons diviser les quatre critères en deux groupes : ceux qui concernent la décomposition sémantique (sous partie 3.1) et ceux qui renforcent l’examen sémantique ayant une base syntaxique (sous partie 3.2).
3.1 Les critères de décomposition sémantique

Dans cette sous partie nous allons examiner deux méthodologies assez similaires pour la délimitation des arguments verbaux. Dans un premier cas, il s’agit d’identifier ces arguments lors de la définition du verbe (sous partie 3.1.1) et dans un autre cas, lors de la scène cognitive que celui-ci évoque (sous partie 3.1.2).

3.1.1 La définition lexicographique

Le premier critère que nous allons présenter est utilisé dans les projets SenSem et ADESSE partant de la tradition lexicographique lorsque l’on considère que les participants inclus à la définition ont été considérés argumentaux. Dans chacun des cas cela a été fait de façon différente. Dans SenSem, comme les rôles des arguments ont été prédéfinis, les définitions verbales sont reformulées pour inclure l’expression de ces rôles, au cas où ils n’apparaîtraient pas. Dans ADESSE par contre, la définition est utilisée pour décider si un cas précis est argumental ou non.

Les deux pratiques présentent des faiblesses et cela, toujours autour du même problème de fond. Si les arguments nucléaires sont toujours présents dans la définition d’un verbe et sont ceux qui ne présentent pas de problèmes au moment de leur attribuer leurs rôles d’actants, les participants moins centraux, par contre, peuvent apparaître ou non dans la définition du verbe. Par conséquent, cette étude ne permet pas de décider du caractère argumental de ces constituants. Il faut signaler que dans le cas où, lors de l’application d’autres critères, on considère que ces participants sont argumentaux, nous considérons que d’un point de vue méthodologique, il est recommandable que ceux-ci apparaissent dans la définition.

3.1.2 La scène cognitive

Un autre critère de nature strictement sémantique et qui est également utilisé pour identifier les arguments d’un verbe part d’un présupposé cognitif. Il est considéré que les constituants argumentaux sont ceux qui sont obligatoires sémantiquement, c’est-à-dire, ceux qui sont inhérents à la scène désignée (le potentiel des valences selon Agel 1995 et Vater 2003).
De nouveau, la question que l’on se pose est la suivante : quels sont les participants considérés sémantiquement obligatoires en ce qui concerne les constituants nucléaires ?

Il faudrait remarquer que le concept d’obligation sémantique varie d’un auteur à l’autre. Pour Koenig et al. (2003) ces participants qui sont évoqués nécessairement dans la scène entrent dans cette catégorie indépendamment du fait qu’ils soient plus ou moins nucléaires. Par contre, pour García de Miguel et al. (2005) ce sont ceux sans quoi le processus désigné est inconcevable.

3.2 Les critères syntactico-sémantiques

Les critères que nous allons analyser dans cette partie sont essentiellement de nature sémantique. Néanmoins ils s’appuient sur la syntaxe lors de l’argumentation, que ce soit par la considération de la possibilité d’expression syntaxique des arguments (sous partie 3.2.1) ou de certaines transformations diathétiques (sous partie 3.2.2).

3.2.1 La spécificité des arguments

À partir du critère de la spécificité, présentée par Koenig et al. (2003), on considère comme argumentaux les constituants qui sont particuliers à un verbe ou à une catégorie de verbes. Selon ce critère, les constituants qui peuvent apparaître avec la grande majorité des verbes ne sont pas candidats à être argumentaux. Comme on peut s’en apercevoir ce critère est en principe de nature sémantique, de sorte qu’il se base sur la caractérisation sémantique verbale, mais il reste conditionné par la possibilité d’expression syntaxique.

Koenig et al. (2003) considèrent comme probables toutes les combinaisons entre le critère de l’obligation sémantique (présenté dans le 3.1.2) et la spécificité. Selon eux, on pourrait se confronter aux situations énoncées ci-dessous :

– qu’un constituant ne soit ni sémantiquement obligatoire ni spécifique à une catégorie, comme c’est le cas des constituants qui expriment le bénéficiaire de l’action ;
– qu’un constituant soit sémantiquement obligatoire, mais non spécifique à une catégorie, comme c’est le cas pour le temps et le lieu ;
– qu’un constituant ne soit pas sémantiquement obligatoire, étant néanmoins spécifique à une catégorie comme le sont les participants qui expriment la force ou la cause, participants qui provoquent un changement d’état ;
– qu’un constituant soit sémantiquement aussi bien obligatoire que spécifique à une catégorie, comme c’est le cas des participants qui expriment l’agent ou l’être qui réalise l’action de façon intentionnée ou qu’il soit aussi l’instrument avec lequel on réalise l’action.

Pour ces auteurs, nous ne pouvons considérer comme argumentaux que les participants qui remplissent les deux conditions, celles énoncées en quatrième position sur la liste. Selon cette approximation, les constituants qui expriment le temps, le lieu ou le bénéficiaire ne peuvent jamais être considérés argumentaux puisque après étude ces participants sont considérés sémantiquement obligatoires pour plus de 80 % des verbes qu’ils analysent (environ 4.000 verbes de l’anglais) et, donc, ils ne sont pas spécifiques à une catégorie de verbes.

Néanmoins, le temps, le lieu et le bénéficiaire peuvent parfois avoir un statut nucléaire, ce qui se reflète dans la syntaxe où ils sont obligatoirement exprimés. C’est ce qui se produit pour le participant qui exprime le lieu dans certains verbes de déplacement comme “ir” (aller, 25a) ou de changement de position comme “poner” (mettre, 25b).

(25) a. Los expertos policiales van casi todos los días al garaje para reconstruir la escena. (Les experts policiers vont presque tous les jours au garage pour reconstituer la scène.)

b. … se celebrará el “Dia del Comerç al Carrer”, en el que los comerciantes pondrán carpas en la calle. (On célébrera le “jour du commerce dans la rue” où les commerçants installeront des chapiteaux.)

En ce qui concerne le temps, nous pouvons aussi trouver des verbes qui nécessitent sémantiquement ce participant avec emphase spéciale comme c’est le cas pour le verbe “empezar” (commencer). Bien que dans ces cas l’expression du temps puisse être optionnelle, s’il n’apparaît pas

16 Selon nous, tel que nous comprenons la cause, celle-ci est effectivement spécifique de catégories sémantiques déterminées, comme celle des prédicats de changement d’état.
syntaxiquement, il a un référent défini et il est clairement récupérable par le contex. 

Quant au bénéficiaire, nous considérons que l’objet direct en lui-même du verbe “beneficiar” (bénéficier, 26), à caractère obligatoire, est un exemple clair de ce type de rôle. Nous ajoutons aussi parmi les bénéficiaires le sujet d’un verbe comme “recibir” (recevoir, 27) :

(26) …la sentencia beneficiará ahora a cerca de 80 vecinos… (la sentence bénéficiera à présent 80 voisins environ)

(27) Los clientes reciben una papeleta de voto por cada consumición. (Les clients reçoivent un bulletin de vote pour chaque consommation.)

Dans le cas du lieu, nous pouvons trouver aussi des cas où l’expression de ce rôle n’est pas syntaxiquement obligatoire. Nous parlons des phrases où l’origine, le destin ou d’autres participants concernant les points de déplacement sont évoqués par la scène et, donc, ils sont considérés nucléaires du point de vue sémantique, mais ils sont rarement exprimés (28).

(28) Este policía, considerado un testigo clave para las acusaciones, está enfermo y no puede desplazarse. (Ce policier, considéré comme un témoin clef pour l’accusation, est malade et ne peut pas se déplacer.)

Nous aimerions citer également le cas des objets indirects bénéficiaires des verbes de changement de possession, tel que “ceder” (céder, 29). Bien qu’ils ne soient pas de caractère obligatoire, ils sont communément acceptés comme argumentaux.

(29) Las autoridades no sólo han cedido gratis unos angares del muelle para el rodaje. (Les autorités n’ont pas seulement cédé gratuitement quelques hangars du quai pour le tournage.)

Ainsi donc, il semble que nous ne puissions affirmer non plus que les participants qui jouent le rôle de bénéficiaires, comme le temps et le lieu, ne peuvent être argumentaux.

17 Des auteurs comme Horno (2002) ne partagent pas le fait de considérer argumentaux ces participants, car ils considèrent que ces verbes ne lexicalisent pas une location interne. On trouve dans Cuadros (2005) une critique à cette proposition.
3.2.2 L’équivalence sémantique des arguments avec catégorie syntagmatique différente

Nous aimerions souligner un dernier critère, selon lequel les constituants sémantiquement équivalents à d’autres considérés comme argumentaux (García de Miguel 1995), sont eux aussi considérés comme argumentaux. Pour cet auteur ce critère est applicable sur deux sens. D’une part, celui des verbes synonymes qui ont différents schémas de sous-catégorisation, comme il en est le cas pour “recordar” et “acordarse” (se souvenir) dans l’exemple (30), ou bien d’autre part, celui d’un verbe qui permette le croisement d’arguments déterminés, comme il en est pour “cargar” (charger, 31) :

(30) a. ¿O es que nadie recuerda los decenios que nos costaba ganar una simple Liga de fútbol?

b. ¿O es que nadie se acuerda de los decenios que nos costaba ganar una simple Liga de fútbol?

(Ou personne ne se souvient de combien il nous coûtait gagner une simple Ligue de football?)

(31) a. Ha cargado el camión con paquetes. (Il a chargé le camion de paquets.)

b. Ha cargado paquetes en el camión. (Il a chargé des paquets dans le camion.)

Dans l’exemple (30) les verbes “recordar” et “acordarse” (se souvenir) sont synonymes mais ils présentent chacun différentes sous-catégorisations : SP, dans le premier cas, et SN dans le second. D’un autre côté, à l’exemple (31) le verbe “cargar” (charger) présente une alternance dans SV avec un croisement argumental (Levin 1993) : dans l’exemple (31a) le SV inclut comme compléments “camión” (camion) et “paquetes” (paquets) exprimés par un SN et un SP, respectivement, tandis que dans l’exemple (31b) le premier mot est le noyau d’un SP et le second configure un SN.

Suivant le critère exposé, le SP de l’exemple (30b) comme ceux des exemples (31a) et (31b) sont argumentaux puisqu’ils sont équivalents aux SN des phrases (30a), (31b) et (31a), respectivement, qui eux le sont incontestablement. Selon l’auteur le problème repose sur le fait que ce critère est applicable à un nombre très réduit de cas. Ainsi, il rejette l’idée
que ce critère soit applicable à des arguments de type bénéficiaire ou
instrument, néanmoins nous ne partageons pas toutes ces restrictions. En
effet, l’instrument exprimé avec un SP peut aussi apparaître en position
syntaxique en tant que sujet et, donc, comme SN, à de nombreuses
occasions (cf. sous partie 1.2).

4. La fréquence vue comme un paramètre de différenciation
de l’argumentalité

Une fois analysés les différents types de critères qui s’utilisent pour
différencier des arguments et des adjoints, nous pouvons conclure que ces
critères sont valables dans leur application pour détecter les constituants
centraux et nucléaires dans l’action décrite par le verbe. Cependant, ils
présentent de petites failles lors de leur utilisation en tant que critères
généraux pour élucider des cas discutables : ceux qui frôlent la frontière de
l’argumentalité. Quant à l’examen strictement sémantique, la difficulté
principale consiste en une application objective des critères. En ce qui
concerne l’application des critères sémantiques s’appuyant sur la syntaxe,
les résultats obtenus sont distincts : soit les résultats sont discutables soit
nous nous apercevons que ce sont des critères dont l’application reste
limitée.

Après toutes ces informations, nous ne croyons pas qu’il soit possible
d’appliquer ces critères de façon valable au-delà de l’obligation syntaxique.
En effet, il semble que personne ne puisse démentir le caractère argumental
d’un constituant qui s’exprime obligatoirement. D’autre part, bien qu’un
constituant puisse être élimé, parfois il est présent référentiellement, comme
c’est le cas du sujet en espagnol ou d’autres fonctions de certains verbes
(cf. sous partie 2.1). Cette optionalité n’est donc en réalité qu’apparente :
s’ils ne permettent que ce genre d’élimion ils ne doivent être considérés que
comme argumentaux.

Dans le reste des cas, c’est-à-dire, pour les constituants vraiment
optionnels, nous pensons qu’un des critères qui pourrait servir serait celui
qui se baserait sur la fréquence et qu’un seuil limite pourrait être défini,
seuil en dessous duquel on devrait parler de constituants à “nucléarité”
faible. Notre hypothèse de départ est que, pour un élément qui ne serait pas
syntaxiquement obligatoire mais qui s’avèrerait être sémantiquement très
lié au verbe, sa présence dans un corpus devrait être importante. C’est ce
qui arrive avec les objets directs de verbes tels que “comer” (manger),
comme nous avons pu l’observer dans le corpus SenSem. Dans les 67
phrases consignées pour ce verbe dans ce corpus, ce syntagme apparaît dans 80,59 % des cas. Seules 13 phrases ne l’ont pas. Voyons d’autres cas similaires à “comer” (manger) dans le tableau suivant. Dans tous les cas, même si le pourcentage n’est pas aussi élevé, il est suffisamment représentatif étant donné qu’il n’existe qu’un seul cas qui soit inférieur à 50 %.

**Tableau 1.** Fréquence d’apparition dans le corpus SenSem des constituants jouant le rôle de thème et de destinée et prévisiblement considérés comme argumentaux.

<table>
<thead>
<tr>
<th>Rôle</th>
<th>Verbe</th>
<th>Nombre de phrases du sens</th>
<th>Nombre de phrases avec le rôle</th>
<th>Pourcentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>thème</td>
<td>comer (manger)</td>
<td>67</td>
<td>54</td>
<td>80.59 %</td>
</tr>
<tr>
<td>thème</td>
<td>vivir (vivre)</td>
<td>21</td>
<td>15</td>
<td>71.42 %</td>
</tr>
<tr>
<td>but (destinée)</td>
<td>dar (donner)</td>
<td>37</td>
<td>20</td>
<td>54.05 %</td>
</tr>
<tr>
<td>but (destinée)</td>
<td>facilitar (faciliter)</td>
<td>38</td>
<td>18</td>
<td>47.36 %</td>
</tr>
</tbody>
</table>

D’autre part, nous pensons qu’il faut considérer comme n’étant pas sémantiquement nucléaire un constituant qui ne serait pas syntaxiquement obligatoire et dont l’apparition dans le corpus serait faible. C’est ce qui arrive avec le complément de moyen de transport dans un verbe comme “viajar” (voyager). De 96 phrases consignées pour ce verbe dans le corpus SenSem, seulement 3 incluent ce type de constituants, ce qui représentent 3,13 % des phrases. Dans le tableau 2, on voit d’autres données sur la fréquence semblables à celles du participant moyen de “viajar” (voyager) pour des constituants que l’on pourrait également considérer au départ comme faisant partie de la scène cognitive évoquée par le prédicat. Tel qu’on peut le voir, dans aucun des cas présentés le pourcentage trouvé ne dépasse 10 %.
Tableau 2. Fréquence d’apparition dans le corpus SenSem des constituants jouant le rôle d’instrument, de moyen, d’origine et de destinée, et prévisiblement considérés argumentaux.

<table>
<thead>
<tr>
<th>Rôle</th>
<th>Verbe</th>
<th>Nombre de phrases du sens</th>
<th>Nombre de phrases avec le rôle</th>
<th>Pourcentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>moyen</td>
<td>viajar (voyager)</td>
<td>96</td>
<td>3</td>
<td>3.13 %</td>
</tr>
<tr>
<td>instrument</td>
<td>construir</td>
<td>78</td>
<td>1</td>
<td>1.3 %</td>
</tr>
<tr>
<td>origine</td>
<td>acceder (accéder)</td>
<td>78</td>
<td>4</td>
<td>5.13 %</td>
</tr>
<tr>
<td>but (destinée)</td>
<td>recorrer (parcourir)</td>
<td>90</td>
<td>7</td>
<td>7.78 %</td>
</tr>
</tbody>
</table>

Si nous comparons les données des deux tableaux nous pouvons conclure que les constituants susceptibles d’être élidés peuvent avoir une présence plus importante ou moindre selon les cas. Et nous pouvons ajouter qu’il est envisageable que cela ait une relation avec leur relevance en tant qu’éléments argumentaux. Après observation, même si nous n’osons pas établir un pourcentage approprié pour parler d’argumentalité, il semble que nous puissions affirmer que les compléments du tableau 1 ont un statut argumental beaucoup plus notable que ceux du tableau 2.

Il faut signaler malgré tout que nous sommes conscients que ces informations peuvent varier d’un corpus à l’autre. De fait, dans le cas des participants de destinée reliés aux verbes tels que “hablar” (parler) ou “decir” (dire), verbes de communication pour lesquels ce participant est probablement un argument prototypique, les données présentées dans le tableau 3 nous amèneraient à supposer que le constituant exprimant ce rôle n’a pas de place dans la structure argumentale de ces prédicats. Néanmoins, nous signalons que l’on peut penser que ces données ne sont pas totalement valables si l’on tient compte du fait que le corpus SenSem est journalistique et qu’il existe donc une certaine justification sur le fait que l’omission du destinataire est spécialement fréquente.
Tableau 3. Fréquence d’apparition dans le corpus SenSem du constituant jouant le rôle de destinée dans des verbes de communication.

<table>
<thead>
<tr>
<th>Rôle</th>
<th>Verbe</th>
<th>Nombre de phrases du sens</th>
<th>Nombre de phrases avec le rôle</th>
<th>Pourcentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>but (destinée)</td>
<td>decir (dire)</td>
<td>100</td>
<td>13</td>
<td>13 %</td>
</tr>
<tr>
<td></td>
<td>hablar (parler)</td>
<td>69</td>
<td>2</td>
<td>2.89 %</td>
</tr>
</tbody>
</table>

Nous pourrions en dire de même des données présentées dans le tableau 2. En effet, par exemple, dans un corpus sur la construction, il est probable que l’instrument soit plus fréquent que ce que l’on indique dans ce tableau.


<table>
<thead>
<tr>
<th>Rôle</th>
<th>Verbe</th>
<th>Pourcentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>desplazarse (se déplacer)</td>
<td></td>
</tr>
<tr>
<td>manière</td>
<td>10/86</td>
<td>11.62 %</td>
</tr>
<tr>
<td></td>
<td>descubrir (découvrir)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5/77</td>
<td>6.5 %</td>
</tr>
<tr>
<td></td>
<td>pensar (penser)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6/73</td>
<td>8.22 %</td>
</tr>
<tr>
<td></td>
<td>escuchar (écouter)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10/100</td>
<td>10 %</td>
</tr>
<tr>
<td></td>
<td>crear (créer)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9/77</td>
<td>11.69 %</td>
</tr>
<tr>
<td>lieu</td>
<td>15/90</td>
<td>17.27 %</td>
</tr>
<tr>
<td></td>
<td>9/77</td>
<td>11.69 %</td>
</tr>
<tr>
<td></td>
<td>11/77</td>
<td>15.99 %</td>
</tr>
<tr>
<td></td>
<td>19/100</td>
<td>19 %</td>
</tr>
<tr>
<td></td>
<td>15/90</td>
<td>15.99 %</td>
</tr>
<tr>
<td></td>
<td>21.11 %</td>
<td></td>
</tr>
<tr>
<td>but (finalité)</td>
<td>20/86</td>
<td>23.26 %</td>
</tr>
<tr>
<td></td>
<td>14/90</td>
<td>15.56 %</td>
</tr>
<tr>
<td></td>
<td>19/100</td>
<td>19 %</td>
</tr>
<tr>
<td></td>
<td>15/90</td>
<td>15.56 %</td>
</tr>
<tr>
<td></td>
<td>21.11 %</td>
<td></td>
</tr>
<tr>
<td>temps</td>
<td>22/100</td>
<td>22 %</td>
</tr>
<tr>
<td></td>
<td>24/86</td>
<td>27.91 %</td>
</tr>
<tr>
<td></td>
<td>15/90</td>
<td>21.11 %</td>
</tr>
<tr>
<td></td>
<td>22/100</td>
<td>22 %</td>
</tr>
<tr>
<td></td>
<td>27.17 %</td>
<td></td>
</tr>
</tbody>
</table>

D’un autre côté, l’hypothèse présentée se renforce si nous tenons compte du fait que souvent la fréquence de certains adjoints peut être plus importante que celle des constituants qui sont parfois plus proches
sémantiquement de la situation décrite. Dans le tableau 4, nous avons consigné la fréquence d’apparition des éléments considérés adjoints et dans tous les cas, sauf pour le constituant qui exprime la manière du verbe “descubrir” (découvrir), la fréquence d’apparition de ces éléments est plus élevée que celle des constituants prévisiblement argumentaux d’autres cas, comme ceux considérés dans le tableau 2.

5. Conclusion

Cette étude nous a permis de constater que les observations traditionnelles utilisées pour différencier le caractère des arguments d’un constituant restent valables pour la détection des constituants centraux et nucléaires. Néanmoins les critères qui y sont appliqués ne résolvent pas toujours les cas des constituants qui posent un problème.

D’un autre côté, nous nous sommes également rendu compte qu’il n’est pas adéquat de décider de façon générale sur ce qui concerne les arguments à caractère optionnel. En effet un rôle sémantique déterminé peut être argumental pour un verbe spécifique et peut ne pas l’être pour un autre.

Nous partons du principe que la linguistique de corpus et l’annotation de textes réels nous permet de voir les réussites et les limitations de certains aspects concrets décidés par les théories linguistiques. Cela peut être utile lors de la détection du problème posé ainsi que de sa résolution. Pourtant, jusqu’au jour d’aujourd’hui aucune méthodologie adéquate pour cette tâche n’a été utilisée. C’est ainsi que les résultats obtenus dans différents projets en linguistique de corpus sur la différenciation des arguments et des adjoints ne peuvent être considérés en aucun cas comme relevantes (Cuadros 2005).

Notre proposition est qu’il est nécessaire de consigner par des informations syntaxiques et sémantiques tous les constituants d’une phrase et nous considérons qu’une liste d'arguments comme point de départ pour toute étude semble être à priori une erreur. Nous défendons l’idée que la liste de rôles qui indiquent le nombre et la typologie d’arguments du verbe et qui doit s’inclure à l’entrée du lexique doit être proposée une fois consignées les phrases et que, en cas de doute, le critère qui doit être suivi est celui de la fréquence.

Dans ces cas où l’importance sémantique est dominante mais la fréquence faible, nous considérons correcte la différenciation entre arguments périphériques et arguments centraux, dans la ligne de Framenet,
puisquc ceci permet de montrer des distinctions dans le grade des relations des différents participants considérés comme actants.

De plus, pour les arguments qui ne sont pas exprimés, il faudrait vérifier les possibles coréférentialités textuelles. Cela impliquerait le fait de prévoir les annotations au niveau discursif, non seulement pour des éléments pronominaux mais aussi pour des éléments elliptiques, et pas seulement pour le sujet mais aussi pour tous les cas d’omission de compléments pour lesquels il est possible de récupérer la référentialité de l’objet. Il faut indiquer que dans le domaine de la linguistique de corpus ce niveau d’annotation est encore très peu exploré.

Comme les informations de la fréquence peuvent varier entre une typologie de textes et une autre, nous considérons indispensable l’utilisation d’un corpus de référence, donc, équilibré, puisque dans le cas contraire on pourrait obtenir des résultats parfois inadéquats.

Pour conclure, nous voulons prévenir que les résultats présentés dans cette étude devraient être confrontés à un point de vue interlinguistique, même s’il semble logique et évident le maintien de l’hypothèse de départ pour les différentes langues.

Références


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Adverbials of ‘Manner’ and ‘Manner Plus’ in Written English: Why Initial Placement?

Abstract

Adverbials of manner are often regarded as prototypical; yet, there is important variation within the postulated category and a great deal of fuzziness at the edges of this multifaceted theoretical notion. The present study draws a line between two broad categories: ‘manner’ and ‘manner plus’, i.e. semantic blends. Informed by text and discourse linguistics, the focus of the paper is on linearization in written English – in particular, on the strong motivations needed for a non-typical, syntactically marked placement of manner (plus) adverbials at the outset of a clause or sentence, in what is generally also a stylistically dispreferred position. Initial placement is shown to provide an optimal textual fit in two kinds of writing: instructive texts and narratives, where manner (plus) adverbials serve to index contexts for fundamentally different communicative goals. They benefit from the textual potential of the initial slot, adding a particular value to the textual fit.

1. Introduction

The category of ‘manner’ figures prominently in morphosyntactic and semantic analyses of various theoretical orientations. The semantics of manner is often examined in relation to verb meanings, such as tiptoe or whisper. In grammars and syntactic studies, references to manner typically appear in discussions of adverb(ial)s / adjuncts. There is an overt or tacit assumption that adverbs (form) and adverbials/adjuncts (function) of manner are prototypical in terms of their morphology, syntax and semantics. The adverb(ial) carefully in she analysed the data carefully thus seems unproblematic: it manifests the expected morphology as it incorporates the prototypical -ly suffix, it modifies the head of the VP, and specifying the manner in which the event depicted in the VP took place, it can be paraphrased as ‘in a careful manner’. In this example carefully appears in its syntactically unmarked ‘ad-verbial’ (final) position, within the VP, after the verb and its object.
Yet, it is not a straightforward task to pin down what counts as an expression of ‘manner’ and where the boundaries of such a multifaceted theoretical notion should go. Narrowing the focus to manner adverbials raises the issue of the nature and limits of the internal variation of what is included in the postulated category. It is obvious that individual adverbials of manner exhibit properties which differ from one another to an extent where a separate investigation of each lexical item may be motivated. In addition to grammatical characteristics, such investigations profitably take into account collocational patterns and textual behaviour in relation to text type, genre and register.

In this paper a crude distinction is drawn between ‘manner’ and ‘manner plus’, the latter incorporating semantic blends between categories identified in the relevant literature. Informed by text and discourse linguistics, the focus of the paper is on linearization – in particular, on the strong motivations needed for a non-typical, syntactically marked placement of manner adverbials at the beginning of a clause or sentence, in what is generally also a stylistically dispreferred position. Yet, initial placement may be argued to provide an optimal textual fit in two kinds of writing: instructive texts and narratives. It will be shown that the profile of such a textually unmarked placement of manner plus adverbials is to a large extent consonant with that of the ‘plus’ element of the particular adverbial.

In what follows, the distinction between manner and manner plus is first explored in broad terms, to single out default positions in the clause. The two text types, instructive and narrative, are then examined in light of instances of clause-initial adverbials of manner (plus). A corpus study of a set of relevant lexical items is conducted to investigate the extent to which they appear in various kinds of writing. It is argued that clause-initial adverbials of manner in instructive and narrative texts serve to index contexts for fundamentally different communicative goals.

2. ‘Manner’ and ‘manner plus’

Adverbial categorization is a classic topic in linguistics, and explorations of their semantics alone yield many criteria for such an exercise. Even manner adverbials, the most prototypical ones, exhibit a good deal of semantic variation. Many grammars separate four subcategories of what Quirk et al. (1985: 556ff) call ‘process adjuncts’. The concrete ‘means’ and ‘instrument’ are distinguished from the less concrete ‘manner’, e.g. *she did
ADVERBIALS OF ‘MANNER’ AND ‘MANNER PLUS’ IN WRITTEN ENGLISH

it surgically / with a knife vs skillfully. ‘Agent’ adjuncts are separated from the rest, or from ‘means’ adjuncts, as ‘internalised complements’ (Huddleston & Pullum 2002: 670–674), e.g. she was cheated by her competitors vs she travelled by train. Another subcategory is comparison, e.g. he cooks like the French / as the French do, part of manner adverbials proper in many approaches. More subclasses are distinguished by Biber et al. (1999: 778), for instance, that of ‘accompaniment’, e.g. she left with her husband – not by herself (see also ‘company’ in Dik 1989: 195–196; cf. the ‘comitative’ case, for instance, in Finnish). But the existing subcategorizations still leave us with a large bulk of ‘manner’ adverbials which show a high degree of intracategorial semantic variation as is apparent from the following alphabetical list of manner adverbials picked out from various grammars: abruptly, accidentally, angrily, awkwardly, beautifully, carefully, categorically, clearly, coldly, deliberately, discreetly, eloquently, erratically, expertly, fervently, firmly, gloomily, gradually, happily, hastily, irretrievably, loudly, quickly, rudely, skil(l)fully, sloppily, slowly, smoothly, stupidly, systematically, tentatively, thoroughly, typically, unsteadily. It is thus to be expected that particular studies will include some but not all of these in their postulated category of manner adverbials.

There is a continuum of manner plus phenomena, i.e. semantic blends between manner and some other category. Some are clear blends while the classification of others rather relies on the perspective and level of delicacy adopted in the particular study. At one end of the continuum there is the subtle blend between manner adverbials and those of ‘result’. Hence, the following adverbials can be argued to also convey the result of what took place in a particular manner: irretrievably, successfully, perfectly. Some of these have been dealt with as ‘degree of perfection’ manner adverbials (cf. e.g. the discussions of perfectly, well, poorly in Ernst 2002; 2004), as separate from adverbials of ‘measure’. Decisions concerning the inclusion of individual items into something like ‘manner plus result’ adverbials, rather than a category of their own such as ‘result’ adverbials proper, vary in the semantically oriented literature. At the other end of the continuum of manner plus phenomena, another important semantic hybrid is that of manner and ‘time’, often referring to the ‘duration’ of the process, its speed, as in gradually, quickly, slowly. Here the temporal plus component is more readily singled out, and these, too, can be separated from manner adverbials in fine-graded classifications (see e.g. ‘aspect-manner’ adverbials in Ernst 2002: 85; and the discussion of their temporal interpretations in Quirk et al. 1985: 560). It is also possible to indicate the
manner in which motion takes place, for instance, as a metaphor of ‘direction’ in *crabwise*. Manner of motion is, however, usually expressed with the help of the lexical verb, a rich source of expressions of manner in English (see e.g. Caballero 2007, and references therein; for other languages, see e.g. Nikanne 2000 on manner of motion in Finnish).

Expressions of manner (plus) readily contribute to evaluation in the text. The propositional, syntactically integrated ‘manner plus result’ adverbials discussed above provide ample evidence: witness, for instance, *perfectly* functioning in the service of evaluation in *she had timed her arrival perfectly*. The judgement of something having been done *perfectly* not only indicates manner and the ‘perfect’ result, with full intensification, but also makes an evaluation of the process, and indirectly of the abilities of its actor. Evaluation is indeed pervasive in all language use and people will have to make an effort to silence it if they feel that is what is demanded by the genre and context they are engaged in – which suggests that silenced affect is just a very special category of evaluation. Talking about the manner in which an action or event takes place provides writers and interlocutors with a prime locus of the expression of evaluative meanings.

In addition to the ‘degree of perfection’ adverbials of manner such as *beautifully* in *she sang beautifully*, there are other good candidates for explicit evaluation. Hence something can be done, say, *angrily, casually* or *with great care*, where – unlike *beautifully* in this example or *perfectly*, above – the evaluative meaning is much more clearly also associated with the actor even though the judgement is not primarily one of the personal characteristics of the referent but explicitly directed at the act or event in question. Hence, in *she analysed the data with great care* and *she replied angrily / casually*, we also understand that the actor’s contribution to the act or activity whose manner is being evaluated is concomitant with the positive or negative judgement made by the speaker or writer. In other words, we infer that she was ‘careful’, ‘angry’, ‘casual’, but not ‘beautiful’ in the first example in this paragraph, or ‘perfect’ in the example above (see the discussion in Bartsch 1976; Frey 2003). This interpretation is reinforced by placing such adverbials before the subject, and most treatises accordingly assign such clause-initial sentence adverbials to a category distinct from manner adjuncts; cf. e.g. the ‘subject-oriented subjuncts’ in Quirk et al. (1985: 573) as in *casually, she greeted the stranger*. Huddleston and Pullum (2002: 672) call such instances ‘secondary manner
adjuncts’, thus keeping them in the category (e.g. *angrily, he stormed out of the room*).

Adverbials of manner indicating evaluation such as *cleverly, happily* or *sadly* are thus always also implicitly related to the alleged characteristics, temporary or permanent, of the participant, who is tacitly deemed to be ‘clever’, ‘happy’ or ‘sad’ in performing the particular act or activity specified and explicitly evaluated by the adverbial: *she solved the problem cleverly; she was singing happily / sadly*. Otherwise it will be necessary to state the unexpected, e.g. *she was singing happily but / even though she was not happy at all*. But adverbials sharing lexical form with these manner adjuncts are peripheral elements in the clause or sentence when they appear at its outset or are separated from it through prosody or punctuation. They function at another (meta-)level in the text, and the interpretation is then one of the speaker’s or writer’s evaluation of what is said. Stating *cleverly, she solved the problem* means that it was, in the speaker’s or writer’s view, a clever thing to do, and in *sadly, she was singing* the event referred to is similarly judged as sad, not the singing. In *frankly, she spoke her mind* the evaluation is instead of the speaker’s or writer’s own way of speaking (‘I am speaking frankly when I say that she spoke her mind’), in contrast to *she spoke her mind frankly*, where we have an adjunct of manner, integrated in the clause (‘she was speaking in a frank manner’).

Grammars and studies accordingly make a distinction between (i) adverbials (adjuncts) of manner which are ‘integrated’ in clause structure, part of its propositional content, and typically placed in final or (less often) mid-position, within the VP that they modify (or complement), and (ii) ‘peripheral’ adverbials, which include their metatextual homonyms, conveying a comment on what is said or how it is said, or specifying the way in which it relates to what was stated previously or will be stated in the subsequent text. Hence, we find discussions of peripheral adverbials in terms of different kinds of ‘disjuncts’ and ‘conjuncts’ in Greenbaum (1969); and Quirk et al. (1985) – as contrasted with the relatively integrated ‘adjuncts’, to which manner adverbials belong. Biber et al. (1999) present a similar classification, distinguishing the peripheral ‘stance’ and ‘linking’ adverbials from the integrated ‘circumstance’ adverbials. Peripheral adverbials in Huddleston and Pullum (2002: 577–578, 1360; 2005: 79–80) appear as ‘supplements’ (as contrasted with ‘modifiers’). They would seem to cover the ‘speech-act related’, ‘modal’, ‘evaluative’, and ‘connective adjuncts’ singled out in Huddleston and Pullum (2002). In view of the
instances that defy this major distinction in the grammar of adverbials, there are categories such as the various kinds of ‘subjuncts’ in Quirk et al. (1985), including several adjunct classes in Huddleston and Pullum (2002), for instance, their ‘domain adjuncts.’ Still another classification is proposed by Frey (2003), who includes manner adjuncts in ‘process-related adjuncts’, a category distinct from ‘event-internal adjuncts’ (such as instrumentals), ‘event-external adjuncts’, ‘frame adjuncts’ and ‘sentence adjuncts.’ See also Shaer’s (2004) discussion of adverbial ‘orphans’ in grammar; arguments for the semantic basis of the syntax of adverbials in Ernst (2002); and the treatment of adverbials in functional grammar in, for instance, Dik (1989).

In this study the focus is on ‘adjuncts’ in Quirk et al.’s (1985) terms. Manner plus phenomena are semantic blends but they are not members of adverbial categories of the peripheral kind. Yet, some of the borderline instances of subject-oriented subjuncts will be included in the discussion, in line with Huddleston and Pullum’s (2002) notion of secondary manner adjuncts.

While the majority of manner (plus) adverbials are modifiers, some obligatory adjuncts function very much like complements, because of their close valency ties to the lexical verb licensing them; cf. e.g. frugally in they lived frugally, easily in the report reads easily and badly in they behaved badly to our students. For discussions of syntactically and/or semantically obligatory adjuncts, valency adverbials, adjuncts as complements, see e.g. Dik 1989; Dowty 2003; Enkvist 1981; Goldberg 2001; Jackendoff 1972; Quirk et al. 1985; Virtanen 1992a.

Exploring various ‘manner plus phenomena’ is one way of delimiting and understanding the core of the category ‘manner’ – by differentiating it from other categories adjacent to it. Another way is from within the category: the collocational patterns in which manner adverbials participate can be expected to shed light on the range of intracategorial variation and the dimensions that cut across the nexus that we call manner. It is also crucial to consider the use of manner adverbials in various genres, registers, text types, styles and the like.

3. Placement of manner (plus) adverbials in the clause

For the present discussion of placement in the clause it is sufficient to distinguish three zones, each of them consisting of a number of possible slots which can be further explored where expedient. Adverbials can thus
be placed in initial position, i.e. before the subject of a declarative clause; central position (mid-position), i.e. after the subject but before the lexical verb; and final position (end-position), i.e. after all obligatory constituents.

The usual position of manner (plus) adverbials is clause-final. The closer the adverbial is tied to the verb of the clause, the more likely it is to appear adjacent to it. This is so for obligatory valency adverbials (complements), which appear right after the lexical verb. Collocational strength between the lexical verb and a particular adverbial may also affect placement: for instance, *irretrievably* collocating with *broken down* or *lost* is in practice confined to a position next to them, preceding or following the verb. The positions of individual manner (plus) adverbials, however, vary a great deal, and important factors affecting placement also include their form and size. Other things being equal, the plus element in manner plus adverbials has a strong influence on their placement.

\[
\begin{array}{ccc}
\text{initial} & \text{central} & \text{final} \\
\text{Manner} & \text{Manner} & \text{Manner} \\
\text{Manner} & \text{Manner} & \text{Manner} \\
\text{Plus} & \text{Plus} & \text{Plus} \\
\end{array}
\]

Figure 1. Placement of ‘manner’ and ‘manner plus’ adverbials in the clause. Boldface indicates a favoured position while font size reflects decreasing preferences from default to less likely positions.

Figure 1, above, summarizes the main distributional tendencies of manner (plus) adverbials. The row immediately beneath the line refers to manner adverbials proper. Their favourite end-position is thus in boldface. Mid-position, normally the slot immediately preceding the main verb, is also in use, for various reasons. Initial position is, however, very rare, which is indicated by small-sized font. The second row refers to manner plus adverbials. Final position is the default for them, too, and they can also appear centrally in the clause. Manner plus result favours end-position, in accordance with the result naturally being stated after the event. Manner plus time/duration, again, is a category that more readily fills the clause-initial slot, even though these adverbials also appear elsewhere in the clause. The ease, rather than frequency, with which many manner plus adverbials occupy the clause-initial slot is indicated by boldface. Placing adverbials of manner (plus) early in the clause serves to activate particular,
often subtle, meanings, many of which can be related to their plus element. Even in non-final positions, however, the adverbials under discussion in the present study still receive a manner interpretation and are syntactically integrated into clause structure.

Manner adverbials thus tend not to appear in initial position other than occasionally, and even then, this slot is not available to all of them. Further, while lexically identical adverbials can be found at the beginning of a clause or sentence, they are likely to function as subjuncts and disjuncts of various kinds, rather than adjuncts of manner (see the discussion in section 2, above). Such interpretations are called for in a range of central slots, too, making the mid-zone an especially tricky one to investigate. But the intricacies of mid-zone placement in relation to tense, aspect, mood and voice, which necessitate inclusion of auxiliaries of various kinds, lie beyond the scope of the present study.

There is a principled discussion in the syntactic literature of the extent to which adverbials in different positions sharing lexical form can be considered homonyms, or whether they should rather be regarded as different interpretations or readings, to be treated under separate analyses (cf. e.g. Dik 1989; Ernst 2002; Frey 2003; Shaer 2003). A central point of disagreement among sentence grammarians has to do with the modelling of adverbials of manner in non-final position (along with other process-related and event-internal adjuncts, which are typically contrasted with adverbials of wide scope). For some, they have been moved into a non-canonical slot from their default final position; for others they must instead be generated higher up in the tree. For discussions, see e.g. Ernst 2002; Frey 2003; Jackendoff 1972; Shaer 2003; for manner adverbials in Finnish, see Manninen 2003. Apart from the many analyses in the literature of adverbials manifesting lexical shape-sharing in clause-initial and clause-final positions, the mid-zone offers challenging data for studies of the syntactic and semantic factors that influence interpretations of the individual adverbials placed in the various mid-positions.

In a textually oriented study, the question whether or not manner (plus) adverbials have been moved to initial position from somewhere else is of less interest. What is crucial is the fact that people choose to start clauses and sentences using them, and the analysis is accordingly focused on the textual and discoursal motivations for doing so as well as on the effects that such decisions have on the emerging discourse and the processes of contextualization.
When adverbials of manner (plus) appear clause-finally, they are good candidates for end-weight and carriers of new information, which may be evaluated. In mid-position, preceding the head verb, they are still a central part of the predicate and syntactically more conspicuous. In textual terms, however, unless they are long and separated with commas (or prosody), they are here relatively invisible and hence, they appear in a slot allowing possibly tacit evaluation of the process which is given end-weight in the clause or sentence.

Initial placement is rare and it is therefore often not dealt with at all in connection with manner adverbials, apart from the recent sentence-grammar discussions referred to above. Yet, such a conspicuous placement invites discourse-linguistic analyses of its motivations and effects. Two types of text have been identified as possible sources of examples of clause-initial adverbials of manner: instructive and narrative texts (Virtanen 1992a). In what follows, we will see that when adverbials of manner (plus) do appear clause-initially, very strong textual forces are at play.

4. Clause-initial adverbials of manner (plus) in instructive texts

Clause-initial adverbials of manner (plus) are easy to spot in recipes; consider the following examples from Swann (1987).

(1a) Gradually add the cooled curry stock and blend until smooth. (p. 35)
(1b) Thinly slice the radish and cucumber. Slice the strawberries and kiwi fruit. (p. 57)
(1c) Roughly chop each of the vegetables, then steam separately until tender, 15–20 minutes. (p. 61)
(1d) Finely grate the rind from 1 lemon, then squeeze the juice from all 3 lemons. (p. 72)

These sentence-initial manner adverbials have a plus element: ‘time/duration’ in (1a) and ‘result’ in (1b–d). Yet, all fit their texts and may be argued to be in an optimal position in view of the procedural character of the texts. While appearing adjacent to the (imperative) verb conveying the task to be undertaken in this particular fashion, they are, at the same time, in a textually prominent position. This initial slot allows them to highlight the manner of the process as crucial information, in contrast to what would be possible if they were placed in end-position (cf. e.g. slice the radish and cucumber thinly). End-position is textually prominent but for very different reasons as compared to initial position: witness, for instance, the likelihood of weighty elements being placed there,
expectations of the main inferencing effort being made at the informational focus (conveying new information), and anticipations raised concerning the immediately following co-text. In (1a–d), however, it would be too late to specify the manner and give it end-weight in the sentence as the (novice) cook might fail to pay attention to it, or s/he might already at that point have sliced the radish and cucumber in a rough manner or added the stock all at once. These examples thus aptly illustrate the principle of placing ‘crucial information first’, discussed in Enkvist (1989).

As shown in (2), below, adverbials of manner are not automatically or predominantly placed initially in such texts. Apart from the two instances of initial gently, the first conveying crucial information to anyone trying to heat milk, there are a number of adverbials of manner in the text which have been placed non-initially. Hence, there is not, for instance, the same urgency here in expressing the manner of kneading lightly after refrigeration.

(2) Brioche Dough [Description of dish, followed by a list of ingredients.]

Gently heat the milk until tepid then blend with the yeast in a small bowl. Place the flour, salt and sugar in a mixing bowl. Mix in the yeast and eggs, one at a time. Knead for 10 minutes either using a mixer or by hand on a floured board. Next work in the butter a little at a time until it is completely incorporated. The dough should be smooth, glossy and quite soft. Place in a floured bowl, cover and leave in a warm place for about 1 hour or until the dough has doubled in size. Turn on to a floured board and knock back by gently kneading for 5 minutes. If time allows, cover the bowl again and refrigerate overnight. Knead lightly, then shape the dough into 8 balls. Place on a greased baking sheet cover with oiled polythene, and leave to rise until doubled in size. Glaze with beaten egg then bake at 425°F/220°C/gas mark 7 for 15–20 minutes until golden brown. (p. 51)

This use of initial adverbials of manner is not, however, confined to recipes; instructive texts appear in many different genres. For instance, instructions for physical exercise of various kinds manifest adverbials of manner in initial position, not infrequently those of ‘manner plus time/duration’, as in (3) below. Note that the italics appear in the original.

(3) How To Do the Preliminary Leg Pull

1. Sit on the floor with your legs extended straight out in front of you, feet together and backs of the knees touching the floor.
2. Extend your arms straight out in front of you so that your hands are at eye level.
3. Very slowly stretch as far forward as you can and aim your hands for the farthermost part of your legs.
4. Grasp the farthest part of your legs that you can hold without strain. This may be the knee, calf, ankle, foot or toe. (Fig. 1)

5. **Gently, in slow motion**, bend your elbows outward and pull yourself forward and downward until you reach the point beyond which you can no longer stretch comfortably. Stop wherever this movement becomes difficult, for there is never to be any strain in the practice of Yoga. Hold your extreme position absolutely motionless for the advised number of seconds. Do not fidget, fight or strain. (Fig. 2)

6. **When the count is completed, very slowly**, raise your trunk to the upright position. Rest easily for several moments and repeat as advised. (Hittleman 1963: 33–34. Italics in the original.)

Placing adverbials of manner at the outset of a clause or sentence serves to extend their syntactic and semantic scope. Unlike temporal and locative signals of text strategy (discussed e.g. in Virtanen 1992a), however, adverbials of manner in an initial slot have a relatively narrow textual scope. They typically function in the clause (see step 3), and occasionally in the sentence (see step 5). Yet, scrutiny of the above text raises the issue of their textual functions beyond the particular step in the instruction that they are prefacing. In other words, the repetition of references to the slow character of motion, in syntactically iconic structures, may be argued to have textual implications. While the text strategy is action-oriented, consisting of a temporally sequential chain of micro-actions needed to be performed to achieve the goal of the macro-action, there is the insistence of performing this particular macro-action in a slow, gentle manner, foregrounded through lexical repetition, the parallelism of syntactically iconic structures, and the clause-initial placement, which adds to the urgency of the information and helps readers interpret the slow manner of action as crucial.

Text (3) has many instances where it is expedient to have the adverbial out of the way to free the end zone for information that anticipates the particular continuation in various ways; consider again in this light, for instance, steps 3 and 5. In instructions it is profitable to construct sentences which conform to the temporal iconicity of the intended motion. To digress: the sentence-initial adverbial of time, *when the count is completed*, at the beginning of the final step of the exercise, refers to the counting advised at the end of the preceding step. It conforms to the inherently temporal text strategy of instructions, here present in the form of the succession of the micro-actions and the abstraction of listing the sequence of steps. This adverbial clause precedes the main clause in
accordance with a temporally iconic ordering, ‘experiential iconicity’ (Enkvist 1981), which determines text structure in instructive texts.

It is, of course, possible to argue that the clause-initial adverbials of manner in (1)–(3) do not, in fact, occur in an initial position, before the subject, i.e. the implicit ‘you’ of the imperative verb, even though, for instance, Huddleston and Pullum (2002: 781) do assign them to front position. In textual terms, however, they occur at the outset of the micro-action that they refer to.

To round off this section, the genres making use of instructive text may exhibit a relatively small set of lexical items that regularly occur as clause-initial adverbials of manner and the lexical verb of action. These can be interpreted as a ‘construction’, consisting of the initially placed manner adverbial, immediately followed by the imperative form of the action verb and its dependents:

\[
\text{Adv}^{\text{Manner}} + \text{Imp}^{\text{Action}} + \text{Dependents}
\]

Such a construction may thus be argued to function as a ‘genre marker’.

5. **Clause-initial adverbials of manner (plus) in narrative texts**

The other text type identified above as manifesting clause-initial adverbials of manner is narrative. The motivations for this placement are several. There may be local concerns in the text such as a need to reserve the end-position to elements of greater weight which will be elaborated on in the subsequent text. And such an ordering may conform to temporal iconicity (experiential iconicity) but it may also conform to ‘structural iconicity’. In (4), below, the initial placement of the manner adverbial *with infinite care* allows for a (structurally iconic) grouping together of the three actions of freeing the dog, setting it down and giving it water, presented in a temporally iconic order. But the initial slot has textual potential in itself, which has an effect on its fillers. Hence, the textual scope of *with infinite care* is indeterminate: it is not clear from the (decontextualized) example whether the whole sequence was performed with infinite care or just the freeing of the dog; we ultimately need inferencing from our encyclopedic knowledge to determine its textual scope. The indeterminacy of textual scope – in relation to its clause, the entire sentence or perhaps several of them – may come in especially handy for writers of argumentative texts (see e.g. the discussion in Virtanen 2004).
(4) *With infinite care,* Atlas freed the dog, and set it down safely on nothing and gave it water to drink. (Winterson 2005: 126)

The following paragraph from the beginning of a dialogue between the “young revo” Nael and Winston, “the Yare shaman”, illustrates the text-structural iconicity of placing contrasting adverbials of manner adjacent to one another for maximal effect (*in an overly loud, digitally clicky way. With a dignified calm* (*W* countered); *(interrupted and)* impatiently *(interjected)*... *Patiently, but with a touch of resignation*...). An additional advantage of placing adverbials of manner initially in ‘transformers’ (from ‘telling’ to ‘showing’, i.e. ‘reporting clauses’) is that the indication of the speech event (the subject/speaker and the verb of speaking) is thus immediately followed by the reported speech. Starting the paragraph with direct speech and placing the transformer (from ‘showing’ to ‘telling’) only after it, is a way of indicating a local-level textual boundary in written narrative (and sometimes a shift to peak episodes, cf. Virtanen 1992a). Nael’s interruption is reflected in the narrative by a shift back from showing to telling, prefaced with *but.*

(5) “Only out of chaos and the overthrow of the existing order, can we begin to intuit meaning,” said Nael *in an overly loud, digitally clicky way. With a dignified calm* Winston countered: “It is entirely plausible to intuit meaning from the existing order...” but Nael interrupted him and *impatiently* interjected: “Oh, you know what I mean. Don’t play your philosophical games with me... before I know it you will be holding another of your discourses on how emergence fashions order out of chaos.” *Patiently, but with a touch of resignation,* Winston went on: “I’m sorry you feel that way. Revolution and community are usually at odds. So much energy goes into overthrowing the existing order, that this turns into an end in itself, rather than the search for a coherent system of practicable ideals.” (Blumenfeld 1999: 42)

In line with studies of the discourse functions of clause-initial adverbials of time in the service of the temporal text strategy, it is to be expected that ‘manner plus time/duration’ would be found clause-initially in narratives. In such a position their temporality would be dominant, allowing them to participate in the construction of text-strategic continuities and the signalling of text segmentation (Virtanen 1992a; 2004). Hence *suddenly* readily occurs at the beginning of a new textual unit, spanning a few paragraphs in (6a), while (6b) is a book title, having the entire text in its textual scope. Both examples are from popular fiction. In contrast, *suddenly*
in (8), below, appears in medial position, conveying the sudden manner of the memory striking Heracles, in a clause that constitutes a continuation of the same textual unit. The clause-initial *suddenly* can be argued to belong to adverbials of time, fully participating in the signalling of the contingent temporal sequentiality in narrative. But it carries a trace of manner in the sense that the particular event is not only understood as having taken place in a very short time (its plus element of time ‘duration’) but also in such a way that there was no sign that it was going to happen (‘without any warning’): witness the juxtaposition of *and then* and *suddenly* in (6a), stressing different facets of one and the same temporal shift. Ernst (2002: 85) relates *suddenly* to aspect, interpreting the transition-oriented clausal reading in terms of covert manner.

(6a) *And then, suddenly*, she turned back.
(6b) *Suddenly, in Rome*

Adverbials of manner can be graded, and they are an obvious resource for expressing emotions, attitudes and shifts in point of view in narrative. The adverbial *with infinite care* in (4), above, constitutes one of many references to the gentleness of Atlas in the story; as such it also contributes to ‘characterization’ in the narrative. It is preceded by (7) and (8), both of which make references to Atlas’s gentleness. In (7) the *grace, ease, gentleness and love almost* affects Heracles and in (8) his memory of Atlas’s *manner of infinite gentleness* in resuming the task at hand is immediately followed by the sentence-initial *gently*, referring to the action of the “wily” Heracles in this particular (imagined) situational context, as a continuation of the ‘gentleness’ emerging from the memory of the event.

(7) For a second Atlas did not speak. Then as he studied Heracles’s grinning face, he realised he had been tricked. Wily Heracles had no brains but plenty of cunning.

What could Atlas do? He wanted to hurl the universe at Heracles, crush him, annihilate him and make the story start again.

‘Come on Atlas’, said Heracles, ‘you’ve had your fun.’

*Slowly, so as not to spill one drop of milk*, Atlas lowered the Kosmos back onto his shoulders, and bent himself under the burden. He did it with such *grace* and *ease*, with such *gentleness, love almost*, that Heracles was ashamed for a moment. He would gladly have dashed the world to pieces if that would have freed him. He saw now that Atlas could do just that, but did not, and he respected him but would not help him.

‘Goodbye Atlas,’ said Heracles, ‘and thanks …’ (Winterson 2005: 83–84)
(8) Prometheus asked Heracles if he had seen his brother Atlas, and Heracles suddenly remembered the manner of infinite gentleness with which Atlas had resumed the impossible burden of the world. *Gently,* Heracles wiped Prometheus’s brow and promised to intervene with Zeus that day for an end to the punishment. (…) (Winterson 2005: 89)

In (7), *slowly,* followed by a purpose clause, introduces a new textual unit. An implicit ‘then’ is enough to indicate the sequentiality of the narrative, and the positioning of the two adverbials at the outset of the sentence permits placing the two related events of ‘lowering’ and ‘bending’ next to one another, naturally conveying the second as being the consequence of the first. This new textual unit follows a major boundary in the episode, and the initial placement of the adverbial of manner (followed by one of purpose), here serves to change the pace of narration and thus help indicate peak profile (cf. Longacre 1983). As temporal signals of text strategy and the frequent references to participants serve text segmentation in narratives (while also performing other jobs in the service of the text), something else will be needed to distinguish between pre-peak, peak and post-peak episodes in a climactic structure (see Virtanen 1992a). Apart from shifts from telling to showing and other textual devices for what Longacre calls ‘rhetorical underlining’, written narratives may here rely on sentence-initial adverbials of manner. These can be blends of manner and time/duration, and as such reminiscent of the temporality of the other text-strategic signals in the narrative. At the same time, the change of pace may be explicit in the lexical item itself, as in *slowly.*

While *suddenly* readily participates in the text-strategic chain indicating boundaries between textual units at local and global levels in a text, *slowly* manifests an ease of indicating shifts in the peak profile, which is another dimension of the text. It is important to note that the sentence-initial *slowly* is not a priori a backgrounding device, quite the contrary. In (9) it prefaces an especially weighty episode in the narrative, close to the end of a chapter. This is a re-opening after what, to the narrator and the readership, seems like the resolution of the ongoing episode, and the adverbial is preceded by *but.* The closing of this foregrounded peak section of the chapter is signalled by the sentence-initial adverbial of time *by the time either of them spoke again.*

(9) (…) He thought that Holmes had said all that he wanted to say, and he was ready to remain a while as a tribute to his candour and let Holmes’s confession settle. *But slowly* he realized, by the way Holmes faced him, and by Holmes’s filling his
glass with brandy as though the night were long, that his guest had something else to say. He waited, and finally when Holmes spoke again his tone had changed. He was back to this role as judge, public figure, man of the world.

‘You know, finally,’ Holmes said, ‘…

(…)

By the time either of them spoke again it was night, and the darkness seemed strangely grim and complete. Henry told the servant that they would not need a lamp as they were ready to retire. Holmes sipped his drink, crossing and recrossing his legs. Henry could hardly remember how he got to bed. (Tóibín 2004: 118–119)

Extract (10), from the same novel, illustrates the influence of rhythm on adverbial placement in artistic narrative. The clause-initial cluster *slowly and slyly* opens a description of a process which comes to a closure through the iconic cluster *gently but effectively* at the end of the sentence.

(10) (…) When there is a battle between the sea and the land, he would continue, it is generally the sea which emerges victorious and the land which melts away. Rye and Winchelsea, the new Winchelsea that is, were ready to be great ports with great plans and dreams. But then, in the centuries that followed, the land won, and slowly and slyly a modest plain where sheep now grazed began to form between these towns and the sea, pushing the sea back gently but effectively. (Tóibín 2004: 199)

The use of *slowly* in (9) and (10) can be felicitously related to Ernst’s (2002: 85) observations concerning aspectual readings: since transitions between events or states are easily understood as taking place instantaneously, placing an ‘aspect-manner’ adverbial such as *slowly* in initial or medial position conveys the desired lack of speed in the transition while also serving to direct attention to the ingression of the event, state or process that it introduces. In (9) the two inserted adverbials, of considerable length (*by the way Holmes faced him, and by Holmes’s filling his glass with brandy as though the night were long*), reinforce the impression of the slow manner of realizing, thus focusing on its beginnings. And in (10) the verb indicating ingression is explicitly present (*began*).

Authors can make much of the occasional clause-initial adverbial of manner. It is perfectly possible to start clauses and sentences with it. As this is done with moderation, it is a handy signal pointing to different dimensions of the text. Deviating from other openings, it may help single out peak episodes in a climactic narrative. The clause-initial slot itself invites textual interpretations, in line with the text type and the activated
text strategy (Virtanen 2004). If temporal, the plus element in manner plus adverbials will be dominant in narratives, to a degree that may motivate classification of such adverbials as temporal. Clause-initial adverbials of manner of various kinds may contribute to the construction of the narrative at local or global levels. Narrative is also a good candidate for clause-initial secondary manner adverbials, or subject-oriented subjuncts.

6. Evidence from corpora

Analyses of individual texts suggest that two major sources of the occasional clause-initial or sentence-initial adverbial of manner (plus) are instructive and narrative texts. The narrative passages examined above represent various fictional genres, and the investigation of instructive texts highlights two genres, recipes and instructions for physical exercise. This raises the issue of genre and register as contextual factors influencing clause-initial placement of manner (plus) adverbials, and conversely, such adverbials reflexively helping to construct genre and register. Registers, characterized using text-external (contextual) criteria, include broad topical fields such as the language of religion or law. Genres as social action are also usually defined in text-external terms, in contrast to the text-internally characterizable text types (see the discussion in Virtanen 1992b). Standard corpora of written English tend to rely on some notion of genre or register, rather than text types, although mixed categorizations are also usual. We can thus turn to corpora for additional evidence of the distributional patterns of manner (plus) adverbials.

An investigation of the so-called Brown corpora of written British and American English (i.e. Brown, LOB; Frown, FLOB; consisting of 1 million words each, 30 years apart) discloses fiction, rather than non-fiction, as the primary source of manner adverbs of various kinds (in any position in the clause, or as modifiers in a phrase). Looking up a set of lexical items such as suddenly, happily, quickly, carefully, stupidly, slowly, expertly, skil(l)fully, gradually and irretrievably suggests a predominance in particular prose genres: romance fiction, adventure, mystery, and science fiction. Among non-fiction genres, two are conspicuous: skills and hobbies, and secondly, reviews. As shown by Biber et al. (1999: 784), speech is a rich source of manner adverbials, but investigations of their functions in the situated co-construction of discourse, turn-taking mechanisms and intersubjectivity lie beyond the scope of the present paper. The findings reported by Biber et al. (1999: 783–785) concerning writing are, however,
concomitant with the tendencies in the four Brown corpora: fiction, rather than non-fiction, is the predominant locus of manner adverbials.

Even though adverbials in all positions were included in the corpus study, the result confirms the text-analytical findings that narratives and instructive texts manifest a great deal of manner adverbials. Although less frequent, manner adverbials in the Brown corpora also appear in reviews, which suggests argumentative texts as another source of data for future investigations.

The frequencies of occurrence of individual manner adverbials, however, vary a great deal across the text categories distinguished in these corpora. Hence, *suddenly* favours romance, adventure and mystery but it is also conspicuously present in general fiction. *Slowly* appears in adventure, romance, mystery, and science fiction, whereas the most popular genres for *quickly* are romance, adventure, mystery, and the non-fiction genre skills and hobbies. Further, *carefully* is primarily found in general fiction, romance, mystery, adventure but also in skills and hobbies. Although useful for testing hunches, the Brown corpora are too small for other than the most common lexical items.

In the BNC *carefully* shows frequencies above the average for imaginative prose and secondly, informative writing labelled ‘leisure’, which is also the profile of *smoothly*. In contrast, *easily* manifests a more varied pattern of informative writing: sciences, leisure, and belief and thought, while the much rarer occurrences of *irretrievably* are found in informative writing labelled belief and thought, arts, social science, and world affairs. These counts, however, also contain instances of adverbials modifying adjectives and are to be regarded as a first approximation only.

It is worthwhile undertaking a thorough corpus study of individual adverb(ial)s of manner in order to determine the extent to which they have relatively specific register or genre favouring profiles. For instance, while *irretrievably* also appears as a modifier in adjective phrases where the meaning is primarily intensifying (e.g. *irretrievably* hopeless / sad / dumb / alone), as an adverbial of manner plus result it is repeatedly found in constructions such as *the marriage has broken down irretrievably / is irretrievably breaking down / irretrievably broken*, or in contexts where people, things or abstract phenomena have been *irretrievably lost*. In addition to the BNC, this is also obvious if one conducts internet searches using WebCorp: *irretrievably* appears in such constructions in legal discourse (in addition to marriages irretrievably breaking down, it also occurs, for instance, in contexts where *all patent rights to an invention are*
irretrievably lost if...). People discussing religious faith may refer to themselves or others as being irretrievably lost. Typically of the Internet, a number of phenomena tend to take place irretrievably in discussions on computing pages, e.g. multiple edits disappear irretrievably after undo; the file has been irretrievably corrupted. In such registers irretrievably can be understood as conveying manner plus result, even though other interpretations are also available, as is usual for manner plus phenomena.

Some adverbials of manner are not likely to appear clause-initially: in the BNC, for instance, easily, irretrievably and frugally. Smoothly, again, appears sentence-initially several times, all instances in imaginative prose, alone or in a cluster with another sentence-initial adverbial of manner (smoothly, and swiftly; smoothly, menacingly). Carefully occurs at the beginning of a clause or sentence in 7% of the hits (443 out of 6476), mainly in imaginative prose and informative writing labelled ‘leisure’, but above the average also in informative writing labelled ‘commerce and finance.’ Close examination of the examples shows that the large majority of sentence-initial carefully is found in narrative and instructive texts. In this position it collocates with a number of verbs, possibly in the imperative (read, check, consider, pick, watch, examine, listen, plan, think, look, study) but also with personal pronouns in the nominative, subject form (he, she). Another collocate of carefully is very, and very carefully in initial position amounts to 4% of the 412 instances, all in narratives. Suddenly has been categorized above as a manner plus time/duration adverbial: it strongly favours the category of imaginative prose, both in sentence-initial position and elsewhere. Of the hits, nearly one quarter are at the beginning of a clause or sentence. They function in the same way as initial adverbials of time in narrative, thus inviting a predominantly temporal interpretation.

Corpus studies can disclose the extent to which particular adverbials of manner appear clause-initially. Ideally, they can also shed light on the kinds of texts in which such instances of individual adverbials are found. Text categorizations used in corpora are, however, heterogeneous and not necessarily based on consistent (text-external) criteria. Collocations and the various statistics provided are helpful to the extent that the sampling procedure and text categorization are documented and appropriate for the purposes of the particular study. Access to entire texts and information about them are essential for an in-depth analysis of the discourse functions of such adverbials.
7. **Concluding remarks: Constructing text-context interfaces in operational and evocative texts**

Two text types have been identified as manifesting clause-initial adverbials of manner (plus). In instructive texts, where experiential iconicity determines text structure, the initial slot may be filled with adverbials of manner (plus) conveying crucial information. Repeating such information in a structurally iconic form serves to foreground the urgency of performing the task in a particular manner. Manner adverbials in the initial slot allow the end zone to be used for other, weighty elements, which may facilitate anticipation of what is to follow in the text. This ordering profitably conforms to the temporal iconicity of the motion or the various steps to be taken. The construction consisting of an initial manner adverbial and an action verb in the imperative is closely related to instructive texts, and particular genres may exhibit collocations of lexical items characteristic of them, to an extent where these may turn into genre markers.

Narratives manifest clause-initial manner adverbials in the service of characterization, and for reasons of structural iconicity and information structuring in the sentence. Initial manner plus time/duration adverbials are predominantly temporal and participate fully in the construction of the temporal text strategy and the signalling of textual boundaries. They may also be used to single out peak episodes from pre-peak episodes, thus contributing to the construction of a climactic narrative. Narratives exhibit several different motivations for the occasional sentence-initial adverbials of manner; sometimes it is one of rhythm. Such adverbials may also help shift points of view, and the ease with which they convey evaluation is essential to the construction of the narrative.

Instructive texts are ‘operational’ while narratives are ‘evocative’ (Enkvist 1985: 324). The construction of the reflexive text-context interface therefore differs between the two, which has important implications for the kinds of discourse functions that are readily served by initially placed adverbials of manner in such texts. In operational texts indications come to the fore concerning the urgency of particular pieces of information as well as reliance on experiential iconicity, in line with assumptions of a shared situational context. In evocative texts, again, such assumptions cannot be sustained, and clause-initial manner adverbials thus contribute to the task of helping readers build up a textual world in which the text makes sense, by participating in the signalling of textual shifts of
various kinds and by pointing to a host of other discourse phenomena that invite and support individual interpretations.

Adverbials of manner appear at the beginning of a clause or sentence to be able to function in the service of the text. In so doing they benefit from the textual potential of the initial slot, in ways that are reminiscent of other adverbial fillers and yet different enough to bring a particular value to the textual fit.

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References

Texts and corpora

The Brown Corpora: the Brown (AmE), LOB (BrE), Frown (AmE) and Flob (BrE) corpora, available through ICAME at the University of Bergen, Norway.
WebCorp, available at www.webcorp.org.uk

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Repetitive and Correlative Coordinators as Focus Particles Parasitic on Coordinators*

Abstract

This paper presents a cross-linguistic study of the syntax of constructions in which both conjuncts of a coordinate complex have their own coordinator-like element. It is shown that in such constructions, only one coordinator is the head of the whole complex, while the other one is a focus particle parasitic on the associate coordinator.

1. Introduction

In this paper, I analyze the syntactic derivations of constructions that contain two conjuncts and two coordinators, such as either wine or milk. The theoretical framework of this research is the minimalist approach of generative grammar.

I will argue that between the two coordinators, only one of them heads the complex. I will show that the two coordinators are base-generated as a cluster, and the cluster participates in the derivation of coordinate complexes only in focus contexts. The cluster is split so that each coordinator can c-command a focused element. The split is implemented via a (sideward) movement of the coordinator that is not the head of the coordinate complex. The split is shown in (1).

* I am very grateful to two anonymous reviewers for their detailed comments on an early version of this paper. All remaining shortcomings are mine.

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(1)  
\[
\begin{array}{c}
\text{XP} \\
\text{conjunct} \\
\text{[focus]} \\
\text{X'} \\
\text{conjunct} \\
\text{X^0} \\
\text{either, or} \\
\text{[focus]}
\end{array}
\]

Before my argumentation, I introduce the relevant terms and clarify certain issues in this section.

1.1 Repetitive and correlative coordinators

Cross-linguistically, identical coordinators may occur in the same coordinate complex. The phenomenon is called “conjunction doubling” in Progovac (1998a: 4). Following Dik (1968: 45), I use the term repetitive coordinator to refer to such identical coordinators. In Chinese, *you...you* ‘and...and’, as in (2a) and (2b), are conjunctive repetitive coordinators, and *huozhe...huozhe* ‘or...or’, as in (2c), are disjunctive repetitive coordinators. They are all called *Guanlian-Ciyu* ‘connector’ in Chinese grammar books (e.g. Lü et al. 1980).

(2)  
\(a.\) Akiu zai nali *you* shuo *you* xiao. \(\text{(Chinese)}\)  
\(\text{Akiu at there and talk and laugh} \)  
\(\text{‘Akiu talked and laughed over there.’} \)

\(b.\) Na jiahuo *you* gao *you* pang.  
\(\text{that guy and tall and fat} \)  
\(\text{‘That guy is both tall and fat.’} \)

\(c.\) Akiu *huozhe* chi-le miantiao, *huozhe* he-le tang.  
\(\text{Akiu or eat-PRF noodle or drink-PRF soup} \)  
\(\text{‘Akiu either ate noodles or ate soup.’} \)

Various types of repetitive coordinators are also seen in other languages. I list some in (3) (summarized from Payne 1985: 19–20; Schachter 1985: 47; Haspelmath 2000: sec. 3.1).
(3) Repetitive coordinators

<table>
<thead>
<tr>
<th>Language</th>
<th>Conjunction</th>
<th>Language</th>
<th>Negative coordinator</th>
<th>Language</th>
<th>Disjunction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albanian</td>
<td>edhe...edhe</td>
<td>Dutch</td>
<td>noch...noch</td>
<td>Basque</td>
<td>ala...ala</td>
</tr>
<tr>
<td>French</td>
<td>et...et</td>
<td>Italian</td>
<td>né...né</td>
<td>Dutch</td>
<td>af...of</td>
</tr>
<tr>
<td>Hausa</td>
<td>da...da</td>
<td>Latin</td>
<td>ne-que...ne-que</td>
<td>French</td>
<td>ou...ou</td>
</tr>
<tr>
<td>Hungarian</td>
<td>mind...mind</td>
<td>Russian</td>
<td>nje...nje</td>
<td>Lezgian</td>
<td>ja...ja</td>
</tr>
<tr>
<td>Italian</td>
<td>e...e</td>
<td></td>
<td></td>
<td>Polish</td>
<td>albo...albo</td>
</tr>
<tr>
<td>Japanese</td>
<td>to...to</td>
<td></td>
<td></td>
<td>Russian</td>
<td>ili...ili</td>
</tr>
<tr>
<td>Korean</td>
<td>to...to</td>
<td></td>
<td></td>
<td>Somali</td>
<td>ama...ama</td>
</tr>
<tr>
<td>Modern Greek</td>
<td>ke...ke</td>
<td></td>
<td></td>
<td>Spanish</td>
<td>o...o</td>
</tr>
<tr>
<td>Russian</td>
<td>i...i</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tamil</td>
<td>um...um</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turkish</td>
<td>da...da</td>
<td></td>
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</tr>
</tbody>
</table>

Also following Dik (1968: 45), I use the term correlative coordinator to refer to different coordinating particles that co-occur in the same coordinate complex, such as the conjunctive both ... and, the disjunctive either ... or, and the negative coordinator neither ... nor in English, and ji...you ‘and ... and’, bu-dan ... erqie ‘not only...but also’ in Chinese.\(^1\)

(4) a. Akiu ji chang ge you tiaowu.  
   Akiu both sing song and dance  
   ‘Akiu sang and danced.’

b. Daiyu ji congming you piaoliang.  
   Daiyu both smart and pretty  
   ‘Daiyu is both smart and pretty.’

I list some of correlative coordinators of other languages in (5) (summarized from Haspelmath 2000: sec. 3.1).

---

\(^1\) In this paper, I consider only the binary coordination of either...or, both...and, and neither...nor. Sag et al. (1985: 139; also Gazdar et al. 1985: 173f) and Schwarzschild (1996: 139, 150) discuss the binary restriction of such correlative coordinators, whereas Dik (1986: 50) claims that “these correlative coordinators are inherently n-ary”. As acknowledged in Sag et al., there is variation among speakers of English.
Correlative coordinators

<table>
<thead>
<tr>
<th>Language</th>
<th>Conjunction</th>
<th>Language</th>
<th>Negative coordinator</th>
<th>Language</th>
<th>Disjunction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finnish</td>
<td>sekä...että</td>
<td>German</td>
<td>weder...noch</td>
<td>Finnish</td>
<td>joko...tai</td>
</tr>
<tr>
<td>German</td>
<td>sowohl...als auch</td>
<td>Maltese</td>
<td>la...u lanqas</td>
<td>German</td>
<td>entweder...oder</td>
</tr>
<tr>
<td>Indonesian</td>
<td>baik...maupun</td>
<td>Swedish</td>
<td>varken...eller</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irish</td>
<td>idir...agus</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polish</td>
<td>jak...tak (i)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1.2 Repetitive and correlative coordinators are not quantifiers

Dougherty (1970: 866f) claims that correlative coordinators such as *both* are distributive quantifiers. As we know, quantificational nominals, quantifying determiners, and other quantifying elements have different syntactic distributions (regardless of the specific derivations). In English the same forms *both, either, and neither* are used as all of these three types of elements, in addition to the use of correlative coordinators (see Schwarzschild 1996: 144, 146):²

Quantificational nominals
(6) a. There were glasses of iced champagne and cigars. Unfortunately not many of either were consumed.
   b. Miss Brown and her friend, both from Stoke, were arrested.
   c. Neither seemed likely to be aware of my absence for long.

Quantifiers
(7) a. either of the boys
   b. both of the boys
   c. neither of the boys

Pre-nominal determiners
(8) a. either boy
   b. He gripped her suddenly by both arms
   c. neither boy

Elements in other positions
(9) a. There was a time, and not so long ago *either*, when she could walk twenty miles a day.

² Cross-linguistically, correlative coordinators could be developed from numerals or quantifiers (Stassen 2000: 16).
b. The lawyers and the physicians disagreed about the morning’s activities. But in the afternoon, they will both go downtown to the museum.

c. If you don’t go, neither shall I.

In Lakoff & Peters (1966) and Carden (1970), the correlative both comes from an underlying conjunction of a clausal coordinate complex. In Stockwell, Schachter & Partee (1973), both is included in the category QUANTifier in the section on determiners. In their section on conjunction there is a transformation called Both Insertion which derives among other things constructions like both John and Mary. Schwarzschild (1996: 144) convincingly argues that the syntactic and semantic properties of the correlative both and either are very different from the properties of both and either occurring in other contexts. We believe that the same claim can be applied to neither.

Cross-linguistically, repetitive and correlative coordinators do not necessarily share forms with other types of elements in all languages. In Dutch, as described in Hendriks (2003: 38), the repetitive coordinators of ‘either’, en ‘both’, and noch ‘neither’ “do not display any quantifier-like behavior and cannot be used to modify non-conjoined NPs”. Similarly in Italian, correlative coordinators and quantificational elements are in different forms. The word entrambi is the counterpart of the pre-determiner both, and the word sia is the counterpart of the correlative coordinator both (Zamparelli 2000). In Chinese, repetitive and correlative coordinators never share forms with quantificational elements. All in all, the syntax of repetitive and correlative coordinators is tied with conjunctions and thus cannot be covered by the syntax of quantifiers or determiners.

In Ross (1967), Gazdar et al. (1985: 170), and Sag et al. (1985: 135), words such as either, both, and neither in coordinate constructions are claimed to be special coordinators restricted to initial conjuncts. In this paper, I analyze the syntactic properties of such words, showing that their syntactic properties are different from that of independent coordinators.

2. The occurrence dependency of repetitive and correlative coordinators on conjunctions

In this section, we will first introduce prosodic variants of (repetitive) coordinators in Latin in 2.1. Then we will show the occurrence dependency of repetitive and correlative coordinators on conjunctions in 2.2.
2.1 Prosodic variants of (repetitive) coordinators in Latin

In this subsection I want to clarify that in Latin, although there are two conjunctive coordinators, *et* and *que*, they are prosodic variants of a single abstract coordinator, and thus show properties different from regular correlatives.

I. The positions of *-que* and *et-*

In Latin, the coordinator *et* ‘and’ can alternate with the coordinator clitic *-que* ‘and’. The former always precedes a conjunct, and the latter, as a second-position enclitic, generally follows the first word of a conjunct:

(10) a. senatus  *et*    populus romanus
    senate    and      people  Roman
           ‘the senate and the Roman people’
    b. senatus populus-*que* romanus
    senate people-*and*    Roman
           ‘the senate and the Roman people’

The position of *-que* is decided by prosodic conditions (Carlson 1983: 73, 80). This clitic generally follows the first word of a conjunct. However, if the conjunct begins with a monosyllabic preposition, *-que* follows the second word, i.e., to the right of the first word of the object of the preposition, as in (11). In other words, the distance between *-que* and the left edge of a conjunct cannot be as short as a single syllable. If the first word of a conjunct is monosyllabic, *-que* is attached to the right of the second word of the conjunct. However, there is an exception: if PPs with the same monosyllabic preposition are conjoined, *-que* follows the preposition, as in (12). In other words, it still occurs to the right of the first word of the conjunct, as usual.

(11) a. ob                 *eas-que*    *res*
        because (of)  these-*and*  things
           ‘and because of these things’
    b. in  *foro-que*
        in forum-*and*
           ‘and in the forum’

(12) a. [de  se]          [de-*que* provincia]
       from  himself  from-*and*  province
           ‘from himself and from the province’
b. [per senectutem tuam] [per-que eam]
  through old.age your through-and 3SG.F
  ‘through your old age and through it’

The distributions of -que are thus neither pure syntactic nor pure phonological. They must be the result of certain interactions between syntax and phonology. See Halpern (1995) and Embick (2006).

II. The co-occurrence possibilities

The coordinators et- and -que can co-occur, in all possible combinations (Dik 1968: 44):

(13) a. et Marcus et Julius
    and Marcus and Julius
b. Marcus-que Julius-que
    Marcus-and Julius-and
c. et singulid universis-que
    and for.individuals for.all-and
    ‘both for individuals and for all together’
d. dum Augustus seque et domum et pacem sustentavit
    while Augustus him-and and house and peace upheld
    ‘as long as Augustus upheld himself, his house, and peace’

This co-occurrence fact indicates that et- and -que have the same function, and they are different only in their positions with respect to conjuncts. They are therefore positional variants of the same syntactic element. They are thus different from regular correlative-conjunction pairs. In the latter type of pairs, the form of a correlative coordinator and its associate conjunction both have a stable form. Thus, when both et- and -que occur, they are more like repetitive coordinators.

2.2 The occurrence dependency of repetitive and correlative coordinators on conjunctions

In order to analyze the syntactic properties of the multiple occurrences of coordinators, we need to distinguish two patterns of multiple coordinators. In languages such as Malayalam, every conjunct must have a repetitive coordinator suffix (Anandan 1993: 47; Jayaseelan 2001: 64). Similarly, Chinese repetitive coordinator yehao ‘and’ must follow each conjunct (Lü et al. 1999: 598). We do not discuss this pattern.
What we are interested in is the following pattern: the asymmetrical occurrence of multiple coordinators. In English, French, and Chinese in general, if there is only one coordinator in a coordinate complex, it always forms a constituent with the last conjunct (Zhang 2006, among others). This means that coordinators occurring in other positions are parasitic on the presence of the final one, which heads the whole complex (Zhang 2006; 2007, among others). In the following b-sentences of Chinese, the correlative or repetitive coordinator occurs in the absence of a final coordinator, and the sentences are not acceptable.

(14) a. Lao Li bujin mai doufu, erqie yanjiu doufu de tedian.  
Lao Li not only sell tofu but also study tofu MOD property  
‘Lao Li not only sells tofu, but also studies its properties.’

b. *Lao Li bujin mai doufu, yanjiu doufu de tedian.

(15) a. Lao Li you mai doufu, you yanjiu doufu de tedian.  
Lao Li and sell tofu and study tofu MOD property  
‘Lao Li not only sells tofu, but also studies its properties.’

b. *Lao Li you mai doufu, yanjiu doufu de tedian.

(16) a Xiao Hong (yimian) yongxin ting-zhe, yimian ji-zhe biji.  
Xiao Hong and carefully listen-PRG and write-PRG note  
‘Xiao Hong was listening carefully and making notes.’ (Lü et al. 1999: 607)

b. *Xiao Hong yimian yongxin ting-zhe, ji-zhe biji.

The occurrence asymmetry is also seen in Latin. It is always the initial coordinator that is deletable, regardless of whether the coordinator form is -que or et- (McCawley 1988: 525). In (17a), the coordinator et can precede each of the two conjuncts, and the first occurrence is optional. (17b) shows that the occurrence of the second et is not optional. Likewise, the coordinator clitic -que can follow the first word of each conjunct. If each conjunct has only one word, -que can follow the conjunct, as in (18a). In this example, the first occurrence of -que is also optional. (18b) tells us that the occurrence of the second -que is not optional. (18c) tells us that if there is only one coordinator in a three-conjunct complex, the coordinator is in construal with the final conjunct.

(17) a. (et) Marcus et Julius (Latin)  
and Marcus and Julius  
*et Marcus Julius  
and Marcus Julius
(18)   a. Marcus-(que) Julius-que
       Marcus-and    Julius-and
*Marcus-que Julius
Marcus-and    Julius

c. viri mulieres pueri-que (Dik 1968: 43 (47b))
       men women    children-and
       ‘men, women, and children’

In Japanese, the two conjuncts of a -to coordinate construction can also each be followed by a -to ‘and’. However, the -to following the first conjunct is obligatory, while the one following the second conjunct is optional (Vermeulen 2008: 349, 350). So unlike the above data, it is the final coordinator that is optional. This difference between Japanese and other languages considered here can be captured by the following contrast: the -to coordinate construction in Japanese is left-branching, whereas coordinate constructions in other languages such as English are right-branching (Zoerner 1995: 11; see also Zhang, forthcoming).

From now on, I will call the parasitic, or optional repetitive and correlative coordinators R-C coordinators, while keeping the term conjunction for the obligatory ones, those that R-C coordinators rely on.

3. The form dependency of R-C coordinators on conjunctions

The form of R-C coordinators depends on their associate conjunctions. Let us see the dependency in Chinese. Based on Lü et al. (1999) and Zhou (2002), I list some of the R-C coordinators in Mandarin Chinese in (19).

<table>
<thead>
<tr>
<th></th>
<th>CONJUNCTIVE</th>
<th>DP</th>
<th>AP</th>
<th>PP</th>
<th>VP</th>
<th>clause</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>you...you</td>
<td></td>
<td>OK</td>
<td></td>
<td>OK</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>ji...you</td>
<td></td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>yibian...yibian</td>
<td>*</td>
<td></td>
<td>*</td>
<td>OK</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>yimian...yimian</td>
<td>*</td>
<td></td>
<td></td>
<td>OK</td>
<td>*</td>
</tr>
<tr>
<td>DISJUNCTIVE</td>
<td>yaome...yaome</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td></td>
<td>huoze...huoze</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
</tbody>
</table>

This table shows that the forms of conjunctive and disjunctive elements correlate with the categories of the connected conjuncts. For instance, if the conjuncts are APs, only two possible forms of conjunctive elements may occur: *you...you* and *ji...you*. If the conjuncts are PPs, only *ji...you* may
occur. If the conjuncts are DPs, no R-C coordinator may occur, whereas if the conjuncts are VPs, any of the four forms listed may occur. For disjunctive elements, the form *huozhe…huozhe may occur with conjuncts of various categories, whereas *yaome…yaome may occur with VP and clausal conjuncts only.

What is important to our study here is the fact that no mismatch is allowed among various R-C coordinators. For instance, within the conjunctive group, it is not acceptable to say *yibian...yimian, *ji...yimian, *you...yibian, etc. Similarly, within the disjunctive group, it is not acceptable to say: *yaome...huozhe, *huozhe...yaome.

A similar dependency can be shown by Turkish R-D coordinators (Lewis 1967: 269). In this language, four distinct groups of R-D coordinators are available: *de...de, hem...hem(de), ha...ha, and gerek...gerek(se). Among the four groups, no mismatch is allowed.

(20) a. ben de sen de kardeσin de (Turkish)
   I and you and your brother.your and
   ‘I and you and your brother’

b. hem ziyaret hem ticaret
   and pilgrimage and trade
   ‘both pilgrimage and trade’

c. ha bağ, ha bahçe, ha tarla
   and orchard and garden and field
   ‘orchard, garden, and field’

d. gerek Ankara’dan gerekse Vaσington’dan
   and Ankara-in and Washington-in
   ‘both in Ankara and in Washington’

The strict matching of every R-C coordinator to a certain conjunction shows the form dependency of R-C coordinators on conjunctions. Such a matching has long been recognized as a co-occurrence restriction (Dougherty 1970: 867). I will give a syntactic account for the restriction in Section 7.

4. The island-sensitive distance between R-C coordinators and conjunctions

Since Larson (1985), it has been recognized that the distance between R-C coordinators and conjunctions obeys the island constraints on movement.
The following data show that the surface positions of R-C coordinators can be flexible, a topic discussed in Larson (1985), Schwarz (1999), Zamparelli (2000), Johannessen (2005), Hendriks (2004), and den Dikken (2006).

(21) a. Jane ate either rice or beans.
    b. Jane either ate rice or beans.
    c. Jane either ate rice or she ate beans.

(22) a. Mary is both going to school and holding down a job.
    b. Gianni has both eaten the apple and the pear. (Zamparelli 2000: 23)
    c. Mary is both going to the wedding and she is attending the reception afterwards.

(23) a. It’s neither pleasant to eat nor good for you.
    b. It was his custom, indeed, to speak calmly of his approaching dissolution, as of a matter neither to be avoided nor regretted.
    c. The gale had neither abated in the least, nor were there any signs of its abating.

The above examples are all correlative coordinator data. The following Dutch repetitive coordinator data show a similar flexibility (Hendriks 2003: 40; see parallel Italian examples in Bianchi & Zamparelli 2004 and Norwegian examples in Johannessen 2005).

(24) a. dat zij de rozen of geplant heeft of gesnoeid heeft.
    that she the roses or planted has or pruned has
    ‘that she has either planted or pruned the roses.’
    b. Of Jan zal de rozen snoeien of de tulpen planten.
    Or Jan will the roses prune or the tulips plant
    ‘Either Jan will prune the roses or plant the tulips.’
    c. Jan zal of de rozen snoeien of hij zal de tulpen planten.
    Jan will or the roses prune or he will the tulips plant
    ‘Jan will either prune the roses or he will plant the tulips.’

Larson (1985) shows that the position of either is restricted by the island effects. For instance, it cannot be away from a conjunction that is inside a definite complex DP island, as shown in (25b), a wh-island, as shown in (26b), or a tensed clause island, as shown in (27b).

(25) a. Jane revised her decision to cook either rice or beans.
    *Jane either revised [DP her decision to cook rice or beans]. (Complex NP island)

(26) a. John was wondering whether to either resign or retire.
    b. *John was either wondering [whether to resign or retire]. (WH island)
(27) a. John believes that Bill said that [either Mary was drinking or playing video games]
   b. *John believes that Bill said either that [Mary was drinking or playing video games] (Larson 1985: 223) (Tensed Clause island)

Moreover, Hendriks’s (2003: 35) following example shows that either itself cannot be inside a complex NP island:

(28) *The guy who either Jane had invited arrived or the guy who John had invited did.

We conclude that the distance between an R-C coordinator and its associate conjunction must be local: neither can relate to the other that is in a syntactic island.

The surface position of either in data like (21b) is derived by movement in Larson (1985). I will present the differences between my approach and Larson’s in 7.2.

5. Syntactic properties shared by R-C coordinators and focus particles

It is generally recognized that the use of R-C coordinators always brings an emphatic effect (Dik 1968: 273; Stassen 2000: 15; Haspelmath 2000: 14; Liptak 2001: 22–34; Vermeulen 2008: 346). In Hendriks’s works, such elements are directly analyzed as focus particles. Den Dikken (2006) claims that the correlative coordinator either cannot be a focus particle, since it can occur between a preposition and its complement (e.g. John spoke to either Bill or Sue), whereas focus particles cannot do so. However, Bouma, Hendriks and Hoeksema’s (2004) research clarifies that focus particles can occur between a preposition and its complement in English (e.g. They are sending eggs to {even/only} MARIE). Other reported differences between the correlative either and focus markers in den Dikken (2006) can be viewed as language-specific and idiosyncratic properties of the compared elements. For instance, it is claimed that the focus marker only may occur to right of the focused element (e.g., John read chapter 3 only), whereas correlative either cannot do so (e.g. *John read chapter either or chapter 4) (ibid. 701). However, another focus marker in English, even, cannot occur to the right of the focused element, either (e.g. *John read chapter 3 even). Moreover, neither focus markers nor R-C coordinators may occur to the right of the focused element in Chinese. We thus do not think den Dikken’s argument against Hendriks’s focus particle
analysis of R-C coordinators is effective. In this subsection, I present five shared properties between R-C coordinators and focus particles.

### 5.1 The same distribution constraints

The categories of the sisters of R-C coordinators are as free as the focus particles *even* and *only*. The focus particles have been called “admanythings” in Herburger (2000: 87), since “they attach to almost anything”.

(29) a. only three girls (NP or NumP)
   b. only to Sue (PP)
   c. only a bit sick (AP or DegP)
   d. only introduce Bill to Sue (VP)
   e. only that Bill was sick (CP)

Similarly, the correlative coordinator *both*, for instance, can precede elements of various categories (*either* can occur to the left of matrix clauses, whereas *neither* and *both* cannot. We will discuss this constraint in Section 8):

(30) a. Jane ate both rice and beans.
   b. She's both clever and honest.
   c. We’ve both eaten and slept.
   d. Julie satisfied Curval both when she was the active member and when she was the passive member.
   e. I’m absolutely certain that both [Tom will sing] and [Mary will dance].
   f. I returned to the house where both [I was born] and [my parents died].

It seems that the syntactic distributions of correlative coordinators might be as free as their associated conjunctions. However, this is not the case. The patterns of coordinate complexes in which R-C coordinators occur are in fact more restricted than the corresponding patterns of coordinate complexes in which isolated conjunctions occur (Neijt 1979: 1–7). They cannot occur in the positions where focus particles cannot occur, although the corresponding coordinate constructions without them are acceptable. The following data are reformulated versions of the data in Hendriks (2004). Specifically, neither focus particles nor correlative coordinators may occur between an adjective and the noun modified, as shown by (32a), (34a), (36a), and (38a), between the word *right* and a PP, as shown by
(32b), (34b), (36b), and (38b), and between the degree word very and an adjective, as shown by (32c), (34c), (36c), and (38c).

(31) a. {only/even} a small bus  
    b. {only/even} right above that little chest  
    c. {only/even} very red

(32) a. a small (*only/*even) bus  
    b. right (*only/*even) above that little chest  
    c. very (*only/*even) red

(33) a. either a small bus or a small car  
    b. either right above that little chest or right beneath it  
    c. either very red or very blue

(34) a. a small (*either) bus or car  
    b. right (*either) above or beneath that little chest  
    c. very (*either) red or blue

(35) a. both a small bus and a small car  
    b. both right above that little chest and right beneath it  
    c. both very red and very blue

(36) a. a small (*both) bus and car  
    b. right (*both) above and beneath that little chest  
    c. very (*both) red and blue

(37) a. neither a small bus nor a small car  
    b. neither right above that little chest nor right beneath it  
    c. neither very red nor very blue

(38) a. a small (*neither) bus nor car  
    b. right (*neither) above or beneath that little chest  
    c. very (*neither) red or blue

The similar restrictions on R-C coordinators in Chinese are stated in Lü et al. (1999: 283). The following data serve to illustrate the shared constraints on focus particles and R-C coordinators.

Focus particles

(39) a. shenzhi yi liang hongsede zixingche  
    even one CL red bike  
    b. shenzhi hen hong  
    even very red

(40) a. yi liang hongsede (*shenzhi) zixingche  
    one CL red even bike  
    b. hen (*shenzhi) hong  
    very even red


In addition to the subparts of DPs and APs, Zamparelli (2000) reports more types of elements that both...and and its Italian counterpart cannot conjoin. None of the elements is able to bear focus. For instance, auxiliaries plus participles, small clauses selected by epistemic and elective verbs, and relative CPs, are among such elements.

Zamparelli (2000: 13) proposes that the sentence in (46a) is derived by (46b) and (46c). In (46b), la pera ‘the pear’ is raised from the object position to SpecFocP with the first clausal conjunct, and la mela ‘the apple’ is raised from the object position to SpecFocP with the second clausal conjunct. In (46c), the IP of the first conjunct, which contains the trace of la pera, and...
the IP of the second conjunct, which contains the trace of *la mela*, undergo the assumed ATB movement, landing at the matrix SpecIP.

(46) a. Gianni mangio sia [la pera] che [la mela]
    Gianni ate both the pear and the apple

   b. I^0
       VP
          sia
             CP
                FocP
                   C'
                      DP_i  Foc' che FocP
                          Foc IP DP_j Foc'
                                            Gianni I' mangiò VP
                                                                 t_i

   c. IP
       I^0
          VP
             sia
                CP
                    FocP
                       C'
                          DP_i  Foc' che FocP
                                  Foc IP
                                                     Gianni I' mangiò VP
                                                                         t_j

       IP
           I'
              I^0
                 VP
                    sia
                        CP
                            FocP
                               C'
                                  DP_i  Foc' che FocP
                                          Foc IP
                                                             Gianni I' mangiò VP
                                                                 t_i/j

                                                      t_k
                                                          DP_j  Foc'
                                                           la mela
                                                            Foc t_k
In Zamparelli’s approach, elements that cannot undergo the first step of movement, i.e., the focus raising, make the construction unacceptable. We can see that Hendriks’s analysis is a R-C coordinator-oriented analysis, whereas Zamparelli’s is a conjunct-oriented analysis.

Hendriks (2004) observes that *either, both, and neither* do not show properties of focus particles if they do not occur with a coordinator. No focused element is related to *either* in (47a) (= her (42a)), *both* in (47b) (= her (43a)), and *neither* in (47c) (= her (62a)).

(47) a. “I am quite ashamed to confess,” I replied, “that I have never even heard the names of either gentlemen before.”
   b. The first action of my life was the taking hold of my nose with both hands.
   c. It is not too much to say that neither of us believe in preternatural events.

If *either, both, and neither* are not intrinsic focus particles, and they behave like focus particles in coordinate complexes only, one cannot help asking what makes them to behave like focus particles in this particular construction. The answer must be conjunctions. Then next question is how and why. These are the questions we try to answer.

5.2 The same scrambling triggering effects

Another shared property of R-C coordinators and focus particles is that neither of them can occur postverbally in Chinese. Among various R-C pairs, *huozhe...huozhe* is the one that can conjoin nominals (see (19)). The following data show that coordinate complexes without an R-C coordinator can occur as postverbal objects, as in the a-sentences in (48) through (50), whereas coordinate complexes with an R-C coordinator cannot, as seen in the b-sentences there (see Lü et al. 1999: 283). The latter type of complexes, however, can occur in preverbal positions, as preverbal subjects or topics, as in (48c) and (49c), or temporal expressions, as in (48d) and (49d), or preposed objects, as in (48e) and (49e).

(48) a. Xiren kanjian-le Baoyu huozhe Daiyu.
   Xiren see-PRF Baoyu or Daiyu
   ‘Xiren saw Baoyu or Daiyu.’
   b. *Xiren kanjian-le huozhe Baoyu huozhe Daiyu.
   Xiren see-PRF or Baoyu or Daiyu
c. Huozhe Baoyu huozhe Daiyu na-zou-le wode qianbi.
   ‘Baoyu or Daiyu took away my pencil.’

d. Xiren huozhe mingtian huozhe houtian hui lai.
   Xiren or tomorrow or the.day.after will come
   ‘Xiren will come tomorrow or the day after tomorrow.’

e. Huozhe sheng-xue, huozhe canjia gongzuo, ni ziji jueding.
   or higher.school.going or take.part.in job you self decide
   ‘Either entering a higher school or taking a job, you yourself decide.’

(49) a. Xiren xihuan Baoyu huozhe Daiyu.
   Xiren like Baoyu or Daiyu
   ‘Xiren liked Baoyu or Daiyu.’

b. *Xiren xihuan huozhe Baoyu huozhe Daiyu.
   Xiren like or Baoyu or Daiyu

Total to this constraint, no focus particle can occur postverbally in Chinese. Focus particles such as shenzhi, lian ‘even’, and zhi, zhiyou ‘only’ occur preverbally. The following (51a) shows that the focus particle only in English can occur postverbally, however, (51b) shows that zhiyou ‘only’ in Chinese cannot occur postverbally. In (51c), the focus particle occurs preverbally and the sentence is fine. A similar acceptability pattern is seen in (52) and (53), for the focus particle shenzhi ‘even’.3

3 A well-recognized fact is that the focus particle shi ‘be’ cannot occur postverbally either. In order to save the trouble of showing whether the shi-sentences are cleft sentences, I use the other two types of focus particles to show the same generalization.

Note that there are two focus markers in (51c) and (52c). The first on in each case is optional.
(51) a. Albert grows only vegetables.
   b. *Lao Wang (cai) zhong zhiyou shucai.
      Lao Wang only grow only vegetable
   c. Zhiyou shucai Lao Wang cai zhong.
      only vegetable Lao Wang only grow
   ‘Only vegetable, Lao Wang grows.’

(52) a. The freshmen were reminded to bring even the registration form.
   b. *Lao Wang (dou) dailai-le shenzhi huzhao.
      Lao Wang all bring-PRF even passport
   c. Shenzhi huzhao Lao Wang dou dailai-le.
      Even passport Lao Wang all bring-PRF
   ‘Even passport, Lao Wang brought with him.’

(53) a. John asked even Mary to come.
   b. *Lao Wang jiao shenzhi Xiao Li lai.
      Lao Wang ask even Xiao Li come

The correlation between the occurrence of the focus particles *shenzhi* ‘even’ and *zhiyou* ‘only’ and object preposing in Chinese has been studied in Zhang (2000). As for the fact that R-C coordinators cannot conjoin postverbal objects, Lü et al. (1999: 283) explicitly state that when two objects are conjoined, only one coordinator is allowed to occur. The generalization is confirmed by the unanimous responses to my data-inquiring in the SINA internet forum (Feb. 16, 2003). The fact is clear.

This fact is not isolated, cross-linguistically. Hendriks (2003: 41) reports that “the presence of the Dutch initial coordinator of triggers the occurrence of scrambling effects in Dutch of-of [*‘either-or’*] construction. Interestingly, the same effects can be witnessed with focus particles. Ordinary coordinate constructions, on the other hand, do not exhibit these scrambling effects.” We thus see that in both Chinese and Dutch, R-C coordinators can trigger scrambling, like focus particles.

### 5.3 The same inversion triggering effect

Horn (1996) discusses the fact that focus particles such as *only* may trigger inversion, as seen in the following sentence. The semantic conditions of this type of inversion are studied in Herburger (2000: 103–105).

(54) Only in stories does a dropped glass betray agitation.

R-C coordinators and their associate conjunctions may also trigger subject-auxiliary inversion if they occur clause-initially (Hendriks 2004):
Neither had the gale abated, nor were there any signs of its abating.

The gale had neither abated in the least, nor were there any signs of its abating.

Johannessen (1998: 156 (84), 161 (99)), following Norwegian correlative data in (56), and Greek repetitive data in (57), further show the inversion possibility of R-C coordinators in other languages:

(56) a. Per gikk til jobben, og Marit tok trikken til skolen.
   ‘Peter walked to work, and Mary took the tram to school.’

b. Både gikk Per til jobben, og Marit tok trikken til skolen.
   ‘It is both the case that Peter walked to work, and Mary went by tram to school.’

(57) a. [o Janis tha erthi sto parti] i [tha min spiti].
   ‘John will come to the party or (he will) stay at home.’

b. [tha erthi o Janis sto parti] i [tha min spiti].
   ‘Either John will come to the party or (he will) stay at home.’

5.4 The same scope ambiguity

Both focus particles and R-C coordinators have ambiguous scopes, when they occur in “low” positions.

When a focus particle such as only and even attaches to a nominal, its scope can be ambiguous; however, if it attaches to a verb phrase that hosts the nominal, its scope is not ambiguous (Taglicht 1984: 150ff).

(58) a. The man at the nursery told us to water [only the azaleas].

b. The man at the nursery told us to only water the azaleas.

c. The man at the nursery only told us to water the azaleas.

(59) a. The freshmen were reminded to bring [even the registration form].

b. The freshmen were reminded to even bring the registration form.

I cite Herburger’s (2000: 88, 109) description of the above data as follows. (58a) is ambiguous. On its first reading, it says that azaleas are the only kind of plant the man at the nursery told us to water; he didn’t say anything about the rose bushes or the rhododendrons, maybe because he assumed we already knew we needed to water those. I call this reading the highlighting reading. On its second reading, (58a) says that the man explicitly told us to
water nothing else but the azaleas, saying something like “Be careful to water the azaleas only!” I call this reading the contrastive reading. In contrast with (58a), neither (58b) nor (58c) is ambiguous; (58b) has only the second reading, i.e., the contrastive reading, and (58c) only the first, i.e., the highlighting reading. Similarly, (59a) is ambiguous. On its first reading (wide-scope), it says that even the registration form is such that the freshmen were told to bring it (even though the registration forms were impossible to find, for example). On its second reading (narrow scope) (59a) says that the freshmen received a piece of advice something like this: “Bring even the REGISTRATION FORM, along with the tuition bill and your preliminary schedule. You’ll need it.” This reading is the only reading of (59b).

According to Rooth (1985: 83f) and Krifka (1992: 40), focus particles do not get wide scope of their own. But they do when they are carried ‘piggy-back’ by an expression that can get wide scope. In data like the above examples, when focus particles are adjoined to the nominals, which can get wide scope, the wide scope reading is available. However, when they are adjoined to verbal phrases, which are not scope taking expressions, no ambiguity arises.

A parallel fact is seen in R-C coordinators. The disjunction or has scopal properties, as shown in (60) (Rooth & Partee 1982; Larson 1985):

(60)  a. Max wants to eat (either) grapes or cherries.
    b. Max wants to either eat grapes or cherries.
    c. Max either wants to eat grapes, or cherries.

In the narrow scope reading of (60a), Max doesn’t care which, he’d be happy to eat either. In the wide scope reading of (60a), Max wants to eat grapes or Max wants to eat cherries – I don’t know which. Larson (1985) notes that either can act as a scope marker. If either is close to or, as in (60a), both readings are available. (60b), however, has only the narrow scope reading, and (60c) has only the wide scope reading.

5.5 The same distributiveness effect

I. R-C coordinators exclude collective readings

One semantic function of R-C coordinators is to exclude collective readings, when such readings are possible in their absence (see Dik 1968: 272; Dougherty 1970: 866; Lang 1984: 92; Munn 1993: 173, 179–185;
Kayne 1994: 66; Progovac 1999; 2002, among others). Let us consider correlative coordinator constructions first. It is well-known that the word both disambiguates a sentence that can have either distributive or collective meaning. For instance:

(61)  a. John and Mary bought a car.
     b. Both John and Mary bought a car.

(61a) has two readings. Either John and Mary bought a single car together or each of them bought a car. (61b) however has only the latter reading.

The same contrast is seen between the single coordinator constructions and the repetitive coordinator constructions. Such a contrast is discussed in Zwart (1995: 12). The following Dutch data can show the contrast (I thank Petra Hendriks and Jan-Wouter Zwart for helping me with the data).

(62)  a. A en B kochten een auto
       A and B bought a car
     b. en A en B kochten een auto
       and A and B bought a car

(62a) has two readings. Either John and Mary bought a single car together or each of them bought a car. (62b) however has only the latter reading.

R-C coordinators exclude collective readings of not only nominal coordinate complexes but also non-nominal coordinate complexes. Sag et al. (1985: 151) cite Schmerling’s (1975) following contrast:

(63)  a. I went to the store and bought some whiskey.
     b. I both went to the store and bought some whiskey.

(63a) can be an Asymmetrical Coordination (Culicover & Jackendoff 1997), whereas (63b) is not. The meanings of the two conjuncts in (63a) can be related to each other. The whiskey-buying may be the purpose of the store-going. In contrast, the two conjuncts in (63b) are semantically symmetrical.

The correlation between distributiveness and R-C coordinators is shown even in morphology. Winter (2001: 170–171) presents the fact that in Hebrew, an accusative case marker occurs to the left of every conjunct of a coordinate object complex if the coordination is distributive, as in (64b) or occurs to the left of the whole coordinate complex if the coordination is either distributive or collective, as in (64a).
Importantly, if an R-C coordinator occurs, an accusative case marker must occur to the left of every conjunct of a coordinate object complex. In other words, R-C coordinator constructions morphologically pattern with the constructions that have an exclusive distributive reading. In the following example, *gam...ve-gam ‘both...and’ requires the accusative case marker *et to occur to the left of each conjunct.

(65) a. *dan makir et gam rina ve gam sara
   Dan knows ACC too Rina and too Sara
b. dan makir gam et rina ve gam et sara
   Dan knows too ACC Rina and too ACC Sara
   ‘Dan knows both Rina and Sara.’

Such data show that the syntax of R-C coordinators patterns with the syntax of distributiveness.

Summarizing, R-C coordinator constructions encode an exclusive distributive meaning, whereas coordinate constructions with a single conjunction can be ambiguous between distributive and collective meaning.

II. Focus particles also exclude collective readings
Winter (1998, see Hendriks 2004: 33) uses data like the following to show that the focus particles *too, also, and as well all can exclude a collective reading.

(66) a. The Americans and the Russians *too fought each other.
b. The Americans and the Russians *as well fought each other.
c. The Americans and also the Russians fought each other.

The reading of (66a) is that the Americans fought each other and the Russians fought each other. It does not mean that the Americans fought
against the Russians. As we know, if *too* did not occur, the sentence would have the latter reading. Parallel effects are seen in (66b) and (66c).  

The above two subsections tell us that R-C coordinators and focus particles have the same semantic function, namely, to exclude possible collective readings. In this semantic sense, compared to coordinate complexes with a single conjunction, R-C coordinator constructions are not built vacuously.

### III. *Both does not always signal a distributive reading if it is not a correlative coordinator*  
In contrast to the correlative coordinator use of *both*, other uses of *both* do not always signal a distributive reading. Schwarzschild (1996: 149) uses the following contrast to show the difference:

(67) a. “Napoleon and Squealer sold Boxer to the knacker” does not imply that Napoleon sold Boxer to the knacker, nor does it imply that Squealer did so. It entails that both of them sold Boxer to the knacker.  
b. # “Napoleon and Squealer sold Boxer to the knacker” does not imply that Napoleon sold Boxer to the knacker, nor does it imply that Squealer did so. It entails that both Napoleon and Squealer sold Boxer to the knacker.

The word *both* in (67a) is not a correlative, and it is compatible with the intended collective reading, whereas the correlative *both* (67a/b) is not compatible with a collective reading of (67b). Schwarzschild states that (67b) “makes no sense”. Once more, we see the contrasts between R-C coordinators and other elements, even when they share their phonological forms.

### IV. The occurrence of R-C coordinators with elements specified with a certain distributiveness value  
It is necessary to stress that if an element has been specified to be either distributive or collective by other factors, the occurrence of *both* or an R-C coordinator does not play any role in disambiguating the element, since

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4 Note that not all types of focus markers exclude collective readings. The additive focus marker *even* and *lian…dou* ‘even’ in Chinese do allow collective readings. I leave the inconsistency between different types of focus markers for future study.  
(i) Even the Georgians and the Russians fight each other.  
(ii) Lian Baoyu gen Daiyu dou huxiang chaojiao.  
   even Baoyu and Daiyu even mutual quarrel  
   ‘Even Baoyu and Daiyu quarreled.’
there is no ambiguity at all. Two effects are seen if R-C coordinators occur with such elements. One is that the relevant coordinate complexes are emphasized, as seen in the following data.

(68)  
(a) Last night, John watched (both) the appearance and the disappearance of the moon. (Tsohatzidis 2001: 25)  
(b) Since the person you most admired and the person you most feared was the very same person, by killing that person, you killed (both) the person you most admired and the person you most feared. (Tsohatzidis 2001: 27)  
(c) Jean connait et Paul et Michel. (French, Kayne 1994: 58, 146 fn. 16)  
Jean knows and Paul and Michel  
‘Jean knows Paul and Michel.’

In (68a) and (68b), the meanings of the two conjuncts are contrastive, therefore, a collective reading of the coordinate complex is impossible. The occurrence of both does not play any role in disambiguating anything. In (68c), the verb connait ‘know’ is intrinsically distributive. It does not select a collective object. Thus the occurrence of the repetitive coordinator et does not play any role in disambiguating anything, either.

When an R-C coordinator occurs with an element that has been determined to be collective by other factors, the sentence can also be simply unacceptable. There are cases where R-C coordinators cannot occur in clearly collective contexts. For instance, the predicate to make syrup in (69) is an intrinsic collective predicate of the material subject. Both cannot occur in the coordinate subject.

(69)  
(a) Sugar and water make syrup.  
(b) *Both sugar and water make syrup. (Dik 1968: 272)

Similarly, the following collective predicates are in conflict with the focus particles as well.

(70)  
(a) John and Mary (*as well) are {friends/alike}.  
(b) The bus and the van (*as well) collided.  
(c) Water and sugar (*as well) make syrup.

The behaviors of R-C coordinators pattern with focus particles such as as well.
So far, we have seen that the English data are consistent: R-C coordinators are not compatible with any collective readings. This is shown in (69) and Schwarzschild’s example in (67b).\(^5\)

On the other hand, as we mentioned before, there are languages in which every conjunct must be in construal with a coordinator. In such languages, since the choice of not using R-C coordinators is not available, it makes no sense to discuss any semantic contrast between using and not using such coordinators. In Kannada (or Malayalam, a sister Dravidian language), -\textit{uu} is used both as a coordinating particle and an emphatic particle, meaning ‘also’. This -\textit{uu} must appear on both conjuncts. There is no optionality. The coordinate complex seems to be ambiguous (I thank R. Amritavalli for discussing the issue with me and giving me the example below. Similar data can be found in Sridhar 1990: 106):

\begin{quote}
(71) raaman-uu bhiiman-uu ondu kaaru tegedaru \textit{(Kannada)}
\begin{itemize}
\item Rama-and Bhiima-and one car bought
\item ‘Rama and Bhiima bought a car each.’
\item ‘Rama and Bhiima bought a car together.’
\end{itemize}
\end{quote}

The repetitive coordinators \textit{um}…\textit{um} in Tamil are also obligatory and thus they do not bring any special semantic effect (Payne 1985: 20).

In this subsection, we have presented the shared properties between focus particles and R-C coordinators. One might claim, following Hendriks (2002; 2003; 2004), that R-C coordinators are just focus particles. Our next subsection will show that the issue is not so simple.

6. R-C coordinator constructions: symmetrical foci in pairs

Are R-C coordinators just focus particles? If so, however, we still need to account for one crucial property of R-C coordinators, which is not shared

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\(^5\) The predicate of (i), \textit{kekkonsita} ‘married’, is a collective predicate by default (in the absence of any distributive markers such as ‘respectively’). The occurrence of the repetitive coordinator -\textit{to} does not play any role in disambiguating.

(i) John-to Mary-to-ga kekkonsita. (Japanese, Kayne 1994: 58, 146 fn.16)
\begin{itemize}
\item John-and Mary-and-NOM married
\item ‘John and Mary married.’
\end{itemize}

This Japanese example seems to suggest that the R-C coordinator -\textit{to} is compatible with collective readings. However, I do not want to make any claim at this moment, since its judgment is rejected by my informant (the sentence would be fine if the second -\textit{to} is removed, i.e., if there were no R-C coordinator).
by regular focus particles: their dependencies on conjunctions. The dependency relation is exhibited in their occurrence (2), their form (3), and their local distance from conjunctions (4). In addition to these, there is a mutual focus dependency relation between R-C coordinators and their associate conjunctions: the conjunctions also exhibit properties of focus particles. I will first of all present the fact that in the absence of R-C coordinators, there is no parallelism between conjuncts with respect to focus. Then I will show the symmetrical foci in R-C coordinator constructions.

6.1 Single conjunct focalization

In general, it is possible for one of the two conjuncts to bear a focus in a coordinate complex. For instance, in the following coordinate complex, the focus particle *only* occurs in the second conjunct only, and accordingly only the second conjunct is focalized.

(72) I interviewed 10 men but only 3 women. (Heycock & Zamparelli 2005)

6.2 The symmetrical foci in R-C coordinator constructions

The symmetrical foci in R-C coordinator constructions are observed in the following three aspects:

I. Not only there is a focused element to the right of an R-C coordinator, but also there is a focused element to the right of the associate conjunction, in the second conjunct. In other words, the foci must be in pairs. In the following data, focused elements are in capital letters.

(73) a. Either JANE will eat rice or JOHN.
b. *Either JANE will eat rice or John.
(74) a. Jane will eat both RICE and BEANS.
b. *Jane will eat both RICE and beans.
(75) a. Neither JANE will eat rice nor JOHN.
b. *Neither JANE will eat rice nor John.

II. Usually, the order of the two conjuncts makes no reading difference in the R-C constructions.

(76) a. Jane ate both rice and beans. =
b. Jane ate both beans and rice.
This fact indicates that an R-C coordinator and its associate conjunction each provide a focus domain, and elements in the domain of the former and elements in the domain of the latter are equally focused. Therefore, the order of the two conjuncts is not significant with respect to information structure. The foci are symmetrical.

The above data are in contrast to the following data:

(77) a. Jane ate rice and beans too. ≠
    b. Jane ate beans and rice too.
(78) a. Jane ate rice and also beans. ≠
    b. Jane ate beans and also rice.

The focus particles too and also are related to the focused element in the second conjunct alone here. Let us ignore the syntactic positions of the focus elements, since according to Stechow (1991: 806) (also see Herburger 2000: 109), focus particles do not need to c-command the focused elements. Importantly, there is only one focused element in each of the examples in (77) and (78). The focused element in the a-sentences is beans and the focused element in the b-sentences is rice. Thus the a-sentences and the corresponding b-sentences do not have the same information-structure. This is different from the R-C constructions in (76).

So far, we have shown that descriptively, R-C coordinators exhibit properties of focus particles, and so do their associate conjunctions. In the absence of a R-C coordinator, a conjunction does not exhibit properties of focus particles. Likewise, if either, both, and neither do not occur in a coordinate construction, they do not exhibit properties of focus particles, either (see the end of 5.1).

III. Not only a R-C coordinator, but also its associate conjunction, can trigger subject-auxiliary inversion, patterning with focus particles. We repeat our previous two examples in (55) below:

(79) a. Neither had the gale abated, nor were there any signs of its abating.
    b. The gale had neither abated in the least, nor were there any signs of its abating.

In (79a), the correlative coordinator neither triggers the inversion, and in (79b), the conjunction nor, which is the associate of neither, triggers the inversion.
The above three points show that both R-C coordinators and their associate conjunctions exhibit properties of focus particle, and thus R-C coordinator constructions are foci in pair constructions.

7. **A coordinator doubling approach to R-C coordinators**

7.1 **Previous approaches to the focus nature of R-C constructions**

I review three syntactic approaches to the focus nature of R-C constructions. Hendriks (2002: 18) proposes the following structure for R-C coordinate constructions, where the R-C coordinator *either* is claimed to be a focus particle.\(^6\)

\[
\begin{array}{c}
\text{CoP} \\
\text{first conjunct} \\
\text{Co’} \\
\text{Co} \\
\text{either-or} \\
\text{second conjunct}
\end{array}
\]

\[\text{(80)}\]

She assumes that *either* undergoes leftward movement, surfacing somewhere to the left of *or*. In her analysis, the structure of (81a) is (81b), and the structure of (82a) is (82b):

\[
\begin{array}{c}
\text{(81) a. } \text{Jane either ate RICE or BEANS.} \\
\text{b. Jane either, ate } [\text{DP [DP RICE] [ti or] [DP BEANS]]}
\end{array}
\]

\[
\begin{array}{c}
\text{(82) a. } \text{Jane either ate RICE or she ate BEANS.} \\
\text{b. [IP [IP Jane either, ate RICE] [ti or] [IP she ate BEANS]]}
\end{array}
\]

What Hendriks’s analysis does not consider is the fact that the occurrence of a R-C coordinator, which she claims to be a focus particle, brings about a pair of foci rather than a single focus, in the relevant coordinate complex. The double foci nature of coordinate complexes in which R-C coordinators occur seems to be captured by Zamparelli’s (2000) assumption that such complexes are derived by parallel focus raising plus ATB movement of the

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\(^6\) Later, Hendriks (2003: 37) expresses her doubt on this movement approach however. Her doubt is based on her worry that the surface position of R-C coordinators do not c-command their traces. Our sideward movement approach, to be presented in section II of this subsection, will make this worry unnecessary.
remnant clausal conjuncts (see (46)). Although the assumed parallel A-bar movement of focused elements and the ATB movement capture the co-occurrence of double foci in the R-C coordinator constructions, this analysis, however, still fails to cover the three dependencies of such coordinators on conjunctions (occurrence, form, and the island-sensitive distance).

De Vries (2005) proposes the following structure to capture the focus and distributive reading of R-C constructions:

\[\text{(83)}\]

\[
\text{DistP} \rightarrow \text{Dist'} \rightarrow \text{Dist} \rightarrow \text{CoP} \rightarrow \text{either} \rightarrow \text{Co} \rightarrow \text{1}^{\text{st}} \text{ conjunct} \rightarrow \text{or} \rightarrow \text{2}^{\text{nd}} \text{ conjunct}
\]

However, it is not clear how this structure represents the constructions in which an R-C coordinator occurs within the first conjunct.

### 7.2 My refining upon Hendriks’s proposal

The idea that multiple coordinators of a coordinate complex form a single constituent in an earlier step of derivation, as in (80), is implied in Pesetsky (1982: 438, the 1st line). In this subsection, I advocate Hendriks’s general proposal in (80) above, and refine upon it.

My analysis is the following. An R-C coordinator and its associate conjunction are always base-generated as a cluster, the head of the cluster is the associate conjunction, and the cluster is split later, causing the R-C coordinator to be away from the conjunction. The pair [either, or] in the following tree represents all types of pairs that are composed of an R-C coordinator and its associate conjunction.
Since the R-C coordinator is not the head of the cluster, it does not project in its base-position. After the splitting, it does not project, either, since it is a moved element (see Chomsky 1994; 1995 for why moved elements do not project). It simply adjoins to another element.

Importantly, the cluster is formed only under the focus environment. Technically, we can assume that the cluster selects a focus complement (the 2\textsuperscript{nd} conjunct in (84)) only, and the movement of the R-C coordinator targets only a constituent with a focus feature.

Unlike Hendriks’s (80), this more transparent version of the proposal captures the fact that not only R-C coordinators, but also the associated conjunctions have properties of focus particles. Thus focus features occur in each conjunct in the constructions.

The theoretical background of this cluster proposal is the following. First of all, clusters that are composed of correlative or repetitive words are easy to find. There are quite a lot of such V-V, A-A, and N-N compounds in Chinese and other languages. The following are Chinese examples.

<table>
<thead>
<tr>
<th>Correlative cluster</th>
<th>Repetitive cluster</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. da-pei</td>
<td>xiang-xiang</td>
</tr>
<tr>
<td>correlate-match</td>
<td>think-think</td>
</tr>
<tr>
<td>‘match’</td>
<td>‘think’</td>
</tr>
<tr>
<td>b. ping-jing</td>
<td>xiao-xiao</td>
</tr>
<tr>
<td>peace-quiet</td>
<td>small-small</td>
</tr>
<tr>
<td>‘quiet’</td>
<td>‘small’</td>
</tr>
<tr>
<td>c. zhou-wei</td>
<td>wa-wa</td>
</tr>
<tr>
<td>circle-surroundings</td>
<td>child-child</td>
</tr>
<tr>
<td>‘surroundings’</td>
<td>‘child’</td>
</tr>
</tbody>
</table>

Moreover, this proposal is an extension of Kayne’s (2002) cluster-splitting analysis of nominal doubles to coordinator doubles. In Kayne’s cluster-splitting analysis, a nominal double and its associate pronoun are merged as a cluster, and then the double raises alone to either a theta or non-theta
position. This cluster-splitting analysis accounts for a series of dependencies in syntax. In this theory, we see a simpler and more unified computation system than we have assumed it to be. If this cluster-splitting mechanism accounts for the derivations of nominal doubling, it seems plausible that a similar mechanism also works in the computations of other types of element doubling, including coordinator doubling.

I claim that R-C coordinators are doubles of their associate conjunctions, and their various surface positions are the landing sites of the splitting. I will not go into any technical details of the mechanism of cluster-splitting (see Kayne 2002 and Boeckx 2003 for some discussion), since I do not see any construction-specific property in this respect. As for the surface positions and other syntactic properties of R-C coordinators, they pattern with that of focus particles of the relevant language. This has been shown in 5.

The term “conjunction doubling” is used in Progovac (1998b: 4) to refer to repetitive coordinator constructions only, not including correlative coordinator constructions. In our approach, the term covers all types of R-C coordinator constructions.

This coordinator cluster hypothesis explains the existence of R-C coordinators cross-linguistically. If every conjunct always occurs with a coordinator, as in Malayalam (Anandan 1993), it is possible that the multiple coordinators are base-generated as clusters and split later. It has been found that in English, first conjuncts were also preceded by and or or in Shakespeare and Chaucer’s works (see Anandan 1993: 53 for examples).

### 7.3 Supporting facts for the doubling approach

In this subsection, we present two supporting facts for our doubling approach to R-C coordinate constructions, from the perspectives of the interaction with degree words and of the function of predicates.

One supporting fact for our doubling approach to R-C coordinate constructions is that in Chinese, neither coordinate complexes with a repetitive coordinator nor adjectives in reduplicate forms may occur with the degree word *hen* ‘very’, whereas both coordinate complexes with a single coordinator and adjectives that are not in reduplicate forms can occur with the degree word.
(86) a. gao de shu
    high MOD tree
    ‘high trees’
  b. hen gao de shu
    very high MOD tree
    ‘very high trees’
  c. gaogao de shu
    high MOD tree
    ‘high trees’
  d. *hen gaogao de shu

(87) a. gao you da de shu
    high and big MOD tree
    ‘high and big trees’
  b. hen gao you hen da de shu
    very high and very big MOD tree
    ‘very high and very big trees’
  c. you gao you da de shu
    and high and big MOD tree
    ‘both high and big trees’
  d. *you hen gao you hen da de shu

(88) a. zhe ke shu hen gao you hen da.
    this CL tree very high and very big
    ‘This tree is both high and big.’
  b. *zhe ke shu you hen gao you hen da.

The example in (86a) has a simple adjective gao ‘high’. This adjective can be modified by the degree word hen ‘very’, as seen in (86b). This adjective can also occur in a reduplication form, gaogao, as seen in (86c). However, the example in (86d) shows that the reduplication form cannot be modified by the degree word. A similar constraint is seen in the coordination data in (87). The example in (87a) has two adjective conjuncts, gao ‘high’ and da ‘big’. Both conjuncts can be modified by hen, as seen in (87b). The two adjectives can also be the conjuncts of a repetitive coordinator construction, as seen in (87c). However, the example in (87d) shows that the repetitive coordinator construction is not compatible with hen. The contrast between (87b) and (87d) is also seen between (88a) and (88b), where the coordinate complex occurs as predicate.

We thus see the incompatibility between reduplicative adjectives and the degree word in (86), and the incompatibility between repetitive coordinator constructions and the degree word in (87) and (88). We see that the behavior of coordinate complexes with a repetitive coordinator is similar to that of reduplicate adjectives. The similarity can be captured if
the two types of elements have undergone the same step of derivations, and they show the same restriction. Then, if a reduplicative adjective undergoes a stage in which two identical forms form a constituent, so does a repetitive coordinator and its associate conjunction.

Another supporting fact for our doubling approach to R-C coordinate constructions is that in Chinese, both coordinate complexes with a repetitive coordinator and adjectives in reduplicate forms can function as predicate, whereas neither coordinate complexes with a single conjunction nor adjectives that are not in reduplicate forms can function as predicate.

(89) a. *tade lian hong.
   his     face red
b. tade lian honghong de.
   his face red       PRT
   ‘His face is red.’

(90) a. *tade lian hong you nen.
   his face red   and tendon
b. tade lian you hong you nen.
   his face and red and tender
   ‘His face is both red and tender.’

It is well-known that adjectival predicates in Chinese cannot be in a simple form, as shown in (89a); instead, they can be in a reduplication form, such as (89b), or a coordinate form with a repetitive coordinator, as in (90b) (see Zhu 1980: 26–27). From (90a), we see that coordinate complexes without a repetitive coordinator cannot function as predicate, either. Again we see that the behavior of coordinate complexes without a repetitive coordinator is similar to that of reduplicate adjectives. The similarity can be captured if the two types of elements have undergone the same step of derivations, and they show the same restriction. Then, if a reduplicative adjective undergoes a stage in which two identical forms form a constituent, so do a repetitive coordinator and its associate conjunction.

The above two facts support our doubling approach to repetitive coordinator constructions.

7.4 Accounting for the five properties

Empirically, the coordinator doubling analysis explains the five properties presented in Section 2 through Section 6.
I. The occurrence dependency relations between R-C coordinators and conjunctions
The properties presented in 2, namely, the occurrence dependency between R-C coordinators and their associate conjunctions is captured by the definition of doubling itself. The dependency is not expected if the former are integrated into the coordinate complexes independently. Specifically, we now can account for the “born-in-pairs” nature of R-C coordinators with their associate conjunctions. Treating R-C coordinators as conjunction doubles, we realize the parallelism between the dependencies of such elements on conjunctions and the dependencies of doubles on their associates.

II. The form dependency relations between R-C coordinators and conjunctions
The property presented in 3, namely, the form dependency between R-C coordinators and their associate conjunctions is also captured by the properties of doubling. The dependency is a kind of compatibility between the partners in each pair of such coordinators. As we mentioned before, such a compatibility has long been recognized as a co-occurrence restriction (Dougherty 1970: 867). Treating R-C coordinators as conjunction doubles, we can now account for the form dependency by the co-occurrence restrictions between an associate and its double, in their base-positions.

III. The island-sensitive distance between R-C coordinators and their associate conjunctions
I adopt a hypothesis made by Hendriks (2002): unlike regular focus particles, R-C coordinators are never base-generated in their surface positions. The island effects observed between such coordinators and their associate conjunctions (Larson 1985, see our 4) are accounted for by our movement approach. In this movement chain, the property of the element that undergoes the movement is consistent: R-C coordinators do not project in either their base-position (i.e., within the cluster) or their landing site. Moreover, the fact that R-C coordinators can keep different distances from the associate conjunctions can be accounted for by their multiple possible landing sites. The landing sites can be to the immediate left of the first conjunct, as in the a-sentences in (21) through (23), at a position away from the coordinate complex, as in b-sentences in (21) through (23), and inside the first conjunct, as in the c-sentences in (21) through (23). In the
first two cases, the movement of R-C coordinators is the regular forward movement, in the sense that the landing sites of the movement is free so long as they obey the island constraints.

The last case is different. I repeat the relevant data as (91) below.

(91) a. Jane either ate rice or she ate beans. (= (21c))
   b. Mary is both going to the wedding and she is attending the reception afterwards. (= (22c))
   c. The gale had neither abated in the least, nor were there any signs of its abating. (= (23c))

I claim that the derivations of such data have a sideward movement involved. Before I spell out my proposal, let me briefly introduce this mode of movement. Generally speaking, the movement of X lands at a position that c-command the launching site, in the same “tree”. The movement from one tree into another tree is sideward movement. Sideward movement is discussed in Bobaljik & Brown (1997), Nunes (1995; 2001), Hornstein (2001), and Nunes & Uriagereka (2000). The existence of sideward movement is expected, if Remerge (Move), like Merge, simply sets up new syntactic relations. As correctly pointed out by Hornstein & Nunes (2002: 27), sideward movement does not add any new constraint to our current computational system. In contrast, it removes a stipulation from the system that movement must target the syntactic object that contains the trace. Hornstein & Nunes (2002) claim that such a stipulation is actually a residue of D-structure, which is not compatible with the Minimalist Program. If no D-structure is assumed and the computational system resorts to generalized transformations to build phrasal objects, the landing site of a movement may be beyond the domain that contains the trace. “In other words, in a system that may operate with more than one single-rooted syntactic object at once, as in Chomsky 1995, only brute force would force movement to always target the same tree.” (Hornstein & Nunes 2002: 28) Sideward movement has been argued to account for a number of unrelated phenomena, such as adjunct control, tough-movement, and other null-operator constructions (Hornstein 2001), issues pertaining to extraction domains (Nunes & Uriagereka 2000), PRO-gate effects (Hornstein & Kiguchi 2003), donkey anaphora (Boeckx 2003), antecedent-resumptive relations (Kayne 2002), head movement (Bobaljik & Brown 1997), and others.

Return to our derivations of data like (91). I claim that the double undergoes a sideward movement from the cluster to the working site where
the first conjunct is assembled. After the first conjunct is built, the conjunct is merged at Spec of the associate conjunction and the coordinate complex is thus formed.

In data like (91), the second conjunct is a full clause, and the constituent that precedes the conjunction is also a full-clause. The R-C occurs inside this left clause.

Larson (1985: 235) claims that data like (91) are special in that they are well-formed if and only if the second clause contains an instance of nominal co-referential with the subject of the first clause. In (91a), *she* in the second conjunct is co-referential with *Jane* in the first conjunct.

Hendriks (2002: 15; 2003: 30), however, convincingly shows that Larson’s observation might be a tendency rather than a constraint:

(92) a. Perhaps Wallace is under the impression that the team will either change its mind or the league will win on appeal.
   b. Yet our invitation was either a complete hoax [...] or else we had good reason to think that important issues might hang upon our journey.

In the above examples (= Hendriks’s (48) and (49)), there is no co-referential relation between the two clauses. Hendriks further argues that the real constraint on the positions of R-Cs is that they must occur to the left of a focused element. She is right.

So far, we have discussed how our movement including sideward movement analysis captures the distance between R-C coordinators and their associate conjunctions. We can see that since the position of the associate conjunctions mark the launching site of the relevant R-C coordinators, the former cannot occur in islands. However, there is still one more issue to address: why can R-C coordinators themselves not occur in islands? This in fact is a more general question: if an element can undergo sideward movement, why can it not land inside an island? The issue is brought to us by data like (28), repeated here as (93):

(93) *The guy who either Jane had invited arrived or the guy who John had invited did.*

Such data could be derived if the sideward movement occurred very early. I believe that a timing constraint is required to rule out any sideward movement that aims to build an island inside the target working site. Nunes and Uriagereka (2000) claim that the regular island effects are caused by the lateness of the movement operation. Specifically, when an island “chunk” is sent off to PF to spell-out, there is no way to move anything out
of it. In data like (93), the assumed sideward movement occurs too early. Conceptually speaking, the two aspects of a timing issue, the too late and too early one, should both be considered. Since the issue is not restricted to coordination, I leave it for future research.

At this moment, I also leave it open whether R-C coordinators may undergo any covert movement from their surface positions so that they can c-command the focused elements at LF (see Johannessen 2005 for such an approach). Since their distributions are identical to focus particles, they may undergo whatever operations that the focus particles in the relevant language do.

In the rest of this subsection, I say more about how our analysis of the distance issue is different from other approaches to R-C coordinator constructions in the literature.

In dealing with this “floating”-like property of R-C coordinators, our analysis is superior to the two proposals made by Kayne (1994). In one proposal (ibid. 58), the French *et Paul et Michel* is analyzed as *

\[
\text{et} [\text{Paul} [\text{et Michel}]]
\]

*, in which the first *et* takes as its complement the phrase headed by the second *et*. In the other proposal (ibid 143 n.2), *et Paul* is taken to be in the specifier of the second *et*. Thus the assumed structure is *

\[
[[\text{et Paul}] [\text{et Michel}]]
\]

*. In both proposals, the positions of R-C coordinators are fixed. Neither proposal is able to capture the “floating”-like property of R-C coordinators. The two proposals cannot account for data like (91). In Collins (1988), Zwart (1995), and Progovac (1997), it is assumed that an R-C coordinator and its associate conjunction each head a projection and each projection hosts one conjunct. Such proposals cannot explain data like (91), either.

My analysis is also different from other approaches such as Larson (1985), Schwarz (1999), Munn (1993), and Winter (1998). In Larson’s analysis, the syntactic representation of (94a) is assumed to be (94b):

(94) a. Jane either ate rice or beans. \(= (21b)\)
   b. Jane either; ate [t; [rice] or [beans]]. (Larson 1985)

Schwarz (1999) argues against Larson’s movement approach, claiming that *either* always occurs at the left edge of the first conjunct, and deletion applies in the second conjunct. This deletion analysis is also proposed in Zamparelli (2000). For instance, in the deletion approach, (94a) is derived from (95a). Another example is (95b) \(= (22b)\).
a. Jane either ate rice or [ate beans]. (See Schwarz 1999: 341)

b. Gianni has both eaten the pear and [eaten the apple]. (Zamparelli 2000: 23)

One difference between Larson (1985) and Schwarz (1999) is that the latter claims that there is deletion in the second conjunct, whereas the former does not do so. Den Dikken (2006) correctly points out that in data like (91), there is nothing to elide. In (96a), however, it seems that deletion in the second conjunct, as in (96b), is a possible analysis.

a. Either this pissed Bill off or Sue. (den Dikken 2006: 695)

b. Either this pissed Bill off or this pissed Sue off.

In this research, we care about the syntactic distance between R-C coordinators and the associated conjunctions. So long as we agree that the syntactic positions of the associate conjunctions are stable in the R-C coordinator constructions (see our comments on Munn’s 1993 and Winter’s 1998 approach below; also see 3.5.2 and 3.5.3), and that in languages such as English conjunctions occur between two conjuncts, what happens in the second conjunct does not affect our understanding of the distance between conjunctions and R-C coordinators, which are always outside the second conjunct. The implication of this statement is that we do not make any claim on the issue whether there is any deletion in the second conjunct of the construction. The dispute between Larson (1985) and Schwarz (1999) needs an independent study.

Another difference between Larson (1985) and Schwarz (1999) is that the former claims that the surface positions of R-C coordinators sometimes are and sometimes are not their base-generated positions, whereas the latter assumes that the surface positions are always the base-generated positions. In this paper, I study the issue of how far R-C coordinators can be away from the related conjunctions, and seek a unified account for the distance restriction and other dependencies between R-C coordinators and conjunctions. Based on their occurrence and form dependencies, I have concluded that the surface positions of R-C coordinators are never their base-positions. This conclusion is different from both that of Larson (1985) and Schwarz (1999).

A further issue involved in the R-C coordinator literature is whether the surface positions of such elements mark the left-periphery of the first conjunct. See Hendriks (2002; 2003) for a recent and comprehensive review of both Larson (1985) and Schwarz (1999), with respect to the issue. In our view, this depends on the answer of the issue above. If the
positions are landing sites of the movement of R-C coordinators, they are
decided by the properties of the movement. As noted by Rooth & Partee
(1982), the positions also correspond to the scope readings (see 5.4). It is
possible that the positions mark the left-periphery of certain constituents,
regardless of whether the constituents are the first conjuncts or not. As we
know, it is not always the case that two conjuncts are of the same category
(see Zhang 2007, among others). Moreover, it is well-known that not all
coordinate complexes are symmetrical.

In Munn (1993) and Winter (1998), it is the coordinate complex rather
than either that moves. Munn (1993: 187f) claims that if either occurs
displaced from the coordinate complex, its selectional restrictions are not
satisfied. If the disjunction or moves to the position of either at LF, and
then the entire coordinate complex moves, he claims, the selectional
restrictions will be satisfied. As we know, selectional restrictions must be
satisfied in initial merge, rather than move (remerge). This approach thus
runs against our basic understanding of syntactic operations.

IV. The syntax of focus particles and the splitting of coordinator-
clusters
In this subsection, I describe how my new analysis accounts for the
syntactic similarities between R-C coordinators and focus particles
presented in Section 5.

I have adopted Hendriks’s (2004) analysis in treating R-C
coordinators as focus particles. However, I have further specified that they
are focus particles parasitic on conjunctions. The fact that their syntax
patterns with that of focus particles such as even and only (5) is thus
captured. Focus particles have been claimed to be “admanythings” in
Herburger (2000: 89). Compatible to Hendricks’s claim, Johannessen
(1998: 162) claims that R-C coordinators are not real coordinators. She
argues that such elements not only do not conjoin anything, but also are
phonologically stressed, unlike real coordinators, in languages such as
Greek, French, and Dutch.

V. The parallel focalization effect of coordinator doubling
Finally, our approach also covers the property presented in 6: the parallel
focalization effect of R-C coordinator constructions. Assuming coordinator
clusters are clusters of focus-marking elements, we can explain why each
element of a cluster is related to a focused element in R-C constructions.
The parallel focalization effect of R-C coordinator constructions is not mentioned in either Hendriks’s nor Johannessen’s (2005) focus particle approaches. Accordingly, the effect is not captured in their approaches.

I make it explicit that in languages where the occurrence of R-C coordinators is not obligatory, only focus particle-like coordinators take part in the computation of cluster formation and a sequential cluster-splitting in the derivations. In such languages, however, a regular coordinator does not take part in the computation of clusters, and it is not subject to the constraints on focus particles. The property reported in Section 6, namely, both R-C coordinators and their associated conjunctions show properties of focus particles, is captured by the assumption that both components of a coordinator cluster must occur to the left of an element with a [focus] feature. Accordingly, the syntax of both components of such clusters should pattern with that of focus particles in the language. For instance, for independent reasons, there is no post-verbal focus particle in Chinese. Accordingly, R-C coordinators do not occur postverbally in the language.

In this subsection, I have presented how my cluster-splitting analysis accounts for the five facts listed in Section 2 through Section 6.

8. The left-peripheral effects shown in the distribution of both and neither

In this section I address the issue of the distribution restrictions of certain R-C coordinators in English.

It has been claimed that both…and cannot conjoin matrix clauses (Schane 1966: 3, 4 fn. 1; Dik 1968: 273, 281):

\[(97)\]  
\[
a. \text{Mary both [fulfilled her obligation] and [brought a bottle of wine].} 
\]
\[
b. \text{*Both [John laughed] and [he cried].} 
\]
\[
c. \text{*Both [John sang] and [Mary danced].} 
\]
\[
d. \text{*Both [I am reading] and [you are writing].} 
\]

However, both can introduce conjoined subordinate clauses (Dougherty 1970b: 867, e.g. (155); Gazdar et al. 1985: 180 fn. 9; Sag et al. 1985: 138 fn. 10; McCawley 1988: 288):

\[(98)\]  
\[
a. \text{Julie satisfied Curval both when she was the active member and when she was the passive member.} 
\]
\[
b. \text{I’m absolutely certain that both [Tom will sing] and [Mary will dance].} 
\]
c. I returned to the house where both [I was born] and [my parents died].

The restriction is also claimed to apply to *neither...nor*. Data like the following (99c) seem to suggest that *neither...nor* cannot coordinate matrix clauses (McCawley 1988: 544 fn. 2; Schwarz 1999: 340 fn.). In contrast, *either...or* does not have this constraint, as seen in (99a) and (99b).

However, *neither...nor* can coordinate embedded clauses, as seen in (100):

(99)  
\begin{itemize}
  \item a. Either Mary needs a bath or something died here.
  \item b. Either John laughed or he cried.
  \item c. *[Neither] John laughed nor he cried
\end{itemize}

(100)  
\begin{itemize}
  \item a. John knows neither [who the murderer is] nor [where the body is]. (Munn 1993: 122)
  \item b. John knows neither [the murderer] nor [where the body is].
  \item c. John knows neither [where the body is] nor [the murderer].
\end{itemize}

However, we do find examples in which *both...and*, and *neither...nor* coordinate matrix clauses (see Johannessen 2005 sec. 4 for a discussion of the parallel observation in Norwegian and other Germanic languages):

(101)  
\begin{itemize}
  \item a. Mary is both going to the wedding and she is attending the reception afterwards. (= (22c))
  \item b. The gale had neither abated in the least, nor were there any signs of its abating. (= (23c)/(55b))
  \item c. Neither had the gale abated, nor were there any signs of its abating. (= (55a))
\end{itemize}

In our perspective, it is not that *both...and* and *neither...or* cannot conjoin two matrix clauses. Instead, it is the correlative coordinator *both* and *neither* that are not or do not need to be spelled out at the left-peripheral position of matrix clauses. This means that if they do not move as far as to the left-periphery of a matrix clause, they can occur in matrix clauses. In (101a) and (101b), the correlative coordinators occur in non-peripheral positions of the matrix clauses.

The distribution restrictions are accounted for by the special syntactic properties of the left-periphery of matrix clauses. See Fitzpatrick (2003) for a discussion of the properties. It should not be surprising that the correlative coordinator *both*, like the complementizer *that*, cannot occur at the left-periphery of matrix clauses. The restriction of *that* is shown in (102a). As we know, matrix C can be taken by auxiliaries and modals, which have more semantic features than the complementizer *that*. Between modals and auxiliaries, the former have richer semantic features and they
cannot drop, as seen in (102b), whereas the latter have poorer semantic features and they can drop, as seen in (102c), (102d), and (102e):

(102) a. (*That) Mary picked up John at the airport.
   b. *(Can) anyone pick up John at the airport?
   c. (Does) Anybody want a hot dog?
   d. (Has) Anybody seen John today?
   e. (Is) Anybody going to the game?

I claim that the constraint on both and neither can have a unified account with other left-peripheral effects.

9. Summary

In this paper, I have argued that R-C coordinators and their associated conjunctions are base-generated as a cluster, which is split later in the derivation. Specifically, R-C coordinators are simply focus particles parasitic on conjunctions.

The main characteristics of this new analysis of R-C coordinator constructions are summed up as follows. This coordinator doubling approach is different from all other assumptions on R-C coordinators in that such a coordinator and its associated conjunction are base-generated in the same head position, as a cluster. This new analysis, first of all, explains the occurrence and form dependencies of R-C coordinators on conjunctions. Their parasitic nature is accounted for by their status as coordinator doubles. Moreover, we regard R-C coordinators as focus particles parasitic on conjunctions. They show the full set of properties of focus particles. Furthermore, the coordinator doubling approach also accounts for the focus particle properties of both conjunctions and R-C coordinators when they co-occur. We capture the pairing property of focalization of R-C coordinator constructions without resorting to any ATB movement of remnant and clausal conjunct hypothesis (contra Zamparelli 2000). In Zamparelli (2000), focused elements inside conjuncts move, and remnant conjuncts move later. In my approach, R-C coordinators move. Finally, the surface position variations of R-C coordinators are explained by various possible landing sites of cluster-splitting. The sites are subject to island constraints, as noted by Larson (1985).

In this approach, it is clear that unlike conjunctions, R-C coordinators do not head any projection (contra Collins 1988; Zwart 1995; Progovac
1997). Instead, they adjoin to other elements. Furthermore, their surface positions do not necessarily mark the left-periphery of coordinate complexes (see Larson 1985; contra Schwarz 1999). Instead, they occur wherever focus particles are allowed to occur, and their distance away from the associate conjunctions obey the constraints on movement chains.

References


—— (Forthcoming) *Coordination in Syntax*. Cambridge: Cambridge University Press.


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Squibs

Patrice Larroque

Non-standard English: One or Several Systems?

Abstract

A language is a system, i.e. a set of relations or rules which are involved in the formation of sounds, word patterns, and sentences. A language is also learned, which means that it is governed by social and cultural conventions, and subject to individual appropriation. This study takes the example of English which has evolved into various forms. Linguistically, it is questionable whether we deal with several systems depending on the variety studied, or with a single system inside which any movement is reflected in the other relations of the set, and cause more or less major changes. It is then hypothesized that heterogeneous and personal linguistic facts allow the linguist to understand the relations between competence and performance. The paper’s aim is neither to describe the origin of any given linguistic fact, nor to expose deviance. It addresses the issue of the underlying operations applied by individuals within a linguistic system to interpret and produce utterances.

Introduction

The English philosopher John Locke, in Some Thoughts Concerning Education (Grants & Tarkov 1996: 126) claims that “languages were made not by rules or art, but by accident and the common use of the people”, and that speakers must trust their memory and the habit of speaking by rote in order to communicate. It is true that imitation and repetition are ways of learning a language, but users of a common language have to rely on their ability to produce new combinations of signs and produce utterances, as

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1 I wish to thank the anonymous reviewers of this paper for their insightful comments and suggestions.
well as on their knowledge of the language, which, I argue, requires a long
time to learn and arguably does not come naturally (Crystal 1969: 29).

For the structuralists, a language is essentially a system, a set of
relations or rules which are involved in the formation of sounds, word
patterns, and sentences. These relations form a stable arrangement in which
the linguistic signs are defined by no other rule than their mutual relations
within the language. The stability of the system depends on this type of
determination. Any movement inside the system is immediately reflected in
the other relations of the system. If the process is repeated, this may lead to
a redefinition of all the signs and markers of the system. The structuralist
view of language favours synchronic description, thus allowing varieties to
be compared (McMahon 1994: 232), and the problem of dialect systematic
differences to be approached (Chamber & Trudgill 1998: 33–44).

As English emerges as a transnational language, it is bound to develop
into various linguistic forms which are determined by country, region, or
class. These forms are usually called dialects or varieties of the language.
Linguistically, there is an issue of whether we deal with several systems
according to the varieties studied, or with one single system within which
every modification affects the relations between the different elements (or
categories), causing more or less important changes. Consider the use of
what in the following examples:

(1) Well, the one what’s my husband, he said, let her lay there, he said. (Norwich,
quoted in Hughes & Trudgill 1996: 76)
(2) Well er they never spent no money but they got local talent … they got a lot of
local talent what come up … you know like … out of the amateur side. (West
Midlands, Hughes & Trudgill 1996: 87)

These sentences may reflect inadequate competence as regards Standard
English, yet this type of performance would be recognized and interpreted,
if not accepted, by a large number of English-speaking people. The aim is
neither to describe the origin of a given linguistic fact, nor to expose
deviance, but it addresses the issue of system congruity in contrast to the
users’ tacit or subconscious knowledge of their native language.

The following study, therefore, deals with the interplay between
standard and non-standard varieties of English. Some commentators (Bauer
1994: 11; Burchfield 1985: 160; Crystal 1988: 11; Quirk & Greenbaum
1973: 2) argue that there is more than one English language, which implies
more than one system, or sub-system likely to diversify and develop into a family of new languages. On the other hand, since most English varieties are strongly related to Standard English, it can be justified to regard them as dialects, or non-standard forms of English rather than separate languages. From these two somewhat opposite viewpoints, I shall attempt to determine the elements that may help to tip the scales one way or the other.

1. A family of new languages

The adjective *several* derives from the verb *sever*, which comes from (Old) French *sevrer*, from Latin *separare*, ‘separate’. In most dictionaries the adjective is defined as: separate and distinct from one another, relating separately to each individual involved, more than two but fewer than many. The term then may be used in reference to separation from a whole and heterogeneity. This is the idea evoked by D. Graddol, D. Leith and J. Swann in their book, *English, History, Diversity and Change* (1996: 166). They explain that “there are opposing tendencies, such as regional pride and interest in local dialects. The existence of such competing forces – which some scholars have called ‘centripetal’ (pulling in to the center) and ‘centrifugal’ (tending to pull away from the center and fragment) – is one reason why a single homogeneous variety of English will never be achieved”. The internal structure of a language is governed by rules which are learned, but it is also virtual and can only be apprehended through speech. Speech is a social institution\(^2\) which involves individuals and their own appropriation of the system, and which may be regarded as one locus of variation. There is indeed a constant interplay between so-called non-standard productions, i.e. the idiosyncratic way in which the verbal system has been internalized, and the grammar of the common language. This may create many kinds of communication communities including dialects. A dialect can be defined as the distinctive speech of a group within the language community, mainly determined by region or class. Some dialects

\(^2\) Cf. Jean-Jacques Rousseau, *Essai sur l’origine des langues* (1993 [1781]: 55): “… la parole étant la première institution sociale ne doit sa forme qu’à des causes naturelles.” (“… speech being the first social institution, it only owes its form to natural causes”).
triumph over others and achieve languagehood, thus developing their own conceptual system.

The Ancient Greeks, who took pride in their civilisation, used to define themselves in terms of language, and designate the other peoples whom they did not understand as ‘barbarians’, non-Greeks, peoples who could only produce onomatopoeic ‘baa-baa’ sounds. Following the example of ancient Greek society, each area where a dialect is spoken can also be defined in terms of language, and the people who do not speak the local vernacular referred to as ‘others’. Otherness can not only be construed as the state of being different, but it may also imply a change in status. An existing language variety can then serve as the basis of a new system, mainly because some of its features are accounted an integral part of the values and lifestyle of a particular society (Ihalainen 1994: 199). The codification of the selected variety will rest on new grammatical and lexical rules which will be enforced through education. The implementation of a language variety correlates with the emergence of one independent system, and this may be repeated for each of the varieties of a given language. From these distinct systems, one single, ‘hierarchically’ higher order is constructed, bringing forth differences and similarities. A sequence of examples taken at random in varieties of English in Britain, North America, and the West Indies will now illustrate the topic.

Let us first consider sentences in African American Vernacular English (AAVE). AAVE reflects a double linguistic heritage from Africa and Europe. It is a form of English which exists parallel to Standard American English. Like other language varieties it seems to have its own grammatical and phonological rules, together with specific expressions and style which make it unique. Here are the examples:

3 In his *Tour Through the Whole Island of Great Britain* (1724–1726), Daniel Defoe (1962: 253) comments on aspects of dialect, namely Somerset and Northumbrian English: “I must not quit Northumberland, without taking notice, that the natives of this country, of the antient original race or families, are distinguished by a shibboleth upon their tongues, namely, a difficulty in pronouncing the letter r, which they cannot deliver from their tongues without a hollow jarring in the throat, by which they are plainly known, as a foreigner is, in pronouncing the th: This they call the Northumbrian r, and the natives value themselves upon that imperfection, because, forsooth, it shews the antiquity of their blood.” See also Ihalainen (1994: 198–199).
In the AAVE grammatical system the forms be copula (3) or auxiliary associated with V-ing (4) seem to be identical and are deleted. The link is explicit in Standard English (as in He is a nice little girl and we are drinking) while in AAVE the juxtaposition of he and nice little girl (3), and of we and drinkin (4) is a syntactic feature which signals identity, even though in the case of sentence (4), the identification involves the time of a situation. As Labov (1969: 721) suggests, “the evidence given here points to an underlying copula and auxiliary be which is deleted”. Although it is not marked superficially, the operation linking the subject to the predicate remains. Many languages share this feature with AAVE: Russian, Hebrew, the French Creole of the Caribbean, and English Creoles of the same area show no present copula. It is a linguistic invariant which is explicit in some languages (like German, Standard English, Standard French, etc.) and underlying in others.

Another grammatical feature of AAVE is the negative concord rule which in this specific variety of English has become almost systematic, so that the construction has lost some of its emphatic meaning. The generalization of this rule leads to changes in the expression of emphasis. Indeed, the repetition of a negative element may initially have been motivated by a desire for expression (Meillet 1912). One rule is the duplication of the negative particle, as in

(5) It ain’t nobody can’t sit here.

The negative particle is duplicated (cf. can’t) in AAVE, so that sentence (5) corresponds to white non-standard English there ain’t nobody can sit here. The second rule is the fronting of the negative:

(6) Can’t nobody do nothing about that.

This example is the emphatic form of nobody can’t do nothing about that (Labov 1971: 452).

Caribbean English shows some similarities with AAVE, like the deletion of be copula or the use of the double negative. There are, however,
grammatical features that characterize most forms of Caribbean English. For example, the lack of case marking in the pronominal and possessive system and unmarked verbs as in the following:

(7) (The mother recounts the events leading up to her son’s death)
    “Ten minutes after me hear my 19-year-old son cry out and she dosomething happen to Marlon. When me go in deh me see Marlon on the bed, me draw weh the baby from underneath the mother’s arm and the uncle carry the baby a Children (Bustamante Children’s Hospital). The baby dead a Children and Marlon dead inna him cousin arm in a him room.” (Weekly Gleaner, Oct. 6, 2007, Kingston, Jamaica)

In this passage When me go in deh me see Marlon on the bed means ‘When I went in there I saw Marlon on the bed’ and inna him cousin arm in a him room means ‘in his cousin’s arms in his room’. This type of production is still intelligible, despite the apparent simplification.

The intensive iteration of forms, adjectives or adverbs, is a rather common feature in Caribbean grammar (but also in Pacific Creoles and South-East Asian varieties). Creole big big, for instance, means ‘huge’ (Holm 1994: 359), fool fool, means ‘simple minded’ or ‘provokingly very stupid’ (cf. the Dictionary of Caribbean English Usage). Correspondingly, this characteristic is bound to occur in exclamatory sentences. In example (8), the speaker is shouting in a woman’s direction at the Linstead market (Jamaica). The repetition of the adjective spotty is here strongly expressive.

(8) “You see how yuh foot dem spotty spotty!” (Weekly Gleaner, Oct. 11, 2007, Kingston, Jamaica)

Of the numerous features that characterize Caribbean English, there is the deletion of there in existential sentences. The following is a mother’s comment about the confusion at some schools in areas affected by a category four hurricane. One school was forced to close its doors:

(9) “Is pure chaos and confusion here this morning, because we weren’t given any prior notice until today about the shift system.” (Weekly Gleaner, Sept.11, 2007, Kingston, Jamaica)

Is in this passage can be translated into Standard English as there is (cf. ‘There is pure chaos and confusion here this morning’). In our example,
only *be* is used to express the existence of the event. Existential *there* in Standard English has lost its locative meaning to become a function word, a syntactic subject, *chaos and confusion* being the real subject of the sentence and *here* the locative adverb. *Be* identifies the subject with the situation. Similarly, the pronoun *it* is also regularly deleted when in subject position as in the following:

(10) (The reporter asks a woman if the market is very busy every day)
“*Yes, man, is Linstead this name you know. You never hear bout di song weh say, ‘carry me ackee go a Linstead market?’ Is we it singing about so we always busy over here. Hee, Hee! If you want peace and quiet you haffi go inna one a di likkle town dem. But which part you is standing is always busy.*” (*Weekly Gleaner*, Oct. 11, 2007, Kingston, Jamaica)

Phonologically, this phenomenon may be the result of elision, i.e. loss of an intervocalic consonant: *i(t) is* (cf. the *Dictionary of Caribbean English Usage*); linguistically, the missing pronoun without any previous mention has a ‘deixis ad oculo’ (Bolinger 1977: 80), a reference to the immediate situation. In the sentence *is Linstead this name you know*, the referent is the predicative item (i.e. Linstead) identified by this name; in the sentence *Is we it singing about*, the referent is *we*. The pronoun *it* (at the beginning of the sentence) being redundant is logically deleted.

The perfect aspect in Caribbean English is often rendered by the past participle *done* as in:

(11) She *done* know wha’ goin’ on. (Winford 1993: 153)

Here *done* is used as an auxiliary comparable with *have* in Standard English Present Perfect. In this system, however, *done* not only evokes a situation that still exists in the present time, but it also acts as an intensifier (Chevillet 1991: 194; Feagin 1995: 179):

(12) *me don nuo se im naa go* ‘I know full well that he won’t go’. (Jamaican Creole, Bailey 1966: 42; also in Feagin 1995: 181)

The translation into Standard English clearly shows that *don* has an intensive meaning (cf. *full well*) in addition to its perfective function. Again, Caribbean Creole shares this feature with AAVE and Southern White non-standard American English, probably because of language
contact between slaves and white small farmers over 100 years ago (Feagin 1995: 161). Feagin (1995: 183) also points out that there was a *done* in Middle English which had the same perfective meaning, but it was preceded by auxiliary *have*.

(13) An oratorie, riche for to see,
    In worship of Dyane, of Chastitée,

This shows that in terms of system *done* is not strictly speaking an innovation, but a case of grammaticalization motivated by a need for expressiveness, which also concerns negative markers.

In Caribbean English, one of the most common ways of making a clause negative is to insert the operator *ain’t* before the verb base as in

(14) I ain’t see the car hit Leslie. I ain’t know about the car P522 striking another car. (Barbados, Court Report, in the *Dictionary of Caribbean English Usage*)

(15) I turned to him and tell, James is thre weeks that you ain’t give me anything. You don’t know how I living. (Barbados, Court Report, in the *Dictionary of Caribbean English Usage*)

Although *ain’t* is widely felt to be non-standard, it appears to be a systematic feature in this variety. *Ain’t* is no longer a contraction (cf. *isn’t, aren’t, hasn’t, haven’t*), but a kind of ‘boundary morpheme’, like *don’t* in example (15), which establishes a direct relationship between the sentence and the speaker who negates the positivity.

All these dialects with their specific characteristics can be regarded as systems which are coherent in themselves, and which assign slightly different values to the markers they share with English. Indeed, most English varieties have diverged from English, but they have not quite achieved complete independence as separate national languages. Often enough, users are able to handle a dual system, the English system, and the ‘New English’ system which has developed from the former. Some of them are even recognized as languages: it is now the case of Scots in Scotland (McArthur 1998: 138–139) and Tok Pisin which enjoys official status in Papua New Guinea (McMahon 1994: 165). It can be argued, however, that although most English users speak non-standard varieties, they certainly recognize and understand Standard English, both oral and written. Already,
Standard English is not absolutely clear-cut and mutual comprehension remains in most cases possible from one variety to another (Trudgill 1975: 22). This means that speakers may refer to one common dynamic system within which relations are flexible enough to resist radical modifications. Change is a slow and gradual process; it spreads over dialectal boundaries, thus permitting intelligibility between generations and people from different areas. However remote a variety may be, it has in it a set of rules and features which are common to all varieties. The stage reached with the languages born from Latin (that are French, Italian, Portuguese, Spanish, etc.) or the Germanic dialects (like Dutch or German), for instance, has not yet been achieved with English dialects despite the geographical dispersal of the English-speaking communities (Quirk & Greenbaum 1973: 2).4

2. Varieties of one system

The generative approach assumes that dialects of one language share the same underlying representations, and are distinguished only in the form (McMahon 1994: 212).

(16) Move boy, or I go give you bois (http://en.wikibooks.org/wiki/Trinidadian English/Words and phrases)

This sentence in Trinidadian English can be interpreted with reference to the English system in that go, for instance, plays the same metalinguistic role as in ‘I am going to give you bois’. Go does not indicate a movement toward a place, but a form of progressive location of the process relative to the subject. In both sentences it is used to predict the immediate consequence of the protasis Move boy. In addition to the definition of go, the words used in this utterance all belong to the English system and have the same meaning (except for the word bois which is borrowed from French and means ‘a heavy stick’), and the syntax parallels that of Standard English. The construction go + V may be regarded as a distinctive syntactic

4 At this point a parallel can be drawn with Arabic speakers who are referred to as diglossic, and use dialectal or ‘colloquial’ Arabic (which varies from one area to another) for everyday conversation and ‘classical’ Arabic (which is constant and standardized) for written and formal language (Mneimneh 1997: 18–19, see also McArthur 1998: 208–209, 234).
feature of Caribbean English, but examples can be found in Scottish English, in which *go* is predictive (cf. *will*):

(17) Good discussion! Thank you all very much indeed! I hope you’ve heard something that er meant something to you. If you need help, I** hope you go look for it.** (Scottish women: discussion about smoking, spoken part of BNC)

The socio-linguist William Labov (1972a) has distinguished three kinds of rules governing a language. There are first the categorical rules which no English speaker would ever violate.

(18) *Mary Peter loves
 *Peter has going to Paris
 *Mary dined a hamburger
 *The government isn’t agree with the Senate’s decision
 *The government is not the responsible
 *Peter put the car

Such sentences are ungrammatical in the sense that any ordinary speaker of English would feel that something is wrong with them, that they somehow do not belong to the system and therefore cannot be accepted. These sentences may be produced by non-English speakers or learners who do not totally master the rules and use different ones as a basis to communicate. Aitchison (1991: 113) explains that “when people learn a new language they unintentionally impose their sound pattern and to a lesser extent, syntax”, e.g. ‘The government isn’t agree…’ will be pronounced by a Frenchman who will translate literally from *Le gouvernement n’est pas d’accord*… Native speakers do not make mistakes of this kind because they have learned their language from infancy, at a time in their lives when humans are programmed to learn languages (Andersson & Trudgill 1992: 110).

The second type include rules the violation of which can be interpreted socially, idioms that are considered to be vulgar or incorrect, such as the use of double negatives, the employment of *ain’t* for *am not, isn’t, aren’t, hasn’t, haven’t*, or the use of *them* for *those*. These forms are regarded as bad grammar by the people who “judge them against the norms of writing or formal speech ” (Milroy 1998: 101).
The systemic principles of the third type are variable rules which do not really affect the system and whose choice depends on circumstances. It is the case of the split infinitive or constructions ending with a preposition. A problem of acceptability may arise with expressions that appear grammatically unnatural, when there are for instance two coordinated subject pronouns, as in

(19) Where, when I start, Albert’s He, I tell you want he doesn’t do, I shouldn’t let you hear, but, when he, **when him and me are arguing** when we were younger, and me dad used to wind Collin up, and wind me up, and I’d get madder and madder, and me dad used to love it. (Conversation recorded by ‘Albert’, between 1 and 6 Feb. 1992, spoken part of BNC)

(20) Well, the idea of farming was much the same but he certainly was not very much of a farmer. Mm and was his treatment any different? Slightly **but then him and me didn’t get on**. He never wanted me there in the first place. (Orkney Library Sound Archive tape: interview for oral history project, recorded on 15 Mar. 1987, spoken part of BNC)

There seems to be much freedom of usage between speakers as to this type of construction which cuts across dialectal boundaries and happens to be very much in use as an alternative to **him and I are arguing (19)/didn’t get on (20)**, or **he and I are arguing/didn’t get on**. The order I and he is sometimes frowned upon, but it is a perfectly correct form in the English system.

There are, however, some dialectal features which can be seen as either systematic or unsystematic. The apparently random use of the third person singular -s inflection in the present tense, for instance, may appear to be unsystematic in the following:

(21) I says, all right then, good night, and I went to bed (Hughes & Trudgill 1996: 86)
He can gets hurt (Labov 1972b)
They starts bringing peoples in (Poplack & Tagliamonte 1989: 55)

In many dialects it is not a third person singular marker and it is not assigned any specific value in varieties other than Standard English, hence its mobility. It is in most cases superfluous and is probably going to disappear like the similar second person -est suffix.⁵ On the other hand, the

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⁵ In the East Anglian vernacular, for instance, the -s is no longer in use.
negative concord rule which has been stigmatized as ‘illogical’ and ungrammatical by prescriptivist grammarians establishes a series of systematic relations in the operation of rules governing the negative (Labov 1971: 452).

(22) I ain’t done nothing (conversation)
    I ain’t nicked no car (in Made in Britain, a BBC film by D. Leland, 1982)
    Can’t nobody do nothing about it (Labov 1972b)

Thus, change or deviation do not depend on the breach of rules, but they may result from the possibilities that are open to users. People have many ways within a system of conceptualizing and expressing their thoughts according to the different contexts in which they speak. This is one of the reasons why the grammar of a living language is not one fixed and unchanging system. Although some of its aspects still correspond to Early Modern English usage (which shows that the system evolves slowly), others can be seen in original innovations which occasionally appear in marginal trends of the language like the present perfect used with past reference adverbials (Gachelin 1990: 221) as in

(23) These clearances have taken place some sixty years ago. (‘Scottish Poor – Rural Improvement’, The Inverness Courier, Aug. 20, 1845)

In his Minimalist Program (1995: 19–20), Chomsky opposes the core of a language and its periphery. The core system then rests on what we assume to be something analogous to “the pure instantiation of universal grammar”, the actual instantiation of the English grammar. This refers to the internal competence of users and the systemic rules they would never infringe. There is indeed an underlying grammatical system which speakers exploit differently in accordance with their personal appropriation of it and communication needs. Conversely, the periphery concerns marked expressions (i.e. irregular verbs, agreement morphemes, grammatical constructions, …) which are likely to vary. To a certain extent, it can be argued that there are as many (sub-)systems as there are speakers depending on the individuals and the choices made:

Try to list the varieties of English you are exposed to in a single day. You will hear, perhaps, the English of your family, localised or non-localised; of
shopkeepers and bus-conductors, probably localised; if you are a student, you will hear lecturers using different Englishes, probably at least one of them having a foreign accent; you will read books and newspapers in international Standard; hear television new programmes, probably incorporating at least one American report; see a film using, perhaps, one or more varieties of American English; listen to pop-records, which may be genuine transatlantic, mid-Atlantic, Merseyside, Midland (but perhaps not RP); and chat with friends using different sorts of English. (Strang 1970: 19)

There are distinctions indeed, but they are not significant enough to affect mutual comprehension. Grammatical uncertainties which are visible at the morpho-syntactic level do not necessarily translate into systemic differences. These differences may be regarded by users as distinct systems all the more so since they are generally distinguished phonologically. But a linguistic system can only be apprehended from traces which are carried by sentences. A trace is the emergence of an underlying structure, that of the language itself. Only part of the emergence shows on the surface and for a given mental operation there can be several different performances from one individual or group of individuals to another. Therefore the system cannot be totally perceived from one surface representation. It is on the contrary useful to consider and exploit the various forms of the language. A standard language is only one aspect of the system, it is the centre, the ‘common core’ (Quirk & Greenbaum 1973: 1), the reference, the established norm, and the deviant-prone non-standard varieties an indication of the linguistic usage. What counts is the common mental representations that are conceived of, and this goes beyond the obvious surface structure.

3. Establishing boundaries

It is a very difficult task first to distinguish dialects from languages, and then draw a dividing line and decide exactly whether we deal with one or several systems since most varieties are regularly in contact and influencing each other (Trudgill 1975: 22). Indeed, the factors which define dialects and languages are not only linguistic. Swedish and Norwegian, for example, are mutually understandable because they are closely related, both linguistically and culturally. They are nevertheless regarded as different languages (they enjoy national status) and as such they are
perceived as different systems although the two languages are very similar (Chambers & Trudgill 1998: 3–14; Andersson 1998: 50). In this case, the boundary is political, not systemic.

In comparison with the phonological and lexical changes, grammatical variation may seem secondary and insignificant. Of course, there has been considerable grammatical change over the past centuries, but modern English grammar has shown little variation and is to some extent quite stable. Besides the fact that there are common features from one dialect to another, the rules on which no native speaker could be wrong and which constitute the basic structure that enables them to communicate are widely neglected. Indeed, this disregard relies on the assumption that there is one standard, one correct way of formulating the ‘right’ sentences, and departures from that are accounted mistakes. Except that native speakers do not make mistakes when they speak their own language. They may employ usages that are not taught, but which can be heard in their speech community. Some might react to a production and say: ‘This is hardly part of English’ or ‘There’s no such construction in English’, but on the whole, save perhaps the basically unnatural (or abnormal) utterances, the changes which have been recorded do not affect the overall shape of the system.\(^6\) It cannot be denied, however, that language diversification may eventually lead to increasingly important modifications and a gradual loss of inter-intelligibility. I think that there are at least two possible solutions to this kind of issue.

Closely linked to general acceptance and social graces is the conservative and prescriptive attitude to the language, in defence of a refined, perfect, logical standard, “a type of English which is neither provincial, nor vulgar, a type which most people would willingly speak if they could, and desire to speak if they do not” (Wyld 1934). It is a rearguard action. Generally, minor variations from one area to another are not significant enough to require correction, but any radical change that would hinder mutual understanding will sooner or later become an inconvenience, and in time develop into a new system with its own rules and prescriptions as could be seen with the diversification of Latin.

\(^{6}\) The distinction between unnatural or abnormal use is not quite clear. Normal language corresponds to the linguistic behaviour of ordinary people. An abnormal use of language means that the utterance does not belong to an actual variety of the language (Andersson & Trudgill 1992: 28).
English-based creoles, for instance, may fall into that category, even though they have not yet acquired complete stability. Admittedly, creole is a distinct linguistic system with its own vocabulary, phonology, and regular morpho-syntactic rules. But because of language contact and mutual influence, it shares many features with the dialects brought from Britain. On the problem of deciding whether some varieties are closer to creoles than regional varieties of English, John A. Holm (1994: 332) writes:

On structural grounds a good case can be made for basilect Jamaican constituting a linguistic system quite different from English, while on the same grounds the acrolect is clearly the same language as English, with only negligible differences from the British standard in certain areas of lexis and intonation. Similarly, it is not at all clear that there is significant typological difference between very decreolised continua such as American Black English and English dialects such as Cockney just because the former retain rather more foreign elements.

The relative uncertainty of creole, if any, stems from the fact that it results from the superposition of two (or more) different systems which have remained in close contact with their English parent. We may also consider that there are some universal grammatical principles which come into play in the structuring of languages and are involved in the expression of what Chomsky (1976: 29) calls “the essence of human language”. As a matter of fact, it will almost certainly depend on the degree of mutual comprehension between individuals, and the ability of the system to resist relational movements and at the same time be flexible enough to adapt to external conditions.

The second possible solution to address the issue of intelligibility relates to the institution of a new standard, which may be copied from the former, but on a global scale, a ‘super-reference’, a language to communicate and palliate difficulties in mutual comprehension. This is reminiscent of a linguistic situation analogous to that of the early 15th century. At that time, English was the sum of many diverse local dialects. For political, economic, and cultural needs a common language was to emerge. It contained the features of various dialects which were gradually codified and contributed to the making of Modern English.
Conclusion

A language is not a homogeneous monolith. It is a collection of several dialects which are all varieties of the same linguistic system with phonological, lexical, and to a lesser extent grammatical differences that do not cause severe structural disorders, or affect mutual comprehension. The system represents the core of the language, the necessary reference for users to communicate. Yet, the system is virtual, it does not provide ready-made sentences, but the rules to construct them. These rules may be quite flexible as long as they do not alter the stability of the system. It is actualised through speech and permits intelligible exchanges between users.

Variation and change, on the other hand, are to be found in the practical usage, in the way people speak and write their language; it also involves their own appropriation of the system. The example of English shows that when we deal with a living language, we are dealing with a group of varieties (dialects or languages?) that have enough systemic relations in common to maintain mutual intelligibility. There is no objective boundary between varieties of the same language which exist in a context of a continuum and differ slightly from one area to another. This implies that the system is capable of absorbing changes inasmuch as they do not disrupt the continuum. Holm (1994: 332), then, is quite right in his assertion that “these are all questions of degree which can only be answered somewhat arbitrarily”.

References


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The title of *Stancetaking in Discourse* reveals the basic tenets of the book: throughout the volume stance is regarded as a situated, interactional process actively engaged in by language users communicating with each other. The book sets out to explore how speakers, and also writers, take stances in natural discourse (p. 2). In general, defining stance is a messy endeavour, as the term has a wide scholarly circulation with a variety of different meanings and other terms like subjectivity, evaluation and appraisal have been used for stance type of phenomena. Moreover, stance cannot be tied to single linguistic markers, but different linguistic features and their combinations may contribute to stance in discourse. For instance, adverbials, modals, evaluative adjectives and nouns, complement clauses and complement taking predicates have been shown to index stance (p. 17), and the studies in this volume introduce a couple of other linguistic phenomena including voice, generalizing grammatical subjects and questions.

Although this volume does not aim at a monolithic understanding of stance either (p. 1), it makes a lot of sense of the phenomenon and is an indispensable companion to every stance scholar. The volume is based on the work presented at the 10th Biennial Rice Linguistics Symposium held at Rice University in 2004, and it contains an introductory article by the editor plus nine research articles by scholars focusing mostly on English but also on Indonesian and Finnish. The interpretations and understandings concerning stance and stancetaking discussed in the book are highly relevant beyond language boundaries, and the volume offers an insightful guidebook to what stance is, how it creates social meanings and how it could be studied. The approaches adopted in the individual studies range from corpus linguistics and sociolinguistics to field linguistics and conversation analysis, from written texts to talk-in-interaction, and from qualitative to quantitative analyses, even combining the two in some cases.

Two articles in particular stand out as major theoretical contributions and models for the analysis of stance in discourse. These are Robert
Englebretson’s “Stancetaking in discourse: An introduction” (pp. 1–25) and John W. Du Bois’s “The stance triangle” (pp. 139–182). Englebretson first approaches stance as an everyday concept, surveying the occurrences of the lemma stance in the *Santa Barbara Corpus of Spoken American English* (SBCSAE) and the *British National Corpus* (BNC). On the basis of the qualitative analysis of the tokens in the corpora, he arrives at five conceptual principles defining stance: (1) stancetaking occurs on three levels as physical action, personal attitude/belief/evaluation and social morality; (2) stance is public and perceivable, interpretable and available for inspection by others; (3) stance is interactional and it is collaboratively constructed among participants with respect to other stances; (4) stance is indexical, evoking aspects of the broader sociocultural frameworks or physical contexts; and (5) stance is consequential, leading to real consequences for the persons or institutions involved (p. 6).

Du Bois assembles an analytic toolkit for stance researchers, the stance triangle, which posits that stance is to be understood as three acts in one. Rather than being three different types of stance as suggested in many studies, for Du Bois, evaluation, positioning and alignment represent different aspects of the same stance act, so that taking a stance means that the stancetaker (1) evaluates an object, (2) positions a subject (usually the self), and (3) aligns with other subjects. Thus, Du Bois offers the following definition of stance, which I think describes the general understanding of stance in the other articles of this book:

Stance is a public act by a social actor, achieved dialogically through overt communicative means, of simultaneously evaluating objects, positioning subjects (self and others), and aligning with other subjects, with respect to any salient dimension of the sociocultural field (p. 163).

The rest of the articles are arranged so that the first four papers adopt a specific approach to linguistics: corpus linguistics, sociolinguistics, field linguistics/grammatical description and discourse linguistics (p. 20). The last four papers, on the other hand, focus on particular aspects of stance with conversation analytic methods. Moreover, the last four papers are all written by members of the stance research group at the University of Oulu, which has perhaps been Englebretson’s strongest motivation for keeping and describing them together as a group; these papers also subscribe to Du Bois’s ideas concerning stancetaking as an intersubjective, socially constructed activity presented in this volume.
The first set of articles begins with Susan Hunston’s “Using a corpus to investigate stance quantitatively and qualitatively” (pp. 27–48). The problem she raises concerns the difficulty of locating stance in discourse, since evaluative meanings do not occur in discrete items alone but are cumulatively produced across whole phrases and units of meanings (p. 39). She shows how the problem of locating stance can be solved by corpus linguistic methods. In her approach, quantitative analyses of word choice and reoccurring patterns of language use based on plentiful corpus data provide the background for the informed qualitative reading and interpretation of stance in a particular text sample. Both methodologies are needed and they can be fruitfully combined, as Hunston shows.

Barbara Johnstone’s “Linking identity and dialect through stancetaking” (pp. 49–68) employs a dialogic text from a sociolinguistic interview to show how a dialect identity emerges as a resource for and through stancetaking. The dialect under scrutiny is that of Pittsburgh, Pennsylvania, which is associated with distinctive linguistic features by linguists and non-linguists alike. Pittsburghers talk about their dialect often and in many contexts (p. 55), and in the dialogue Johnstone analyses a mother and her 13-year-old daughter discuss their use of “Pittsburghese”. During the talk they make claims about their own use of dialect speech and perform local pronunciations in order to establish their authority or to undermine the other person’s authority to make insider claims about the dialect. Thus, Johnstone’s analysis links epistemic stance-moves with dialect use and local dialect identity.

Robert Englebretson’s “Grammatical resources for special purposes: Some aspects of stancetaking in colloquial Indonesian conversation” (pp. 69–110) uses field linguistic methods to establish and explain the use of three frequent Indonesiangrammatical features as reflecting patterns of stancetaking. He focuses on first-person singular referring expressions, the –nya clitic and the verbal diathesis (voice), which as such are well-documented grammatical categories in traditional Indonesian reference grammars but only in terms of being cognitively-oriented, propositional systems for coding information (p. 72). Englebretson, on the other hand, has two points of departure for his argument: first, stancetaking is a pervasive activity in all language use, and second, grammar is motivated and shaped by language use (p. 69). The main purpose of the paper stems from these presuppositions, as Englebretson’s work highlights the interactional nature of the grammatical categories studied and shows how
the categories are used to manage identity, epistemicity and positioning respectively.

Joanne Scheibman’s “Subjective and intersubjective uses of generalizations in English conversations” (pp. 111–138) focuses on generalising grammatical subjects referring to classes or groups (e.g. and all these teachers are coming in and saying; your people...tortured him to death). Her analysis suggests that generalizations are not referential descriptions of the world, but they are used subjectively and intersubjectively to express individual, interactive and sociocultural stances. For instance, they subjects often convey speakers’ evaluative stances, creating ingroup solidarity and othering outsiders. Generalizations, thus, animate and reflect broader societal discourses.

The section of four papers by the stance research group of Oulu opens up with Elise Kärkkäinen’s “The role of I guess in conversational stancetaking” (pp. 183–219), which discusses I guess as an epistemic/evidential fragment frequently used in American English but not so frequently in British English. It emerges from the analysis that from the subjective speaker perspective I guess indexes a reasoning or an inferential process of the speaker, i.e. epistemic stance and changes in epistemic stance. Moreover, I guess has intersubjective functions in that it, for instance, arises from some evidence or stimulus gleaned by the speaker from the ongoing or prior turn(s), from the physical environment of the speech situation or from the wider social context. From the intersubjective perspective, I guess may also invite others to take a stance (p. 212). Kärkkäinen concludes that, on the one hand, stance marking can be rather routinized, as speakers use only a small set of markers, I guess being one of them. On the other hand, frequent markers do not express a clear, unambiguous stance, but they have to be analysed in terms of a complex process that the participants orient to (p. 213).

Mirka Raunionmaa’s “Stance markers in spoken Finnish: Minun mielestä and minusta in assessments” (pp. 221–252) deals with a Finnish phrase comparable to I guess or rather I think in particular. This paper also focuses on the intersubjective aspects of stancetaking. Raunionmaa notes that the stance markers minun mielestä/minusta are often embedded in or followed by assessments, which already contribute to stancetaking on their own. Consequently, she asks, “What is it that makes stance markers relevant in assessments?” (p. 228). The answer is that they orient participants to the stancetaking, signalling that such an activity is now taking place. More specifically, the phrases minun mielestä and minusta
project disagreement and transitions to first assessments across turns or within an extended turn, and they can be seen to alleviate the potential risks of disagreeing or moving from non-evaluative to explicitly evaluative talk by acknowledging that other possible stances exist (p. 247).

Tiina Keisanen’s “Stancetaking as an interactional activity: Challenging the prior speaker” (pp. 253–281) studies the social-interactional processes of alignment and disalignment in everyday speech events extracted from the *Santa Barbara Corpus of Spoken American English*. Disaligning is operationalized as negative yes/no interrogatives and tag questions disrupting the alignment with the previous turn. These forms challenge the prior turn by displaying doubt towards a claim or stance expressed previously. Moreover, Keisanen’s analysis pays attention to the affective dimension of prosodic turn-design features as well as to delays, repair initiators and reformulations that often indicate problems in turn transition. These occur also with interrogatives, which may be due to the fact that interrogatives foreground something that was not originally meant to be challengeable information. Thus, Keisanen concludes that discourse participants seem to be held responsible for anything that they produce in interaction, even if only implicitly (p. 277).

Pentti Haddington’s “Positioning and alignment as activities of stancetaking in news interviews” (pp. 283–317) concentrates on describing the linguistic, sequential and turn organizational features of positioning and alignment in British and American news interviews. In this context positioning is defined as the interviewer’s forward-looking intersubjective activity of designing difficult questions and creating a problematic interactional context for the interviewee (p. 283). Aligning refers to a range of convergent and divergent positions that the interactants can take vis-à-vis each other (p. 285). Significantly, the interviewees tend to repeat certain linguistic patterns in order to align with the question. Not that surprisingly perhaps, a combination of a stance marker (e.g. *I don’t think*) and a recycled unit from the question is a particularly frequent pattern (p. 290). Although the studies in this volume emphasise stancetaking in everyday interaction as a joint negotiation where participants do not usually converse with predetermined stances in mind, Haddington points out that news interviews are a different genre. Since their main purpose is to give a hard time for the interviewee, the interviewer does in fact come to the situation with prepared questions and specific stances in mind.
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