A Comparison of Pitch Accent Patterns in Contrastive Adjective+Noun Structures in Bilingual Englishes

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Abstract

This study examines the prosody of modified NPs in bilingual Englishes exploring spontaneous productions by 48 speakers of different first languages (L1 Greek and Russian) and 24 monolinguals. The realization of adjectives is related to information structure as they are more likely to be produced when expressing a contrast. In English contrast is connected to pitch accent (PA) placement. This prosodic contrast marking is likely to change in language contact because of the marked status of such pragmatic constraints on prosody.

While many studies specifically elicit contrastive adjectives in a controlled setup, this study adds to the previous research the analysis of spontaneous data and provides evidence for language contact phenomena in bilingual prosody of NPs.

In the analyzed data the bilinguals’ prosody generally follows pragmatic considerations resulting in native-like contrastive adjective accentuation. The Russian-English bilinguals frequently realize double accentuations with PAs on the contrastive adjective and the noun. This is in line with previous findings on overaccentuation in bilingual speech as a result of structural considerations. The Greek-English bilinguals, however, generally pattern with the monolinguals. A first look at the Russian data of the same speakers shows a similar PA pattern in their L1, suggesting a language-specific contact phenomenon.

Index Terms: Contrast, Adjectives, Bilingual Prosody, Spontaneous Speech, English

1. Introduction

1.1. Adjectives and Contrast

The realization of adjectives is related to both information structure and prosody. While some parts of speech, such as pronouns, are inherently given constituents [1], others, like adjectives (ADJs), are related to focus indicating the presence of alternatives in the previous discourse. In the case of contrast such an alternative is not only indicated and excluded, but contrasted with a given constituent [2]. In English these information structural aspects alter the sentence prosody (see 1.3). The prosodic marking of such contrastive focus in the case of ADJs has been investigated in both perception [3] and production [4], as well as in the research on bilingual speech [5, 6, 7, 8, 9]. This study adds to this body of research an investigation of the prosodic realization of contrastive ADJs in the English by bilingual speakers of Russian and Greek in semi-spontaneous speech.

1.2. Bilingual Prosody

The prosodic realization of contrast in the case of modified noun phrases (NPs) is an area of interest in the research on bilingual prosody. Following the Markedness Differential Hypothesis [10] prosodic contrast marking is likely to change in language contact because of its marked status [11]. This has indeed been found for different language pairs [5, 6]. That is, bilingual prosody more frequently follows structural constraints (e.g. syntactic phrasing) than pragmatic constraints (e.g. contrast marking) while a higher level of proficiency results in native-like productions [8].

Heritage speakers (HS) are a subgroup of simultaneous or early sequential bilinguals of a weaker heritage language (HL) usually spoken at home and a stronger majority language (ML) of their society [12] and provide important insight into language contact in individuals from an early age. Previous research has shown the phonology of HS to be less affected by language contact than other areas of their grammar [13] while research on the prosody of HS has provided insight into possible (bidirectional) influence of one language on the other [14, 15]. This study contributes to the body of research on HSs’ prosody. General and specific language contact phenomena are considered by analysing speakers with different HL comparing their productions in their ML.

1.3. The Prosody of Contrastive Adjectives

In English contrastive focus (cf) is marked prosodically by pitch accent (PA) placement (indicated by small capitals below). In a neutral context a PA is realised rightmost in a phrase or clause [16]. The following accent patterns are possible in modified NPs in English: in a neutral context stress is realized on the noun (N, see (a) below). The same is true for a context evoking contrast on the N (b). A contrastive context narrowly focusing the ADJ results in PA realization on the ADJ (c). There is also the possibility of a double contrast where both the ADJ and the N are contrasted. In this case both constituents are accentuated (d).

(a) Along came [a white [CAR]].

(b) There was a white [VAN]cf and a white [CAR]cf.


In prior studies on the prosodic realization of modified NPs in English communicative speech contrastive constituents were always accented and most frequently realized with a rising (L+H*) or a monotonal high PA (H*) [17, 4]. While the Ns following the contrastive ADJs are deaccented, additional PA placement on the non-contrastive ADJ was also found.

The two HLs under discussion here, Russian and Greek, employ similar constraints to English on the prosody of modified NPs in the case of contrast [18, 19, 20]. The flexible word order in the two languages provides additional syntactic resources with contrastive constituents in preverbal position. The availability of two structures in bilinguals has been found to result in a preference for non-native like and usually more explicit structures (e.g. [21]). This study contributes an analysis of the external interface of prosody and information structure. Possible differences in the prosodic marking of contrastive ADJs in
Table 1: Number of monolingual, and bilingual speakers analysed in this study along with the number of Ss producing ADJ+N phrases (S_{ADJ+N}), ADJ+N phrases, contrastive ADJ_{+}N, and average number of words per narration (ø w/n).

<table>
<thead>
<tr>
<th>Group</th>
<th>S</th>
<th>S_{ADJ+N}</th>
<th>ADJ+N</th>
<th>ADJ_{+}N</th>
<th>ø w/n</th>
</tr>
</thead>
<tbody>
<tr>
<td>mono</td>
<td>24</td>
<td>18</td>
<td>63</td>
<td>53</td>
<td>122</td>
</tr>
<tr>
<td>bi-Russian</td>
<td>24</td>
<td>21</td>
<td>114</td>
<td>102</td>
<td>176</td>
</tr>
<tr>
<td>bi-Greek</td>
<td>24</td>
<td>14</td>
<td>65</td>
<td>60</td>
<td>138</td>
</tr>
<tr>
<td>Total</td>
<td>72</td>
<td>53</td>
<td>242</td>
<td>215</td>
<td>145</td>
</tr>
</tbody>
</table>

bilingual speakers despite the similarity of available structures, would provide further evidence for the Interface Hypothesis.

1.4. Research questions and predictions

Since prior investigations used controlled setups to elicit contrastive ADJs, the first research question addresses the nature of the semi-spontaneous data under investigation here. That is, (i) does the semi-spontaneous data analysed here confirm previous findings on the prosody of contrastive ADJs in English? The second research question addresses the main research interest, i.e. bilingual prosody. (ii) Does the semi-spontaneous bilingual data analysed here differ and if so to what extent?

If the semi-spontaneous data under consideration follows the same principles regarding the prosodic marking of information structure the prediction for research question i) is to find PA placement on a contrastive ADJ (H* or L+H*). Following the prior findings on bilingual prosody the prediction for bilinguals is to find different PA placement following structural constraints resulting in N accentuation similar to example (a)[11, 8].

2. Method

2.1. The RUEG corpus

The research questions introduced above are investigated in the RUEG corpus [22], a corpus of semi-spontaneous speech. The data in the corpus comprise recordings of different HLs and two MLs along with monolingual data. To address the research questions in this study, the English productions of monolinguals and two bilingual speaker groups were considered. The bilingual speakers comprised HS of Russian and Greek.

The narrations within the RUEG corpus were elicited by means of a video depicting a car accident involving two different coloured cars. This video was used to prompt participants to explain what happened in two situations. Participants were asked to provide a police report yielding formal speech (fs) and were also asked to tell the incident to a friend by means of a voice message yielding informal speech (is). This results in two spoken narrations by each speaker.

2.2. The data set

The productions of 72 speakers, i.e. 24 monolinguals, 24 bilingual Russian and 24 bilingual Greek (34 male distributed across speaker groups) were considered. All speakers were adolescents between the ages of 14 and 19 (mean age: 16) and all HSs started learning and using both languages before the age of 6 (mean age of onset: 2). The narrations of these speakers are part of the RUEG 0.4.0 which was searched for the sequence of an ADJ followed by a N (ADJ+N).

The nature of the story involving two cars results in the frequent use of the lexeme car (52% of modified NPs (n=614) in the English RUEG 0.4.0) and also allows for contrastive constructions to occur with this constituent. Therefore, the corpus search was restricted to ADJ+car combinations (referred to as ADJ+N in the following). However, the speakers were free in their speech planning and thus in the constructions they produced. Therefore, not all speakers used ADJ+N to realize the car contrast as can be seen in Table 1. The narrations containing a ADJ+N construction were further annotated for contrast (2.3) and prosody (2.4).

2.3. Contrast Annotation

The narrations containing ADJ+N were further analysed for the presence of contrast following guidelines by [23]. ADJ+N were analysed as contrastive when they evoked a notion of contrast to another constituent in the previous context, i.e. whether there was a semantic or syntactic parallel (1). They were then further specified as one of the categories of partiality (2), selection (3), replacement (4) or implication (5). The last category was applied in cases where the contrast was implicitly encoded in the semantics of the ADJ (e.g. other).

1) **contrastive focus**
   um in the distance you could see a blue car follow a small [blue]_{f} car followed by a small [white]_{f} car

2) **partiality**
   and the cars had to stop really quickly and the uh the silver [white]_{f-part} car that was behind the [blue]_{f-part} car uh hit the back of the blue car

3) **selection**
   but the first car which is a blue renault turned in to the parking lot heading towards me and immediately afterwards the white golf also turned in and followed it cause it was following pretty closely behind but as the [blue]_{f-set} car pulled up to the crosswalk the um supposed couple oh came up to the crosswalk and turned right to get onto it

4) **replacement**
   but because the w blue [white]_{f-repl} car turned in immediately after the blue one

5) **implication**
   so the car had to stop but and then the [other]_{f-repl} car ran into it

The contrast categories were annotated based on the written transcription only. Since it is the aim of this study to investigate the prosodic realization of information structural categories, the prosodic realization was annotated in a separate step presented in the following section.

2.4. Prosodic analysis

The prosody of the narrations was annotated with regard to two aspects: prosodic phrasing and PA placement. An analysis of the data was carried out by the author considering both auditory and visual information (i.e. f0 contour) provided by PRAAT [24]. For the segmentation into intonation phrases (IPs) the data was analysed following universally relevant phonetic boundary cues, e.g. pre-boundary lengthening.

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1Prosaic annotations in the RUEG corpus were carried out for the English and Russian data in close collaboration with Yulia Zuban.
Table 2: Accentuation patterns with PA realizations on the ADJ/active, the Noun or both constituents across all and the contrastive ADJ+N phrases and the different contrast categories.

<table>
<thead>
<tr>
<th>Accentuation pattern</th>
<th>ADJ+N</th>
<th>ADJ\text{f}+N</th>
<th>ADJ both</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADJ+N</td>
<td>184 (76%)</td>
<td>51 (21%)</td>
<td>7 (3%)</td>
<td></td>
</tr>
<tr>
<td>ADJ\text{f}+N</td>
<td>163 (76%)</td>
<td>45 (21%)</td>
<td>7 (3%)</td>
<td></td>
</tr>
<tr>
<td><strong>Contrast category</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>contrast (n=62)</td>
<td>50 (81%)</td>
<td>13 (21%)</td>
<td>0 (0%)</td>
<td></td>
</tr>
<tr>
<td>implication (n=84)</td>
<td>53 (65%)</td>
<td>25 (30%)</td>
<td>6 (7%)</td>
<td></td>
</tr>
<tr>
<td>partiality (n=33)</td>
<td>29 (88%)</td>
<td>4 (12%)</td>
<td>0 (0%)</td>
<td></td>
</tr>
<tr>
<td>selection (n=33)</td>
<td>28 (85%)</td>
<td>4 (12%)</td>
<td>1 (3%)</td>
<td></td>
</tr>
<tr>
<td>replacement (n=2)</td>
<td>2 (100%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td></td>
</tr>
</tbody>
</table>

Table 3: Accentuation patterns with PA realizations on the ADJ/active, the Noun or both constituents across contrastive ADJ+N phrases for mono- and bilingual (Russian=RU, Greek=GR) speakers and formal (fs) and informal (is) situations.

<table>
<thead>
<tr>
<th>Group</th>
<th>Sit</th>
<th>ADJ</th>
<th>both</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>mono</td>
<td>fs</td>
<td>29 (83%)</td>
<td>5 (14%)</td>
<td>1 (3%)</td>
</tr>
<tr>
<td></td>
<td>is</td>
<td>13 (72%)</td>
<td>2 (11%)</td>
<td>3 (16%)</td>
</tr>
<tr>
<td>bi-RU</td>
<td>fs</td>
<td>43 (66%)</td>
<td>21 (31%)</td>
<td>1 (2%)</td>
</tr>
<tr>
<td></td>
<td>is</td>
<td>29 (78%)</td>
<td>8 (22%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>bi-GR</td>
<td>fs</td>
<td>30 (79%)</td>
<td>7 (18%)</td>
<td>1 (3%)</td>
</tr>
<tr>
<td></td>
<td>is</td>
<td>19 (86%)</td>
<td>2 (9%)</td>
<td>1 (5%)</td>
</tr>
</tbody>
</table>

3. Results

There were 242 ADJ+N phrases produced in the 144 narrations analysed in this study. Of these, 215 ADJ+N were analysed with a contrastive ADJ along the categories illustrated in 2.3. The most frequent contrast category was implication (n=84; 39%) followed by not further specified cf (n=62, 29%). The contrast categories partiality (n=34, 16%) and selection (n=33, 15%) were equally frequent. In the semi-spontaneous data analysed here, there were only two instances of replacement. A distribution of accentuation patterns across the contrastive and non-contrastive ADJ+N phrases is presented in Table 2.

3.1. Accentuation patterns

Overall the predominant accentuation pattern was a PA on the ADJ, either with a nuclear (n=184, 76%) or prenuclear accent (n=51, 21%). Only 7 ADJs (i.e. 3%) in ADJ+N phrases were accentless. In the latter two cases a nuclear accent was realized on the N. The same relative distribution of PA patterns holds for contrastive and non-contrastive ADJs. Interestingly, the 7 noun-only accentuations were all analyzed as following a contrastive ADJ. Most of these Ns (n=5) were realised at the end of an intonation phrase together with a boundary tone in a structurally prominent position.

The considerable number of double accentuations, i.e. PAs on both ADJ and N, in the case of contrastive ADJ+N is surprising. An analysis of the PA placement in different contrast categories shows this pattern to be most frequent in cases of an implication contrast, i.e. 54% of double PAs are realized in this contrast category. These instances of double PA and implication contrast included ADJs like other which already imply a contrast. The tendency towards one PA pattern for certain ADJs is also reflected in their frequency: Overall the most frequent contrastive ADJs express the colour contrast blue (n=79) and white (n=40). This is also true for the ADJ accentuation pattern (with 68 x blue and 34 x white). However, the most frequent PAs produced with double accentuation express a numeral contrast with first (n=12) and second (n=9).

3.2. Accentuation patterns across speaker groups

While the predominant accent pattern in ADJf+N was a PA realised on the ADJ only across all speaker groups, a difference emerges especially in the use of the double accentuation. The distribution of different PA patterns across speaker groups is presented in Figure 1 and Table 3 which shows a tendency for more frequent use of the double accentuation pattern by Russian bilingual speakers, who produce the double accent on both the ADJ and the N about twice as frequently as the monolinguals (77; 13%) and the Greek bilinguals (n=9; 15%). Additionally, there is a difference in the frequency of the double accentuation pattern between the different situations. The PA realisation on both ADJ and N is more frequent in the formal compared to the informal situation. This tendency is stronger for the bilinguals compared to monolinguals, as can be seen in Table 3).

The same observation for contrast category and lexical choice in the case of double accentuations also holds for monolingual and bilingual speakers. That is, all speaker groups produce the double accent most frequently with implication contrast. They show a difference in the choice of ADJ within this category. While monolinguals and Russian bilinguals predominantly produce the numeral contrast (first, second) the Greek bilinguals produce a spacial contrast (back/rear front). It is important to note that both bilingual groups also produce the colour contrast with a double accentuation, yet less frequently so compared to the numeral contrast.

3.3. PA type

As expected the predominant PA type realized on contrastive ADJ was H* (n=102; 63%) followed by rising L+H* (n=80; 49%). There were few instances of L* (n=24; 15%) and only
Table 4: PA types (MAE ToBI) realized in a contrastive ADJ+N phrase on the adjective by mono- and bilingual speakers.

<table>
<thead>
<tr>
<th>PA type on the adjective</th>
<th>H*</th>
<th>L*</th>
<th>L+H*</th>
</tr>
</thead>
<tbody>
<tr>
<td>mono</td>
<td>24 (50%)</td>
<td>4</td>
<td>20 (41%)</td>
</tr>
<tr>
<td>bi-Russian</td>
<td>47 (46%)</td>
<td>13</td>
<td>40 (39%)</td>
</tr>
<tr>
<td>bi-Greek</td>
<td>31 (53%)</td>
<td>7</td>
<td>20 (34%)</td>
</tr>
</tbody>
</table>

one instance of a falling H+L*. This preference for PA types realized on contrastive ADJ is shared by speakers of all groups (see Table 4 for PA-type distribution).

4. Discussion

The analysis presented in this study investigated the prosody of contrastive ADJs in semi-spontaneous mono- and bilingual English. Contrastive ADJs were realised predominantly with PA placement of H* or L+H* on the ADJ. That is, addressing research question (i) the semi-spontaneous data analysed here confirms the predictions based on the literature and prior research [16, 4, 17]. The observation that the same PA placement pattern was also found for non-contrastive ADJs is surprising but can be related to the fact that ADJs are contextually more salient [16] in narrations on a car accident. The N *car* is then either explicitly given (e.g. *there were two cars*) or accessible (e.g. *I just saw an accident*). This explains a deaccentuation of the N due to its predictability.

The realisation of prominent ADJs has also been related to the White Bear Effect [3]. Speakers have been found to produce more prominent ADJs when they are aware of a contrast, even if contrast is not mentioned explicitly. The speakers analysed in this study saw a video of the car accident they then had to narrate. It is possible that the speakers’ awareness of the two cars involved in the accident resulted in the realisation of contrastively accented ADJs in non-contrastive discourse contexts.

The relative informativity and the relevance of the White Bear Effect also explains the considerable number of double accents of both ADJ and N. The additional accentuation of the non-contrastive constituent has been observed in previous studies on semi-spontaneous speech [4]. The results presented here add to this the aspect of lexical choice. The double accentuation in the semi-spontaneous data analysed here occurred more frequently with semantically weaker ADJs (e.g. *other, second, first*). The PA placement in such cases can be related to relative informativity of the constituents [16]. That is, the use of ADJs like *second is less* informative in a context where several pairs are contextually present.

These observations on the accentuation of contrastive ADJs also hold for research question (ii): Overall the HS of Russian and Greek analysed here realize PA on contrastive ADJs. They can be identified as proficient bilinguals who generally follow pragmatic constraints in the prosodic realisation of contrastive ADJs as in [8]. This observation is not surprising, given that English is the dominant language of the larger speech community the bilinguals under discussion grew up and live in. However, there is a difference between monolingual and bilingual speakers, as well as, between bilinguals with different language backgrounds in the accentuation of the N. The Russian bilinguals more frequently produce contrastive ADJs with double accentuation. The overuse of PAs in bilingual speech has also been found in other contexts [28] and can be related to bilinguals’ effort to speak “in a maximally clear manner” [13, p.144]. This is supported by the higher frequency of double accentuation in the formal compared to the informal narrations of the bilingual speakers in this study. The formality of the situation could have prompted the bilinguals to be as explicit as possible in marking both constituents prosodically.

There is further evidence from the Russian data in the corpus [29] which suggests an influence from these speakers’ HL to their ML use. The accentuation of both the ADJ and the N is the predominant PA pattern in the heritage Russian of the Russian bilingual speakers analysed in this study. The comparison of the prosodic realization between bilingual speaker groups with different HLs illustrated here is therefore an important contribution to the analysis of a possibly a specific language contact phenomenon in this case. This will be addressed in future work of the research group.

5. Conclusions

Overall the analysed semi-spontaneous data confirm the predictions based on the literature on the prosody of contrastive ADJs in English and adds to the research on prosody in semi-spontaneous discourse. The results of this study support the analysis of heritage speakers as proficient bilinguals in their dominant language resulting in native-like prosodic marking of contrastive ADJs while also hinting at specific language contact phenomena in the case of Russian and English. Further studies will focus on other language pairs, including pairs with differences in the constraints on prosody (e.g. English and Turkish), which will be interesting with regard to the investigation of bilingual prosody and the MHD.

6. Acknowledgements

This research is based on the data and methods of the research unit “Emerging Grammars in Language Contact Situations: A Comparative Approach” (FOR 2537) in project P8 (project no: 313607803, GZ: ZE 940/4-1), funded by the German Research Foundation (DFG). Many thanks to Sabine Zerbian and Fabian Schubö for supervision and support.
7. References


