Journal of Phonetics 52 (2015) 170–182

Contents lists available at ScienceDirect

Journal of Phonetics

journal homepage: www.elsevier.com/locate/phonetics

Research Article

Accent shifts in spoken noun phrases affect verification latencies of listeners in Dutch but not Canadian French

Marc Swerts [a,*], Jean Vroomen [b]

[a] Tilburg University, Center for Cognition and Communication (TiCC), P.O. Box 90153, 5000 LE Tilburg, The Netherlands
[b] Tilburg University, Department of Cognitive Neuropsychology, The Netherlands

ARTICLE INFO

Article history:
Received 20 May 2014
Received in revised form
7 July 2015
Accepted 14 July 2015

Keywords:
Dutch
Canadian French
Accent shifts
Verification latencies
Crosslinguistic differences

ABSTRACT

Germanic and Romance languages (such as Dutch and French) differ in the extent to which they allow pitch accents to be moved inside spoken noun phrases (NPs). In Dutch NPs, a primary accent is usually shifted to the word that is in focus, while the unfocused words remain unaccented. In contrast, French has been argued to be much more constrained in that respect, especially regarding the extent to which it can deaccent unfocused words inside NPs. Given these differences in production, the current study explores whether listeners of these languages actually use different listening strategies in accent processing. Dutch and Canadian-French listeners were asked to verify as fast as possible whether the content of the second of two utterances was an accurate description of a picture. Dutch listeners were faster when the primary accent in that second utterance occurred on a word that represented new information, whereas French listeners were not affected by accent shifts. This demonstrates that there are language-specific constraints on accent processing.

1. Introduction

Form-function relations can vary widely between languages. This becomes very clear from observing how intonational features of languages across the world are exploited for certain communicative purposes. Languages can be quite distinct, for instance, in how they use melodic patterns to signal whether a sentence is a statement or a question (e.g. Borràs-Comes, Kaland, Prieto, & Swerts, 2014; Gósy & Terken, 1994; Rialland, 2007), to mark surface clauses as restrictive or non-restrictive (e.g. Garro & Parker, 1982, 1983), to chunk utterances in smaller prosodic phrases (e.g. Gabriel & Lleó, 2011), or to regulate the turn-taking system (e.g. Koiso, Horiuchi, Tutiya, Ichikawa, & Den, 1998; Wichmann & Caspers, 2001). Such language-specific functional usages of intonational features also appear from analyses of the way pitch accents may serve to highlight information that is important to the discourse (e.g. because it represents new, contrastive, or corrective information). Within the Indo-European language family, there is an interesting opposition in that respect between Germanic and Romance languages, with the former being more flexible in how accents can be shifted to words that are "in focus". The current article presents a comparative analysis of how such variations in accent distributions are perceptually processed in Dutch and Canadian French. Before we go into the details of our study, we introduce some general facts about differences in the relation between information structure and accent patterns.

Because of a strong British and American tradition of research in this area, many of our current prosodic insights have naturally been based on analyses of English. A lot of attention has been paid in particular to the way speakers of that language distribute pitch accents in their sentences, and whether these distributions can be explained on the basis of syntactic, semantic and pragmatic factors (e.g. Cruttenden, 1986; Gussenhoven, 1984, 2004; Ladd, 1996). A common claim in most intonation models of English is that speakers of that language have a standard way to accentuate words in a neutral sentence which only contains all-new information. For instance, consider an utterance like (1):

(1) Give me that blue ball.

When (1) would be produced as the first utterance of a dialogue exchange or as a response to a general question like "What do you want?", a natural rendition of that utterance would be one which puts a nuclear accent on the final noun (ball), with the option to also

* Corresponding author. Tel.: +31 13 466 2922; fax: +31 13 466 2892.
E-mail address: m.g.j.swerts@tilburguniversity.edu (M. Swerts).

0095-4470/$ - see front matter © 2015 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.wocn.2015.07.005

put prenuclear accents on words in the preceding part of the utterance, such as on the prefinal adjective (blue). Most models of intonation consider such an accent distribution with a main accent on the final noun to represent the default pattern that has a broad focus interpretation, consistent with what has become known as the Nuclear Stress Rule (Hayes, 1985). However, given specific discourse contexts, speakers of English may "shift" that final accent to an earlier non-default syntactic position so that the final noun gets "de-accented". For instance, in response to the question "Do you want the red ball?", speakers are more likely to produce (1) with a main accent on the prefinal word (blue), with the final word remaining unaccented; when prosodically realizing an utterance this way, a speaker puts a narrow focus on "blue", thus signalling that the colour information represents contrastive or corrective information (Ladd, 1996). These kinds of observations on how accents can shift from their default position to another one and on how such shifts mark different kinds of discourse information appear to be true for a number of other Germanic languages as well, like German or Dutch (e.g. Baumann, 2006; Krahmer & Swerts, 2001). All these languages have been argued to belong to a family of so-called "plastic" languages with a relatively fixed word order, but with prominence patterns that can easily be adapted so that only important information gets prosodically highlighted (Ladd, 1996).

Based on such facts for English and other Germanic languages, it would seem tempting to assume that the phenomenon of variable accent distributions would generalize to other languages as well. However, the flexibility with which accent distributions can be moulded so that they fit specific discourse contexts is not a universal characteristic of the languages of the world. As a matter of fact, even in specific varieties of English, counter-examples to this prosodic flexibility can be found, such as in Malaysian English (Gut, Pillai, & Mohd Don, 2013) or Indian English (Gumperz, 1982). For instance, Gumperz gives the following example, in which the second instance of "cigarette" gets re-accented rather than de-accented:

(2) If you don't give me that CIGARETTE, I will have to buy a CIGARETTE

Speakers of the British or American version of English would typically have "moved" the second accent to an earlier word, like "buy". Similar observations have been made for utterances of speakers who use English as their second language and whose intonation structure is affected by the accent distributions of their first language (Swerts & Zerbian, 2010). Counter-evidence against the alleged universality of flexible accent distributions becomes even more obvious from looking at languages that are typologically very distinct from English, and that also differ in other levels of linguistic structure, such as in a number of Bantu languages (Downing, 2008) and Arabic (Hellmuth, 2005, 2009), or in languages such as Japanese in which the presence or absence of an accent is lexically determined (Pierrehumbert & Beckman, 1988). In these, there appears to be no obvious link between the occurrence of pitch accents and focus distributions in an utterance. Within the Indo-European language family, Romance languages, such as Italian, Spanish or Catalan, are distinct from Germanic ones, in that the former are more constrained in how accents can be exploited to signal informational focus, which is especially true when considering accent distributions inside noun phrases (Cruttenden, 2006; Ladd, 1996; Swerts, Krahmer, & Avesani, 2002; Swerts, 2007; van Maastricht, Krahmer, & Swerts, 2015).

From a cross-linguistic perspective, French (referring to the different varieties spoken in France, Belgium or Canada) occupies an interesting position in the debate. In earlier accounts (e.g. Garde, 1968; Lambrecht, 1994), it has been argued that French patterns with other Romance languages by having a comparatively fixed accent distribution, and by being resistant to moving pitch accents within certain syntactic constituents. Various researchers have argued that accents serve mainly a demarcative function in French, in that speakers reserve primary stresses for syllables in phrase-final position (Di Cristo, 1999, 2000; D'Imperio, German, & Michelas, 2012; Jun & Fougeron, 2002; Mertens, 2006; Post, 2000, 2011). Just like other non-plastic languages, French would rely more on other (syntactic) devices for marking information that is important to the discourse. For instance, a typical way to mark an adjective or a noun in an NP like "un ballon bleu" (a blue ball) would be to put the accented word in clefting or dislocation, like in 3(a) and 3(b), respectively.

(3) a. C'est le BALLON, qui est bleu.
b. Il est BLEU, ce ballon.

Recent work (Rasier & Hiligsman, 2007; Féry, 2001; Vander Klok, Wagner, & Goad, 2011) has shown, however, that the accentual constraints are comparatively less severe than in other Romance languages, like Catalan. In French, de-accentuation and accent shifts may occur optionally, but would then represent relatively marked structures when compared to what appears to be true for English, Dutch or German.

An interesting observation (also in view of our own experiment described below) comes from a study by Rasier and Hiligsman (2007). They used a paradigm in which speakers of French and Dutch were asked to describe sequences in their respective languages of pictures that were consecutively shown on a computer screen; target pictures were minimally distinct in terms of their colour or shape from a preceding picture in the sequence (e.g. "a red circle" followed by either "a blue circle" or "a red triangle"). Note that the word order of these kinds of NPs was different for the Dutch and the French data, with the adjective preceding the noun in Dutch (e.g. "een rode cirkel") and following it in French (e.g. "un cercle rouge"). Counting the accent patterns in utterances collected this way, the authors found that speakers of Dutch mark the contrastive, distinguishing information with single accents on the focused word in a large proportion of the cases (50% of contrastive nouns got a single accent in the NP, and 95% of the contrastive adjectives). However, in the French data, these single accents occurred less frequently (30% of the times for both contrastive nouns and adjectives). The more frequent pattern (of around 60%) was one where an accent on the focused word was accompanied by an additional accent on either the determiner "un" (when the noun was contrastive) or on the noun (when the adjective was contrastive). Note, though, that focus-determined single accents did not