A study of the melodic contour of Mandarin and French through Syntactic Structural Ambiguity
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An acoustic study was conducted to investigate the melodic properties of prosodic boundary markers in the resolution of Syntactic Structural Ambiguity (SSA) in Mandarin and French. Based on the experimental results, I present the following arguments: as a well-documented marker of discourse junctures in other languages [1], [6], [7], [17], [18], [21], pitch reset is also used within the sentence to convey prosodic boundaries in both Mandarin and French; the co-presence of language-specific melodic features and pitch reset (found in both languages) in the melodic contours and prosodic boundaries provides empirical support to the Overlay Model of Intonation (OMI) [8-10].

SSA refers to the phenomenon in which an utterance is represented by more than one well-formed syntactic structure cf. [11], [12], [19], [27]. In a situation where contextual information is not available for disambiguation, prosody is shown to be effective in resolving SSA [20]. The intended syntactic structure is conveyed by aligning the prosodic and syntactic boundary [14], [15], [20]. The acoustic experiments were conducted to examine the melodic devices used to convey major syntactic boundaries in speech production in Mandarin and French.

Mandarin: hong2se4 / zhi3 na2 / san1 zhang1 (Take only 3 sheets of the red ones.)
hong2se4 zhi3 / na2 san1 zhang1 (Take 3 sheets of red paper.)

French: Le petit / garde la porte. (The little one guards the door.)
Le petit garde / la porte. (The little guard wears it.)

A read-aloud corpus of carefully designed syntactically ambiguous sentences (such as the ones above) was collected. The sequences were designed so that the natural prosodic breaks align with major syntactic boundaries. In the script, contextual primer sentences precede the test-sequences in order to semantically and rhythmically prepare the readers to convey the intended structure. The purpose was to minimize unnatural ad hoc responses that would otherwise be elicited by explicitly marking the prosodic boundaries in the script.

Phonetic analyses of the corpus reveal that, although slightly less reliable than temporal cues, melodic cues are effectively used by speakers of both languages in marking prosodic breaks. Although the basic contour shape of Mandarin and French are governed by different language-specific phonological rules within different linguistic domains, pitch reset [8], [13], [16], [21] is proven to be a prominent prosodic boundary-marking device in both languages [4], [5]. As a well-documented marker of discourse juncture in narrative and conversational settings in many languages [2], [3], [17], [21-26], results indicate that pitch reset is present in junctures within the sentence in French and Mandarin as well.

The OMI states that the melodic contour is generated by a combination of two pitch components. In the accent component, pitch movement is largely governed by language-specific rules with rather 'localized' impact on smaller prosodic domains. The phrase component consists mainly of the language-universal declination contour and is subject to rules dominating larger domains with more widespread impact on melody. The observed language difference in melodic pattern and phonological rules governing the melodic contour coincide with the descriptions of the accent component. Pitch reset, an element of the language-universal phrase component, is
found to be a prominent boundary-marker in both languages. As a result, data from the present experiment provides further empirical support to the OMI.

In summary, the study of the melodic boundary markers of two typologically different languages showed pitch reset to be a prominent prosodic boundary marker within the sentence. The observed differences and similarities in terms of syntax-melody correspondence between Mandarin and French are shown to be in accordance with the view of the OMI.

Reference (Selected):


