

THE EMERGENCE OF INTONATION AND STRESS
IN HUNGARIAN: A CASE STUDY

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ABSTRACT

The paper discusses the prosodic achievements of the one-unit stage as they appear in the comparison of coexisting communicative and non-communicative utterances.

1. INTRODUCTION

I started research on child prosody by asking the following questions: (1) How does the conventional prosodic system of the adult language emerge out of the physiologically controlled, therefore highly symptomatic vocalizations of the child? I am particularly interested in the emergence and evolution of intonation and stress; (2) How does the child make use of prosodic features in performing different functions and what kind of functions does it perform through these features? For the purposes of a longitudinal study I regularly recorded the spontaneous productions of my daughter from the moment when she was 1 year old up to 6 years. In the present paper I shall outline the child's achievements in the one-unit period.

2. THE SYSTEM TO BE ACQUIRED

Hungarian, a "free" word order language, has fixed, first-syllable stress. Sentences may have several, equally strong primary stresses in their main part (comment). The rightmost primary-stressed syllable initiates a character tone (=terminal contour) which can be: falling, falling-rising, rising, descending and rising-falling. The character tones actually appear in phonetic variations conditioned by the number of syllables on which they are spread out. The one-syllable, two-syllable and three-or-more syllable variants (=allotones) are in complementary distribution. If there are any primary-stressed syllables before the terminal pattern, each of them initiates a half-falling tone, i.e. a steep fall not reaching the base line. These primary stressed sequences are subject to downdrift. If there is only one primary stress in the sentence, it is most often located on the focus position, i.e. on the position immediately preceding the verb or, if the F-position is vacant,

utterances 8 items show an overall rising contour. 19 items are expressed by level contour while the remaining 36 items, i.e. the majority, display falling intonation. Tokens of the same type make the consistency in the use of falling contour apparent (Fig. 1).

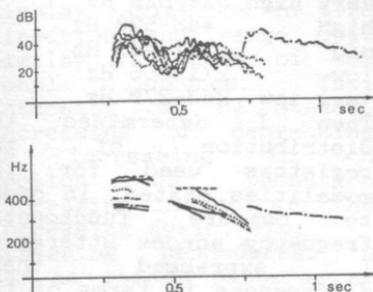


Fig. 1. Intensity and F₀ curves of seven occurrences of the utterance *Cica* [tsitsɔ] 'cat'.

The tendency for fall is also evidenced by the distribution of the registers used in the first and the second syllables of disyllabic utterances (Table 1). The average extent of the fall turned out to be a third, the same as in adult language use [1]. The intensity loss of second syllables is 6 dB on the average.

Table 1

Reg. 1st syll. 2nd syll.

high	20,0	11,0
mid	65,0	39,0
low	12,7	47,6

Interrogatives. This modality is not really used yet by the child but the acoustic shape of monosyllabic

questions is already set up: all four instances display a sharp rise of about a large fourth up to the end of the phonation from mid to high register which turns out to be the dominant one.

Imperatives. Imperative utterances, as a rule, are characterized by a strong fall (5-8 semitones) from high to low register and a strong decrease in intensity.

Calls or vocatives. In calls both the intensity curve and the pitch curve are level, the latter being kept in mid register. Therefore, the overall pitch range is as narrow as 50 Hz (371-421).

Sound play. A general characteristic of playful sequences, in contrast to communicative utterances, is their much longer duration along with abrupt and rapid changes both in F₀ and intensity values within and across syllables. The magnitude of F₀ movement within syllables goes from a third to a large seventh. Sound play is realized in mid, high and very high registers within a range given between 243 and 629 Hz. In monosyllabic items durational values range between 280-1157 ms, the average duration being 600 ms, while that of the corresponding communicative utterances is 170 ms. If we analyze F₀ changes as a function of duration we can state that the longer the utterance, the smaller the F₀ changes are. This fact suggests that the child always performs the same underlying pattern displaying a constant decrease between starting

on the verb itself. However, it may happen that sentence stress falls on some other constituent within the comment. In final analysis, both word order and stress placement seem to be governed by the speaker's communicative needs reflected in topic-comment structure. (For details see [1] [3] [4].)

3. THE ONSET OF ACQUISITION

The results reported concern the period from 1;0 to 1;7. From the recorded material I selected 123 utterances for instrumental analysis. On the basis of their primary function 94 of these utterances were identified as communicative, i.e. aiming at communication with the environment, while 29 items were regarded as non-communicative, informative [2] utterances aiming at practising skills in voice production and also at playing with sounds. Therefore, they are taken as late babbling and referred to as sound play. Within the communicative utterances, on pragmatic grounds, I distinguished the following modalities or intention-types: (1) declarative (80 items), (2) interrogative (4 items), (3) imperative (6 items), and (4) call or vocative (4 items). The instrumental part of the investigation consisted of fundamental frequency, intensity and durational measurements. Data processing was completed by a perceptual test for stress patterns made on 20 adult listeners. In the data first I established the overall pitch range used by the

child in both communicative and non-communicative utterances. The respective values are:

Play	243-629 (=386 Hz)
Decl	271-528 (=257 Hz)
Int	357-500 (=143 Hz)
Imp	314-443 (=129 Hz)
Call	371-424 (= 50 Hz)

Within the overall pitch range I defined five registers(=pitches):

very high	529-629 Hz
high	443-528 Hz
mid	357-442 Hz
low	271-356 Hz
very low	243-270 Hz

Then I determined the distribution of the registers used for the modalities stated. In order to compare fundamental frequency across utterances I expressed their differences in terms of the musical scale, i.e. in semitones. For the intensity I only measured peak values. On the basis of the measurements the following general statement may be made: the overall intensity curve and pitch curve go hand-in-hand, i.e. both peaks and valleys coincide at some point of the utterance. It follows then that all that will be stated about pitch contours holds for intensity curves as well. The methodological framework thus established, I analyzed each utterance for the pitch of its syllables, the difference in the registers of subsequent syllables and the pitch movement occurring within syllables. The results underly the overall description that follows.

Declaratives. Monosyllabic utterances are all characterized by level contour. From among the 63 disyllabic declarative

and end points of the phonation. Thus, when the pattern is realized in a longer time, F_0 changes become even. The underlying pattern itself is likely to be determined by the physiological capacity of the child for voice production. Sequences built up of repeated syllables, e.g. [pipipipil], often display variations in pitch direction and range quite similar to those of some tonal language. Their intensity can be steadily increasing or decreasing, or increasing in one section of phonation, decreasing in another, then increasing again, etc.

Stressing procedures. As far as stress patterns are concerned, the perceptual test has yielded the following results. In many cases one-unit utterances display more than one stress and this does not agree with the stress rules of adult Hungarian assigning, if at all, a single stress to the first syllable of a word. The options are:

- There is one stress which can fall on any syllable; usually, however, it falls on the first or the last one. This variation can even be observed in different occurrences of the same word, like in ATLéta/atLÉta/atLÉTA 'athlete' (capital letters refer to stressed syllables).

- There are two stresses, one placed on the first and one on the last syllable as in BABakoCSI 'baby carriage'.

- There are more than two stresses as each syllable of the word has its own stress, e.g. PINGVINEKET

'penguins (acc)' OLLÓVAL
'with scissors'.

These procedures are present simultaneously during the period examined. Among stresses assigned by the child to more than one syllable one can discern a "primary stress", i.e. the strongest one. Last syllable stress occurs mostly when the child wants to maintain the contact already established with the partner.

In playful sequences stress falls either on every syllable or on every other syllable that can be the even-numbered as well as the odd-numbered. All it looks as if the child used stressing for the rhythmical structuring of these playful sequences.

4. CONCLUSION

Communicative utterances seem to be from the start under linguistic control manifested in each acoustic parameter, especially in the use of pitch patterns while non-communicative, playful utterances are under physiological control. All kinds of differences between the two categories are ultimately due to this fundamental difference. In the category of communicative utterances intonation serves to actualize abstract linguistic entities in different speech acts by signalling modalities. On the other hand, the wild variety of stress patterns indicates that stress, at this early stage of the acquisition process, does not reliably perform yet its linguistic functions.

5. PROSPECTS

Later prosodic development

applies the same trial-and-error principle that operates in segmental development. In complex structures the child may be (and is) mistaken both in the number of stresses to assigne and their placement. Intonation errors occur mainly in yes/no intonation questions whose patterning is intimately related to semantic focus. The elimination of errors takes places through learning the complex interplay of prosody, syntax and semantics. Therefore, these errors constitute a major challenge to the linguist for they can tell how far the child's grammatical knowledge actually extends.

5. REFERENCES

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