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Phrasal Stress in Telugu

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Abstract

The phrasal stress refers to the most prominent syllable in a sentence. It serves to highlight, focus, contrast, comment, or indicate new information (Hirst, 1977).

The current study thus aims to identify the location of phrasal/sentence stress in Telugu. Thirty right-handed native speakers of Telugu described a picture for about 2-3 minutes.

The utterances were transcribed in The International Phonetic Alphabet and classified into separate intonation units by 2 speech pathologists. Later, 3 speech pathologists independently identified the primary stressed syllable in each intonation unit i.e., the most prominent syllable.

The percentage frequency occurrence of stress on specific syllable position in each intonation unit was calculated. The outcome of the study suggest that phrasal stress is variable and can occur on any syllable in a sentence. However, it more likely occurs on the first 6 syllables.

Introduction

Stress indicates the most prominent syllable/word in an utterance. The default stress in a sentence is also called the phrasal stress or sentence stress. The emphatic sentence stress serves to highlight, focus, contrast, comment, or indicate new information and it contributes to identification of intonation pattern of a sentence (Hirst, 1977).

The stress in an utterance is also reported to occur in certain position in an utterance in some languages. An important feature of English intonation is the use of an intonational accent (and extra stress) to mark the focus of a sentence. Normally this focus falls on the last major word of sentence, but it can occur earlier in the order to emphasize one of the earlier words or to contrast it with something else (Russell, 1997).

Thus the default phrasal stress in English is reported to occur on the last major word (Russell, 1997), where as in Kannada language, it reportedly occurs on the first few syllables (Manjula, 1997).

In Tamil, which is a Dravidian language of India, the stress is reported to occur on the first syllable of a phrase (Ashtamurthy, 2003). Thirumalai & Gayathri (1988) too reported that although there is no word stress in Indian languages, the sentence stress occurs at the beginning of a sentence.

Another type of stress is the contrastive stress which marks comment or psychological predicate in an utterance (Hornby & Haas, 1970). It can occur on almost any element on an utterance. Its occurrence on a particular element is linked to specific situational and contextual aspects of discourse and to speaker-hearer presuppositions. It is related, in particular, to the element he/she wishes to place into focus. Bates and Macwhinney (1979) noted that contrastive stress is the device speakers' use most often when the point of an utterance is to contradict or replace some aspect of the listener's beliefs.

Prosodic prominence/stress has been claimed to be closely linked to the notion of "information structure" of an utterance, reflecting the flow of information and the ordering of new vs. given information (Nooteboom & Terken, 1982).

A common observation is that given information, i.e. information that has already been mentioned or is assumed by the speaker to be known, tends to precede new information. If, for some reason, this unmarked structure of information is deviated, it is usually signaled prosodically, for instance by a focal stress. Another, related generalization is that new information tends to be stressed, whereas given information tends to be destressed (Hirschberg, 2002).

This particular prominence function of prosody signals the listener about new/important information (Nooteboom & Terken, 1982; Nooteboom & Kruyt, 1987; van Dozel &

Koopmans-van Beinum, 2000). However, information structure alone is not the sole instigator of stress.

Terken and Hirschberg (1994) investigated the relationship between stress and the new vs. given distinction in an experiment where the additional factors of syntactic function and sentence position were looked at. They found that when a given item has a certain syntactic function in the context of an utterance, it is just as likely to be accented as an element which is new to the discourse.

In some languages, the syllable that carries stress in an utterance is in part determined by vowel quality i.e., the kind of vowel it consists in its structure. For instance, in English, the central vowels are unlikely to receive stress compared to the peripheral ones (Collins & Mees, 2003).

The research related to the default stress pattern in Telugu is not reported in any of the published studies yet. However, the phenomenon is well established in other 2 Dravidian languages of Kannada and Tamil. Hence the current study intends to study the stress pattern of Telugu which is another major Dravidian language.

Aim

The study aims to identify the location of phrasal/sentence stress in Telugu.

Method

The participants included 30 right handed native speakers of Telugu. All the participants were young adults in the age range of 19-22 years and were either studying graduation or post graduation. The participants did not present any previous history of speech, language or hearing deficits as ascertained by the information provided by themselves. The screening for speech or hearing deficits in all participants revealed also no pathology.

Stimulus

A picture description task was selected. The picture stimulus was a part of standardized test called the Linguistic Profile Test (Karanth, 1980). The picture depicted a 'market scene'. Initially, a pilot study was carried out to confirm:

(a) that expressive speech of minimum 3 minutes could be elicited from the subjects.
(b) the possible occurrence of different grammatical classes of Telugu.

Five normal participants narrated the events related to the selected picture stimuli. Analysis of the discourse content revealed that the participants described the picture for about 2-3 minutes and there was sufficient scope for use of various grammatical classes

such as nouns, verbs, adjectives, pronouns, postpositions, and conjunctions. There was also scope for repeated use of some of the grammatical categories. More importantly, the chosen stimulus facilitated generation of a significant number of sentences thus enabling collection of large corpus of speech sample.

Procedure
Recording procedure

Prior to recording of speech sample, informed consent in writing for participation in the study was obtained from all participants and before the actual recording of speech sample the principal investigator demonstrated narration of picture using another stimulus to each participant.

All the participants were given sufficient time to formulate the utterances and get familiarized about the picture to be narrated. The picture stimulus was placed in front of participants. The participants were instructed to observe and verbally describe as many events, things, and activities about the picture.

The speech sample was recorded in a single trial in a quiet environment. The duration of recording extended from 2-3 minutes across participants. The participants' utterances were recorded using Transcend digital voice recorder with a uni-directional microphone placed at a distance of about 10 cm from the mouth.

Analysis
The recorded utterances were transcribed by the principal investigator using The International Phonetic Alphabet (revised to 1993, updated 1996). The utterances were classified into separate intonation units by the principal investigator. An intonation unit (IU) was operationally defined as 'a sequence of words combined under a single, coherent intonation contour' (Chafe, 1987).

The perceptual criteria adopted for demarcating intonation units were: presence of at least one stressed syllable, significant pause between intonation units, phrase final lengthening, anacrusis, and pitch reset (Cruttenden, 1997).

Another judge who was a qualified speech-language pathologist with experience in analysis of prosody also identified the intonation units independently. The item-by-item inter-judge reliability coefficient 'Alpha' for identification of intonation units was found to be 0.9204.

The judgment task was repeated after 2 weeks time by the principal investigator and other judge to establish intra-judge reliability. The item-by-item intra-judge reliability coefficient 'Alpha' for the principal investigator was found to be 0.9404 and for another judge it was 0.9302. Later, 3 speech-language pathologists independently identified the

primary stressed syllable in each intonation unit i.e the most prominent syllable of a given intonation unit.

The judges were aware of the perceptual cues which facilitate identification of stress. The item-by-item inter-judge reliability coefficient 'Alpha' was found to be 0.8604. The judgment task was repeated after one week to establish intra-judge reliability. The item-by-item intra-judge reliability coefficient 'Alpha' for the 3 judges were 0.8805, 0.9103, and 0.8902 respectively.

The percentage frequency occurrence of primary stress on specific syllable position with respect to intonation unit was obtained by noting the occurrence of primary stressed syllable with respect to the syllabic position in each intonation unit. It was calculated as

$$\frac{\textit{Total of occurrences of primary stress on specific syllable position in intonation unit}}{\textit{Total of primary stress that occurred on all possible syllable positions in intonation unit}} \times 100$$

The percentage frequency occurrence of primary stress on specific syllable position was calculated for each of the judges. This was followed by calculating the average of the results of 3 judges for each participant.

Results

The aim of the study was to identify the location of default stress in a sentence. The phrasal stress was identified independently by 3 speech pathologists in the intonation units of the speech of 30 native Telugu speakers.

The master data of the percentage frequency occurrence of primary stress on specific syllable position in the intonation units of all 30 participants is given in Table 1. It represents the mean of the syllable identified by the 3 judges as carrying stress.

The results revealed variable placement of stress in an intonation unit across all the participants.

The participant 1 (P1) placed the stress with a highest frequency of 15 % on syllable 6, followed by 12 % on syllable 2, 10% on syllable 3 and 16 where as the frequency of occurrence gradually decreased from syllable 10 onwards.

In participant 2 (P2), the syllable 2 was received a higher percentage of stress (24%), followed closely by 21% for syllable 5 and 17% for syllable 4.

In participant 3 (P3), the syllable 7 was stressed more frequently (22%), followed by 19.66% for syllable 1 and 17 % for syllable 3.

The participant 4 (P4) placed stress on the first 5 syllables while no stress was found beyond syllable 10.

The highest percentage of stress was found on syllable 5 (18%) in participant 5 (P5) and on syllable 4 (20%) in participant 6 (P6). In participants 7 to 12, the frequency of occurrence of stress was highest on syllables 4 (20%), 3 (23.66%), 6 (36.20%), 1 (26.08%), 3 (47.60%), 3 (33.33%) & 5 (33.33%) respectively. Similar higher frequency of stress can be observed for other participants also.

Table 2 represents the combined data obtained in all 30 participants. It may be observed that the highest percentage frequency of stress (15.20%) was placed on syllable 3. It was followed by 12.43% on syllable 5, 11.27% on syllable 1, 11.22% on syllable 6, 10.84% and slightly less 9.94% on syllables 2 and 4, respectively. The variability of primary stress placement is clearly depicted in Figure 1.

Table 1: Average percentage frequency occurrence of primary stress on specific syllable position in the intonation units of all 30 participants.

SP	Participants																													
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20	P21	P22	P23	P24	P25	P26	P27	P28	P29	P30
1	8.33	3	19.66	25.66	6	15.66	-	14.33	11.06	26.08	4.76	3.03	19.44	19.29	10	24.44	4.16	10.41	15.86	3.70	10.52	-	27.77	4.73	4.76	33.33	12.12	-	-	-
2	12	24	8	20	9	36	6.66	4	13.20	2.66	-	6.06	19.44	15.78	6.66	-	2.08	14.58	3.17	22.22	12.27	9.50	-	28.50	16.66	29.92	3.03	-	-	-
3	10	8	17	14	15	5.33	-	23.66	8.30	11.33	47.60	33.33	11.10	14.03	20	13.32	10.41	20.83	9.52	11.11	1.75	33.26	16.66	14.20	26.18	3.03	15.15	16.66	14.20	11.10
4	8	17	3	15	6	15	20	13	2.76	10.13	7.04	6.06	-	1.75	3.33	6.66	4.16	2.08	9.52	22.22	33.32	23.76	5.55	14.20	7.14	-	-	25.00	-	16.66
5	5	21	8	16	18	-	6.66	16.33	8.30	7.11	11.71	33.33	11.10	12.27	16.66	11.10	14.58	16.66	11.10	11.11	14.02	-	-	23.73	9.52	3.03	15.15	20.83	14.20	16.66
6	15	7	11	-	12	8	7	16	36.20	10.34	11.85	6.06	19.44	12.27	16.66	22.22	12.50	6.25	3.17	3.70	-	4.73	5.55	4.73	4.76	12.12	27.27	25.00	4.73	11.10
7	5	13	22	-	15	2.66	10	6.00	-	8.96	4.76	-	2.76	10.52	10.00	6.66	4.16	4.16	9.52	11.11	3.50	4.73	22.32	4.73	11.90	-	-	-	-	27.73
8	8	-	5	5	3	10.33	7	6	2.76	2.66	7.04	3.03	-	5.26	13.33	-	6.25	6.25	4.76	3.70	14.02	-	-	-	7.14	-	21.21	8.33	-	-
9	5	-	-	2	9	-	20	-	8.43	6.00	2.38	-	-	7.01	-	-	2.08	-	1.58	7.40	1.75	14.20	5.55	-	-	6.06	3.03	-	23.73	11.10
10	2	-	-	5	-	2.66	-	-	5.43	4.00	2.38	3.03	11.10	1.75	-	-	12.50	4.16	11.10	-	3.50	9.46	5.55	-	4.76	3.03	-	4.16	9.50	-
11	3	2	3	-	-	5.33	-	-	-	1.33	-	-	2.76	-	-	-	0.00	2.08	14.28	-	7.01		11.10	4.73	-	6.06	-	-	14.23	-
12	-	3	-	-	3	-	7	-	-	-	-	3.03	2.76	-	-	-	2.08	2.08	-	-	-	-	-	-	-	-	3.03	-	4.73	5.55
13	-	-	3	-	-	-	-	-	-	1.33	-	3.03		-	3.33	6.66	4.16	4.16	-	3.70	-	-	-	-	4.76	3.03	-	-	9.50	-
14	3	-	-	-	-	-	-	-	2.66	1.33	-	-	-	-	-	-	2.08	-	-	-	-	-	-	-	2.38	-	-	-	9.50	-
15	3	-	-	-	3	-	7	-	-	-	-	-	-	-	-	-	-	-	1.58	-	-	-	-	-	-	-	-	-	-	-
16	10	-	-	-	-	-	-	-	-	2.66	-	-	-	-	-	-	2.08	6.25	-	-	-	-	-	-	-	-	-	-	-	-
17	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.22	-	-	1.58	-	-	-	-	-	-	-	-	-	-	-

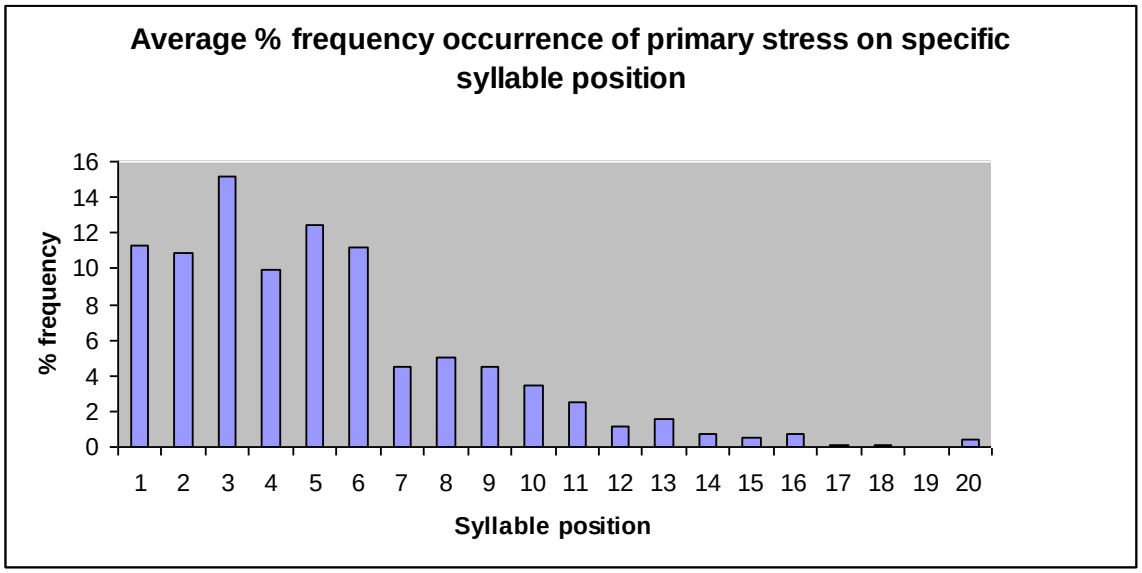
19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	10	-	-	-	-	-	-	-	-	2.22	-	-	1.58	-	-	-	-	-	-	-	-	-	-	-	-

SP – Syllable position; P - Participant

Table 2. Combined average percentage frequency occurrence of primary stress on specific syllable position in the intonation units.

Syllable Position	Average % occurrence of stress
1	11.27
2	10.84
3	15.2
4	9.94
5	12.43
6	11.22
7	4.54
8	5
9	4.54
10	3.5
11	2.56
12	1.2
13	1.55
14	0.69
15	0.48
16	0.69
17	0.06
18	0.12
19	0
20	0.46

Figure 1. Combined average percentage frequency occurrence of primary stress on specific syllable position in the intonation units.



Discussion

The results of the study provided the database related to stress placement in a sentence in Telugu. The study revealed certain curious results concerning placement of stress.

The important outcome is that speakers of Telugu exhibit variable stress pattern in a sentence. It is not constant a constant phenomenon. The variability may be due to various factors that influence stress placement. Some of the factors may be the possibility of new versus given information (Nooteboom & Terken, 1982; Nooteboom & Kruyt, 1987; van Dozel & Koopmans-van Beinum, 2000), the vowel quality occurring in the phonetic environment (Collins & Mees, 2003), and also the grammatical category of the word stressed. Usually the content words are more frequently stressed than the function words.

Secondly, the stress occurred more frequently within the first 6 syllables of intonation unit. Even among those 6 syllables, it is the third syllable that was received prominence. The possibility of occurrence of stress decreases from left to right of the utterance. It is least on the syllables that are in the terminal portion of utterance.

The results are quite similar to those reported by Thirumalai & Gayathri (1988) for Indian languages, Manjula (1997) in Kannada and Ashtamurthy (2003) in Tamil. It differs from English in which the stress generally occurs on the terminal syllables (Russell, 1997).

Conclusion

Based on the results of the current study it may be concluded that in Telugu the default sentence stress is variable and can occur on any syllable in a sentence However, it more likely occurs on the first 6 syllables.

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