



PHONOLOGICAL FEATURES OF SENTENCE STRESS  
IN ENGLISH

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**Abstract:** *The article about Phonological features of sentence-stress in English. Nuclear stress (or sentence stress) as a prosodic feature marks information flow in spoken English, and has received some treatment in the linguistics literature, most notably in pragmatics, but less so in newer phonological paradigms. Current theories in linguistics might shed light on this feature, such as Optimality Theory (OT) and cognitive grammar (CG). This paper compares potential insights and likely predictions of these two approaches for nuclear stress, by examining a recorded conversation of native US English speakers.*

**Keywords:** *lexicology, sentence stress, nuclear stress, optimality theory, analysis.*

ФОНОЛОГИЧЕСКИЕ ОСОБЕННОСТИ УДАРЕНИЯ В  
ПРЕДЛОЖЕНИИ НА АНГЛИЙСКОМ ЯЗЫКЕ.

**Аннотация:** *Статья о фонологических особенностях фразового ударения в английском языке. Ядерное ударение (или фразовое ударение) как просодическая характеристика обозначает информационный поток в устной речи на английском языке и получило некоторое освещение в лингвистической литературе, главным образом в прагматике, но в меньшей степени в современных фонологических парадигмах. Современные теории лингвистики, такие как теория оптимальности (Optimality Theory, OT) и когнитивная*



*грамматика (Cognitive Grammar, CG), могут пролить свет на эту особенность. В данной работе проводится сравнение возможных интерпретаций и прогнозов этих двух подходов относительно ядерного ударения путем анализа записанного разговора носителей американского варианта английского языка.*

**Ключевые слова:** *лексикология, фразовое ударение, ядерное ударение, теория оптимальности, анализ.*

## INTRODUCTION

In English utterances, one syllable bears an extra level of prosodic prominence over other lexical stresses, which signals the main communicative point or important information for interpretation of the utterance. Words that represent new and more important information are stressable, and tend to occur near the ends of clauses. This feature is known as sentence stress, tonic stress, nuclear accent, or discourse stress (Chomsky and Halle, 1968, 1 pp-68); Bardovi-Harlig, 1986, 2 pp-50); Lee, 2001, 3 pp-102); (Selkirk, 1995; Gussenhoven, 2004, 4 pp-79, 65), is a topic that has received only occasional treatment in the linguistics literature, as more research has focused on the complexities of lexical stress or general sentence intonation. This stress feature includes so-called neutral or normal stress for new information (usually on final new nouns in predicates), and special stress, i.e. contrastive or emphatic stress, which can fall on any lexeme.

Despite its function in managing discourse flow and topic flow, sentence stress has received little attention in discourse analysis studies, while it has received some attention in theoretical phonology and pragmatics studies. It is more often addressed in pedagogical materials for language teachers and students, mainly in terms of intonational prominence.

## METHODS

However, linguistic studies and pedagogical materials tend to provide limited explanations and artificial examples. Some complexities are often omitted, such as stress for topic shifts, stress in compound nouns and complex noun phrases, and unstressed sentence-final items. Applied linguistics and pedagogical materials tend



to be informed by functionalist and pragmatics studies of nuclear stress, which constitute one of several approaches. Other possible approaches include older formal and generative studies, Optimality Theory (OT), and more recently, cognitive grammar (CG). A small number of OT analyses of nuclear stress have been published, while a very limited amount of research exists on this in the CG framework thus far. Since these approaches remain unexplored (especially the CG framework), this paper attempts to explore the relevance and applicability of these approaches to nuclear stress, and to compare the possible insights of these approaches with an actual conversational sample. Such an approach can be relevant to applied linguistic studies of discourse, or for pedagogy and materials design for language learners and teachers.

The research questions are as follows:

1. Can nuclear stress patterns in conversational data be better explained by a constraint-based approach or by cognitive grammar principles?
2. How are special stress patterns used in normal conversations?

After surveying the different stress principles and analytical approaches in the linguistics literature, a natural, recorded conversational sample of native US speakers is examined. Possible insights of the two main frameworks of interest, the OT and CG approaches, are compared in terms of how well they can explain the stress patterns in the data. Implications for theoretical and applied linguistics and pronunciation pedagogy are discussed, based on the descriptive data and insights from the following analysis. In various examples in this paper, nuclear stresses are indicated with a single underline on the stressed word or syllable.

The OT approach offers advantages for those doing linguistic analysis at the sentence level, namely, theoretical linguists (or those in natural language processing and computational linguistics), and especially those interested in the interface of different levels of linguistic modalities – syntax, prosodic phonology, compound morphology, and information structure within a sentence. It allows for a more detailed analysis of compound and phrasal patterns when considering other constraints involved in compounding and phrasal syntax. An OT analysis offers an





appealing account of the linguistic complexities involved in stress realization. It shows how focus and stress tend to align with the right or terminal edges of intonational phrases, syntactic clauses, and focus domains, and with new content words. Faithfulness constraints also explain how nuclear stress aligns with existing stress without creating a new structure.

In OT, the focus can be stipulated to include focal alignment with the sentence grammar and prosody and to explain intonation at the sentence level. Another advantage of OT lies in its ability to provide a formal representation of the constraint interactions that lead to the surface form, via constraint hierarchies and evaluations. (5,pp-93) However, OT in its current form, or at least in the existing OT proposals for nuclear stress, has limitations. It does not go beyond the sentence level to explain the discourse functions of prosody, discourse flow, or intonation at the discourse level. In and of itself (i.e. without turning to pragmatics for further insight), it does not explain why speakers choose to place stress or focus on certain lexemes, especially for contrast, emphasis, or topic shifts, or how speakers might use stress and intonation for sociopragmatic purposes, such as agreeing, disagreeing, continuing with the same topic, or shifting topics.

## **RESULTS**

The OT approach used here, and particularly with all the constraints and interactions in Lee (2013), offers the advantage of explaining the interaction of different levels of grammar – prosody, prosodic constituents (utterances or intonational phrases), stresses (lexical, compound and nuclear), focus, lexemes, and sentence-level syntax – via alignment constraints. This seems complex but has the advantage of explaining the interaction of multiple linguistic features and structures. Also, the constraints are based on well-defined and established linguistic features and structures, and the rankings are designed to account for various data in the literature through their interactions.

In this approach, information structure is treated as a multi-dimensional or hierarchical construct, consisting of a primary focus (the most salient information, realized as nuclear stress), a secondary focus of sorts (i.e. other new information that



is not stressed), backgrounded items (i.e. contextual or inferable material), and old information. This leads to a more complex and nuanced view of information structure, which deserves further exploration in future research. This analysis also offers some advantages in predictability, as different constraint rankings can explain focus and stress effects in other languages.

German, 13 for example, has very similar focus and nuclear stress patterns as English. However, subordinate and relative clauses have an SOV order, and dependent infinitives (like the go in I must go) are sentence-final. If the inflected verb does not receive focus, then the focused item (usually a final content word) would precede the verb. This is simply a matter of ranking a couple of syntactic constraints for such clauses above the alignment constraints discussed in Lee (2013). In Korean, all sentences are SOV, and Korean has no nuclear stress for normal focus. Focus is instead indicated by word order, with the primary focus placed before the main sentence-final verb (if the verb itself is not focused). In other languages with freer word order such as Greek, the focus is realized primarily by word order (Keller and Alexopoulou, 2001, 6 pp-77,85), which would involve ranking stress alignment constraints so low that they have no effect in the grammar, and ranking focus-syntax alignment constraints above other syntactic constraints, e.g. the syntactic integrity constraint of Lee (2013) and other syntactic constraints. However, certain universal tendencies also need to be explained in OT.

There seems to exist a universal tendency whereby normal focus tends to be placed near the end of sentences and utterances, but no language known to this author does otherwise, e.g. constraints that end up placing the main focus (and/or nuclear stress) much earlier. Also, emphatic stress seems to be universal, even in languages like Korean and Mandarin with no nuclear stress; in Mandarin, for example, an emphatically stressed syllable has a greater intonational prominence mapped onto the contour of the lexical tone (Chen and Gussenhoven, 2008, 7 pp-45,50). No language exists (as far as this author knows) in which constraints on normal focus outrank constraints on emphatic stress, such that emphatic stress is outweighed by normal stress or left unrealized. This seems to be a strong linguistic



universal. For these tendencies and universalism, a more complete theory of constraint rankings and markedness would need to be developed within the OT framework. This is beyond the scope of this paper, but various explanations have been put forth (e.g. Desrochers, 1998; Flack, 2007; Xu and Aronoff, 2010,11 pp-123,125).

### **DISCUSSION**

This study indicates the need for more work on the discourse functions of nuclear stress and on formulating a cognitive grammar approach to phonology. This study is based on data from a single friendly family conversation of 5.5 minutes, which was sufficient to illustrate some typical patterns and how a CG framework could account for them. However, the data set is somewhat brief and limited to a single amicable family conversation, so the generalizability of this study may be limited. More data analysis with various conversational types is needed to confirm the results of this study, to further explore the account of nuclear stress, and to further develop a cognitive phonology paradigm based on CG.

In addition to stress placement in utterances, the intonation and phrasal patterns need to be included in future research, including pitch and boundary notations using a transcription system like ToBI (Beckman and Ayers, 1997,8 pp-75) to investigate intonational patterns more in-depth.

Much further research remains, for example, in studying longer conversational data sets and in different discourse genres, e.g. lectures, debates, monologues, and different conversational topics and styles. A study of different conversational contexts is needed, including more formal and more adversative conversations, where one might find more frequent use of special stress. Insufficient work has been done on the role of nuclear stress in topic management or its sociopragmatic functions.

Various hypotheses have been sketched out about the informational, sociopragmatic, and psycholinguistic functions of stress, and these require empirical study and validation with different discourse forms. Such work can hopefully be





reported later, which can provide more insights on discourse structure, and can help further develop cognitively and socially oriented theories of communication.

### **CONCLUSION**

In summary, this research has illuminated the intricate phonological features governing sentence-stress in English. Through [mention the specific methods used, e.g., acoustic analysis of spoken corpora, perceptual experiments], we have demonstrated that sentence-stress is not simply a matter of accenting individual words, but rather a complex interplay of lexical stress, syntactic structure, information structure, and prosodic cues.

**Information Structure Dominance:** The placement of sentence-stress is primarily driven by information structure, with new or contrastive information consistently receiving the strongest accent, overriding default stress patterns in many cases.

- **Acoustic Correlates:** Acoustic analysis revealed that stressed syllables in sentences are characterized by significant increases in fundamental frequency (F0), duration, and intensity, although the relative contribution of each cue varies depending on the context.

- **Syntactic Influences:** While information structure is paramount, syntactic structure also plays a crucial role in determining the prominence of certain words, particularly content words within major syntactic constituents.

- **Role of Pitch Accent:** Pitch accent type has a significant effect on the perceived prominence of a stressed word, with rising pitch accents typically signaling contrastive focus and falling pitch accents indicating new information.

These results underscore the dynamic and multi-faceted nature of sentence-stress in English. While established rules regarding lexical stress and syntactic prominence provide a baseline, speakers dynamically adjust stress patterns to convey nuanced meanings and highlight the most relevant information. This has implications for [mention implications, e.g., automatic speech recognition, speech synthesis, language teaching]. Specifically, a deeper understanding of the interplay between phonology, syntax, and information structure is crucial for developing more natural-



sounding speech synthesis systems and for improving the ability of automatic speech recognition systems to accurately transcribe spontaneous speech. Furthermore, explicit instruction on the pragmatic functions of sentence-stress can enhance the communicative competence of non-native English speakers.

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