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BILINGUALISM: MODERN SPEECH MODELS AND ISSUES OF MENTAL GRAMMAR

Annotation

This article examines and analyzes mental grammar in the speech of Uzbek artificial bilinguals, with particular emphasis on contemporary speech models and their significance for second-language acquisition. It also investigates the functional role of mental grammar in the speech of contemporary Uzbek–English artificial bilinguals and explores the stages involved in the development of mental grammars in both the first and second languages.

Key words: Mental grammar, speech production, speech models, bilingualism, universal grammar, FLA(First Language Acquisition), SLA(Second Language Acquisition), mental chronology, The Levelt’s model, The BIA+ model, The SSH model.

ДВУЯЗЫЧИЕ: СОВРЕМЕННЫЕ РЕЧЕВЫЕ МОДЕЛИ И ВОПРОСЫ МЕНТАЛЬНОЙ ГРАММАТИКИ

Аннотация

Данная статья посвящена изучению и анализу ментальной грамматики в речи узбекских искусственных билингвов, а также современных речевых моделей и их значения в процессе усвоения второго языка. Кроме того, целью исследования является анализ функционального значения ментальной грамматики в речи современных узбекско-английских искусственных билингвов, а также этапов формирования ментальных грамматик первого и второго языков.

Ключевые слова: Ментальная грамматика, порождение речи, модели речевой деятельности, билингвизм, универсальная грамматика, усвоение первого языка (FLA), усвоение второго языка (SLA), ментальная хронология, модель Левелта, модель BIA+, модель SSH.

IKKITILLILIK: ZAMONAVIY NUTQIY MODELLAR VA MENTAL GRAMMATIKA MASALALARI

Annotatsiya

Ushbu maqolada O‘zbek sun’iy bilingvlar nutqida mental grammatika hamda zamonaviy nutqiy modellar va ularning ikkinchi tilni o‘zlashtirishdagi ahamiyatini o‘rganish va tahlil qilishga bag‘ishlanadi. Shuningdek, zamonaviy o‘zbek-ingliz sun’iy bilingvlar nutqida mental grammatikaning funksiyaviy ahamiyati hamda birinchi va ikkinchi til mental grammatikasining hosil bo‘lish bosqichlarini tahlil qilishdan iborat.

Kalit so‘zlar: Mental grammatika, nutq hosil qilish, nutqiy modellari, ikki tillilik, universal grammatika, ona tilini o‘zlashtirish (FLA), ikkinchi tilni o‘zlashtirish (SLA), mental xronologiya, Levelt modeli, BIA+ modeli, SSH modeli.

Introduction. Throughout the history of linguistics, extensive research has been conducted into the processes of human speech comprehension and speech production, as well as into the role of natural (mental) grammar in the implementation of these processes. This has given rise to a number of theoretical debates among linguists and psycholinguists. To begin with, it is necessary to consider the concept of mental grammar. Mental grammar refers to an individual’s internal knowledge of the grammar of their native language; in other words, it is the body of linguistic knowledge that enables individuals to understand language and express their knowledge, ideas, and thoughts. The rules and principles of a language are generally acquired during childhood and are stored in the mind of a native speaker.

Similarly, grammar represents one of the most important aspects of second-language learning. Mental grammar encompasses internal linguistic knowledge related to phonology (the rules governing pronunciation and sound patterns), morphology (word structure), syntax (sentences and their structural organization), semantics (aspects of meaning), and the lexicon (vocabulary and lexical knowledge). One of the major research areas of psycholinguistics is to investigate how mental grammar functions in speech production and in the comprehension of another speaker’s utterances. Mental grammar is represented in the human mind and regulates such processes as the production of speech sounds, the combination of words, and the formation of grammatically well-formed utterances. By the late nineteenth and especially the twentieth century, numerous theoretical perspectives had emerged concerning how this mental grammar operates in the human mind and what kind of structure it constitutes. One of the most influential formalist approaches was proposed by Noam Chomsky, who argued that grammar should be understood not merely as a descriptive instrument for representing a language, but as a system of knowledge underlying the human capacity for language. He developed these ideas extensively in his work Aspects of the Theory of Syntax. According to Chomsky, Universal Grammar (UG) is a set of innate grammatical principles and constraints that are common to human languages and provide the basis for acquiring the grammar of a particular language. Universal Grammar cannot operate in isolation from linguistic input received from the external environment; however, within Chomsky’s theoretical framework, it is considered to be independent of general intelligence and thought. For example, when a child is exposed to Russian or English words and linguistic structures, the interaction between the child’s innate grammatical endowment and the linguistic input contributes to the development of the grammar of Russian or English in the child’s mind. Thus, the formation of a particular language grammar can be viewed as resulting from the interaction between Universal Grammar and linguistic experience in the external environment. This approach differs from empiricist perspectives, according to which the development of a

particular language grammar is fundamentally dependent on experience. From this perspective, linguistic knowledge develops through mechanisms that process experience. One such position is associated with Hilary Putnam, who emphasized the role of cognitive mechanisms in the development of linguistic knowledge. The acquisition of negation, for example, has been used in discussions of whether grammatical rules can be fully explained on the basis of linguistic experience alone. From a generative perspective, certain grammatical principles cannot be derived simply by generalizing from the linguistic input available to the child; rather, their development is assumed to involve innate linguistic constraints and the child’s cognitive processing of linguistic experience.

Literature review. According to Chomsky’s theory, Universal Grammar constitutes a fundamental grammatical system, or core grammar, containing principles and parameters that are common to human languages. The grammar of a particular language, however, is not identical to Universal Grammar itself but involves language-specific properties that may be associated with the peripheral grammar. For example, the use of the auxiliary verb do in English to form negative and interrogative sentences represents a language-specific grammatical property that is not itself a universal principle but belongs to the particular grammatical realization of English. Chomsky’s theory of Universal Grammar has therefore proposed several fundamental assumptions. However, as with every theoretical approach, these assumptions have been subjected to critical examination and alternative interpretations

1. The Poverty of the Stimulus argument. One of the central claims associated with the generative approach is that the linguistic input available to children is limited, incomplete, and potentially insufficient to account for the complexity of the grammatical knowledge they acquire. This position has been strongly criticized by empiricist researchers. They argue that the linguistic input available to children is not necessarily as defective or limited as the Poverty of the Stimulus argument suggests. For example, some empiricist studies have demonstrated that grammatical errors in adult speech constitute only a relatively small proportion of the linguistic input to which children are exposed (Johnson & Newport, 1989, p. 91).

2. The rapid and effortless acquisition of language by children. Another argument concerns the speed and apparent ease with which children acquire language. Empiricist approaches challenge the assumption that children acquire complex grammatical structures without extensive linguistic experience. From this perspective, children may have limited conscious access to deep syntactic analysis and may experience difficulties when processing structurally complex sentences. Rather than consciously analyzing every sentence they encounter, children gradually construct grammatical representations on the basis of repeated linguistic experience and patterns available in the input. This aspect of Chomsky’s approach has also been critically discussed by Hilary Putnam. From an empiricist perspective, it has been argued that the process of language acquisition is neither instantaneous nor completely effortless. In particular, comparisons between children acquiring their first language and adults learning a second language suggest that children require several years—often approximately four to five years—to develop a basic grammatical system. Thus, the apparent rapidity of child language acquisition should not necessarily be interpreted as evidence that children acquire grammar more quickly than adults in every respect; rather, the developmental process is gradual and depends on both linguistic experience and cognitive mechanisms. Initially, linguists, phoneticians, and neurologists conducted research into how speech is produced. Later, as psychologists became increasingly involved in this field, detailed analyses of linguistic and theoretical speech errors, phonetic descriptions of articulation, and models of language disorders associated with aphasia began to emerge in psychology. This, in turn, laid the foundation for the development of psycholinguistic approaches. Compared with other disciplines, psychology primarily focuses on the process of speech production itself when investigating speech activity. From a psycholinguistic perspective, the analysis of speech activity addresses questions such as: “How does a person move from a communicative intention to actual articulated speech?” and “Which cognitive and linguistic components are involved in producing fluent speech?”

Research Methodology. Analyzing how these components function in speech production can be carried out by measuring the speaker’s reaction time.Contemporary speech models also involve numerous picture-naming experiments, in which participants are asked to name various objects and their reaction times are measured. One of the most important discoveries in psychology is mental chronometry, a method for measuring the temporal duration of mental processes occurring in the human mind. This method was introduced into science in the nineteenth century by the Dutch physiologist, physician, and psychologist Franciscus Cornelis Donders. To this day, this method continues to be widely used in research on speech production and speech-related difficulties. Speech models and their role in understanding the mechanisms underlying speech production are therefore of considerable importance. The following section focuses specifically on these speech models. **Levelt’s model**. The speech production model developed by W. J. Levelt (1989), which describes the general organization of speech production and explains how communicative intentions are transformed into actual speech, has been regarded as an important contribution to psycholinguistic research. This model has subsequently served as a working framework for numerous studies. According to the model, the ability to speak is based on several processing components and on the interaction among these components. The complexity of the speech production process arises from the interaction between the components; that is, the model explains how the output of one component becomes the input for another and how these components depend on and interact with one another. Since an ideal and fully comprehensive speech production model has not yet been developed, it is important to consider several questions in understanding the organization of such a model: Is the division of the speech production process into these particular groups of components theoretically justified? What functions does each component perform? How do the components interact with one another to produce speech that is comprehensible to the listener?

According to the Levelt model, the following components play an active role in speech production and each component carries out vital tasks in the process of speech production, three main stages to transfer communicative goal to articulation;
1.Conceptual preparation (Conceptualizer). (The initial stage of speech beginning with communicative goal and the procedure of linearization, choice of perspective)
2.Formulation process(Formulator),(two main encodings; grammatical and fonological stages will occur in this stage and all information will be sent to the next one)

3. Articulation (Articulator)

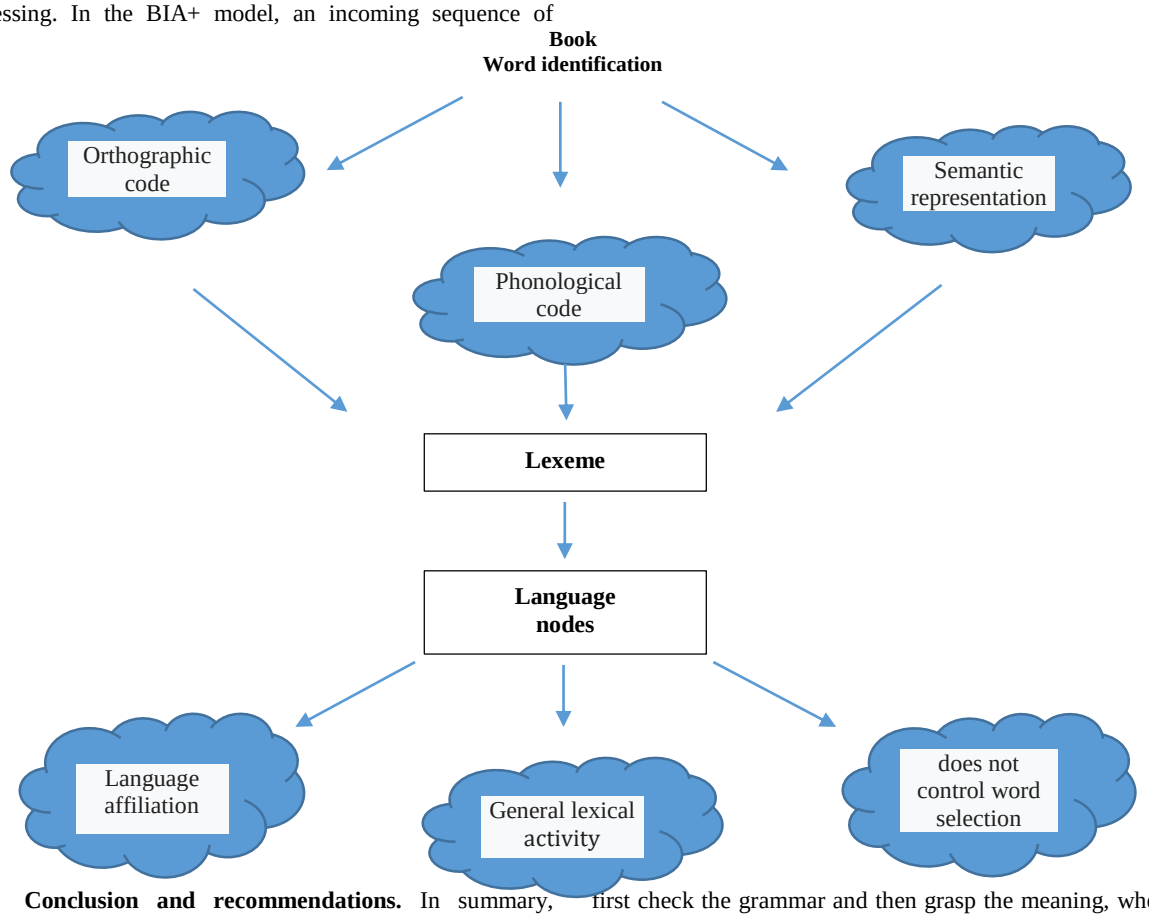
Analysis and results. The Shallow Structure Hypothesis is a model developed by Harald Clahsen and Claudia Felser in 2006; its primary aim was to analyze the differences in how first-language and second-language users process words in real time. The model also examines the issue

of how—unlike native speakers—even highly proficient second-language users rely relatively more on semantic, pragmatic, probabilistic, and surface-level information rather than constructing or utilizing abstract syntactic representations during real-time processing.

The BIA+ model. The BIA+ model examines whether the mental lexicons of the first and second languages (L1 and L2) in a bilingual system are organized separately or form a single integrated lexicon. It also analyzes how word identification is carried out in the second language. In the context of bilingual language processing, the BIA+ model addresses several controversial questions: Does a speaker have separate mental lexicons for both languages during the process of acquiring a second language? If so, how does the process of word recognition take place within two separate mental lexicons or within a single mental lexicon? According to the BIA+ model, word identification, or the process of recognizing a word, is related to the stages described in Levelt’s model, namely conceptualization → formulation → articulation, whereas task and decision-making processes are activated after the word has been fully identified. Within a bilingual lexical system, competition and selection may occur among lexical units. In a system with separate lexicons, lexical access is language-selective, meaning that access to the L1 and L2 lexicons occurs separately according to the selected language. In contrast, an integrated mental lexicon involves non-selective lexical access. The BIA+ model supports the latter approach.

According to this model, lexical access is non-selective, and the mental lexicons of the two languages form a single integrated system in which lexical units belonging to both languages are activated to some extent. As a result, during the process of word recognition, the orthographic, phonological, and semantic similarities among lexical units in the bilingual’s two languages may jointly influence processing. In the BIA+ model, an incoming sequence of letters initially activates orthographically similar lexical representations. The degree of activation depends on factors such as the word’s subjective frequency, its recent use, and the level of second-language proficiency. Therefore, L2 lexical units generally become activated more slowly than L1 lexical units. Subsequently, the activated orthographic representations activate their corresponding phonological and semantic representations. The speed of activation does not depend exclusively on the language to which a lexical unit belongs; rather, it depends on the degree of similarity between the incoming signal and the representations stored in the mental lexicon. A higher degree of similarity results in faster activation. The BIA+ model incorporates the time-delay hypothesis, according to which L2 language codes are activated more slowly than L1 language codes. Within the integrated mental lexicon, language nodes do not directly control the selection of words. Instead, they function as mechanisms that reflect the overall activation level of lexical units associated with a particular language and indicate activation in accordance with the linguistic context.

For this reason, lexical access initially occurs in a non-selective manner, while language nodes contribute to determining which language has a relatively higher level of activation. Language nodes are representations that indicate the language membership of a lexical item selected from the mental lexicon. At the lexical level, language nodes help determine whether a word belongs to English, Russian, or Uzbek. Thus, when an English lexical item is identified, the English language node becomes activated, whereas the Russian or Uzbek language node becomes activated when the identified lexical item belongs to Russian or Uzbek, respectively. This process can be clearly illustrated in the following diagram. When a bilingual individual hears or sees the English word “book,” word identification proceeds through the following stages:



Conclusion and recommendations. In summary, during the morphological analysis of complex words, L1 users first check the grammar and then grasp the meaning, whereas L2 users focus on the meaning first and then apply grammar.

L2 users activate grammatical and non-grammatical information in a different order and at a different time compared to L1 users. Here, modern speech models play an important role to understand the production of uzbek bilinguals’ speech, and answer the questions related to how mental grammar carries out basic functions in second language acquisition and come to some predicting theories related to L1 grammar transfer, interlanguage grammar, interference, code-switching.

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