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Спецвыпуск

“Техника как язык: понимание и действие в техническом мировоззрении”



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Research article

## The Grammar of Behavior as a Theoretical Notion

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### Abstract

Many researchers of human behavior lack empirical data in the form of descriptions of actually observed behaviors and their generalizations. Fictional narratives could be used as a source of empirical descriptive data, and their analysis naturally results in the formulation of some “grammar of behavior.” The purpose of this paper is to explore the possibility to use the notion of behavioral grammar in a strict scientific sense. Since the notion of grammar comes from linguistics, the article starts by comparing different linguistic approaches to the understanding of grammar. Then it explores how the concept of grammar is used outside of linguistics, in notions of “grammar of behavior,” “grammar of society,” and “grammar of culture.” Any linguistic grammar explicitly or implicitly contains theoretical ideas about what language is in general, offers some typology of language elements, and some rules which can be conceptualized rather differently (prescriptions and proscriptions, distributions, algorithms, schemes, templates). A grammar of behavior also presupposes a certain theoretical view of behavior: how it is generated, where its forms come from, how they are assimilated and chosen, etc. However, not every theory of behavior can be understood as grammar. A grammar of behavior is that part of a theory that describes behavior, explains it by formulating rules, by specifying what is necessary, typical, possible, and what is atypical or impossible. A model of behavioral grammar extracted from fiction corpora can be based on Lewinian theory of behavior, and understood as a set of generalized descriptions of typical persons' behaviors in typical psychophysiological conditions and typical circumstances.

**Keywords:** Human Behavior; Grammar; Rules; Norms; Language; Culture; Scientific Models

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Научная статья

## Грамматика поведения как теоретическое понятие

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### Аннотация

Многим исследователям человеческого поведения не хватает эмпирических данных в виде описаний реально наблюдаемого поведения и их обобщений. Вымышленные повествования могут использоваться как источник эмпирических описательных данных, и их анализ естественным образом приводит к формулированию некой “грамматики поведения”. Цель данной статьи – изучить возможность использования понятия поведенческой грамматики в строгом научном смысле. Поскольку понятие грамматики пришло из лингвистики, статья начинается со сравнения различных лингвистических подходов к пониманию грамматики. Затем исследуется, как понятие грамматики используется вне лингвистики, в понятиях “грамматика поведения”, “грамматика общества” и “грамматика культуры”. Любая лингвистическая грамматика явно или неявно содержит теоретические идеи о том, что такое язык в целом, предлагает некоторую типологию языковых элементов и некоторые правила, которые можно концептуализировать по-разному (предписания и запреты, распределения, алгоритмы, схемы, шаблоны). Грамматика поведения также предполагает определенный теоретический взгляд на поведение: как оно создается, откуда берутся его формы, как они ассимилируются и выбираются и т. д. Однако не каждую теорию поведения можно понять как грамматику. Грамматика поведения – это та часть теории, которая описывает поведение, объясняет его, формулируя правила, определяя, что необходимо, типично, возможно, а что нетипично или невозможно. Модель поведенческой грамматики, извлеченная из корпусов художественных произведений, может быть основана на теории поведения Левина и понимается как набор обобщенных описаний поведения типичных людей в типичных психофизиологических условиях и типичных обстоятельствах.

**Ключевые слова:** Поведение человека; Грамматика; Правила; Нормы; Язык; Культура; Научные модели

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## **INTRODUCTION: THE NEED FOR GRAMMARS OF BEHAVIOR**

Obviously, there are many scientific publications devoted to the study of various aspects of human behavior. In order to roughly estimate the number of such publications, it is possible to use the Scopus database. In July 2021, the list of Scopus journals with titles including “behavior” or “behavioral” or “behaviour” or “behavioural”, after the removal of journals exclusively related to animal research, still consisted of 160 titles. The search engine found 328,536 documents published in the journals, and all of them had something to do with empirical research of human behavior (328,536 document results, n.d.).

However, some experts think that our empirical knowledge is not yet sufficient to serve as the basis of a really scientific theory of human behavior. According to David Funder (2009), “psychology is still in the early stages of developing conceptualizations of behavior” (p. 124), and much more descriptive research needs to be done in order to formulate well-grounded theoretical hypotheses about relations among persons, situations and behaviors:

A massive empirical effort will be required, requiring studies in which individuals are each placed into or observed in each of a range of different situations, and their behavior in them observed and measured directly. Studies that do this are almost unknown in the literature, not really because psychologists do not grasp the need for them, but because they are so difficult and expensive to conduct. (Funder, p. 124-125)

More recently Ronald Fisher (2017) diagnosed a similar condition for psychological research of values:

Even a casual observer will quickly be struck by the fact that actual behavior is largely absent from psychological research. When a colleague and I tried to summarize the available evidence of the value–attitude–behavior linkage . . . , we soon realized that there were very few, if any studies that had examined the same type of behavior repeatedly. In order to make valid claims about any empirical fact, you need a substantive body of literature with multiple studies replicating proposed relationships. This is clearly not the case with values and behavior. There are isolated studies showing relationships with diverse constructs, but no substantive body of research that allows substantive claims. In the end, we could only analyze value–attitude relations, but not the relationship of values with behavior. Psychology after the cognitive turn appears to have abandoned the study of behavior, and psychologists now instead focus on what participant think, feel or believe they have done or want to do. (p. 219-220)

Rusty Greaves (2018), an ethnoarchaeologist with experience in anthropology, argues that interview methods dominated in traditional cultural anthropology, and that cultural anthropology needs to embrace ethological methods:

The implications have had tremendous influence among paleoanthropologist and archaeologists who recognize the importance of rigorously quantified



approaches to better understanding traditional peoples' adaptations to these different environmental, subsistence, and demographic conditions. Sadly, some vocal faction of cultural anthropology not only disagrees with this perspective, but actively advocates for the destructive nature of this paradigm. The terms “scientistic”, falsely objective, colonial, hegemonic, racist, etc. are employed to criticize such comparative anthropology as demeaning of human nobility.

He further writes that even those scientists who understand the importance of biological approaches to explaining behavior underestimate the importance of observing and collecting descriptive data:

The problem for human behavioral ecologists, is that the fast nature of the ev psych studies, and the alleged identification of evolutionarily important aspects of behavior, has led to a greater emphasis on quick fieldwork, use of questionnaires that allegedly elicit propensities such as risk aversion or risk taking, and a decrease in actual behavior observation. I still feel, from over 30 months of quantified behavior observation among savanna hunter-gatherers in Venezuela and over 12 months among Maya agriculturalists, that we continue to need dedicated fieldwork to research about what actual variation in human behavior is like across the many different environments where people live. (Greaves, 2018)

This lack of empirical data is also felt by Pedersen et al. (2018) who call for the development of Behavioural Computer Science that would incorporate “empirical evidence for actual human behaviour, instead of making inferences about behaviour based on the rational agent model” (p. 1). Similar feelings are shared by researchers of health behavior looking forward to using new data-driven scientific approaches (Marsch, 2021; Moustafa et al., 2018).

In the context of the lack of behavioral data, it was suggested elsewhere (Serikov, 2019) that fictional narratives could be used as a source of empirical descriptive data. Indeed, in addition to anthropologists, sociologists and psychologists, there is another type of professional observers of people – writers. And all the results of their observations are in the public domain. If we assume that stories, novellas and novels contain descriptions of human behavior, we can try to use them as material for generalizations about behavioral patterns that are typical for different persons in all sorts of psychophysiological states, as well as in different cultural, social or natural circumstances. It is also possible to compare fictional texts of different authors and, on the basis of this comparison, suggest which forms of behavior are universal and which are specific to some cultures, societies or historical periods. Besides, we can make conjectures about atypically rare or even impossible behaviors that would go against cultural rules or human natural dispositions.

Such an analysis would result in the formulation of some “grammar of behavior,” and possibly also in a future implementation of computational “behavioral grammar parsing” in addition to already existing computational parsing methods. The solution of the task will presumably compensate the lack of empirical descriptions of behavior and their generalizations.



The purpose of this paper is to explore the possibility of talking about the grammar of behavior in a strict scientific sense. The paper aims to answer the question: if “grammar of behavior” is not just a metaphor, what can be its characteristics as a theoretical notion?

## DESIGN

Since the notion of grammar obviously comes from linguistics, we will start by comparing different linguistic approaches to the understanding of grammar. As a result, it will be possible to list properties of scientific grammars that are most important from the perspective of language studies.

Then we will explore how the concept of grammar is used outside of linguistics. Although the notion of behavioral grammar is rare in the scientific literature, it is not entirely absent or absolutely new (Zolyan & Chernov, 1977). It was first proposed by members of the Tartu-Moscow School of Semiotics Suren Zolyan and Igor Chernov. In 2000, Makiko Miwa (2007) developed a conceptual model of “information behavioral grammar”. More recently anthropologist Kate Fox (2014) wrote that in “Watching the English” her aim “was to provide a 'grammar' of English behaviour” (p. 7). Some authors employed the closely related notion of syntax in computational models of human behavior. For example, Subrahmanian et al. (2013) described “the syntax and semantics of Temporal Probabilistic (or TP) behavioral rules” used to predict the behavior of terror groups (p. 69). Besides, a similar concept of “grammar of society” was included in the title of Cristina Bicchieri's (2006) book. Did the abovementioned authors use the concept of grammar just as a metaphor or as a theoretical notion? Was there something in common in their use of the term? Where their understandings of grammar somehow connected to linguistic theories? We will try to answer the questions.

Finally, we will discuss the necessary requirements for the grammar of behavior as a scientific concept in general, and how they can be implemented for the behavioral grammar extracted from fiction.

## TRADITIONAL GRAMMAR

The word “grammar” comes from the Latin “grammatica”, which, in turn, is a translation from the ancient Greek “γραμματική”. Accordingly, the classical European understanding of grammar was formed on the basis of the ancient Greco-Latin tradition of language learning (Seppänen, 2014). However, the European tradition was not the only one. Independently of it, Indian, Chinese and Japanese linguistic traditions developed in the ancient world, and classical Arabic linguistics also developed relatively independently of European (Alpatov, 2019).

Since the 19th century, the European understanding of grammar has been influenced by knowledge about Sanskrit grammar (Kiparsky, 2009) and about the features of Chinese and other non-European languages, and the Eastern linguistics have been adapting some European concepts based on the Latin grammar (McDonald, 2020).



It is generally accepted that modern linguistics begins with the work of Ferdinand de Saussure (1857-1913) and other structuralists. On the basis of structuralism, such popular approaches in linguistics as descriptivism and functionalism were developed, which in turn gave rise to generativism and cognitive linguistics. Therefore, in contemporary linguistics, there is not so much the development of national traditions of understanding grammar, much rather of various theoretical approaches within the framework of a single international science. But since linguists are inevitably influenced by the peculiarities of their native language, regional specificity remains in the adoption of certain theoretical approaches by scientists. For example, in the United States, the most popular is the generative approach to grammar, and in Russia, the functional approach. The understanding of grammar in such contemporary approaches usually differs from traditional grammars.

Three stages of development of the concept of grammar took place in ancient Europe:

In the Classical era, the Greek term is used to refer to a very concrete art of letters (*grámmata*); from the Hellenistic era onwards it refers to the art developed by the Alexandrian scholars, a matter of textual and literary criticism. Towards the end of the Hellenistic era, the grammarian also becomes involved with the question of correct language, which gradually begins to appear in the definitions as well. (Seppänen, 2014, Abstract)

The latter trend gradually became dominant, and a tradition developed of understanding grammar as a set of prescriptions that must be followed in order to speak and write correctly. Dionysius Thrax (ca. 170-90 BCE), the alleged author of the earliest Greek grammatical text, devoted his work to what today we call phonetics and morphology, while syntax as part of grammar appeared later, in the works of Appolonius Dyscolus (ca. 110-175 CE). Dionysius Thrax had very generally defined grammar as “an experimental knowledge (*ἐμπειρία*) of the usages of language as generally current among poets and prose writers” (Dionysios Thrax, 1874, p. 3). But already in the medieval commentaries to Dionysius Thrax (Hilgard, 1901, p. 300), grammar was understood more specifically as a set of definitions and rules necessary for the correct use of the language:

What is the art of grammar? A theoretical and practical skill that teaches us to speak and write well; yet not everyone who can write or read is called a grammarian, but he who transmits rules and definition. (as translated by Seppänen, 2014, p. 15)

Today, this understanding of grammar is at the heart of most L1 and L2 textbooks and is usually called “traditional grammar” or “school grammar,” in contrast to contemporary linguistic grammar models developed within the framework of various theoretical approaches. Two conventional parts of traditional grammar are morphology and syntax. The traditional grammar is built on the idea of distinguishing between educated and uneducated persons. Education presupposes explicit knowledge of grammar rules and their application when creating new texts. The most important



characteristic of traditional grammar is its prescriptivism: it lays down the rules of proper language.

## FORM-CENTERED GRAMMARS

There could be different bases employed in a logical division of grammar models in modern linguistics. Perhaps most important is the distinction between form-centered and meaning-centered approaches to the study of language in general and grammar, in particular. The most famous examples of the formal approach are American structuralist descriptivism, and Chomsky's generativism. The meaning-centered approaches include various variants of functional and cognitive linguistic theories and models of grammar.

The most important protagonist of modern formal approach to language should be considered Zellig Harris (1909-1992), the author of “Methods in Structural Linguistics” (1951). His main influence came from Leonard Bloomfield (1887-1949) who suggested a very simple analytical principle: a sentence could be divided into subject and predicate parts, each of the parts being analyzed in terms of a subject and its attribute (Bloomfield, 1914, p. 61). Later Bloomfield (1933) elaborated this principle into the idea of Immediate Constituent (IC) analysis: complex linguistic forms were understood as constructed of simple forms (ultimate constituents, morphemes) (p. 158-161). Discussing this idea, Bloomfield wrote that a “morpheme can be described phonetically, since it consists of one or more phonemes, but its meaning cannot be analyzed within the scope of our science” (p. 161), and that “linguistic study must always start from the phonetic form and not from the meaning” (p. 162). Accordingly, “the meaningful arrangements of forms in a language constitute its grammar” (Bloomfield, p. 163).

Such an understanding of grammar Harris (1963) took literally: “The over-all purpose of work in descriptive linguistics is to obtain a compact one-one representation of the stock of utterances in the corpus” (p. 366). From this formalistic perspective, meaningfulness and correctness of linguistic forms depend on their distribution. Therefore, the key in linguistics is the method of distributional analysis.

This methodological program involved finding the maximum regularity in the occurrence of parts of utterances in respect to other parts. In its most general form it required the description of the departures from randomness in the combinations of elements, i.e. the constraints on freedom of occurrence of elements in respect to each other. (Harris, 1990, p. 1)

When discussing Harris's methodological ideas, it should be understood that descriptive linguistics and distributional analysis are not simply historical relics. Today they are being revived within the framework of corpus linguistics (Schneider et al., 2020). At the same time, contemporary versions of descriptive grammar can rely on the ideas of not only formalists, but also functionalists (Laury & Ono, 2019).

In a radical interpretation, Harris's distributional analysis led to the idea that it is possible to predict all well-formed utterances of a given language without referring to their meaning, simply on the basis of their mathematical model. This idea was actually implemented by Harris' student Noam Chomsky, when he offered an understanding of



grammar as a finite set of formal algorithms that make up the linguistic competence of a native speaker. Therefore, one can speak of Chomsky's formalism in linguistics in the same sense as one speaks of David Hilbert's formalism in mathematics.

A language is a collection of sentences of finite length all constructed from a finite alphabet (or, where our concern is limited to syntax, a finite vocabulary) of symbols. Since any language  $L$  in which we are likely to be interested is an infinite set, we can investigate the structure of  $L$  only through the study of the finite devices (grammars) which are capable of enumerating its sentences. A grammar of  $L$  can be regarded as a function whose range is exactly  $L$ . Such devices have been called “sentence-generating grammars.” (Chomsky, 1959, p. 137)

Chomsky himself sees his fundamental innovation in the transition from descriptive grammar to generative. He writes that Harris's work “was a true classic, the apogee of the procedural enterprise and its virtual culmination” (Chomsky, 2021, p. 4). But it is not enough to describe what the correct language forms look like. “Taxonomic science has limits. It does not ask 'why?’” (Chomsky, 2021, p. 4). So, one goal of Chomsky's generativism in all its successive theoretical implementations, was to suggest a formal model of the innate human faculty of language which, on the basis of some limited experience, would yield language competence (the internal language). Another goal was to formally explain how the internal language “generates an unbounded array of hierarchically structured expressions that constitute the linguistic formulation of thoughts and that can (but need not) be externalized in some sensory modality” (Chomsky, 2021, p. 8).

From Chomsky's point of view, the grammar only consists of syntactic generative algorithms, which are formal also because they do not depend on semantics. The standard generative grammar equals the generative syntax. However, there are other variants of generativism today. For example, Parallel Architecture grammar is understood as a model of the interaction of phonological, syntactic, and semantic structures, each having its own formation rules. “The basic premise of the Parallel Architecture is that linguistic structure is determined by three independent generative systems – phonology, syntax, and semantics – plus, crucially, the linkages between them. This contrasts with the traditional 'syntactocentrism' of generative grammar” (Jackendoff & Audring, 2019, p. 218).

So far, we have discussed two interrelated meanings of formalism in linguistics: the assumption that linguistic forms are independent of meaning and the understanding of grammar as a set of algorithms. But there is another meaning of formalism. In practice, most linguists consider formal those approaches and grammar models that use formal means of description, such as symbolic notations, formulas, schemes, diagrams, matrices, etc. Thus, one of the most common ways to describe syntactic structures are tree diagrams. In this sense, not only form-centered models are formal, but many contemporary meaning-centered models as well.



## MEANING-CENTERED GRAMMARS

For Chomsky, the rules of grammar are the rules of the internal language (competence) as opposed to the external language (performance). For most functionalists and cognitivists, there is no such distinction between competence and performance. Even if they recognize the difference between ideal rules and their practical implementation, for them the grammar includes not just formal rules but the knowledge of how these rules should be used depending on different situations and contextual meanings. For example, the Functional Syntax theory “is based on the principle of going 'from meaning to form'; to be more specific, 'from semantic categories to linguistic means.'” (Mustajoki, 2007, p. 6).

According to Christopher Butler (2003), three main characteristics of functional theories in linguistics are:

- an emphasis on language as a means of human communication in social and psychological contexts;
- a rejection, wholly or in part, of the claim that the language system (the ‘grammar’) is arbitrary and self-contained, in favour of functional explanation in terms of cognitive, socio-cultural, physiological and diachronic factors;
- a rejection, wholly or in part, of the claim that syntax is a self-contained system, in favour of an approach where semantic and pragmatic patterning is regarded as central, with syntax, if recognised as a structural system at all, regarded as one means for the expression of meanings, which is at least partially motivated by those meanings. (p. 29)

A standard point of view is that grammars could be either generative or constraint-based. When generative grammars provide algorithms that would produce all possible well-formed linguistic objects, constraint-based grammars state conditions that the objects must meet. The constraints can be more or less categorical. Lexical Functional Grammar (LFG) that was first suggested by Joan Bresnan and Ronald Kaplan in the late 1970s (Kaplan & Bresnan, 1995) is an example of a constraint-based model that treated well-formedness as categorical. “That is, sentences (or, rather, linguistic descriptions) are either a part of the grammar or are not. There is no notion that some grammatical violations are ‘better’ or ‘worse’ than others“ (Dalrymple & Findlay, 2019, p. 126). However, in the contemporary Optimality-Theoretic (OT) version of LFG, a competition-based view of well-formedness is applied:

In OT-LFG . . . the grammar consists of a set of possibly incompatible, violable constraints, where a linguistic description need not satisfy all of the constraints in order to be well-formed, but must merely be the ‘least bad’ candidate description. Such a system allows for a much more fine-grained analysis of well-formedness. For example, it makes it possible to describe levels of ungrammaticality: a sub-optimal candidate can still be ranked above other suboptimal candidates, by violating fewer highly-ranked constraints, and can therefore be ‘less ungrammatical’ in a well-defined sense. (Dalrymple & Findlay, 2019, p. 126)



Cognitive linguistic theories are close to functional ones in the sense that neither the language as a whole, nor the syntax within the language are considered as autonomous systems. Jacob Bielak and Mirosław Pawlak even say that cognitive linguistics “belongs to the functional tradition of language study” (Bielak & Pawlak, 2013, p. 8). The major claim of cognitive approaches in general is that “language draws on such facets of cognition as general human cognitive capacities (e.g. memory, perception, categorization), embodied experience, knowledge, cognitive models, and other related phenomena” (Bielak & Pawlak, 2013, p. 9).

The most famous examples of cognitive grammar models are Ronald Langacker's Cognitive Grammar (CG) (Broccias, 2019; Langacker, 1986, 2008) and Charles Fillmore's Construction Grammar (CxG) (Chaves, 2019; Fillmore, 1988). CG and CxG share an assumption that there is no clear-cut boundaries between syntax and lexicon. Instead, any linguistic utterance can be described as a system of constructions which have their place somewhere in the grammar-lexicon continuum. Constructions are understood as templates or schemata that can be closer to prototypical lexical items such as words and idioms, or closer to grammatical patterns such as word order rules. Fillmore (1988) defines grammatical construction as “any syntactic pattern which is assigned one or more conventional functions in a language, together with whatever is linguistically conventionalized about its contribution to the meaning or the use of structures containing it” (p. 36). Accordingly, the grammar of a language is seen as “a repertory of constructions, plus a set of principles which govern the nesting and superimposition of constructions into or upon one another” (Fillmore, 1988, p. 37).

## **GRAMMARS OF BEHAVIOR, CULTURE AND SOCIETY**

The notion of behavioral grammar was first proposed by Suren Zolyan and Igor Chernov. They considered behavior as a semiotic system that can be investigated by linguistic methods. Explicitly referring to Chomsky's generative grammar and the notion of linguistic competence, Zolyan and Chernov (1977) suggested that it was possible to model human behavioral competence – the finite system of basic alphabet and rules that would generate an infinite number of behaviors. Behavior was seen as analogous to surface language structure, and normative descriptions of behavior in natural languages – as analogous to deep language structure. Behavior was understood as language, the descriptions of behavior – as metalinguistic.

Numerous texts function in the cultural system that extrapolate and explicate the competence of society (the system of prescriptions and proscriptions). Let us call grammar the mechanism that generates such texts. (Zolyan & Chernov, 1977, p. 155)

Discussing the influence of metalinguistic norms on behavior, Zolyan and Chernov wrote about the possibility of building a hierarchy of metalanguages from their complete ignorance (which corresponds to unregulated and uncontrolled behavior) to a high degree of reflection and complete mastery of the regulation of behavior. Accordingly, the grammar of behavior can work implicitly or explicitly. But it looks



like Zolyan and Chernov were primarily interested in modeling more or less explicit rules, expressed in different texts. Therefore, the grammar they proposed was prescriptive rather than descriptive. Unfortunately, they presented their ideas in a short general form and did not elaborate them into a detailed model, which would systematically correlate with empirical facts.

Cristina Bicchieri (2006) offers a theory of social norms, which she calls “the grammar of society” explicitly referring to a linguistic notion of grammar:

I call social norms the grammar of society because, like a collection of linguistic rules that are implicit in a language and define it, social norms are implicit in the operations of a society and make it what it is. Like a grammar, a system of norms specifies what is acceptable and what is not in a social group. And analogously to a grammar, a system of norms is not the product of human design and planning. (p. ix)

Bicchieri formally defines different types of norms, and describes different types of persons and situations, which she models by game theory methods. Social norms, according to Bicchieri, differ from descriptive ones. Following social norms often conflicts with self-interests, while conformity to descriptive norms is dictated by self-interest. Conventions are a kind of descriptive norms. In game-theoretic terms, conformity to conventions helps to solve coordination problems. Since social norms go against self-interests, “a social norm need not be an equilibrium of an ordinary game in which payoffs represent self-interested preferences” (Bicchieri, 2006, p. 25). An example of such a game can be the Prisoner's Dilemma. However, if a social norm exists and is followed, the original PD game transforms into a coordination game.

The 1st edition of Kate Fox's “Watching the English: The Hidden Rules of English Behaviour” was published in 2004, the 2nd revised edition in 2014. Fox's (2014) research goals were to “identify distinctive patterns or regularities in English behaviour” and then “to detect the unwritten social rules governing those behaviour patterns,” and “to figure out what these rules can tell us about Englishness” (p. 31). As a result, she described approximately 250 implicit unspoken rules of behavior typical of the English. She called them the cultural “grammar of Englishness” or the “grammar of English behaviour”. Fox (2006) puts the term “grammar” in quotation marks meaning that it is not exactly the same as grammar of language, but the similarities between the two grammars seem obvious to her:

Native speakers can rarely explain the grammatical rules of their own language. In the same way, those who are most 'fluent' in the rituals, customs and traditions of a particular culture generally lack the detachment necessary to explain the 'grammar' of these practices in an intelligible manner. (p. 7)

Fox (2006) understands rules descriptively, “in the wider sense of standards, norms, ideals, guiding principles and 'facts' about 'normal or usual' English behaviour” (p. 15). The rules understood in this way can be followed both automatically or consciously. And they are not obeyed by all without exception or deviation, but only by a significant number of people. “Indeed, it is a fundamental requirement of a social



rule – by whatever definition – that it can be broken” (Fox, 2006, p. 15). Fox does not formalize the rules, but if we do it the form would be something like “A typical English representative of her/his gender, generation and social class usually does this sort of things in such and such circumstances.”

My own suggestion is that a model of behavioral grammar extracted from fiction corpora can be very similar to what Fox has done. It should be based on Lewinian theory of behavior (Serikov, 2020) and describe behavior as sequences of events, an event being conceptualized as a set of four variables: 1) the social and/or demographic status of the acting person, 2) her/his psychophysiological state, 3) the circumstances of behavior, 4) the pattern of behavior. The values of the variables can be more or less typical (from impossible and very unusual to ordinary and very common) and of different levels of generalization (from very specific and particular to generic). Then, for a given culture and society, the grammar of behavior can be understood as the set of generalized descriptions of typical persons' behaviors in typical psychophysiological conditions and typical circumstances.

## CONCLUSIONS

The notion of behavioral grammar should be based on a clear understanding of how language and behavior relate. For example, Zolyan and Chernov proceeded from the premise that behavior is a kind of language, because, from their point of view, all behavior expresses something meant by the acting person. However, since people can do something unconsciously, automatically, out of habit, it is hardly justifiable to consider all behavior as linguistic. Rather, on the contrary, verbal behavior should be viewed as a kind of behavior in general. By the way, this position is reflected in Fox's book, since the book is for the most part devoted to the rules of behavior, and only the first part to the conversation codes. If verbal behavior is a kind of behavior then the transfer of the idea of grammar from linguistics to the behavioral sciences should be understood as a generalization.

A comparison of different approaches to the grammar of a language shows that they all have similarities. First, any grammar offers some typology of language elements, either by describing the existing elements or by prescribing what they should be. Secondly, it offers some rules in the broad sense of the word (prescriptions and proscriptions, distributions, algorithms, schemes, templates), which partly consist already in the description of elements and their types, and partly in a description of how these elements can be combined among themselves. Third, any grammar explicitly or implicitly contains theoretical ideas about what language is in general and what role it plays in human life.

A grammar of behavior also presupposes a certain theoretical view of behavior: how it is generated, where its forms come from, how they are assimilated and chosen, etc. For example, Bicchieri's grammar of social norms builds on the ontology of social constructivism, and therefore ignores the question of norms associated with biological predisposition to certain types of behavior. But behavior as a whole can be understood not only as a consequence of rational choice, but also as instinctive, not only as



corresponding to certain explicit rules, but also as based on imitation, impulses and habits that are for the most part unconscious.

At the same time not every social, psychological, or anthropological theory of behavior can be understood as grammar. A grammar of behavior is that part of a theory which describes behavior, explains it by formulating rules, by specifying what is necessary, typical, possible, and what is atypical or impossible.

From a general theoretical perspective, a generative model of behavioral grammar is quite possible. In analogy to the existence of unconscious mechanisms of consciousness, it can be assumed that there are unconscious algorithms that generate behaviors on the basis of a person's states and situations. But in order to develop a generative model, we need preliminary empirical data on what forms of behavior this model should generate. Do not forget that in linguistics the construction of generative models was preceded by a long period of descriptive research.

Therefore, descriptive methods should not be ignored when developing behavioral grammar models. First, contrary to Bicchieri's statements, descriptive methods allow us to identify not only the actually observed forms of behavior (descriptive norms), but also what people say about values and expectations, prescriptions and proscriptions (injunctive norms). Secondly, theoretical models should explain the whole variety of observed facts, and not just some individual examples chosen by the theoretician to illustrate the theory. From this point of view, the essence of descriptivism is that a theoretical model must be open to the inclusion of new types of facts in it. In contemporary linguistics, corpus studies are aimed at developing such open models, although until recently it seemed that linguists knew everything about the correct forms possible in a particular language. As for behavior, there are very few works devoted to the systematic empirical description of human behavior patterns and their theoretical generalization. And research in the field of grammar of behavior should fill this gap by being analogous to corpus research in linguistics.

## REFERENCES

- 328,536 Document Results. (n.d.). *Scopus*. Retrieved July 11, 2021, from <https://cutt.us/scopusbehavioural>
- Alpatov, V. M. (2019). Evropejskaya Lingvisticheskaya Tradiciya v Sravnenii s Drugimi [The European linguistic tradition as compared to other traditions]. *Orientalistica*, 2 (4), 1009–1020. <https://doi.org/10.31696/2618-7043-2019-2-4-1009-1020>
- Bicchieri, C. (2006). *The Grammar of Society: The Nature and Dynamics of Social Norms*. Cambridge University Press. <https://doi.org/10.1017/CBO9780511616037>
- Bielak, J., & Pawlak, M. (2013). Introduction to Cognitive Grammar. In: *Applying Cognitive Grammar in the Foreign Language Classroom. Second Language Learning and Teaching* (pp. 7-56). Springer. [https://doi.org/10.1007/978-3-642-27455-8\\_2](https://doi.org/10.1007/978-3-642-27455-8_2)



- Bloomfield, L. (1914). *An Introduction to the Study of Language*. Henry Holt and Company.  
[https://pure.mpg.de/rest/items/item\\_2282964\\_2/component/file\\_2282963/content](https://pure.mpg.de/rest/items/item_2282964_2/component/file_2282963/content)
- Bloomfield, L. (1933). *Language*. George Allen & Unwin Ltd.  
<http://arrow.latrobe.edu.au/store/3/4/3/4/8/public/B15113309.pdf>
- Broccias, C. (2019). 2. Cognitive Grammar. In: A. Kertész, E. Moravcsik, & C. Rákosi (Eds.), *Current Approaches to Syntax* (pp. 23-48). De Gruyter Mouton.  
<https://doi.org/10.1515/9783110540253-002>
- Butler, C. S. (2003) *Structure and Function: A Guide to Three Major Structural-Functional Theories*. John Benjamins Publishing Company.  
[https://edisciplinas.usp.br/pluginfile.php/270688/mod\\_folder/content/0/v.%20e%20vi.%20Butler%20-%20Structure%20and%20Function.pdf?forcedownload=1](https://edisciplinas.usp.br/pluginfile.php/270688/mod_folder/content/0/v.%20e%20vi.%20Butler%20-%20Structure%20and%20Function.pdf?forcedownload=1)
- Chaves, R. (2019). 3. Construction Grammar. In: A. Kertész, E. Moravcsik, & C. Rákosi (Eds.), *Current Approaches to Syntax* (pp. 49-96). De Gruyter Mouton.  
<https://doi.org/10.1515/9783110540253-003>
- Chomsky, N. (1959). On Certain Formal Properties of Grammars. *Information and Control*, 2 (2), 137-167. [https://doi.org/10.1016/S0019-9958\(59\)90362-6](https://doi.org/10.1016/S0019-9958(59)90362-6)
- Chomsky, N. (2021). Linguistics Then and Now: Some Personal Reflections. *Annual Review of Linguistics*, 7(1), 1-11. <https://doi.org/10.1146/annurev-linguistics-081720-111352>
- Dalrymple, M., & Findlay, J. (2019). 5. Lexical Functional Grammar. In A. Kertész, E. Moravcsik, & C. Rákosi (Eds.), *Current Approaches to Syntax* (pp. 123-154). De Gruyter Mouton. <https://doi.org/10.1515/9783110540253-005>
- Dionysios Thrax (1874). *The Grammar of Dionysios Thrax. Translated from the Greek by Thomas Davidson*. The R. P. Studley Co, St.Louis, MO.  
<http://international.loc.gov/service/gdc/scd0001/2005/20050921004gr/20050921004gr.pdf>
- Fillmore, C. J. (1988). The Mechanisms of “Construction Grammar”. In *Proceedings of the Fourteenth Annual Meeting of the Berkeley Linguistics Society* (pp. 35-55). Linguistic Society of America. <https://doi.org/10.3765/bls.v14i0.1794>
- Fischer, R. (2017). From Values to Behavior and from Behavior to Values. In: Roccas S., Sagiv L. (eds), *Values and Behavior* (pp. 219-235). Springer.  
[https://doi.org/10.1007/978-3-319-56352-7\\_10](https://doi.org/10.1007/978-3-319-56352-7_10)
- Fox, K. (2014). *Watching the English: The Hidden Rules of English Behaviour* (2nd ed.). Hodder.
- Funder, D. (2009). Persons, Behaviors and Situations: An Agenda for Personality Psychology in the Postwar Era. *Journal of Research in Personality*, 43(2), 120-126. <https://doi.org/10.1016/j.jrp.2008.12.041>
- Greaves, R. (2018, January 12). For a New Real Empirical Science of Human Behavior, Clearly the Biology of Behavior, Let's Move Towards a Human Ethogram. Might a Yahoo Group Help? [Online forum post]. *ResearchGate*.



<https://www.researchgate.net/post/For-a-new-real-empirical-science-of-human-behavior-clearly-the-biology-of-behavior-lets-move-towards-a-human-ethogram-Might-a-Yahoo-group-help>

- Harris, Z. S. (1963). *Structural Linguistics (formerly entitled Methods in Structural Linguistics)* (6th ed.). The University of Chicago Press.  
[https://pure.mpg.de/rest/items/item\\_2346220/component/file\\_2346219/content](https://pure.mpg.de/rest/items/item_2346220/component/file_2346219/content)
- Harris, Z. S. (1990) The Background of Transformational and Metalanguage Analysis. In: Nevin, B. (Ed.) *The Legacy of Zellig Harris: Language and Information into the 21st Century, Vol. 1: Philosophy of Science, Syntax, and Semantics* (pp. 1-15). Benjamins. <http://www.zelligharris.org/HAR.pdf>
- Hilgard, A. (Ed.). (1901). *Scholia in Dionysii Thracis Artem grammaticam* [A school of grammar in Dionysius of Thrace]. In aedibus B. G. Teubneri. Lipsiae.  
<https://archive.org/details/scholiaindionys00hilggoog>
- Jackendoff, R., & Audring, J. (2019). 8. The Parallel Architecture. In A. Kertész, E. Moravcsik, & C. Rákosi (Eds.), *Current Approaches to Syntax* (pp. 215-240). De Gruyter Mouton. <https://doi.org/10.1515/9783110540253-008>
- Kaplan, R. M., & Bresnan, J. (1995). Lexical-Functional Grammar: A Formal System for Grammatical Representation. In Dalrymple, M., Kaplan, R. M., Maxwell, J. T., & Zaenen, A. (Eds.), *Formal Issues in Lexical-Functional Grammar* (pp. 1-102). Stanford University.  
[https://www.researchgate.net/publication/230876175\\_Lexical-Functional\\_Grammar\\_A\\_Formal\\_System\\_for\\_Grammatical\\_Representation](https://www.researchgate.net/publication/230876175_Lexical-Functional_Grammar_A_Formal_System_for_Grammatical_Representation)
- Kiparsky, P. (2009). On the Architecture of Pāṇini's Grammar. In: Huet G., Kulkarni A., Scharf P. (Eds.), *Sanskrit Computational Linguistics. ISCLS 2007, ISCLS 2008. Lecture Notes in Computer Science, vol 5402.* (pp. 33-94). Springer.  
[https://doi.org/10.1007/978-3-642-00155-0\\_2](https://doi.org/10.1007/978-3-642-00155-0_2)
- Langacker, R. W. (1986). An Introduction to Cognitive Grammar. *Cognitive Science*, 10, 1-40. [https://doi.org/10.1207/s15516709cog1001\\_1](https://doi.org/10.1207/s15516709cog1001_1)
- Langacker, R. W. (2008). *Cognitive Grammar: A Basic Introduction*. Oxford University Press. <http://dx.doi.org/10.1093/acprof:oso/9780195331967.001.0001>
- Laury, R., & Ono, T. (2019). 9. Usage-based Grammar. In: A. Kertész, E. Moravcsik, & C. Rákosi (Eds.), *Current Approaches to Syntax* (pp. 361-388). De Gruyter Mouton. <https://doi.org/10.1515/9783110540253-009>
- Marsch, L. A. (2021). Digital Health Data-Driven Approaches to Understand Human Behavior. *Neuropsychopharmacology*, 46, 191–196.  
<https://doi.org/10.1038/s41386-020-0761-5>
- McDonald, E. (2020). *Grammar West to East*. Springer. [https://doi.org/10.1007/978-981-13-7597-2\\_11](https://doi.org/10.1007/978-981-13-7597-2_11)
- Miwa, M. (2007). Verification of Information Behavioral Grammar: Role of Searchers. *Proceedings of the American Society for Information Science and Technology*, 44 (1), 1-12. <https://doi.org/10.1002/meet.1450440274>



- Moustafa, A. A., Diallo, T. M. O., Amoroso, N., Zaki, N., Hassan, M., & Alashwal, H. (2018). Applying Big Data Methods to Understanding Human Behavior and Health. *Frontiers in Computational Neuroscience*, 12, 84. <https://doi.org/10.3389/fncom.2018.00084>
- Mustajoki, A. (2007). From Meaning to Form: An Alternative Model of Functional Syntax. *Russian Language Journal*, 57, 3-28. <http://www.jstor.org/stable/43669786>
- Pedersen, T., Johansen, C., & Jøsang, A. (2018). Behavioural Computer Science: An Agenda for Combining Modelling of Human and System Behaviours. *Human-Centric Computing and Information Sciences*, 8, 7. <https://doi.org/10.1186/s13673-018-0130-0>
- Schneider, G., Hundt, M., & Schreier, D. (2020). Pluralized Non-Count Nouns Across Englishes: A Corpus-Linguistic Approach to Variety Types. *Corpus Linguistics and Linguistic Theory*, 16(3), 515-546. <https://doi.org/10.1515/cllt-2018-0068>
- Seppänen, M. (2014). Defining the Art of Grammar: Ancient Perceptions of Γραμματική and Grammatica [Doctoral dissertation, University of Turku]. *Annales Universitatis Turkuensis*, B379. <https://www.utupub.fi/bitstream/handle/10024/94624/AnnalesB379Seppanen.pdf?sequence=2&isAllowed=y>
- Serikov, A. E. (2019). Tipichnye Emocional'nye Sostoyaniya [Typical Emotional States]. *Humanitarian Vector*, 14(4), 98-106. <https://doi.org/10.21209/1996-7853-2019-14-4-98-106>
- Serikov, A. E. (2020). Konceptual'nyj Konstrukt "Povedenie" v Teorii Polya Kurta Levina [Conceptual Construct "Behavior" in Kurt Lewin's Field Theory]. *Humanitarian Vector*, 15(4), 180-187. <https://doi.org/10.21209/1996-7853-2020-15-4-180-187>
- Subrahmanian, V. S., Mannes, A., Sliva, A., Shakarian, J., & Dickerson, J. P. (2013). Temporal Probabilistic Behavior Rules. In: *Computational Analysis of Terrorist Groups: Lashkar-e-Taiba* (pp. 69-79). Springer. [https://doi.org/10.1007/978-1-4614-4769-6\\_3](https://doi.org/10.1007/978-1-4614-4769-6_3)
- Zolyan, S.T., & Chernov, I. (1977). O Strukture Yazyka Opisaniya Povedeniya [About the Structure of the Language of Behaviour Description]. *Σημειωτική – Sign Systems Studies*, 8(1), 151-163. <https://www.ceeol.com/search/article-detail?id=817938>

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