

# COMPARING AND CONTRASTING NATURAL PHONOLOGY WITH THE THEORY OF PHONOLOGY AS HUMAN BEHAVIOR

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## ABSTRACT

This paper compares and contrasts the theories of Natural Phonology and Phonology as Human Behavior in general and shows how each theory views the notion of language universals in particular. The concepts of combinatory phonology, phonotactics, and diachronic, developmental, clinical and evolutionary phonology will be discussed as measures of defining and determining the concept of language universals. The author maintains that biological, physiological, cognitive, psychological, sociological and other universals of human behavior are merely reflected in language rather than being specific "language universals" per se.

**Keywords:** Natural Phonology, Phonology as Human Behavior, universals.

## 1. INTRODUCTION

In this paper I will compare and contrast Natural Phonology (NP) [12], [13], [14] with the theory of Phonology as Human Behavior (PHB) [5], [8], [11], [33, 34] in general and with regard to how they view the concept of (language) universals in particular. The comparing and contrasting of these two theories are based on the following set of principles originally presented in [30].

One of the most fundamental questions which must be addressed when discussing various linguistic approaches is: according to what theoretical and methodological principles can different linguistic theories be compared and contrasted? And, even more fundamentally: what is the basis for determining these principles?

Every linguistic analysis is the direct result of a specific set of theoretical and methodological assumptions which are directly related to how the linguist:

- (1) defines language;
- (2) defines a linguistic problem;
- (3) determines the source, kind and amount of data to be selected and analyzed;
- (4) chooses a methodology to select and analyze the data;
- (5) evaluates, compares and contrasts analyses in light of all of the above.

These five criteria basically serve to describe how and what the particular linguist or linguistic school views as the goal of linguistic research.

It is possible, therefore, to compare linguistic theories if they share a similar definition, or have a fundamentally similar view of language. This is certainly the case with NP and PHB because they are both "naturalistic" and "ecological" in their approach (as defined for PHB [7], [9], [10]). Saussure [26] has maintained that everything (in language) is an "opposition", thus we can define "X by what it is opposed to in Y" as Gibbon [this workshop] does when defining Naturalism in linguistics: "Naturalism in linguistics has a history of opposition to abstractness, to generative linguistics, to formalist approaches."

Therefore, we may safely state that both NP and PHB are theories that form part of a larger "naturalist" paradigm which are opposed to the various syntactic, semantic and phonological theories found in the "formalist" generative paradigm (including Optimality Theory (e.g. [19] which was compared and contrasted to PHB by Tobin [35]). Advocates of this generative paradigm believe that formalization *per se* serves as the most basic theoretical criterion for the "scientific" explanation of linguistic phenomena.

From the point of view of both theory and methodology, Gibbon further claims the following for NP: "The present approach concentrates on a key feature of Natural Linguistics and Natural Phonology in particular, namely the empirical centrality of external evidence."

This same, or at least a very similar empirical (rather than rationalist) focus may be attributed to the theory of PHB. The underlying assumption of PHB is that the acquisition and the phonotactic distribution of sounds in human languages can be directly compared with other instances of human behavior in general, and the need to learn how to control the musculature involved in performing fine motor movements in particular.

In addition to the "naturalism" underlying NP and PHB, Gibbon also underscores and emphasizes

the "ecological" aspects of NP: "A step further than traditional naturalism is taken, in replacing the Viennese schools of philosophy of science ... which typically underlie the metatheory of NP, by an ecological view that science is evaluated – intellectually and by the taxpayer – in terms of its operational functionality in personal, social, political, economic environments."

Gibbon refers to the "ecological perspective" in terms of "being related to applications of linguistics in speech technology", I prefer to bring the reader's attention to the ecological applications of both NP [16] [17], [27] and PHB [33], [34] to the speech and hearing clinic and to their applications and implications to language teaching (for NP [15] and for PHB [23]). The theory of PHB has also been extended recently by Tobin [36], [37] as a means to better describe, analyze and explain sign language used by the deaf .

On the other hand, when Diver [7], [9], originally used the word "ecological" with regard to his innovative approach to linguistics, he chose this term to describe the direct and integral connection between the forces of the human factor and the communication factor which Tobin [30], [31], [32] concisely summarized in the axiom that: human language represents a synergetic compromise in the fundamental struggle to achieve maximum communication with minimal effort.

## 2. THE COLUMBIA SCHOOL OF LINGUISTICS

PHB was developed by William Diver [8] in an analysis of the non-random distribution of certain classes of initial consonant clusters in English, which he later expanded to explain the non-random combinations of vowels and consonants in English and in language in general [11]). PHB has been extended further to explain the combinatory phonology of consonant and vowel phonemes as well as initial consonant clusters in a large number of diverse languages from several different language families. PHB has been further applied to the areas of developmental, clinical and evolutionary phonology, the interface between phonology and morphology and phonology and the lexicon, and to a wide range of historical, psycholinguistic, and sociolinguistic issues [e.g. [4], [6], [24], [33], [34], [36], [37].

PHB is part of a larger, functionalist, Saussurean sign-based theory of language formerly called

Form-Content Analysis (FCA) and now referred to as the Columbia School (CS). FCA originally defined language as: "a system of systems composed of various sub-systems revolving around the notion of the linguistic sign which are organized internally and systematically related to each other and used by human beings to communicate" (Tobin [30], [31], [32]). This definition has been further simplified to: "language is seen as a symbolic tool whose structure is shaped both by its communicative function and by the characteristics of its users" (Tobin [36], [37]).

These definitions have both theoretical and methodological implications which highlight the differences between the sign-oriented CS versus the sentence-oriented generative paradigm (and even to a certain extent to other Natural Linguistic theories such as NP). In CS theory, for example: (1) the holistic Saussurean sign (*signe linguistique*) combining a signal (*signifiant*) and an invariant meaning (*signifié*) is the main unit of analysis rather than the sentence, therefore CS theory does not recognize autonomous or separate levels of syntax and semantics (as well as the other well-established categories of "grammar" such as subject, direct and indirect object, transitive, intransitive, etc.) which are widely accepted to be language universals; (2) CS theory does not distinguish between "deep" or "underlying" and "surface" forms concentrating on actual language use only; therefore, the theory does not employ derivations composed of formal rules or other constraints; (3) CS theory does not recognize a dichotic distinction between grammar and lexicon but rather views them as a continuum; (4) CS theory concentrates on language-specific analyses rather than the more formal sentence-oriented concept of Universal Grammar (UG) as can be seen in a number of anthologies that have primarily focused on sign-oriented CS (e.g. [1], [2], [3], [4], [6], [24]).

## 3. PLACING PHB IN ITS HISTORICAL FRAMEWORK

PHB may be viewed as part of the historical development of a larger twentieth century structural, functional, cognitive and naturalistic approach to linguistics. This tradition begins with Ferdinand de Saussure's [26] concept of system and the dichotomies of *langue* and *parole* and phonetics and phonology based on a classification

of sounds according to their articulatory and acoustic features. This fundamental dichotomy between the abstract code and its concrete realization based on distinctive features was further developed by Trubetzkoy [38] and Jakobson [18] of the communication-oriented Prague School (PS) (Tobin 1988). The strict communication factor adhered to by the PS was further supplemented by the introduction of the human factor to phonology through the concepts of "asymmetry" and "economy of effort in phonological change" by Martinet [22]. Martinet maintained that phonological systems are arranged asymmetrically and change in such a way that their non-random diachronic distribution reflects the search for equilibrium and harmony within the system as it is affected by the principle of least effort in human behavior. This principle of minimal effort postulated by Martinet implies that speakers strive for a minimal number of distinct phonemes which requires the least amount of effort to be produced and combined together in what Sampson [25] (reviewed in Tobin [28]) referred to as the "therapeutic view of sound change".

It was Diver [8], however, who has shown that a more complete theory of phonology has to take both the communication factor and the human factor into account. Diver maintains that there is a constant struggle between our need for maximum communication and our desire for minimal effort (referred to as "language synergy" in Tobin [30]). The communication factor (requiring a large number of maximally distinct linguistic units demanding a great deal of effort) will be in conflict with the human factor (striving for minimal effort) resulting in a synergetic trade-off between the two. Therefore Diver [8] extended Martinet's [22] more limited diachronic view of the human factor to that of a means of explaining the non-random distribution of phonemes in language in coordination with the needs of communication as originally established by Saussure [26] and the Prague School (discussed in Liberman [20], and Tobin [29], [34]).

#### 4. NP VERSUS PHB AND LANGUAGE UNIVERSALS

According to Dziubalska-Kořaczyk, the convenor of this special workshop on: Natural Phonology: Universal principles for the study of language.

(Insiders meet outsiders.): "Ever since Jakobson (or, shall we say, Plato?) linguists have been searching for universals (e.g. Maddieson [21], [this workshop] [Y.T.]). Their views on the role of universals in language and linguistics have varied widely, though. In this session we want to concentrate on the question of the existence of universal principles for the study of language. NP ... has always advocated the holistic view on language, both in the sense of analyzing language structures (against 'splendid isolation' of any structure) as well as in the sense of seeing language as part of the universe. The latter means that the same principles of explanation apply to language and to other aspects of life, and thus they are derivable from the most general laws of human interaction with nature. In NP the principles are cognitive, phonetic, psychological, sociological, etc. They lead to the establishment of linguistic preferences which guide the explanation of language-specific structures. Apart from Natural Phonology, many other theories refer to universals. Do they, however, look for universal principles of explanation? This is the core of the planned debate between the NP insiders and the outsiders wishing to take part."

As an answer to this question I can state that both the theories of PHB and NP unabashedly advocate a holistic view of language both theoretically and methodologically. For PHB this holistic approach to language is based on the following two tenets that: (a) all levels of language represent and embody the same mini-max principle regarding the compromise between the human and the communication factors and (b) the same principles found for language can be found in and directly supported by other aspects of human behavior that are extra-linguistic. Regarding which aspects of human behavior and how they are related – for phonetics and phonology at least – they are found in the successful control of musculature in order to perform activities that are related to fine motor movement. However, advocates of the theories of CS and PHB primarily focus their attention on language specific analyses only to determine which aspects of human biological, physiological, cognitive, psychological, sociological, pragmatic and other aspects connected to our behavior may be directly or indirectly reflected in and influence individual languages as a fundamental and integral means to support our explanations of language phenomena. Thus, they may differ from followers

of NP who assume *a priori* that there are language universals which underlie and may determine in advance the way all languages work. Thus, it is basically a question of which is the horse and which is the cart? and/or which is the chicken and which is the egg? Not all the postulated language universals appear in every language, nor do languages represent the same shared universals in identical or similar ways. Maddieson [this workshop] also points out that "typological frequency" does not indicate "phonetic motivation" -- which, he views as being complex, diverse and random. Therefore the potential role of "language" universals and the study of language is still an empirical question requiring further research by diverse theoretical and methodological approaches.

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