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THE ROLE OF LINGUISTIC THEORIES IN LANGUAGE ACQUISITION

There is a number of possible goals for the science of linguistics. Drachman (1981, 347) gives the following examples over the last fifty years:

— an account of surface sentence types, as in taxonomies of Bloomfield or Hockett; perhaps associated with Information-theoretic statistical properties;
— Harmony — like theories of word-order constraints, as in the work of Greenberg and Lehmann;
— A theory of sources of sentences in real time, as in Osgood or Skinner;
— A theory of sentence meaning in terms of use, as in Wittgenstein-derived speech-act theories of Austin and Searle;
— A list of parsing-strategies, perhaps on perceptual basis, as a real time, as distinct from a metatheoretical formal grammar, as in work by Bever;
— Theories of sentence well-formedness in terms of truth-conditions (Montague grammar) or Grammatical Relations (Relational grammar).

The early goals of transformational linguistics were, by contrast:

— To develop a set of concepts rich enough to permit the expression of linguistic processes that escape any natural formulation within a single-level theory of syntax, for example, that of phrase structure, viz., in the first place the development of Transformational grammar; (for details, cf. Chomsky, 1957, 1965, 1975);
— To show that this enrichment of grammatical theory laid the basis for a more adequate account of the meaning of linguistic expressions, viz., minimally, an extra-grammatical account of paraphrase, ambiguity, cotradiction and anomally, as in Katz—Fodor (1963), where extra-grammatical is made explicit in terms of the grammar as defined in Bloomfield's and Hockett's taxonomies;
— To show that the theory of transformational grammar could provide an explanation for some of the formal properties of natural language (Chomsky—Lasnik, 1977, 425 ff.).

To this list let us add two more, namely,

— The Brown's theory of the Pivot and open-class distinction and
— the Fillmore's theory of Case grammar and test their relevance in nowadays linguistics with special concern on paedolinguistics.

Chomsky and Lasnik maintain that goals expressed in Bloomfield's, Hockett's, Greenberg's and Lehmann's theories have to do with descriptive adequacy, which seems to require even more and complexer mechanisms and thus extensions of the class of possible grammars, whereas Skinner's or Osgood's theories, on the other hand, imply the restriction of the class of possible grammars. The emphasis on the need for a highly constraint theory of Universal grammar speaks in favour of Skinner and Osgood; since the grammar developed by the child is grossly underdetermined by the available data, we would attribute Universal grammar to the organism as species-specifically innate, provided it restricted the learning space by making available a very small class of potential grammars from which the child has to choose.

In the light of goals and hypotheses adopted, the explicanda relevants to earlier or even contemporary and competing goal orientations have become irrelevant, marginal, or — at best — complementary to those of transformational generative grammar. Following are some examples to illustrate the present state of things:

The definitions of language by homologues, as in Hockett's survey, have become irrelevant — in connection with newly acquired information, namely, that particular features of language are shared by other species in their communicative systems, e.g. conventionality in crabs and sea-gulls, semanticity in apes, duality in birds, transmission in bees etc. (For details, cf. Aitchison, 1976, 38 ff. and Pačesová, 1983, 360 ff.).

Now the goal is to discover the factors biologically necessary to language. As shown by Drachman (1981, 350) and confirmed by our exploration in paedolinguistics, those factors which are logically necessary, as are those of communication systems, have become irrelevant to the main concern, though retaining their importance, together with the theories of use, at the level at which successful communication must at length be treated.

Information theory and the resultant statistical studies of language have also become irrelevant to the main concern — due to the fact that '*probability*' plays no principled role in defining the well-formedness of sentences. The marginal role of this theory, through binarity and phonotactic redundancy in phonology, nevertheless has remained.

Many of the theory-significant differences between languages constitute variants along core-parameters. How such variation might correlate with the speaker's — whether child's or adult's — "world's view" in the sense of the Humboldt—Sapir—Whorf hypothesis seems no less mystery than it was in other goal-orientations; the relevant explicanda are now irrelevant to current concerns, especially in the total absence of an independent theory of pre-utterance "thought".

On the other hand the results, though not necessarily all the explicanda from competing orientations such as Montague grammar and Relational grammar seem complementary to those of Transformational generative grammar.

Some earlier explicanda are now to be stipulated; thus, e.g. Chomsky's "*organ*" attitude to "*language as ability*" (Chomsky, 1975) parallels the acquisition of language with the growth of a body organ such as the heart. And since the functions of the heart are genetically determined, these can

hardly have an ontogenetic effect on heart structure. The same holds good of language: the problem of function is to be relegated to phylogeny or language history, appearing at the interface between grammar and perceptual strategies in the form of *filters* (Chomsky—Lasnik, 1977) i.e. as stipulations rather than explicanda.

As for the acquisition of grammar, the appearance of grammatical forms in various traditionally defined grammatical classes was studied. The result of the influence of linguistic theory upon the study of language acquisition was that linguists started to look at the children's utterances as though they had been produced by speakers of an unknown language. *Syntactic classes*, i.e. groups of words whose members share priviliges of occurrence with each other and have different priviliges of occurrences from words in another class became the core of interest. In applying distributional analyses to discover what syntactic classes children use, three groups of researchers, viz., Braine, Brown—Fraser (1963) and Miller—Ervin (1964) discovered similar phenomena which have entered into linguistics as *the pivot* and *open-class distinction*. The early syntactic knowledge of the child was proclaimed to be represented by a grammar which generates their utterances with rules concatenating *pivot* and *open-classes* according to their distinct priviliges of occurrences, i.e. $P_1 + 0$, $0 + P_2$, $0 + 0$ and 0. The grammar, on the other hand, does not generate P or P + P, since these are considered ill-formed according to the child's own system. Further studies — both of English and other languages speaking children — however, revealed that words in early utterances do not conform distributional priviliges of occurrence specified by the rules of *the Pivot grammar*. Children, no matter of which nationality, use words of a relatively large proportion of constructions, but these words rarely incorporate simultaneously all the properties attributed to *pivots*. Moreover, the existence of undifferentiated *open class* has not been corroborated. The facts of early child speech have proved to be far more complex than *the pivot-open model* indicates and cannot be accounted for simply by the form and arrangement of words, the properties of which are, more-over, often disputable. Hence the irrelevance of this theory.

Transformational generative grammar's approach, on the other hand, seemed to be more promissing for an understanding of the child's grammar. As generally known, the grammar consists of three components, viz., *the syntactic, the phonological* and *the semantic. The syntactic component* which specifies both deep and surface structure in central in that the other two components operate on its output. *The phonological component* operates on surface structures to indicate the acoustical properties of sentences, while *the semantic component* operates on the abstract accounts of sentences provided by deep structures to produce semantic interpretations. It is the syntactic component which has so far been applied to the child's language in most cases (McNeill, 1966a, 1966b, 1970, 1971; Brown—Cazden—Bellugi, 1968; Bloom, 1970; Bowerman, 1973; et al.). The syntactic component, nevertheless, has two parts, *a base* and *a transformational component.* Rules of the base component generate underlying structures of sentences and indicate, how particular lexical items are inserted into these structures. They must have grammatical categories with which to work. Distributional

analysis of privileges of occurrence is effective in revealing the grammatical classes of a language as it is spoken by adults. The presence of inflectional clues usually aids the analysis. Whether the distributional analysis of the word-order in the child's constructions can reveal the syntactic classes needed for an adequate representation of the child's linguistic knowledge, is, however, not so clear. It may be possible that children sometimes distinguish cognitively between groups of words on the basis of meaning but it may be equally possible that this distinction is not initially reflected in a difference in distributional priviliges of occurrence but only in difference in the semantic or syntactic functions performed by words. Whether words distinguished in this way should be considered members of different classes before clear-cut distributional differences emerge is uncertain. A cross-linguistic comparison of children at early stages of language development has pointed out many similarities; any child evidently works on the expression of *subject—verb—object relationships.* Words in these roles are combined in *subject—verb, verb—object, subject—object* and *subject—verb—object.* Next productive patterns are *noun—locative, adjective—noun, demonstrative pronoun—noun.* Other parts of speech, such as *prepositions, numerals, conjunctions, copulas* and *pronouns* are either rare or completely absent at this stage of language acquisition. The constructions are simple and consist mostly of two or three morphemes. *Inflection* is not utilized, *word—order,* on the other hand, is fairly stable. These observations of language behaviour in children has led to the hypothesis that the child's utterances can be generated almost entirely by *the base component* while *the transformational component* is thought to be largely absent in early developmental stages, cf. e.g. McNeill's statement (1966b, 51): "It is not too unreasonable to think of children talking the base strings directly". This opinion, however, has been criticized on the grounds that morphonemic and phonological rules do not operate on the abstract symbols present in base structure but only on the output of the base and transformational component. According to Bowerman (1973, 72) the claim might be reworded to state that the surface structures of most children utterances can be generated directly by the rules of the base component and do not require transformational modifications. McNeill's argument, is, on the other hand, the following: if the child begins his productive linguistic career with a competence limited to the base structure of sentences, it si difficult to see how it can be explained by any theory of language acquisition that restricts attention to what a child might obtain from the observable surface characteristics of parental speech. Such theories would have to predict the opposite course of development: first, *the surface structure,* second, *the base structure.* In other words, since children's early utterances are base structures and as these are abstract and never directly observable in speech, "a child cannot acquire language only by observing and making inferences from the speech he is exposed to and *innate linguistic knowledge* is needed" (McNeill, 1970, 1088).

The fact that most of children's early utterances can be generated by the base structure rules of a transformational grammar without intervention of transformational rules, does not, in our opinion, constitute the evidence that children have *innate linguistic knowledge corresponding to the abstract and unobservable base structure representations of sentences.* It appears instead

that almost all the rules needed for generating children's constructions could be derived directly from the surface strings modelled by the adults. From what has been said follows that the theory of transformational generative grammar represents a useful approach to child language. Unlike the pivot grammar which takes into account only the superficial form and arrangement of words, transformational generative grammar enables the formalization of some of the significant syntactic and semantic characteristic of children's utterances and the allowance of fruitful comparison among children learning different languages. The use of the transformational generative grammar to represent children's communicative competence, nevertheless, involves postulating certain kinds of linguistic knowledge to which there is little evidence. And it is mainly this point where its relevance is inconvenienced.

The theory of *Case grammar* — in spite of the fact, that Fillmore's suggestions were motivated purely by linguistic — not paedolinguistic — considerations (Fillmore, 1966, 1971) seems well suited to represent children's linguistic knowledge, especially in two respects:

— it gives formal recognition to *semantic relationships* which are no doubt of primary importance in early speech;

— unlike the transformational generative grammar it does not postulate *the presence in deep structure of the constituent structure, nor subconfiguration of sentence elements which defines the basic grammatical relations.* Cf. e.g. the fact that Fillmore regards relations like "*subject of*" and "*predicate of*" as *surface structure* phenomena which need not occur in all languages and — where needed — should be accounted for transformationally.

Syntactically significant semantic concepts called *case relations*, are, on the other hand, *the basic elements of deep structure.* Languages differ in the particular devices they imploy to mark given case relations. As for rewriting the case symbols, Fillmore suggests K (for Kasus) + NP. Depending on the language and on the case K might be a *preposition, postposition, case affix* or *zero.* Applied to child language the rewriting would be only N or NP. The symbol K here is always zero, as children omit both prepositions and case endings, and, concomitantly, nouns are not marked to indicate the case relations they have to verbs or to other nouns. The case relationship which seems to be of importance for children at early stages of grammatical development are *Agentative, Dative, Locative and Objective,* if we accept the Fillmore's newer conception that the contrast animate vs. inanimate is irrelevant. Most of the early constructions consists of either *two cases* (A + 0, D + 0, L + 0) or *one case + a verb* (A + V, V + 0). From the three term constructions the sequence A + V + 0 is the most typical.

Compared to the transformational generative grammar account the case grammar for children's linguistic knowledge, has, in our opinion, the following advantages:

— it allows to dispense with *the deep structure division between subject and predicate* which, as illustrated e.g. by Kernan (1970), Schlesinger (1971), Bowerman (1973), Aitchison (1976) credits the child with a more abstract linguistic knowledge than his behaviour gives evidence of;

— it offers a concise and non-language specific account for *child word-stock structure consisting mainly of nouns and verbs in various implicit semantic relationships,* the exact nature of these relationships being, however,

not marked in adult speech, and, simultaneously, an account of why almost all *functors* such as *prepositions, case endings, conjunctions* etc. are missing from early child speech;

— it provides for *the generation of deep structure elements in unordered sets.* The cross-linguistic sharing certain semantic and syntactic characteristics enables to formalize our knowledge of these universal aspects of language acquisition in a sort of *Universal grammar* for early child speech;

— it insists on *the grammatical significans of semantic concepts* and rejects certain fundamental assumptions of transformational generative grammar which are inappropriate to child speech, cf. e.g. the above mentioned division between subject and predicate.

In spite of all positive attributes of case grammar theory, at least one drawback should be mentioned here, namely, that some of the semantic categories it employs do not correspond to the functional categories of children's linguistic competence, e.g. *Dative* and *Objectatice* are, in our opinion, more abstract categories than children actually work with at early stages of language development.

But let us come back to the question of *innateness* and the two major factors in acquisition of knowledge which have been subject of study and speculation for centuries. At least the positions that have developed as outgrowths of classical rationalism and empiricism should be mentioned in this connection. *The rationalist theories* are marked by the importance they assign to intrinsic structures in mental operations — to central processes and organizing principles in perception, and to innate ideas and principles in learning. *The empiricist approach,* on the contrary, has stressed the role of experience and control by environmental factors. *The classical empiricist view* is that sensory images are transmitted to the brain as impressions and remain as ideas that will be associated in various ways depending on the fortuitous character of experience. In this view a language is merely a collection of words, phrases and sentences, a habit system, acquired incidentally and extrinsically. In the formulations of Williard Quine, knowledge of language can be represented as "a fabric of sentences variously associated to one another and to non-verbal stimuli by the mechanism of conditioned response". Acquisition of knowledge — linguistic knowledge included — is only a matter of the gradual construction of this fabric. When sensory experience is interpreted, the already established network may be activated in some fashion. In its essentials, this view has been predominant in modern behavioural science. *The classical rationalist view* is quite different. The mind here contains a system of "common notions" that enable it to interpret the scattered and incoherent data of sense in terms of objects and their relations, cause and effect, whole and part, symmetry, gestalt properties, functions etc. Sensations, providing only fleeting and meaningless images, is degenerate and particular. Knowledge, much of it beyond immediate awareness, is rich in structure, involves universals and is highly organized. The innate general principles that underlie and organize this knowledge, according to Leibnitz, "enter into our thoughts, of which they form the soul and the connection, although we do not at all think of them". This active rationalist view of the acquisition of knowledge persisted through the romantic period. With respect to *language,* it has achieved its most

illuminating expression in the profound investigations of Wilhelm von Humboldt. His theory of speech perception supposes a generative system of rules that underlies speech production as well as its interpretation. He regards a language as a structure of forms and concepts based on a system of rules that determine their interrelations, arrangement and organization. But these finate materials can be combined to make a never-ending product.

In the rationalist and romantic tradition of linguistic theory, the normal use of language is regarded as characteristically innovative. The man constructs sentences that are entirely new to him — and so does the child. There is no substantive notion of *analogy* or *generalization* that accounts for this *creative aspect of language use.* It is equally erroneous to describe language as a habit structure or as a network of associated responses. In Humboldt's view, acquisition of language is largely a matter of maturation of *an innate language capacity.* This maturation is guided by internal factors, by an innate "form of language" that is sharpened, differentiated and given its specific realization through experience. Language is thus a kind of latent structure in the human mind, developed and fixed by exposure to specific linguistic experience.

The active and passive views of perception and learning have been elaborated with various degrees of clarity. Some recent works in psychology and neurophysiology are highly suggestive in this regard. There is evidence for the existence of central processes in perception, specifically for control over the functioning of sensory neuroms by the brain-stem reticular system. Furthermore there is evidence for innate organization of perceptual system of a highly specific sort at every level of biological organization. The demonstration of the *innateness of Universal grammar* is by the nature of the data and by accident of the slow development of the relevant auxiliary sciences much more difficult, since less direct. As a genetic hypothesis, it implies that the long asserted uniqueness of the human being depended on a saltatory species-making change, for the universal structural properties of language are arbitrary with respect to any general cognitive ability for which a phylogenetic, or indeed ontogenetic "ascent" theory might be reconstructed. And it goes without saying that genetics is not sufficiently advanced to supply the list of responsible genes, despite hints from familial language problems, whether of spelling or of articulation. On the hypothesis about the brain, there is agreement that *brain-size* — relative to body and absolutely — must have played a phylogenetic role, though not without protest, cf. e.g. Lenneberg, 1967, 70. *The unique brain morphology* in human being is also taken for granted, cf. Geschwind, 1974, Aitchison, 1975 et al. The facts of *lateralization of the human brain* — unlike that of animal, are also considered relevant, the left hemisphere being held responsible for analytic processing as against the holistic processing of the right hemisphere. Indirect support for this theory is cited from cases such as Genie (Curtiss, 1977); deprived and isolated to an unprecendented degree, the girl was not discovered until she was an adolescent. An inhuman childhood had prevented her from learning language and she new little about the world in any respect save abuse, neglect, isolation and deprivation. When found she was practically dump. Since that time, she has been rehabilated and educated to the fullest extent possible and studied in an attempt to answer questions of interests to psy-

cholinguists, such as: *Is there critical period for language acquisition? If so, what kind of language development is possible beyond the critical period? Are language acquisition and language lateralization interrelated? Will language be lateralized if acquired after puberty? If so, will it be lateralized to the left hemisphere as it is in normal human brain?* Genie's serious failure in language learning, expecially in mastering grammatical rules after puberty, has been attributed to the constraining of her language ability to the right hemisphere only — hence positive answers to the first two questions. The onset and offset of language acquisition, seem, on the other hand, no longer to be so clearly associated with lateralization, nor has the early promise concerning species--specific features detectors been fulfilled, as shown by Studdert—Kennedy in his 1979 study.

In summary then, and here we are in agreement with Drachman (1981, 358), the bulk of argument concerning innateness must for the moment come from studies of the core systems of languages, for which universal grammar is hypothetisized as the essential substrate. Within these clearly time-bounded constraints one may claim that, to the extent that the hypothesis "Universal grammar" can be made precise and the basis for computations that are clearly demonstrated by observations, to that extent is its innateness not an occult but a necessary hypothesis of linguistic theory.

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ROLE LINGVISTICKÝCH TEORIÍ PŘI OSVOJOVÁNÍ JAZYKA

Autorka ve svém příspěvku rekapituluje a hodnotí nejběžnější teorie, jež ovlivňují cíle a metody lingvistického bádání zejména v posledním dvacetiletí. Ověřuje jejich relevanci v současné lingvistice a zamýšlí se nad otázkou, jakou úlohu mohou sehrát při explikaci osvojování jazyka. Pozornost soustřeďuje především na ty lingvistické teorie, jež si kladou za cíl osvětlit vznik a vývoj lingvistické kompetence u dítěte, viz model gramatiky pivotní, generativně-transformační a pádové. V souvislosti s hypotézou o „univerzální gramatice" znovu otvírá otázku vrozenosti předpokladů pro jazykový vývoj. V závěru podává přehled o problematice, jež je předmětem výzkumu moderní psycholingvistiky a neurofyziologie.