

PHONETIC AND PHONOLOGICAL PROPERTIES OF CHILD LANGUAGE

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ABSTRACT

The present paper attempts to be a small exploratory study in phonology, adding data from the child's acquisition of his mother tongue, i.e. Czech, with the intention of contributing to our understanding of phonological organization and phonological processes in language development. Particular reference is made throughout to motivating examples from "substitution paths" which children follow in acquiring the phonemes, especially as far as the nature of distinctive features, the active organizational role of marking in determining the structure of child language, the strategies in phonology acquisition and the interrelations between language levels are concerned.

INTRODUCTION

The bulk of linguistically oriented research on child phonology since Jakobson's "Kindersprache" has mostly been concerned with discovering a universal order of phonemic development: /1/. The principle of maximum contrast and various priorities, e.g. that of unmarkedness as against markedness, stop as against fricative and semiocclusive, front as against back and simple as against complex nuclei formations have repeatedly been dealt with in studies in this field: /2/.

The position of a phoneme in a phonemic system is, however, determined not exclusively by possible oppositions but also by the extent to which alternates with other phonemes and by realization of its potential to be an exponent of linguistic meaning. One kind of individual variation is the apparent chance following of alternate paths in the acquisition of particular sounds: /3/.

Our study is based on the data dealing with the linguistic development of a Czech-speaking boy recorded since his first utterances at the age of ten months

and ending at two-and-a-half years when his phonological system was well established and language use quite fluent. The data were collected daily and notes were made of the context of use. In analyzing them, systematic confrontation with specialized literature and with results gained during our longitudinal research in language development of fifteen children - aged from one to three years, most of them being the boy's playmates at the nursery home - was done.

The observation in the development of consonants have let us to take the position that there is a consistent phonemic patterning within the speech of each child which is often strictly idiosyncratic. A widely recognized principle is exemplified in our study: that of progress from a simple beginning to greater complexity: /4/. An attempt is made to illustrate this at the phonetic and phonological levels, showing at the same time how such development is related to increases in vocabulary size, awareness of grammatical system and amount of language use. In a brief paper of this nature it is not possible to give a full description of the child's phonetics and phonology. Therefore, a restricted aspect, viz. the acquisition of fricative phonemes - with special view to the lateral and vibrants has been selected for consideration.

It is generally acknowledged that at the earliest stage of language development, the child's vocabulary is very small and plosives, nasals and vowels are the only sounds used. Most of them are familiar from babbling and their perception and production is thus well practiced. The continuant sounds, on the other hand, require more skill not only in perceptual discrimination but also in production. The articulators have to be in a posture of close approximation to achieve friction, neither completely in contact as in plosives and nasals, nor well clear of each other as in vowels. The appearance of fricatives - at certain stage of phonologic development - is, nevertheless, not seen

as resulting primarily from a production difficulty but as arising from the boy's increased perceptual discrimination, the need for their production not having arisen until the child is able to discriminate and to recognize them as functional. In our subject, first attempts at the friction and sibilance were made with varying degrees of success. Friction was achieved at the following points of articulation: labial (= bilabial I_lI and labiodental I_fI, the former having predominance, in spite of the fact that it does not exist in Standard Czech); palatal (= I_jI) and velo-glottal (= velar I_xI and glottal I_hI). Sibilance, on the other hand, was produced at the alveolar, post-alveolar, palato-alveolar and palatal areas (= I_sI, I_ʃI, I_ʃI and I_ʃI, of these only /s/ and /ʃ/ have their counterparts in adult language).

The new sounds, however imperfect, brought new consonantal contrast into use so that a higher level of complexity was reached and, simultaneously, the new contrasts resulted in new word structures. In addition to the already established structures such as plosive+vowel (e.g. I_bu:I), vowel+plosive (I_opI), plosive+vowel+nasal (I_bu_mI), there were now also nasal+vowel+sibilant (I_mi_ʃI), plosive+vowel+sibilant (I_ba:sI), plosive+vowel+fricative (I_ba_fI), fricative+vowel+nasal (I_ha_mI) and fricative+vowel+fricative (I_ha_fI).

As for the frequency of use with fricatives, only /j/ can compete with the frequency of plosives and nasals. And it is the substitutive function of /j/ which accounts for most of its occurrences, cf. the fact that the observed child utilized /j/, simultaneously, as a substitute for five fricative phonemes, viz. /v/, /z/, /ʒ/, /l/ and /r/. The child's phonological system had thus a phoneme with very high functional load, the degree of its integration in the fricative subsystem was, on the other hand, minimal: having been used as a substitute for five fricative phonemes, it was not opposed to them by means of related distinctive features. With gradual mastering distinctive features of the so far substituted phonemes viz. labiodentality in /v/, alveolarity and sibilance in /z/, postalveolarity and sibilance in /ʒ/, alveolarity and laterality in /l/ and alveolarity and vibrativity in /r/ and /ʃ/ - the phoneme /j/ lost its former phonemic territory and became a fully integrated phoneme opposed to the above mentioned phonemes by its otherness: /5/.

Interesting steps in the phonological maturation process can be seen in the boy's mastering the fricative phonemes /l/, /r/ and /ʃ/. The former two, commonly classified as liquids, in Standard Czech split in two subcategories, viz. the lateral /l/ and the vibrant /r/. They differ in various properties, the most important being

the kind of conjunction of closure and opening: while in the lateral the closure and opening occurs simultaneously but in different places, in the vibrant these two attributes alternate but occur in one and the same place, i.e. at the point of alveolars. As mentioned before, both /l/ and /r/ were - at earliest stages of phonology development - replaced by the phoneme /j/: in terms of features, both the lateral and vibrant character were ignored and so was the point of articulation. The next output, the palatalized /l/, signalled the child's mastering the feature of laterality as well as the contrast simple vs. complex nuclei in fricative articulation. By additional loosening the palatal character and the obstruction the output became an intrinsic allophone of the Standard phoneme /l/, distributively, however, it still represented the two liquids, namely, /l/ and /r/. The output /r/- identified with the Standard phoneme /r/- was then telescoped by the additional feature of having become a discontiguous vibrant opposed to continuant lateral, and, at this stage, the demand of language system, viz. the semantic contrast should be encoded phonologically, was fulfilled.

A glance at the boy's dealing with the syllabic allophones of the two liquids that are firm elements of the phonemic system of Standard Czech, displays another interesting phenomenon in the process of phonology development. At the stage in which the boy has not yet mastered the feature of laterality and in which, naturally, the even more difficult feature of vibrance is also absent, he uses the vowels /u/ and /e/ as substitutes for both the syllabic I_lI and syllabic I_rI thus showing his awareness of the feature of syllabicity. Nevertheless, a question arises as to what makes him use two vowels in substituting one syllabic allophone and whether the alternation of the two substituting vowels is purposeful or merely accidental. A deeper insight into the boy's behaviour reveals rather surprising phenomenon: the alternation takes place even within the inflected or derived forms of an identical word unit, cf. I_pu_ʃi:I = přší (it rains) with I_pe_ʃe_joI = přšlo (it rained); I_vunaI = vlna (wool) with I_ve_ne_ne_jI = vlněný (woollen). This observation of ours certainly runs counter to the boy's habit in the domain of morphology where alternation - in Standard Czech obligatory - is ignored by him and the preservation of the same vowel (or consonant) is one of the most typical features of his early phonotactic system. For illustration cf. the following examples: the child forms I_ku_ʃoI = nom. (horse) - I_ku_ʃaI = accus.; I_bloukI = nom.sg. (beetle) - I_bloukiI = nom.pl. with the corresponding adult forms I_ku_ʃi - I_ko_neI, I_broukI - I_brousiI. From what has been said follows

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that what seems to be universal at the morphological level does not hold good at the phonological level. Instances such as I_ke_tʃe_kI = nom. (neck) - I_do_ku_tʃk_uI = accus. (into the neck), I_vunaI = noun (wool) - I_ve_ne_ne_jI = adj. (woollen) bear evidence of this. The discrepancy might be, in our opinion, accounted for in the following way: at that stage of language development where morphophonemics has the upper hand, the child pays little attention to morphology including the origin and function of inflections and derivations. The acquisition of word forms takes place at first by processing each item as an individual unit. Their phonological patterning, deletions or substitutions of phonemes correspond to adopting the strategy which seems fundamental in the communicative act, namely the application of the principle of least effort and maximum economy in articulation. This shows up in various types of assimilations (vowel or consonant harmony being the most frequent), contact and distant dissimilations, metatheses and other phonetic changes. Systematic simplifications both in vocalic and consonantal contrasts phonetic variations and instability in the proper distribution of the phonemes are the next markers which reveal the, as yet, non matured developmental stage. In analyzing the acquisition of the phoneme /ʃ/, many a peculiarity stands out. Before dealing with its implementation in the observed child, a few comments should be made on this consonantal phoneme as far as its realizational and distributional characteristics in the adult speech is concerned.

As probably known, Czech is the sole of the Slavonic languages which has not only developed this phoneme but has also preserved it as a fixed, though structurally isolated element of its phonemic system. The structural isolation shows both from the phonetic and phonemic point-of-view. After much speculation about classifying this sound from both the articulatory and acoustic standpoints it was ranked as a trill with two allophones, voiceless and voiced, occurring in complementary distribution: /5/.

The first output of this no doubt most unusual and difficult consonant in the observed child was the phoneme /c/, i.e. the voiceless palatal plosive utilized for both the voiceless and the voiced allophone of the phoneme /ʃ/. The lenition process, viz. the mastering of the binary feature change /-voice/ - /+voice/ had the occurrence of the phoneme /j/ as its result. Hence both allophones of /ʃ/ found their substitutive sounds. Unlike the other voiced phonemes which - due to neutralization of the feature of voice word-finally obligatory in Standard Czech - are devoiced in this po-

sition, with /j/ its devoicing also in initial and intervocalic position is not exceptional. This fact fits well with inherent physically caused variation in speech, namely the tendency to devoice is the greater the smaller is the surface area of the oral cavity, that is, the less is the capacity to absorb the glottal air-flow: /6/.

The next step on the substitution path was the application of the phoneme /ʃ/ in place of the voiceless I_fI and of the phoneme /z/ in place of the voiced I_fI - an evidence of the fact that the child had already mastered the feature of fricativity. The feature of voice, too, seems to be well established - with few exceptions concerning the lesser stability of the voiced member word-initially. As next followed the output of intrinsic allophone I_rʃI and I_rzI, telescoped by the additional feature of vibrativity. And, finally, when I_rʃI merged with the voiceless allophone I_fI and I_rzI with the voiced allophone I_fI, the phoneme /ʃ/ enters the child phonemic system, being opposed to the other trill, viz. /r/ by its stridency. The adult specific realization of the voiced allophone initially, intervocalically and when preceded by the voiced consonant, and, conversely, the realization of the voiceless allophone in the unvoiced neighbourhood and word-finally, was adopted by the child as one of the obligatory phonological rules in accordance with adult language system: /7/.

We have mentioned before that interrelations between language levels may play an important role in our understanding and explaining the child language. Here are further examples to illustrate the fact: the phoneme /x/ is, evidently because of difficulty concerning velar fricativity, changed into /s/ by a process of fronting, cf. the child's realization I_ne_st_suI instead of the proper I_ne_xt_siI (I don't want). An alternative realization of this rather difficult consonantal cluster in the same child is I_ne_kt_suI - where a process of stop formation and dissimilation takes place. The application of /k/ in substituting I_tsI and I_tʃI in the child's forms I_klukiI = nom.pl. (boys) and I_kluki:kI = the diminutive form of the same noun, viz. I_klukiI = nom. sg. instead of the proper forms I_klukiI - I_klutsiI - I_klut_si:kI is, on the other hand, not only an illustration of the child's preference of stop articulation as against semi-occlusive articulation but also confirmation of the fact that he has not yet gained the awareness of the palato-alveolar formation as an index of morphological plural formation in the first instant and of diminutive formation in the second instant. On the other hand, his active approach in mastering the grammatical sys-

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tem is manifested. He does not passively borrow word forms from adults but creates his own plurals and diminutives (and of course also other inflections and derivations within given grammatical categories) in accordance with his own grammar the typical feature of which is the high degree of regularity and avoidance of exceptions.

The next specimen, viz. the realization of /x/ in the plural form IuxiI instead of the correct IujiI (ears) is explainable not only on the ground of the boy's preference of regular formation, viz. IuxoI = nom.sg. - IuxiI = nom.pl. instead of the proper IuxaI, but, simultaneously, but also of his ignorance of the adult convention, that is the Standard restriction of the word form "ucha" to ear-shaped things, especially handels of a vessel, versus the word form "uši" used in reference to the organ of hearing. To sum up, the child language system is different both for quantity of information and for its organization from that of adult language system at all its levels, and as such should be interpreted.

In concluding our paper we would like to emphasize that - unlike earlier models of phonological acquisition which assumed that the child either passively awaits the maturation of physiological control system /8/ or passively waits until he can limit or suppress the natural processes reducing his output to pabulum /9/ - we take the phonology development as an extremely creative process in which the child "intentionally" partakes and uses a variety of strategies as his guide: /10/. The fact that he, at one moment, pronounces a phoneme correctly and in its proper position, does not mean that from that time onwards he definitely masters the phoneme. It has been said elsewhere that the acquisition of the phonological system is a process. In this place it should be stressed that this process involves steps both forwards and backwards, although, of course, the general trend is progressive. The child's language system as a whole is for a certain period in a state of flux and fuzziness with a fairly strong element of unpredictability as regards phonemic distinctions. And, not exceptionally, the actual distinction between two phonemes may be in free variation with the lack of this distinction. There is no doubt, still a long way to go in establishing and in testifying a detailed model of phonological acquisition. Further studies of a larger number of children and in relation to different languages showing the interrelations of development at various levels of language are needed in order to get deeper information on what we have tried to deduce from the language behaviour of a Czech-speaking child.

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