
THE AUDITORY PERCEPTION OF DISTINCTIVE FEATURES IN A SIX YEAR OLD CHILD

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While I was pulling together the data derived from the bit of research I am going to present here, I came across an article¹ that strikingly supported my findings. The virtual identity of the author's conclusions and mine may be considered significant in that we started from different premises. Prof. Wickelgren is a psychologist and I am a linguist. Moreover, his research and mine had different purposes. Prof. Wickelgren tested errors arising in short-term memory and I tested errors stemming from spontaneous confusion. The subjects too were different. Prof. Wickelgren was dealing with adults while I was concerned with child language.

What had prompted my research was the historical concern of why phonological change—both assimilative and dissimilative, contiguous as well as discontinuous—operates prevalently on distinctive features.² In diachronic linguistics the phoneme may conveniently be considered as a unit, in accordance with the reconstructions of Prof. Hoenigswald.³ But too little is understood of the elements that make up the whole,⁴ even though, to my mind, the simultaneous presence of discrete features does not in itself detract from the unitary character of the whole.⁵ In all probability Prof. Wickelgren was approaching the problem from a synchronic point of view.

His "results suggest that a consonant is coded in short-term memory, not as a unit but as a set of distinctive features each of which may be forgotten at least-semi-independently."⁶ I, too, concluded that a consonant is coded as a set of distinctive

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¹ Wayne A. Wickelgren, Distinctive features and errors in short-time memory for English consonants. „*Journal of the Acoustical Society of America*“ 39, 2 (February 1966), 388—98.

² I am using this term in its broader meaning of phonological component rather than in the specific Jakobson-Halle terminology.

³ Cf. Henry M. Hoenigswald, *Language change and linguistic reconstruction*, U. of Chicago Press, 1960.

⁴ To give only one example that a componential analysis is philologically and structurally sound: during the third century B.C., when Greek loses prevocalic aspiration, it also changes its aspirates *ph* and *th* to the fricatives *f* and *θ*.

⁵ From another standpoint see the comment on the Householder-Chomsky controversy by Marvin D. Carmony, *Surface and deep phonology*, „*Journal of Linguistics*“, 2,2 (October 1966), 208.

⁶ *Op. cit.* Note 1, p. 388.

features. Each of these may be emphasized individually or connectedly, and induce the total or partial oblivion of the others.

At the present state of research we cannot posit the exact hierarchies of distinctive features—within each phoneme, paradigmatically, as opposed to all other phonemes, and, syntagmatically, as determined by the influence of preceding and following phonemes and in every prosodic situation.

Unfortunately I did not have time to consider the important related issue of consonant perception *per se*, whether the perception of a consonant is fully or partially conditioned by onset and offset of the surrounding vowels.⁷ Less vital to my hypothesis or Prof. Wickelgren's is the running controversy over the motor theory of speech perception.⁸

The subject whom I have been observing is my son. He is now six years and ten months old, has completed the first grade of an American school and can read with ease any book designed for children of his age or slightly older, but he does not seem to enjoy reading. He can write English fairly well and occasionally, of his own will, composes simple letters to friends and relatives.

At school, after an initial period of apathy towards the study of his language, he became an excellent speller. One of his favorite pastimes is asking his parents to give him words to spell, and of this he never tires. He also enjoys watching spelling bee programs on television. From infancy on, my son seemed to be more ear than eye minded.⁹

He started the first grade at six years and two weeks of age and was taught "phonics" using the regular English orthography, learning letter after letter. The teacher explained how each graphemic unit corresponded to a phonetic expression. My son considered homonyms like *meat* and *meet* as much fun as playing with a puzzle. Whatever misspelling has so far occurred to the child, a vowel was always confused with some other vowel and never with a consonant. The perception of vowels is undoubtedly different from that of consonants, a fact which has been experimentally demonstrated by the Haskins group.¹⁰

Among the non-vocalic confusions of my son, a special status must be assigned to the *h* phoneme, which was the only sound which could be replaced by zero. The

⁷ Cf. A. A. Hill, *Suprasegmentals, prosodies, prosodemes*, "Language," 37, 4 (Oct.-Dec. 1961), 460: "As machines tell us, it is necessary to assume that only the onset and offset of consonants like (*θ*) and (*f*) in *three* and *free* or *myth* and *miff* are audible. Thus the real cue as to whether a word contains (*θ*) or (*f*) is the audible difference in the surrounding sounds."

⁸ Cf. Harlan Lane, The motor theory of speech perception: a critical review, „*Psychological Review*”, 72, 4 (1965), 275—309.

⁹ Cf. Walburga von Raffler Engel, *Il prelinguaggio infantile*. Paideia 1964, pp. 44, par. 33, 70—71, par. 63.

¹⁰ Cf. D. B. Fry, Arthur S. Abramson, Peter D. Eimas, and Alvin M. Liberman, The identification and discrimination of synthesis vowels, "Language and Speech," 5, 4, (Oct.—Dec. 1962), 171—189.

same phenomenon, as a matter of fact, happens all the time when native speakers of a Romance language are learning a Germanic language. I played at spelling new words with the child between the third and sixth month of his first school year. At that time, he was speaking English like any other American youngster, but it must be remembered that my son is an Italian English bilingual and the English *h/θ* correlation might have been an interference from Italian. During the period of testing via word spelling games, I have, however, observed no other bilingual phonic interference. As a matter of fact during the subject's earlier speaking period, the difficult phoneme *r* was replaced by *w* in English and by *l* in Italian. It thus remains unclear how to interpret utterances like: "Mother, I know two more words that sound alike and are spelled differently: *his* and *is*" (February 18, 1967).

Despite his normal command of spoken English, a little note my son jotted down once about his parents revealed orthographic errors quite similar to the mistakes vocalized by children with speech disturbances: "I weley (really) like them wele [very] much" (April 23, 1967). Voicing is shared by *r*, *l*, *w*, *v*. As a matter of fact no confusion ever arose in his speech between voiced and unvoiced sounds. As has been observed by several scholars, the vibration of the vocal cords seems to be a prime element in the hierarchy of phonological components. Acoustically, *r*, *l*, *w* are all of low frequency. My son confused also *y* and *l*. Obviously, the semi-vowels formed a distinct category. The intrusion of *v* needs further investigation and may be due to nothing more than graphemic similarity.

Among the consonants proper no breakdown by category could be established. Within the stops, *key* and *tea* were considered homonyms and *b* and *d* were confused; but at the same time, the final consonant in *handkerchief* became a stop in *handkerchip*. Here the labiality outweighed the fricativeness. In other words of his, where he substituted *f* for *θ*, the acoustical high frequency component of fricativeness seemed to override both place of articulation and tongue position. From a statement the youngster made during the second half of the first grade (March 20, 1967), it would appear that acoustic perception plays a major role. He complained about the complexities of spelling: "They all sound alike, and you never know if the word is spelled with an *s* or a *c*, like *see* and *cents*. And *c* and *k*: *cat* and *kitten*. Or sometimes they spell with a *k*, and sometimes with a *t*. How do you spell *cake*, with a *k* or with a *t*?"

The collection of my son's spelling errors leads not only to the conclusion that the phoneme is perceived as a set of discrete components, but also that the word or, for that matter, the morpheme need not be conceived of as the unit of perception. Throughout the entire first grade, I was on the lookout for interferences from the plerematic level, and so far, have been able to detect only one instance: "I know a word that ends with *i*, *cab*." When I asked the child to write it down, he wrote *taxi*. The latter confusion points to a "global conceptualisation" on the semantic level.¹¹

¹¹ G. Walburga von Raffler Engel, *The concept of sets in a bilingual child, paper to be presented at the Xth International Congress of Linguists, Bucharest 1967.*

Coming as an afterthought, the phoneme, thus, still seems to perform an essential purpose, but we just do not know enough about the phoneme to determine its function in the missing link between physical perception and psychic interpretation.

DISCUSSION

Becker:

Wir konnten ebenfalls ähnliche, jedoch keine völlig übereinstimmenden Fehlleistungen bei Dyslalikern und Dyslektikern beobachten. Dyslektikern unterlaufen beim Schreiben z. B. häufig Vokalauslassungen, Dyslalikern beim Sprechen nicht bzw. selten. Die Fehler bei Konsonanten unterscheiden sich auch.

Beispielwort Knöpfe = Dyslaliker spricht: Nöppe
 = Dyslektiker schreibt: Köfe
Stube = Dyslaliker spricht: Tube
 Dyslektiker schreibt: Schube oder Schub

Die Fehler scheinen bei Dyslalikern stärker durch Artikulationsschwierigkeiten, bei Dyslektikern mehr durch phonematische Differenzierungsschwäche bedingt. Nach unseren Beobachtungen werden Explosiv- u. Nasallaute von allen Kindern am schlechtesten phonematisch differenziert. (vgl. Beltjukow u. Theiner). Wir stimmen mit der Autorin überein, bei Dyslektikern der phonematischen Differenzierungsfähigkeit mehr Aufmerksamkeit zu schenken.