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ABSTRACT

The pronunciations of children do not merely represent accidental misses with respect to adult pronunciation. Children employ substitutions and deletions in highly systematic ways; child pronunciations reflect a set of simplification strategies. The major common processes of both normal and abnormal child phonology result in simplification of either linguistic output or the underlying phonological system of the child. The processes include: (1) cluster simplification; (2) final consonant deletion; (3) assimilations of various sorts; and (4) processes of category collapse which include liquidation (liquids and glides become glides), voicing avoidance (final voiced consonants are collapsed with the unvoiced category), and stopping (initial fricatives, affricates, and stops become stops). Even some processes which apparently result in complication of the child's output (viz., when the child adds phonetic elements to adult forms) are, in fact, simplifications since they reduce the child's speech effort by maximizing the production of certain preferred syllable shapes. (Author/DD)

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Simplification in Child Phonology

The pronunciations of children do not merely represent accidental misses with respect to adult pronunciation. Children employ substitutions and deletions in highly systematic ways. The present paper argues that child pronunciations reflect a set of simplification strategies. The major common processes of both normal and abnormal child phonology are shown to result in simplification of either linguistic output or the underlying phonological system of the child. The processes discussed include: 1) cluster simplification; 2)final consonant deletion; 3) assimilations of various sorts; and 4) processes of category collapse which include: a) liquidation (liquids and glides become glides); b) voicing avoidance (final voiced consonants are collapsed with the unvoiced category); and c) stopping (initial fricatives, affricates and stops become stops). It is argued that even some processes which apparently result in complication of the child's output (viz., when the child adds phonetic elements to adult forms) are, in fact, simplifications since they reduce the child's speech effort by maximizing the production of certain preferred syllable shapes.

Simplification in Child Phonology

When a child begins to speak meaningfully, he does not pronounce words in exactly the same way adults do. Instead, the child substitutes, deletes and adds phonetic elements which the adult language does not include. It is agreed, of course, that the sorts of substitutions, deletions and additions which occur in child language are not merely random errors on the child's part but are rather the result of a set of systematic strategies on the child's part. The question I want to address today is: What is, in general, the goal of these strategies?

In the middle and late 1800s, the German linguist Schultze (1880) advanced the position that the child substitutes phonetic elements which are easier for him to produce than the corresponding elements which occur in the adult language. More recently, Stampe (1969, 1972) has also argued that the child's substitutions reveal the child's tendency to pronounce phonetic elements which are less physically taxing than those which occur in adult speech. But concrete evidence concerning the relative difficulty of producing particular phonetic elements is hard to come by. In the present paper, I shall claim that the child's phonological processes result in "simplification" of the linguistic system and/or in simplification of the task of hearing and speaking, but I shall emphasize a different sort of evidence from that considered in discussions of "what phoneme substitutes for what other phoneme." Instead, we shall consider the child's processes in terms of a clear question: Do the major processes of child phonology result in some sort of reduction in the raw number of contrastive phonetic elements employed in the child's system as compared with the adult's?

The sorts of processes to be discussed here have been commonly discovered in investigations of child language, both normal and abnormal. These processes can be broken down into four groups: 1) cluster simplifications; 2) final consonant deletions; 3) assimilations; and 4) processes which can be shown to result in

category collapse. As regards cluster simplification, consider the following examples. If the child attempts to say the word "stand," he's likely to say something like "tan" in which he drops out the /s/ in the initial /st/ cluster and drops out the /d/ in the final /nd/ cluster. If he attempts to say a word like "flower," he's likely to say something like "fower," dropping out the liquid in the fricative-liquid cluster. This sort of simplification is natural in both normal children and children manifesting language-delay as a result of brain lesions, hearing loss, or global mental retardation. The sense in which cluster simplifications result in a simplification of the task for the child is fairly transparent since the changes introduced by the child reduce the number of phonetic elements produced. It should be emphasized here that while occasional instances of cluster creation or complication (creation of a cluster where the adult would produce a single consonant) do occur in child speech, these are very rare by comparison with instances of cluster simplification. Furthermore, the complications which occur often appear to result from a sort of "performance" error where the child apparently changes his mind in midstream, pronouncing a consonantal segment and then changing to another segment without pause. Evidence for this interpretation of complications is provided by the fact that, of the two elements produced in such clusters, one is often substituted for the other in precisely the sort of position where the complication occasionally occurs. I have never seen a case where cluster creation was consistently applied, whereas cluster simplification is normally applied quite consistently by young normal and abnormal children.

It is also important to recognize that elements which are deleted from clusters are normally elements which are substituted for when they occur singly. For example, if a child attempts to produce the word "play," he will normally produce "pay." The fact that he drops out the /l/ rather than the /p/ in the /pl/

cluster appears to be no accident. Liquid consonants are normally replaced even when they do not occur in clusters.

A second group of processes which are transparently simplificatory in nature are the processes of final consonant deletion. A child may attempt to say the word "dog" and produce /da/; he may attempt to produce the word "can" and say /kʰæ/. Final consonant deletions are particularly evident in very early child speech and particularly evident in the speech of certain language-delayed children. If we consider both final consonant deletion and cluster simplification conjointly, it appears that the child manifests a preference for the CV syllable shape.

A third group of processes which result in clear simplification for the child are processes of assimilation. Traditionally, in studies of child language, many of the processes of assimilation to which I am referring here have been subsumed under the title "reduplication." For instance, the child's production of "mama" and "papa" are thought to be influenced by the child's inherent assimilatory preference. In the most primitive sorts of phonologies, reduplication is, in fact, the rule as opposed to the exception. One of the language-delayed children which we looked at in a study which has been reported in the Journal of Speech and Hearing Disorders (Oller, 1973) produced long sequences of reduplicated syllables. For instance, the word "watermelon" was pronounced /bábabàba/. The syllable /wa/ in watermelon was the basis for the entire sequence. The child substituted an initial stop consonant for any consonant in initial position. The particular consonant he substituted in this case was /b/. His processes left the vowel unchanged and assimilated all of the following syllables to the initial one. However, reduplication is not the only form that assimilation takes in child speech. In fact, normally, assimilation is of much more limited scope. Particularly common are regressive assimilations of consonant position

or of nasality. For instance, there is a regressive velar assimilation which results in the production of /gɔk/ for "dog" or /gʌk/ for "duck." And there is a regressive nasal assimilation process which results in the production /næ̃m/ for "lamb." If it is not immediately apparent that assimilations result in a simplification of the child's output, let me point out that assimilation reduces the total number of different phonetic features which are produced in any utterance by the child.

The fourth group of processes which I'd like to discuss today I refer to as processes of category collapse. These processes result in the collapsing of two phonemic or phonetic categories in the child's system. For example, one of these processes (we have referred to it as Liquidation in Oller and Kelly, in press) accounts for the substitution of w-like glides for the liquids /r/ and /l/. For example, I am sure you have all heard some child attempt to say the word "rabbit" and produce something like "wabbit." Or you have heard a child attempt "ladder" and say "wadder." The point is that the phonemic elements /r/, /l/ and /w/ are all collapsed or merged into one category, a w-like glide, in the child's speech. This process results in a simplification just in the sense that the child's phonemic inventory is reduced.

Another process of category collapse is Devoicing. By means of this process, the child collapses the categories of voiced and voiceless consonants in final position, but always in one direction. He never substitutes a voiced consonant for a voiceless one in final position, but he very frequently substitutes a voiceless consonant for a voiced one. So the child does not normally say /gɔg/, but /gɔk/ for "dog."

Another process of category collapse which has been frequently reported for both normal and abnormal children is that of Stopping. This process accounts for the substitution of stop consonants for initial fricatives and affricates.

So "chair" becomes /t^hɛr/ and "shoe" becomes /t^hu/ in the speech of some children. Again, the process results in the collapsing of phonemic categories, and thus results in a simplification of the child's phonemic inventory.

In addition to resulting in a simplification of the phonemic inventory, note again that the processes of category collapse normally result in the substitution of phonetic elements which, it has been argued in the past, are easier for the child to produce than the phonetic elements for which he substitutes. So glides are presumably easier than liquids, voiceless final consonants are presumably easier than voiced final consonants, and initial stops are presumably easier than initial fricatives. Support for the claim that, for instance, liquids and fricatives are difficult for the child in initial position is provided by the fact that these are the same phonetic elements which are normally elimimated in the processes of cluster simplification. We certainly would not want to conclude that the parallelism between what happens in cluster simplification and between the kinds of elements which are substituted for in processes of category collapse is merely an accident.

I do not want to leave the impression that all of the pronunciations of child speech can be easily accounted for within a theory of simplification strategies. There are, for instance, certain relatively uncommon processes which we have not been able to handle within this framework to date.

Much of the information we have about these uncommon processes results from a study which we have on instability in child speech (Oller and Warren, 1973). We use the term "instability" to refer to variable pronunciation of the same word or the same string of words. It is very difficult to explain some of our instability data in terms of simplification. For instance, our children have frequently substituted various kinds of phonetic elements for the initial yod in the word "yeah." Sometimes they substitute a depalatalized high front

glide. On other occasions, they substitute a nasal consonant producing /dæ/. We might try to say that the child is merely avoiding the difficult palatal production substituting various phones for the element which he is trying to avoid, but if so, we would have difficulty explaining the fact that the same child is likely to produce a yod in place of /l/ in the word "light" ending up with a pronunciation /jəjt/. It is not my contention that we will never be able to explain these changes in terms of some strategy of simplification on the child's part; I am merely saying that at this point in time it is not obvious how we are to explain these changes in terms of simplification.

On the other hand, there are a whole set of processes which we have discovered which, although they look like just the opposite of simplification, can be shown to fit into general strategies of simplification. For example, in some cases the child will add a schwa vowel to the end of a word producing something like /dágə/ for "dog" or /rʌ́bə/ for "rub." In other cases, the child may insert a schwa between two consonants producing /bəlú/ for "blue" or /bəlǽk/ for "black." The first time we saw processes of this sort we were a little bewildered in the context of the hypothesis about simplification in child phonology. However, with a little closer look, it became obvious that the processes of vowel addition were indeed processes of simplification for the child. Since they resulted in production of syllable shapes for which the child had already indicated a preference in other processes. I pointed out before that the child seems to have a preference for the CV syllable shape as indicated by final consonant deletions and by cluster simplifications. The fact that a child says /bəlú/ instead of "blue" is a reflection of his preference for the CV syllable shape. The production of /bəlú/ is apparently easier for him than the production "blue," in spite of the fact that the former contains a larger number of phonetic elements. If the child does not insert a vowel, he will do something

else to change the cluster (drop out the /l/ or substitute a /w/ for it). The various processes fit into a general strategy on the child's part for avoiding certain kinds of consonant clusters.

In the example /dágə/ for "dog," the child adds a schwa vowel in order to avoid producing a final voiced consonant. We have already seen that children have a preference for voiceless final consonants and they often avoid voiced final consonants by substituting voiceless ones. The child's behavior indicates the existence of a general strategy for avoiding final voiced consonants. This strategy can be operationalized in two different processes, one of which devoices final consonants, the other of which adds a final vowel. We have investigated the phonologies of some children who manifest both of these processes simultaneously, i.e., one or the other of the processes applies to each adult form with a final voiced consonant. As in the case of the two cluster processes mentioned above, we have here two processes which are superficially quite different but which seem to be a part of a "conspiracy" (Kisseberth, 1970) to reach the common goal of avoiding certain kinds of structures.

Unfortunately, there are some additions in the child's speech which are not immediately accountable for in terms of a strategy of simplification. For instance, we have a child who produces the word "lamb" as /l̃æm̃m/ and "can" as /k̃æñn/. In fact, it is not terribly infrequent that we find syllable additions for which we have no obvious explanation. But certainly the most commonly described processes of the child's speech and the ones which occur with the most frequency are all processes which we can describe and explain in terms of the hypothesis of simplification.

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