

PHONOLOGICAL RULES IN THE LANGUAGE OF HUNGARIAN CHILDREN

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Barely five years ago, in summarizing the state of child phonology, McNeil pointed out that while some information had been accumulated on details of phonemic development, i e , on the emergence of the sound units of a language, especially in reference to Jakobson's theory, virtually nothing could be said at that point of phonological development, which implies the emergence of rules (1970 1130) In just half a decade this situation has obviously changed with the appearance of several detailed accounts of the phonological development of individual children (e g , Menn 1971, Vihman 1971, Smith 1973), as well as of reanalyses of previously published data (e g , Moskowitz 1970, Edwards 1973, Braine 1974) It is now widely recognized that as part of their grammar children have partially ordered phonological rules which express certain systematic regularities underlying what in traditional analyses appeared to be random substitutions of one surface segment for another The child strives for the adult model form, which is presumably his underlying form (though cf Kornfeld 1971), but acquires it only by successive approximations because of biological limitations that he is only gradually able to overcome (cf Drachman 1973, Salus & Salus 1974a) In this sense the main function of phonological rules is to simplify the child's output to a level of complexity consistent with his maturationally given phonetic capacity

Phonological rules not just simplify the child's input, however, but do so in a highly purposeful manner The simplification process may be goal-directed in several ways--for example, the reduction of a word's syllable structure to a primitive canonical form via the elimination of weak syllables points to the overriding semantic function of stressed syllables (cf Brown & Bellugi 1964) It is goal-directed, in particular, insofar as the substitution of one segment for another by the child tends to move

in the direction of desonorization, and this, in turn-- as I have argued in a recent paper (Kerek 1975)-- implies a ranking of the phonological 'strength' of segments, and of consonants especially, along a scale that corresponds closely to Jakobson's implicational hierarchy of phonemes (1968). Note that the facts of 'phonemic' and 'phonological' development, as McNeill defines them, are complementary, since the constraints on the order in which phonemes are acquired show up in the child's need for sound substitutions, and the systematic nature of substitutions is just what phonological rules are intended to capture. Thus, in effect, a convenient way to test Jakobson's theory is by studying the effect of children's phonological rules, preferably in a wide variety of languages.

In fact, one of the questions of current interest in child phonology is just how widespread the rules are that have been observed in a handful of languages, especially in English. Clearly, some significant rules are apparently not widespread at all and may pose a critical challenge to the Jakobsonian acquisitional order, such, for example, is the apparent preference of many English-speaking children for velar stops at the expense of front stops, i.e., for velarization as a substitution process (e.g., Menn 1971:246, Weeks 1974:51, also cf. Ferguson & Farwell 1975:435). There have also been some attempts at cross-linguistic generalizations, however. Ingram 1971, for example, cites as being common to a few languages rules for weak syllable deletion and reduplication, liquid, nasal, and s-cluster reduction, initial voicing and final devoicing, and certain types of assimilation. Salus & Salus 1974b add to these rules for spirantization, denasalization, depalatalization, and delateralization (for details of the last of these, see also Edwards 1973). Other apparently common rules include the deletion of initial and final consonants and the replacement of /r/, regardless of its precise phonetic quality (e.g., by deretroflexion, detrilling, etc.). Unfortunately, the range of languages shown by these studies to have such similarities is extremely narrow, besides English, Ingram cites data only from French and Czech, and Salus & Salus use in addition to these only a few forms from Estonian (from Vihman 1971) and German (from Leopold 1939),

although child language data from a score of languages, many of them non-Indo European, is available in print, if not necessarily easily accessible (cf Slobin 1973: 177)

A case in point is Hungarian. Information on Hungarian child language has been almost totally lacking in the Western linguistic literature, a brief note on phoneme acquisition by Molnár (1965) and MacWhinney's recent work (1974, 1975a, 1975b) go a long way in exhausting the list (for comprehensive summaries of Hungarian child language research, see also MacWhinney 1972 and to appear). Yet, a surprising amount of material is available from scattered and sometimes obscure sources published in Hungarian within the past 100 years, a sampling of which--the main sources for this paper--is given in the bibliography below (see Balassa 1893, Thewrewk 1905, Vértés J 1905, Deme 1943, Vértés O 1953, Meggyes 1971). Part of my purpose here is to make some of this material available, though in a reinterpreted form, more importantly, in such a form the data provides strong support for the cross-linguistic generality of most of the rules cited above--precisely those that are 'goal-directed' in the sense previously defined. Some Hungarian children, in fact, have rules that only magnify, in an interesting way, the purposefulness of phonological rules.

In analyzing children's speech, and especially a large corpus representing the speech of several children of language acquisition age, one is confronted, though not equally, by essentially two types of forms. Some output forms almost defy analysis. For example, a little Hungarian girl named Olga /olga/ pronounced her name [omba] (Vértés J 23). In one plausible interpretation the velar stop was replaced by a labial, and the liquid by a homorganic nasal which then regressively assimilated to the labial stop, yielding [omba]. There may be other possibilities. The trouble with this particular analysis is that it requires at least one rule for which no other evidence exists: no velar stop ever becomes a labial or no liquid becomes a nasal in the speech of any of these children. Thus the solution is bound to be ad hoc. On the other hand, a series of substitutions that at first appears

idiosyncratic often turns out to reflect entirely general processes. Thewrewk's grandchild (398) used the adult word víz /v₁ z/ 'water' to refer to 'wine', pronouncing it as [debe]. This is a puzzling output. Yet the derivation is quite straightforward: other than the change involving the vowel, which will be ignored here and subsequently for the sake of simplicity, the child (1) adjusted the syllable structure to its favored CVCV form ([veze]), (2) plosivized both of the spirants ([bede]), and (3) moved the favored stop to the front by metathesis ([debe]). It is highly significant that of the several hundred items that have been analyzed, none is as severely idiosyncratic as [omba], and only very few are nearly so, rather, with the exception of a handful of such isolated cases, a small set of rules such as those generating [debe] accounts for the phonetic forms produced by all the children involved.

Note that there is no question that rules and not unanalyzeable substitutions are involved here. By traditional substitution analysis, which appeals only to surface segments, the substitutions /d/ for /v/ and /b/ for /z/ would have to be assumed for the change /v₁ z/ → /debe/. Or, if metathesis is taken into account, /b/ for /v/ and /d/ for /z/. But in this framework there is no reason to expect these particular changes, rather than some others. Another child (Balassa's son) also had /b/ for /v/, luckily even in another derivative of the same word /vize/ '(its) water' → /bize/, among many others, but Meggyes's daughter pronounced still another suffixed form of the same root, /v₁ zbe/ 'into water,' as /misbe/, thus implying the substitutions /v/ → /m/, and /z/ → /s/ (12). If they are taken to be surface replacements of one unanalyzeable segment for another, these substitutions appear quite ad hoc and unmotivated. If, however, they are analyzed into distinct component processes which apply cumulatively (cf. Smith 1973, Stampe 1973 11, Salus & Salus 1974b 34) and simply result in the actual surface substitutions, their systematic character becomes obvious (I shall assume for our purpose that all rules are optional).

<u>/vi z/</u>			INPUT
bVd-	bVz-	bVz-	stopping
	mVz-		nasalization
dVb-			metathesis
	mVs-		devoicing
[debe]	[misbe]	[bize]	OUTPUT example

Note that different children arrive at vastly different renderings of the same input by drawing from the same inventory of rules, for any Hungarian child, it seems, only certain rules are possible, others are not

This repertoire is made up of rules that can be grouped into roughly four sets some rules reshape syllables, others change manner of articulation features, a third set alter place of articulation features, and a fourth one harmonizes segments, although sometimes these functions overlap.

Weak syllable deletion commonly results in the elimination of all unstressed syllables except the one immediately following the stressed syllable, which is always the initial syllable in Hungarian /katona/ 'soldier' → [tato], /ešernyo/ 'umbrella' → [eše], /kosonom/ 'thank you' → [toso], /gestenyve/ 'chestnut' → [deste], /mošakod-/ 'wash oneself' → [mošša]. Sometimes the deleted syllable is a definite article /az + erke j/ 'the balcony' → [t^serke j], /az + apa/ 'the father' → [t^sapa], /az + inge/ 'his shirt' → [d^zingejje]. This rule may also interact with reduplication /na ndor/ (proper name) → [na na]. Interestingly, the reduplicative tendency shows up most clearly in a nasal epenthesis rule, which many children have /függönj/ 'curtain' → [füngön], /mansetta/ 'cuffs' → [mančenta], /adYdYon/ 'give me' → ([anYdYdYon] →) [anYdYon]. Often nasal epenthesis co-occurs with the epenthesis of a homorganic stop, the two rules complementing each other in successive syllables /katona/ 'soldier' → [tantonda], /anYuka/ 'mommy' → [antunta]. An interesting case is /žebkendő je/ 'his handkerchief' → [enkento je], this is similar to the derivation of [omba], which was discussed earlier, except here the nasalization is regressively induced and is also

perfectly regular /b/ (by labial nasalization →) [m] (by place of articulation adjustment →) [n]. Some cases of nasal epenthesis appear to be uninduced /šegi t/ 'help' → [šekint], /piroš/ 'red' → [pilanč], /alsik/ 'he sleeps' → [alsink], /haragsik/ 'he is angry' → [halanksik]. While not implausible, the epenthesis in some of these cases may also be the result of paradigmatic influence (cf /alsik/ 'he sleeps' vs /alsunk/ 'we sleep'). Finally, nasal epenthesis may also occur to fill a hiatus between two vowels (/mi + ez/ 'what is this?' → [mines]), again the effect being a reshaping of the syllable structure to conform to the favored alternation of consonants and vowels.

The same function is served, furthermore, by various cluster reduction rules, which simplify consonant combinations to a single consonant. Liquid cluster reduction occurs in the speech of every child (/frizura/ 'hairdo' → [fizula], /drunči/ (proper name) → [dunt^sɪ], /trombita lok/ 'I blow a trumpet' → [tombita lok], /elvisi/ 'he takes it away' → [e bisɪ], /repulnek/ 'they fly' → [jepunek]), and only exceptionally fails to assert itself. For example, the rule is weak in Olga's language, as shown by outputs such as /kre ta/ 'chalk' → [le ta] and /krumpli/ 'potato' → [lumpɪ], but she also had /krajtsa r/ 'penny' → [tajtsa r], where the rule did apply. It is tempting to speculate that in the case of /kre ta/ and /krumpli/ liquid deletion did not 'fail,' but that it was preceded by the develarization of the initial /k/ to /t/ (cf [tajtsa r]), thus yielding the cluster *tɪ-/ which, however, was blocked by a general syllable structure constraint and was thus reduced in an unusual way. Balassa's son rendered /krajtsa r/ as [kajtsa r], without develarization, and /krumpli/ as [pumpɪ], both showing the loss of a liquid from clusters, but retained the liquid where it clusters with a sibilant spirant /šlajfni/ 'drawer' → [lajfni], /šro fol/ 'he drives in the screw' → [ro fol], since the spirant is dropped from clusters before a voiceless stop (/škatuja/ 'box' → [katuja], /šponvdva/ 'sponge' → [ponvdva]), spirant cluster reduction can be assumed to be ordered before liquid cluster reduction.

/frizura/ /šro fol/ /škатуja/

- ro fol katuja S-cluster reduction
 fizura - - L-cluster reduction

There are also occasional instances of nasal cluster reduction, e g , /ba ntotta/ 'he hurt her' → [ba totta], /aludni/ 'to sleep' → [ajudi], 'kon^yvečke/ 'little book' → [kovečke] Note that these cluster reduction rules are precisely those cited earlier as being common to other languages

Further simplification of a word's shape is achieved by the deletion of initial and final consonants. Prevocalic initial consonant deletion, also observed by Menn (1971), for example, seems to be limited almost exclusively to spirants, which tend to be among the late sounds to be learned (/hu š/ 'meat' → [uš], /še ta lni/ 'to walk' → [e ta ni], /ho kaba t/ 'snow jacket' → [o kaba t], /zold/ 'green' → [o d], /zongora/ 'piano' → [ongoja], /šuteme n^y/ 'pastry' → [utame], /hol/ 'where' → [ol], /jo žika/ 'little Joe' → [o žita]) Final consonant deletion is even more common, and appears to favor liquids, Meggyes's daughter limits the rule almost totally to these (e g , /engedd + el/ 'let it go' → [engedde], /rajzol/ 'he draws' → [rajzu], /t^seruza t + ke r/ 'he wants a pencil' → [teluza ke], /me r(t) + pišilte l + be/ 'why did you wet your pants?' → [me pišite be] (this could also be a case of liquid cluster simplification), or /ja t^st^sol/ 'are you playing?' → [la t^st^so], which suggests that the final consonant was dropped after regressive l-assimilation (if we discount the possibility of context-free lateralization) For other children too, liquids seem to be the favorite final consonant to be dropped, Balassa's son drops them twice as often as the runner-up stops This is interesting in view of Moskowitz's finding that stops "are deleted one-and-a-half times as frequently as non-stop consonants in final position" (429) The Hungarian data clearly does not support this observation

Perhaps the most interesting means of simplifying the structure of a word used by Hungarian children but not often noted for other languages is metathesis this rule almost always moves the highest-ranking

consonant to the psychologically crucial initial position or at least toward the front of the word, "ranking" being a function of the relative order of acquisition, and hence presumably of relative ease of articulation, roughly as predicted by Jakobson's hypothesis. Thus, among many other examples cited especially by Deme (50) and Vértés 0 (19), /gomb/ 'button' → [bɔŋg], /pe k/ 'baker' → [ke p], /aranʋoš/ 'dear' → [anʋaros], /palacinta/ 'pancake' → [pačalinta], /na špa ngol/ 'spank' → [pa šna ngol], /te likaba t/ 'winter jacket' → [te libaka t]. Incidentally, the metathesis rule often proves useful in helping to determine the relative ordering of rules. Thus Balassa's son gave [tʏuka], [tʏutʏa], and [tutʏa] for /kutʏa/ 'dog'. Since there is no velarization rule in Hungarian, [tʏuka] can only be derived by the metathesis rule applying before progressive assimilation ([tʏutʏa]) and subsequent depalatalization ([tutʏa]). Similarly, given the reported outputs [tʏukoj], [tʏutoj], and [tutʏoj] for /tʏukor/ 'sugar', metathesis must apply after both detripping (i e, /r/ → [j]) and develarization

/kutʏa/		/tʏukor/	
		[tʏukoj]	tʏukoj tʏukoj det
		-	[tʏutoj] tʏutoj dev
[tʏuka]	tʏuka tʏuka	-	[tutʏoj] met
-	[tʏutʏa] tʏutʏa		pro
	-		[tutʏa] dep

(det = detripping, dev = develarization, met = metathesis, pro = progressive assimilation, and dep = depalatalization)

A second major class of rules alter manner-of-articulation features of the child's input, except for nasalization and denasalization, both of which occur (as predicted by Jakobson), all the rules imply unidirectional processes. Denasalization is relatively rare (/nʏusi/ 'bunny rabbit' ([musi] →) → [busi], /marianka/ (name) → [barianka]), while most instances of nasalization presuppose prior stopping, particularly of the change /v/ → [b] /vačora/ 'supper' → [mačola],

/villanʲ/ 'light' → [millanʲ], /vidʲa zʲ/ 'be careful'
 → [mida ss], /bajusa/ 'his mustache' → [majusa]), and
 often overlap with nasal assimilation (/kõnʲvek/
 'books' → [kõnʲmek], /hova + me dʲ/ 'where are you
 going?' → [homa me dʲ], /benne + van + a + matʲika/
 'Marty is in it' → [mennemanamatʲika] The rest of
 the rules are nonreversible there is a rule for
plosivization, which changes continuant obstruants to
 noncontinuants, but there is no rule with the opposite
 effect /vira g/ 'flower' → [bija g], /sappan/ 'soap'
 → [tʲsappan], /hu zʲa/ 'pull it' → [hu dʲdʲa], /fa zik/
 'he is cold' → [pa zik], /sa ja/ 'his mouth' → [ta ja],
 /jo ži/ 'Joe' → [dʲo zi] Note that plosivization
 includes both stopping and affrication Secondly,
detrilling eliminates /r/, but no rule ever assigns
 /r/, the result is generally /l/, which may further
 undergo delateralization to /j/ (for recent additional
 evidence from Hungarian, cf Asztalos & Szende 1975)
 /ördog/ 'devil' → [ojdod], /rendeš/ 'neat' → [lendes],
 /dʲere/ 'come on!' → [dele] Finally, and perhaps most
 interestingly, a devoicing rule devoices not only final
 obstruants (/gomb/ 'button' → [gomp], /mama hoz/ 'to
 mommy' → [mama jos]), which would be expected, but in
 at least one child (Meggyes) applies in a wide variety
 of contexts, including even initial position! Thus
 /kõnʲvet/ 'book (obj)' → [konfet], /megvan/ 'here it
 is' → [mekfan], /megne zʲuk/ 'we'll look at it' →
 [metne ssuk], /az + apa/ 'the father' → ([sapa] →
 [tʲsapa], /dʲoršan/ 'quickly' → [tʲolsan] Whether
 this large-scale context-free 'unmarking' in this
 child's language is an isolated phenomenon remains to
 be seen, it may not be wholly coincidental, though, that
initial voicing, which occurs in some other languages,
 is almost totally absent in this data

The third major group of rules change place of
 articulation features Again, the processes are uni-
 directional, furthermore, other than no more than a
 couple of idiosyncratic cases of labialization in the
 corpus (e g, /olga/ → [omba], and /nʲusi/ → [musi],
 both already cited), all roads seem to lead to dentals
 For Hungarian children, dental stops are the optimal
 consonants This observation supports that made by
 Drachman & Drachman (1973 104), who suggest, on the

basis of data from Greek, that "the archi-status of p [may have] been exaggerated "

In Hungarian child language dentalization takes three forms Meggyes's child had a rule changing /f/ → /s/, e g /fekete/ 'black' → [sekete], /frizura/ 'hairdo' → [sizula] The same rule seems to operate as an intermediate stage in the derivations /fiju/ 'boy' → [t^silu], and /fa zik/ 'he is cold' → [t^sa zit] The other two dentalizing rules are extremely general Depalatalization affects every palatal, the only occasional reversal involves [s] and [š], and is probably limited to the stage where these two phones do not yet have independent phonemic status and are still in free variation Examples /ba či/ 'man' → [ba t^si], /pišta/ 'Steve' → [pišta], /jo ži/ 'Joe' → [jo zi], /kon^yha/ 'kitchen' → [konha] (eventually [no na]), /findža/ 'cup' → [findža], /ninč/ 'isn't' → [nint^s], /ud^yeš/ 'smart' → [udes], /kest^yu t/ 'glove (obj)' → [kestet] The number of dental stops in these children's language is also increased substantially by develarization, which changes velar stops to dental stops /igen/ 'yes' → [iden], /me rgeš/ 'angry' → [me jdes], /ka ve/ 'coffee' → [ta ve], and so on, often via regressive assimilation /katona/ 'soldier' → [tatona], /kettő/ 'two' → [tetto]

Harmonization both within and across words is the last major group of simplification processes It is noteworthy that progressive assimilation, while not at all uncommon in other languages, is extremely limited in the language of Hungarian children, I have found only a handful of clear cases /mariška/ 'Mary' → [man^yišta], /levessük/ 'we'll take it down' → [lelessük], /ma rtika nak + a + villan^ya/ 'Marty's light' → [ma rtika naka millan^ya], /ma šik + soba ba/ 'into the other room' → [ma šik čoba ba], /kut^ya/ 'dog' (→ [t^yuka]) → [t^yut^ya] In some instances progressive assimilation and develarization appear to conspire to effect the desired output /ördög/ 'devil' → [ojdod], /patika š/ 'pharmacist' → [patita š] On the other hand, regressive assimilation is evidenced amply in the speech of every child, affecting both adjacent segments (/alma/ 'apple' → [amma], /hol + van/ 'where is it?' → [huvvan], /esti/ 'Esther' → [etti]) and distant ones,

especially the latter /ša mli/ 'stool' → [ma mli], /ninč + šemmi/ 'there isn't anything' → [ninčemmi], /la mpa/ 'light' → [pa mpa], /te + kis + tsipó/ 'you little shoe' → [kekist^sipó], /benne + van + a + matsika/ 'Marty is in it' → [mennemanamatsika], /hova + me dJ/ 'where are you going?' → [homa me dJ] Partial regressive assimilation, where only some feature and not the entire segment is copied, is quite rare /könYv/ 'book' → [bomv], /kefe/ 'brush' → [pefe], /dyufa/ 'match' → [pufa], /žebkendö je/ 'his handkerchief' → ([žemkendö je] → [enkendo je] Regressive consonant assimilation has a high functional load in Hungarian child language because it appears to be a low-level rule directly fed by a number of other rules for example, by detrilling (/poha r/ 'glass' → [poha l] → [pola l]), by depalatalization (/kon^hha/ 'kitchen' → [ko n^hja] → [ko na] → [no na]), by nasalization (/van/ 'is' → [ban] → [man] → [nan]), by plosivization (/könYv/ 'book' → [könYb] → [komb] → (eventually) [böm] Since several other partial orderings occur (such as those noted above), regressive assimilation is actually fed indirectly by most of the rules That this rule is so predominant in the language of these children is interesting also in view of the fact that most (and possibly all) consonant assimilation processes in adult Hungarian are also regressive, although the particular rules themselves are of course not necessarily the same Does this suggest that the child somehow extracts some overriding phonological tendencies from his input long before he learns the precise rules by which those tendencies are normally realized?

What does all this data mean? The evidence seems to point unmistakably towards a purposeful simplification of adult forms, the same purposefulness that can be observed in other child languages With the possible exception of spirantization and of initial voicing, for each of which I found only one example (/hatYtYu/ 'swan' → [zatYtYu], /fa/ 'tree' → [va]), Hungarian children have all the rules cited in the cross-linguistic studies mentioned above, in addition to some other rules Besides harmonizing segments and simplifying syllable structure, for which the motivation is obvious, the main collective thrust of these rules is to achieve optimal desonorization, i e ,

unmarking the rules change voiced to voiceless, palatal and velar to dental, continuant to stop and affricate to stop, and /r/ to /l/ or /j/, but not the other way around, thus lending strong support to the theory of 'irreversible solidarity.'

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