

Studies in the Acquisition of Greek as a Native Language:
I. Some Preliminary Findings on Phonology¹

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Abstract

This paper discusses some preliminary findings from a 'pilot' study of the acquisition of phonology by normal Greek children in a monolingual environment in Athens, Greece, and draws on data elicited by the authors during the summer of 1971 from children of from 24 months to 9 years of age.

The five topics treated concern (1) the problem of observational adequacy in the transcription of child language, (2) the developmental disruption of the syntactic function of suprasegmentals, (3) the 'primacy' of the labial stop, (4) child speech-production and the migration of Features, segments, and syllables, and (5) the acquisition of external sandhi and the reinterpretation of the Greek stops.

1. The problem of observational adequacy in the transcription of child-language

Fairly frequent and sometimes glaring inconsistencies in transcribing from the same tape from one day to the next have convinced us that we have no adequate orthography for child language, but also that there is a serious problem--one on which there seem to have been few experimental studies (but cf. Menyuk and Klatt, 1968; Kornfeld, 1971)--in the adult perception of child speech.

Both Peterson and Barney (1952) and Lehiste and Meltzer (1971) did in fact include child vowels in their investigations--although those studies were conducted for other ends than the direct investigation of adult perception of child vowels. Analysis of the Lehiste and Meltzer data in particular shows that adult listeners may seriously mis-label certain child vowels listened to in isolation; thus [i, ʌ, and ɔ] are often heard as [u], and [u] is often heard as [a], misidentifications which can hardly be dismissed on the ground of dialect differences between speaker and hearers.

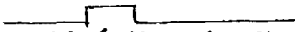
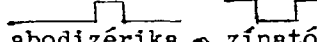
Now while it is quite unclear why perception tests should give such results, we have for the moment the fact that vowels vary a great deal in their relative identifiability, the more so when an adult identifies a child's vowels; and we must wonder, correspondingly, whether a child's consonants are in fact any more easily identifiable to an adult. The problem may be compared to some extent to that of listening to a strange dialect or foreign language, and is to that extent parallel to the problem of what


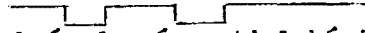
happens to loan words: the heard segments, both in their own right and in their sequential relations, are interpreted and stored in terms of the morpheme structure conditions and phonological rules of the listener's language (cf. Hyman, 1970). However, the added, and perhaps the most important dimension here is that there is also the assumption of homology of production: should this assumption prove unjustified, the misidentifications of child segments by adults would be unpredictable in any systematic sense. It is important to note that such an outcome would seriously call in question the possibility of showing that any particular heard child substitution in fact bears a particular rule-relation to the putative corresponding adult segment.


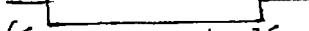
2. Developmental disruption of the syntactic function of suprasegmentals

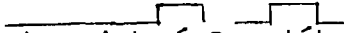

It is well known (e.g., Lieberman, 1967; Kaplan, 1970) that the child responds early to suprasegmental qualities of speech such as intonation and emphasis. Thirty-three month old Maria had learned by heart a seven-line poem. Now while it is unlikely that she understood the meaning of the poem at all well,² Maria delivered it with near perfect preservation of the rhythm, intonation and syllabication.

We contrast this with the case of Elena. At 42 months old, Elena is very far ahead of Maria in general speech ability, at least so far as production is concerned; Elena chatters quite intelligibly all the time, and can converse in quite complex sentences of some length. Yet she has run into serious trouble in her control of breath-groups and intonation. This shows itself in at least five ways, as follows.

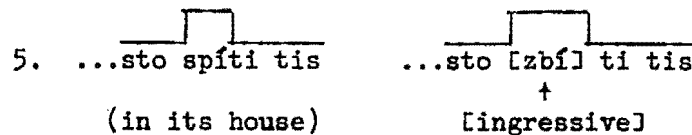
1.  + 

(It's one of Erika's)
2.  + 

(It's cooking in the basin)
3.  + 

(I don't know what it's called)
4.  + 

(on the left one, on this one)



She may fail to lower the pitch on an unstressed syllable, as in sentence (1). Alternatively, she shows pitch assimilation of a word-final unstressed syllable to a following stressed syllable, as in sentence (2). Pitch frequently rises in sentence-final position in declarative sentences, as in sentence (3).³ Pitch contours may even break across constituent boundaries: in sentence (4), not only has the preposition *se* been moved into the following constituent, but its vowel has undergone assimilation to the stressed syllable of the following deictic *túto*.⁴ Finally, as sentence (5) illustrates, Elena sometimes speaks syllables, words, or even whole phrases on ingoing breath--in her desperate attempts not to break across syntactic units to take breath.

It is apparently the case that, as for other abilities in the growing child, maturation problems can arise for the suprasegmental qualities of speech: though determined semantically and syntactically, the intonation and stress patterns may at some stage of integration not conserve constituent structure as they did earlier (as in the case of Maria's poem) and will again later in maturer speech.⁵

3. On the primacy of the labial stop.

During the acquisition period, children characteristically pass through a short period when the only stop they can pronounce is *p*. On the basis of the commonness of this phenomenon, taken in conjunction with the psycho-physical and acoustical theories of Stumpf and Köhler, as well as data from aphasia, Jakobson (1941) proclaimed the priority of the labial consonants and the *a*-vowel, a priority re-asserted in Jakobson-Halle (1956).

With the advent of generative phonology in the 60's, the moderating claims of developmental physiology advanced by scholars such as Leopold (1947) were soon quite overlooked, and psycholinguists continued to accept the Jakobsonian hypothesis as dogma. In particular, no serious attempt was made to explain why, if the systemic pressures were so very strong, there should ever be exceptions at all.

Consider the data for the child Maria. At 33 months, Maria had *t/d* for most instances of adult *p/b* (1a below) and *k/g* (1b below), despite the presence of *m* (1c below). The few examples of labials or velars occur in very constrained environments (2-3 below), environments which--perhaps not coincidentally--are largely common for the two stops.⁶

- | | |
|----------------------|----------|
| 1. a. pétros → tétos | (Peter) |
| pirúni → tulúni | (fork) |
| pará@iro → talátilo | (window) |
| kanapé → tanaté | (couch) |

- | | | |
|----|---------------------------------------------------------------------------------|-----------------------------------------------|
| b. | e _k íno → etíno | (that one) |
| | kumbiá → tũdá | (buttons) |
| | psematák _ɲ ia → tematáta | (lies) |
| c. | mitúla → mitúla | (nose) |
| | psematák _ɲ ia → tematáta ⁷ | (lie) |
| 2. | a. bébis, babá, pipí,
pópi, papá, papíta | (baby, daddy, dress,
Popi, shoe, "Papita") |
| | b. kokoríkos → kokolíkos | (cockerel) |
| 3. | a. epíóí → epilí
periméni → peliméni
- teneméni | (because)
(he waits) |
| | b. s _k ilákí → kílákí
- tilákí
karékla → kaléta
xalí → kalí | (puppy)

(chair)
(carpet) |
| 4. | a. píta → píta
sayapó → tadapó | (pie)
(I love you) |
| | b. déka → déka | (ten) |

At least two (mutually exclusive) explanations suggest themselves for this data. The first is that Maria indeed had p and even perhaps k at an earlier stage, that massive Dentalization has recently occurred, and that the instances of p and k constitute 'survivals'. As a sub-alternative, one might even suppose that Dentalization is not one rule but two--consider languages like Tillamook and Tlingit, which lack labials; and the Slovenian dialects of Carinthia which (Jakobson 1941 informs us) lack velars--and one could imagine the coincidence whereby Maria has adopted both rules.

But the opposite explanation is equally viable, viz., that Maria did not in fact have p or k at an earlier stage, even though she had m--and that the instances of p and k thus constitute 'emerging' environments for these segments.

The late appearance of k is of course not what is unusual: it is the absence of p, the archi-stop--in fact, the archi-consonant. Yet it may well be that the archi-status of p has been exaggerated. Certainly, a physiological model for phonological acquisition (e.g., Drachman, 1970) need give the tongue-tip closure no lesser status than the bilabial one--the tongue tip is indeed a very flexible and fast-moving organ, well endowed with feed-back fibres. Further, it is clear that what is in fact never lacking in the languages of the world is (not p, but) t.

We hazard the speculation, then, that t is at least the alternative and co-equal candidate for archi-stop with p. In reply to the question, which obviously follows, why there are not frequent cases in the acquisition literature of t as the first stop,⁸ the

following brief data are offered from Preyer (1889), Sigismund (in Preyer, 1889), and Taine (1877), in the belief that these were perhaps not the only examples before the case cited above.

Preyer: 14 months; mama, papa → ta-taf
15 months; away, gone → atta, ha-atta

Sigismund: to 16 months: papa, Ida → atta

Taine: 14 months, 3 weeks; papa, tem (first words)
also: mama, mia, wawa,
tete, dada
koko, kaka

4. The migration of features, segments and syllables in child speech-production

The central issue in child phonology has always been held to be the problem of systematic substitutions, a question that arises again seriously in the study of adult speech perhaps only for aphasia and certain speech defects. But there are aspects of speech production seen in exaggerated form in child speech which in fact recur--though only sporadically--in the speech of all normal adults. These sporadic instances of "take-over" by the tract are for adult speech known as 'slips of the tongue' (cf. Fromkin 1971) and are of two types. First, the anticipatory and inertial forces of co-articulation induce varying degrees of vowel and consonant assimilation (called Harmony). Second--though this may prove to be a special case of the discontinuous domain of the first type--the migration or copying of Features, segments, or even syllables, gives rise to metatheses often called Spoonerisms. Our data offer interesting varieties of both types for child language.

4.1. Vowel harmony

In the ongoing vowel gesture which has been held to constitute the substratum of the speech production process (Öhman, 1966; Perkell, 1969) we expect the unstressed vowels to be dominated by (and thus to assimilate to) adjacent stressed ones, whether by anticipation or inertia. This seems to be the physiological basis of vowel harmony in languages of the world, and we expect it to be an especially prevalent process in child language.

Examples are abundant up to the ages of 30 months or more, but there are some unexpected details.

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|----|---------------------|-----------|
| 1. | stoma → otomo | (mouth) |
| 2. | kuneláki → kulaláki | (rabbit) |
| | xelióni → tololóni | (swallow) |

- | | | |
|-----------|------------|-----------------|
| 3. fórema | → lólama | (dress) |
| yarífalo | → kayíkoko | (carnation) |
| si(ero | → lítoto | (electric iron) |

We find assimilation by anticipation to be the rule, although a rare case of inertial assimilation may be seen in the final vowel of 'mouth' in (1) above.⁹ Second, we find only rare examples in which the immediate domain of the stressed syllabic extends beyond one syllable--compare 'rabbit' with 'swallow' in (2) above. Third, it is not always the case that the stressed syllabic dominates--although it is usually true that an unstressed syllabic dominates only another unstressed one, as in the examples under (3) above.

At first sight, certain forms in the corpus for Thanasis (30 months) seem to contradict the claim above; i.e., they apparently illustrate the anticipatory assimilation of a stressed vowel under the dominance of an unstressed one, as in 'door', 'tongue', 'macaroni', and 'please' in (1) below.

- | | | |
|----------|------------|------------|
| 1. póрта | → páta | (door) |
| γλόσα | → γυλάς | (tongue) |
| makaróni | → makaRán | (macaroni) |
| parakaló | → parakalá | (please) |

Now this phenomenon occurs for Thanasis only with adult stressed [ó]. What is more it occurs also in the forms 'poor', 'at Lemos' (in (2) below), where the change to [a] can certainly not be attributed to vowel harmony, since the unstressed vowel is not [a].

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|-----------|-----------|------------|
| 2. ftoxós | → toxás | (poor) |
| sto Lemó | → sa Lemá | (at Lemós) |

However, when we compare also the forms for 'knife', 'hand', and 'teapot' ((3) below) it is clear that we have to do, not with an unrounding rule--as we might suspect from the forms in (1) and (2)--but with a more general rule lowering both mid-vowels under stress.

- | | | |
|----------------------|------------------------|----------|
| 3. maǰéri | → maǰéri | (knife) |
| ǰéri | → ǰéri | (hand) |
| t ^s ayéra | → t ^s ayéra | (teapot) |

Note how context-sensitive such a tendency is in child language: the lowering occurs only when [ó] is in a final syllable or when its syllable is flanked by syllables containing non-high or non-round vowels.¹⁰ Even then, its optimal environment--seen for the front vowel--appear to be the adjacency to [r], here apparently behaving as a laryngeal.¹¹

This analysis also disposes of some apparent cases of inertial assimilation for unstressed vowels, ((4) below) where unstressed [o] seems liable to lowering almost only in the optimal

environment--adjacency to [r].

- | | | |
|----|---------------------|------------|
| 4. | γάρδαρος → γάρδαλας | (donkey) |
| | κόκορας → κάκαλας | (cockerel) |
| | δένδρο → δένδρον | (tree) |

With a preceding stressed front vowel, on the other hand, [o] undergoes partial assimilation and is centralized to [ə], as the forms of (5) below illustrate:

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|----|--------------|----------|
| 5. | θείος → σείə | (uncle) |
| | κλέο → κλέə | (I weep) |
| | πίσο → πείə | (behind) |

The (five-vowel) Greek vowel system is a very simple one, compared with that for English. The present analysis shows that the child's route to the mastery of such a system may be more complex than that comparison suggests. It remains to be seen, however, whether the appearance of such a lowering rule is at all common during the acquisition of phonology by Greek children, or whether it is an example of individual variation.

4.2. Consonant harmony

While the most (developmentally) primitive form of consonant and vowel assimilation is the repetition of identical open syllables, we note that the inhibition of this dominance occurs first with the vowels; thus, consonant assimilation goes on later than does vowel harmony, and has more far-reaching results.

- | | | |
|----|----------------------|--------------|
| 1. | φιλιπάκι → παπάκι | (Philipaki) |
| 2. | γάλα → λάλα | (milk) |
| | λuluδάκι → lululάκι | (flower) |
| | μακαρόνι → μαμαρόνι | (macaroni) |
| 3. | γάγγονι → γαγγόνι | (bites) |
| 4. | βύκα → γύβα | (mouth) |
| | τσουγράνα → γυδάνα | (rake) |
| 5. | λαγυδάκι → γυλαβάκι | (rabbit) |
| | μικρόφωνο → κονίτοτο | (microphone) |
| | τσεκίρι → κτυίλι | (axe) |

For Chrissa (27 months) we see the name Philipaki as the last relic of syllable reduplication, in (1) above. Of course, this form might also be subsumed under a putative labial harmony--and we would thereby logically also set up Lateral, Nasal and other harmony types for forms such as those under (2) above.

Under (3) and (4) above are given forms illustrating so-called velar harmony. But there are complications: while for 'he bites'

the single process velar harmony is invoked (cf. gogi for English 'doggie') for 'mouth' and 'rake' two processes are to be supposed-- thus, velar harmony for the initial dental, then dissimilation for the second velar (as with the alternant godi for English 'doggie').

However, consider the forms under (5) above. At first sight, these too are candidates for velar harmony. But it would in fact require quite ad hoc rules (one per form) to adjust the output of the velar harmony rule to produce the correct forms. For instance, if layuóáki (rabbit) becomes yayuoáki by velar harmony, simple velar dissimilation ought then to produce (incorrect) yaóuáki, giving (equally incorrect) yavuváki--since interdental give labio-dentals for this child. Noticing that the vowels as well as the consonants are switched in place, we suggest that this is really an example of syllabic metathesis.

Similarly, if tsekúri 'axe' became kekúri by velar harmony and then ketúri by velar dissimilation, it would still require either a complex set of further assimilations or a switching rule to adjust the vowels--and again, syllabic metathesis is much the simpler solution.¹²

4.3. Prompted recall and 'slips of the tongue'

In interviewing children we were sometimes driven to prompt them, either to elicit a single utterance of a given word, or to elicit a repetition of (say) a mumbled one. We soon noticed that a second prompt following the child's prompted attempt often produced yet a second variant, and so on. On occasion, as many as eight variants were elicited in this somewhat maddening fashion, as the entry below under 'electric iron' attests.

1. <u>psiyío</u>	Spontaneous Prompted	<u>sibío</u> (refrigerator) <u>piyío</u> ~ <u>tiyío</u> ~ <u>s.kíp+to</u>
2. <u>elvetía</u>	Spontaneous Prompted	<u>eveltía</u> (Switzerland) <u>evletía</u> ~ <u>evetía</u> ~ <u>veltía</u> ~ <u>elveltía</u>
3. <u>sífero</u>	Spontaneous Prompted	<u>lítoto</u> (electric iron) <u>lítoro</u> ~ <u>?lít?oro</u> ~ <u>yíodo</u> ~ <u>líovo</u> ~ <u>yíyelo</u> ~ <u>yíyado</u> ~ <u>yíóolo</u> ~ <u>kí-óé-Ro</u>
4. <u>pondikáki</u>	Spontaneous Prompted	<u>kolíkoko</u> (mouse) <u>gokabé.to</u> ~ <u>gubadáki</u>

The reason why we persisted in this sometimes painful technique is simply that we realized that we could thus watch the operation of the child's Distinctive Feature system. A few preliminary remarks are in order, pending fuller analysis child by child.

First, not only segments but also single Features may migrate across words. The spontaneous form for 'refrigerator', sibío shows this; the stopedness and bilabiality of the initial [p]

migrate to the place of the medial [y], but take on the voicing of the latter. The prompted alternant tiyio in turn suggests that the same cluster may also be resolved in a segment taking the stopedness of the [p], but the place of articulation of the [s], thus, [t].¹³

The second form, 'Switzerland', shows the metathesis of single segments, as well as generating the suspicion that metathesis will sometimes operate by a copy-and-delete procedure, the copy stage of which is seen in the variant elveltia.

The forms for 'electric iron'¹⁴ and 'mouse',¹⁵ the complexities of which are not entirely clear, seem to involve mixtures of metathesis and assimilations.

Now it is not obvious that the construction of Feature-confusion matrices (e.g. Wickelgren, 1966;¹⁶ Klatt, 1967) would in the least illuminate the problems in forms such as those cited here, and one is tempted to conclude that the multiple processes involved may be recaptured only by series of ordered rules. But then neither is it obvious what is really implied by this latter claim either, for the cases in point; after all, the sets of processes we must postulate are hardly regular,¹⁷ as the fact of variation itself demonstrates.

Whatever the analyses, they must in the end account for the relation disclosed between sporadic processes in child language and similar processes, though surfacing much more sporadically, in adult 'slips of the tongue'.

4.4. Pronunciation improvement and intervention.

Although it was never our intention to attempt to improve the pronunciation of the subjects by repeated prompting, improvements did on occasion occur. It is obvious, however, that no systematic advance in pronunciation accompanied these word-specific improvements; on the contrary, even where the same word was elicited again later, a uniform regression to the first spontaneous shape was evident.¹⁸

It will be of interest, to take a rather weaker prediction, to see whether an 'improvement' foreshadowed (as it were) under prompting does in fact appear systematically shortly thereafter--as claimed, for instance, by Smith (1970).¹⁹

5. The acquisition of external sandhi and the reinterpretation of the Greek stops

It is reasonable to hold that the child's earliest perceptual representation of any given word of his language may well be a good deal less abstract than the one he will later require in order to account for complex relationships between certain sets of consonants or vowels--consider the consonants in the set corrode--corrosion--corrosive, or the vowels in the pair telegraph--telegraphy--and that the abduction of the appropriate

relational rules must be accompanied by the reinterpretation of the relevant segmental representations.

At a more nearly surface level, we shall hold for Greek that it is the proper operation of the rules for enclitic sandhi that in fact force the child to reinterpret his representation of the voiced and voiceless stops. But first, some facts about enclitic sandhi in Greek.

Taking only the simplest case,²⁰ Greek shows external sandhi between the final nasal of the Accusative enclitic particle and a following voiceless stop or continuant. The processes involved are simple, perhaps even universal tendencies of the vocal tract: the nasal is 'lost' before the continuant; with a stop, however, the nasal assimilates its point of articulation to that of the stop, while the latter assimilates to the nasal for voicing. Thus, using male names as examples:

	Nominative	o Pétros, O Tásos, O Kóstas, o Vàsilis, O Lákis
but	Accusative	tom betro, ton dáso, ton gósta, to vasíli, to láki

Part of the process of learning the rules will of course involve learning the constraints on them:²¹ the point at issue here is that the child must modify his representation of the stops if the rules are to operate at all, with minimal effort on his part.

The aspiration noted sporadically in the early production of voiceless stops by Greek children strongly suggests that the stops are Tense;²² and this is probably the direct explanation of the child forms corresponding to the above, for the early stage, i.e.,

Accusative: to pétro, to táso, to kósta, etc.

The tense stops will of course fail to assimilate to the preceding nasal for voicing, and will in fact provoke nasal-disposal only slightly less surely than will the continuants.²³

Our data show that some children have not completely mastered the adult sandhi rules even by the age of nine years. Clearly, however, from the time at which sandhi operates at least to the point of voicing a stop following a nasal,²⁴ we must assume that the relevant stops are Lax in articulation.

Now it may be argued that, while the representation of the rule-affected segments must be modified under the kind of rule-pressure exemplified by external sandhi here, the same segments in non-rule-guided environments are free to take the proffered 'free ride' or not.²⁵ In the present case, the child hears and now performs m+p as giving b or m+b in external sandhi: he is now free, it is suggested, to reinterpret those cases of morpheme-internal [mb] which alternate with [b], as underlying /mp/. Does the acquisition data support this notion?

Take first a child not yet producing sandhi-affectable forms at all. Chrisa has at 27 months only single-word utterances, and

thus of course only uninflected nouns; for her, then, the voiceless stops might have been Lax, or Tense, or even Tense and aspirated. She seems to have chosen Lax, however, as is seen from the fact that initial stops sometimes voice through, as in

pórta → bóta (door)

But note that Chrisa has certainly not yet reinterpreted medial [mb] as /mp/: for lámba 'lamp', she also has lá·ba, where the disposal of the nasal by assimilation to the preceding vowel has stranded a b, not a p.

Thanasis, older by three months, shows sandhi of the most advanced type, as in the correct stio guzína (in the kitchen). As predicted, he also seems to have reinterpreted word-internal [mb]; this is strongly suggested by his treatment of sóm̄ba (stove), which shows nasal disposal by vowel assimilation leaving a stranded p, in sá·pa.

On the other hand, the 40-month-old Alexis has clearly not yet reinterpreted his word-internal stops--as is seen from the form ékapé·de for ékapénde (fifteen) with stranded d after nasal assimilation--despite his use of sandhi. But in fact his sandhi shows the alternation of Tense and Lax for the voiceless stops, as in

Accusative ton dáso → to dáso - to táso (Taso)

an indication also evidenced in his occasionally aspirated stops, as in

yatúla → yat^húla (kitten).

Within the framework of the present argument, the only sure evidence adduced for word-initial reinterpretation of [mb] as /mp/ has been the occurrence of a stranded voiceless stop with lengthened preceding vowels. But the occurrence of medial N plus voiceless stop would of course be equally convincing; and Michael, aged 8 years, shows just such a form in

yígandos → yígantos (giant).

The acquisition data thus seem to support the view that it is the rules for enclitic sandhi that force the child to reinterpret the stops of Greek. This reinterpretation is at first applicable only to word-initial stops (the rule-guided environment), but probably begins to be fully mentalized and thus extended to word-medial stops²⁶ fairly early in the acquisition process, though at quite individual rhythms from child to child.

A last comment concerns the child's treatment of 'loan words'. Vasiliki is over 7 years old, and so far as 'native' words are concerned her data show assimilation of voicing after a nasal in external sandhi. Yet Vasiliki reacted to invented masculine

'foreign' names such as *Top* and *Kop* (containing final stops, not permitted in Greek) with (Accusative) to tóp and to kóp instead of the ton dóp and ton góp expected.

Such forms present us with an insight and a problem. The insight is that children probably recognize quite early what constitutes a native shape and what a foreign one: but why should they react to the foreign words by using what would seem to be the more far-reaching rules of a (developmentally) earlier stage?²⁷

One answer might be that the question is in fact ill-formed: if the word is recognized as foreign,²⁸ then perhaps its integrity must be preserved--an end most simply achieved by the disposal of the segment (the nasal) which would modify it.

Footnotes

1. This paper is slightly modified from that read at the December 1971 meeting of the Linguistic Society of America under the title 'Language acquisition in Greece: some preliminary findings.' The study on which this paper is based was partly supported by a Summer Grant-in-Aid awarded by the College of Humanities, the Ohio State University. We warmly thank the authorities and staff of the Greek Red Cross and PIKPA for access to children in the Asklipiion and Christodulakeion Day Care Centers in Athens, Greece.

2. The poem concerns the perhaps not everyday spectacle, for an Athenian child at least, of the encounter of a hedgehog with a vicious snake.

3. Cf. Pike (1949) for one explanation--an explanation which perhaps is less plausible here, considering the 'advanced' age of Elena.

4. The context makes this quite clear: Elena had hurt her own left leg.

5. Cf. the (controversial) case of disruption which concerns the conservation of quantity, in Mehler and Bever (1967), and the reply in Piaget (1968).

6. The examples in (4) are (the only occurring) exceptions.

7. As we expect, the dental nasal is also present, as in

neráki	→	neláki	(water)
ikónes	→	itóneh	(pictures)

8. The establishment of 'first stop' cannot, of course, be disassociated from the methodological problem of identifying the 'first word'.

9. C. P. (27 months) has here a prosthetic vowel, as also seen in alávi for lávi 'oil'. In otómo for stóma 'mouth', the bilabial nasal obviously also provokes rounding harmony.

10. Cf. ayóri 'boy'; and makaRán, for 'makaróni', where final *i* has been deleted.

11. As it did in certain dialects (e.g., Elean) of classical Greek, cf. Lejeune (1955).

12. The output, kuťáli, probably provides a genuine example of anticipatory vowel harmony in which the stressed syllabic is dominated by an unstressed one (Cf. section 4.1); but in fact this is the optimal environment, in which the unstressed vowel on each side provokes harmony of vowel height. The adult form tsekúri alternates, for many speakers, with tsikúri: but the form héré was a response to an adult tsekúri, as the tape confirms.

13. This might simply be [t] from [s] after cluster simplification (cf. siopí → topí); but compare also sófi 'Sophia' → ǵópi ~ ǵóki: sómba 'stove' → ǵómba ~ yómba ~ dómba.

14. The final prompted form is a shouted (exasperated) response, syllable by syllable.

15. The spontaneous form is unrelated to the proper adult form; it is probably related to adult kokoríko 'cockerel'.

16. That there is, on the other hand, a similarity between this prompted recall and the list-recall used for adults is startlingly brought out by an occasional case of interference by 'recency': unable to construct a relationship between adult sto mayazí 'at the shop' and the child's to maǵiláyi, we noted the previous question was tí pulái sto mayazí 'What does he sell at the shop?'; the words tí pulái seem to have been blended with the child's form mayayí 'shop'.

17. 'Irregular' here only means that a given set of rules does not always operate on a particular form; the context sensitivity of rules, already referred to, probably fluctuates at the early stage of acquisition.

18. Thus, 'refrigerator' (section 4.3, example 1) reverted quite firmly to the earliest (spontaneous) form, sibío.

19. The converse, that children who show little or no improvement under prompting remain behind their improveable peers, seems disconfirmed from the report of Templin (1966): lack of such improvement probably relates more to temporary reticence than to abnormally delayed language development.

20. Sandhi also applies with pronominal enclitics (see fn. 21), with the particles ǵen and min, with the numerals énan, mían, and with adverbials like an, san, prin, ótan, with greater or lesser degrees of freedom. For the long-standing controversy on the analysis of Modern Greek stops, see Householder (1964). For the analysis of the adult language assumed here, see especially Hamp (1961) and Newton (1961).

21. E.g., for the pronominal enclitics, loss of the nasal before continuant is optional for Feminine, but excluded for Masculine (which would otherwise merge with Neuter).

22. Tense can, of course, only be considered a cover-term at this time.

23. 'Nasal disposal' is intendedly a neutral term, since it is a moot point whether a rule called 'nasal loss' is really justified here.

The environment VNC seems to provoke vowel nasalization readily: best, when C is a voiceless continuant; slightly less

well, when C is a voiceless stop. The reason is that, since the velum is necessarily raised for an obstruent (ballistically for a stop, but under control for a continuant) it is lowered prematurely for the preceding nasal segment.

But if the velum-lowering is sufficiently early, the stop component may well be inhibited altogether; the time allotted to the nasal will be added to the preceding vowel, since that time is required in any case for the velum to rise again for the following consonant. Alternatively, however, the velum may be late in lowering: in this case, nasality itself may be lost, and the nasal stop may then assimilate to the following consonant both for manner and place of articulation.

For those languages that thus 'lose' nasals, it may prove to be the case that a) if the language possesses contrastive vowel length, then this will encourage disposal of the nasal 'to the left'--i.e. vowel-assimilation, while b) if a language tolerates geminates, this will encourage nasal disposal 'to the right', i.e. consonant assimilation.

Seen in this light, classical Greek (which had both conditions) was free to dispose of nasals in such environments in either manner.

Modern dialects that tolerate geminates are the 'peripheral' dialects; for example, those of the Eastern Aegean: of these dialects, Cypriot, Chios, and Carpathos dispose of the relevant nasal 'to the right' before continuants, while Carpathos does the same even before stops (Cf. Thumb, 1964). But the Standard language shows neither contrastive vowel length nor geminates; we thus expect that neither of the above results can appear as an output--a long vowel will always shorten, and a geminate will always simplify, with the result that a nasal will appear to be simply 'lost'. However, the underlying processes may well appear in child language, where we would predict that, while a geminate might not be tolerated for the early stages referred to, overlong vowels are common and would perhaps not be reshortened as in the adult language.

The child data mostly shows the expected adult result, i.e. apparent 'loss' of the nasal; but there are one or two cases also of lengthened preceding vowel, as predicted. Also as predicted, no cases of gemination appear--though it would be interesting to observe at what age Cypriot children (e.g.) acquire their geminate consonants.

24. The nasal is still optionally disposed of in the adult language.

25. Drachman (1971) argued that the likeliest strategy at such a point of forced change might be "Do what you must--but only where you must." It is that pessimistic suggestion which is perhaps challenged by the present case.

26. If it were true (pace Vennemann, 1971) that a segment not produced by a rule for contextual allophony is to be represented "as it is", then the kind of segment reinterpretation by generalization discussed here could not occur.

27. This is also a possible adult treatment of contemporary 'foreign' words--although there are names in Greek, mostly of

biblical origin, which are treated by adults as 'native' even though they contain 'forbidden' final consonants, e.g. γavrífl 'Gabriel', δαβιδ 'David', etc.

28. Both the occurrence of a non-permitted final consonant and the (English-based) aspiration of the initial stop are relevant.

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