LANGUAGE LEARNING STRATEGIES: DOES THE WHOLE EQUAL THE SUM OF THE PARTS?

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Two fundamentally different strategies may be employed by very young children learning their first language. The basic assumptions underlying the study of children's language development, however, have provided means for dealing with only one of these strategies: that which proceeds from the parts to the whole (Analytic). This paper reports on a child who evidently proceeded from the whole to the parts (Gestalt) in producing much of his early language. Since further evidence for a Gestalt strategy exists in the literature, albeit implicitly, such a strategy is probably quite widespread, and any theory of language or language acquisition needs to be able to account for it. It is also speculated that there may be neurological bases for the different language learning strategies.*

1. INTRODUCTION: ASSUMPTIONS ABOUT LANGUAGE LEARNING STRATEGIES. In studying the development of children's speech, what we find in our data is heavily influenced by what we expect to find on the basis of our theoretical preconceptions. In fact, how we handle the data of children's speech typically reflects the techniques we have already developed for handling linguistic data in general, especially data from normal adult speech. Often, however, there is a class of phenomena that do not fit our expectations, our descriptive techniques, or our theoretical constructs. I will call this the 'residue class'.

If the residue class remains a small proportion of the total data, we may ignore it while we deal with the more tractable data. The insights thus gained may shed light on the residue, showing us how it, or at least part of it, actually does fit our expectations. But if the residue class grows so large that we can neither ignore it, nor describe it within the current paradigm, then we are faced with the choice of either setting aside the data as unanalysable or drastically modifying our outlook.

In my research on the language acquisition of one child, I have come across a situation in which the residue class actually outweighs the data analysable in the standard ways. I propose to show that this phenomenon is actually more widespread than has heretofore been acknowledged, and that we may have to revise our expectations about how children learn language.

First, let me enumerate some of the assumptions that we have, sometimes tacitly, tended to make.

(1) We have assumed that it is appropriate to analyse the child's speech into the same kinds of units and levels into which we have found it profitable to analyse adult speech. Thus we look for distinctive features, phonemes, morphemes, words, immediate constituents etc.

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(2) We have expected language development to follow an orderly progression of stages from most simple to most complex. For example, in phonology Jakobson 1968 suggests that the child first learns one distinctive feature, then a second, and so on. In syntax it is assumed that the child first produces one-word utterances, then two-word utterances, and so on; developmental stages that have been observed in some children include Brown's stages based on utterance length (1973) and Scollon's vertical followed by horizontal constructions (1976). Implicit in this assumption is another assumption about what is 'simple'; e.g., a one-word utterance is considered 'simpler' than a two-word utterance.

(3) We have also assumed that language development follows essentially the same course in all children. This assumption underlies the tendency that persisted through the late 60's to generalize to all children the findings obtained from studies on a few individuals. Although several recent investigations (e.g. Bloom 1970, Nelson 1973, Ferguson & Farwell 1975) have turned up individual differences in language acquisition processes, there has not yet been a systematic effort to identify and study the various dimensions of individual variation. Instead, subjects have, with a few notable exceptions, been chosen on external criteria of convenience, e.g. closeness to home (children of linguists or their colleagues) or volubility (to minimize data-collecting time).

(4) One of the variables that has not yet been systematically explored is intelligibility. Some children are just more intelligible than others. We have tended to study only the more intelligible ones—the unintelligible children are assumed to be basically the same, but harder to work with. A consequence of this assumption is that most children who have been studied were either deliberately chosen for intelligibility (Brown, 51), or happened to be highly intelligible because of other circumstances. One such common circumstance is that of being the firstborn of linguists or other highly educated parents. Nelson 1973 shows in a longitudinal study of 18 children that such firstborn children tend to be 'referential' (see §3 below) in their language acquisition technique, an approach that generally results in greater intelligibillity. In any case, linguists have made little or no effort to seek out the more 'unintelligible' children for study.

(5) Finally, a related assumption which linguists have made is that, even in the speech of generally intelligible children, the unintelligible utterances play little, or at least no direct, part in the process of language acquisition, and can be safely ignored in its study.

I was led to examine these assumptions through struggling with data which I collected from what I will call an 'unintelligible' child—one who now, by age 3, seems to be talking normally, but who, during his second year, produced an extremely high proportion of utterances which I found unintelligible.[1] When I

[1] My impression is that his family understood the child considerably better than I did—though how much better I will never know, since at the time I did not make it a point to ask them systematically for interpretation of speech that I could not understand. My evidence for believing that they did, in fact, understand him fairly well (although not perfectly) comes from those situations in which his mother either spontaneously interpreted his speech for me or responded to his speech, which had seemed unintelligible to me, in such a way as to throw light on its possible meaning.

finally readjusted my preconceptions of what he was doing and listened to my tapes again, I began to make sense of many previously unintelligible utterances.

In making this readjustment, I had to confront the problem of how we decide what is 'only babbling' and what is 'real speech'. We tend to class an utterance as 'real' if we feel that it was INTENDED as real speech. But since we often cannot tell what the child intended, we fall back on what we think the child is capable of producing—i.e. on whether the utterance falls within an appropriate simplicity range. And this is where our unexamined assumptions about what is 'simple' get in the way: while it may be reasonable to suppose that a child begins with 'simple' utterances and builds up to 'more complex' ones, this does not necessarily mean beginning with SHORT clear utterances, and then building up to long clear ones. It might also include beginning with longish utterances which are only sketchily approximated, and then progressively filling in the details.

2. A CHILD WITH A DIFFERENT STRATEGY. The subject of my study, whom I shall call Minh, is the second of two children, both boys, of a family in which the mother has attended college and the father has a graduate degree. The mother, a Vietnamese, came to the U.S. when she was twelve years old. During the time of the study she spoke little Vietnamese to the boys, although they often heard her using it with friends and relatives. The father is Caucasian and was born in the mainland U.S. The family has many local friends in Hawaii, so the boys were exposed primarily to Standard English, secondarily to Hawaiian English and Vietnamese.[2]

Since I was originally interested in the transition from babbling to speech, I began my study when Minh was 7 months old—well before I could have made any judgments about his future intelligibility. I recorded him on a fairly regular basis (never more than one hour per week) until he was 2 years and 3 months old. The first 'speech' I recorded from him that did not appear to be babbling was imitations of adult speech, which first occurred at 7½ months. When Minh was 11 to 12 months old, I found not only imitated and modeled speech,[3] but also a few spontaneous utterances that sounded like appropriate words for the context in which they occurred, but which I was reluctant to judge as intentional because of their surprising complexity as well as their lack of recurrence. Examples of modeled utterances include:

[bu]	*boo*	
[dədə]	*doggie*	[0;11.23]

Spontaneous utterances include these:

[rɪkədæ]	*recorder*	
[kʰa]	*car*	
[tʰyɪkˑho]	*tickle*	[1;0.7]

[2] Hawaiian English includes several varieties, all of which differ phonologically from Standard English, and which in varying degrees differ syntactically and lexically from Standard English. The variety to which Minh has been primarily exposed is one syntactically close to Standard English.

[3] By 'modeled' speech I mean speech that the child MAY have imitated because an adult model for the utterance was present in the speech environment during the preceding few minutes. For a fuller discussion of modeled vs. imitated vs. spontaneous speech, see Scollon 1976.

When Minh was about 14 months old, he began to acquire a reliable repertoire of regularly recurring 'simple' words; e.g.,[4]

⟨ha⟩	*hot*
⟨gayi⟩	*doggie*
⟨gʊgʊ⟩	*cookie*; *eat*
⟨dædi⟩	*daddy*
⟨titi⟩	*to nurse*; *baby*

When he was 17 to 18 months old, Minh developed a frustratingly unintelligible style of speech which I labeled 'mush mouth'. He would occasionally use this style with me, though his mother claimed that he never used it with anyone else. By the time of my last recording he was still, to my ears, somewhat unintelligible; but his speech was quite fluent, and his family seemed to understand him most of the time.

Gradually I realized that Minh was actually producing at least two distinct kinds of speech. The first kind, the one I expected to find, was the nice, neat one-word utterance which began occurring in my data when he was about 14 months old. These early words were all one or two syllables long, and slowly increased both in number and in closeness to the adult target. I will call this kind of speech ANALYTIC.

Although I did not realize it at the time, the second type of speech was beginning to appear even earlier. (A special early case of this I have called 'learning the tune before the words'; Peters 1974). In this type, each target phrase has a very characteristic intonation contour. For example, each of the following phrases has a 'melody' unique enough so that it can be recognized even if rather badly mumbled:

uh-oh! [‾_]

look at that! [_ _↘]

oopsidaisy! [‾ ‾ _ _]

Mommy! [‾ _]

what's that? [_↘]

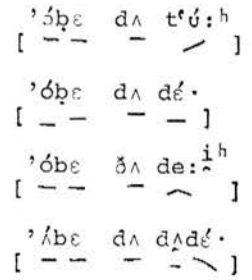
Minh regularly approximated each of these phrases by their intonation contours by the time he was 14 months old, having started as early as 11 months. These early TUNES, i.e. phrases approximated by their melodies, were fairly easy to recognize because they were all used quite frequently in speech to Minh, and because he used them so appropriately.

Minh also apparently attempted to extend this strategy of extracting the melody, at the expense of the individual segments, to those cases where the target sentence was NOT so reliably characterized by its intonation contour, and hence was not recognizable except in very context-bound situations.[5] The result was utterances

[4] Since Minh's pronunciation varied rather widely, I use angle brackets to indicate a 'reconstructed' underlying target form (an abstracted impressionistic average). For example, at around 14 months I find the following pronunciations of *cookie* (⟨gʊgʊ⟩): [kʰʊkʊ, gɪgə̤i, gʊgʊ, dɪdɪ, kʰʊgʊ, kʊki, kuki, gʊgi, gɪgi].

[5] Another way that this could be expressed is that, as Minh moved along the continuum from automatic toward more propositional speech, his strategy of extracting the melody was less successful. See Van Lancker 1975, ch. 9, for a discussion of automatic speech.

in which, although the segmental fidelity was not very great, the combination of number of syllables, stress, intonation, and such segments as could be distinguished combined to give a very good impression of sentencehood. I will call this the GESTALT type of speech, since like the Tunes (which it includes), it seems to aim at whole phrases or sentences rather than single words. For instance, at 14 months, when Minh seemed to have Analytic control of only 6 to 10 words, he quite clearly said *Open the door!* four times in succession:

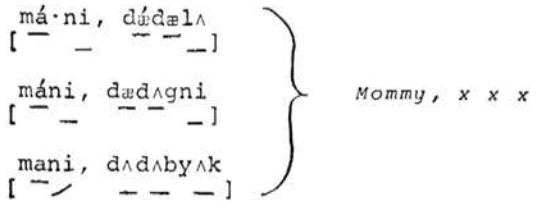


Since he was pounding on the bathroom door and shouting to his brother on the inside, it was quite clear what his target sentence was, even though he had not shown evidence of controlling any of the constituent words.

In some of Minh's early Tunes, in addition to fairly well-analysed parts, there were 'filler syllables' which seemed to be used as place-holders to fill out not yet analysed parts of a phrase. Thus, between 14 and 15 months, when something fell on the floor, Minh would exclaim:

⟨'ó 'o, dʌ dʌ dʌ⟩ *uh-oh, x x x.*

Or, one day he called for his mother:



[1;4.0]

These utterances were presumably aimed at targets heard from adults or his big brother in which one part was relatively fixed (e.g. *uh-oh!* or *Mommy!*), with the other part tending to vary depending on the particular situation (e.g. *uh-oh, fell down!*; *uh-oh, what happened?*; or *Mommy, I want you!*; *Mommy, come help me!*) The fixed parts were reproduced faithfully; but the variable parts seemed to be less well analysed, and were represented by place-holders like ⟨dʌdʌ⟩ and ⟨dʌdʌdʌ⟩.

By 17 months, Minh began putting another type of filler syllable in front of many of his one-word utterances. This syllable took various shapes, ranging over [nʌ], [ə̃], [m̩], [hɪ], [e], though it usually seemed to be of the form [ŋ] or [ɪŋ]. It seemed to mean something like *here*, *there*, *this*, or *where*. Thus,

ɪŋdædɪ — *where(?) daddy?*
[↘ – -]

ebibi — *that(?) baby.*
[˜ – ↘]

m̩bebɪ — *that(?) baby.*
[↘ ˜–] [1;5.0]

There was always a large proportion of Minh's speech which I was unable to understand. Week after week, I would return from recording with the frustrated feeling that I was missing most of what he said. It sounded so much as if it should mean something; and yet I rarely understood a thing, unless he happened to be naming pictures in a book. Sometimes his mother would come in, realizing that I was not understanding, and interpret for me—which helped, especially when I played the tape back at home. Sometimes while transcribing I would suddenly understand an utterance that I had entirely missed when he had originally said it, and so had failed to respond appropriately. I began to wonder if Minh felt frustrated when his speech was so often not understood. In retrospect, I think that he used his 'mush mouth' style of speech to express his exasperation at me for not understanding him. His mother would comment that he talked that way only when I came, and in relistening to one tape I found a clear pattern: when I would fail to understand several of Minh's utterances in a row, he would begin to talk very 'mushily'. Although there were times when his speech seemed to be unintelligible because of imperfect control or incomplete analysis of his target, it seems to me that, in the case of this 'mush mouth' speech, he was making a deliberate attempt to be unintelligible.

In working through some of my tapes again, I gradually began to realize that perhaps I had missed so much of what Minh said because it was in an unexpected form. Perhaps I had expected approximations to WORDS, but he had given me approximations to SENTENCES. Sure enough, in listening again, with a new set of expectations, I found many more understandable utterances than previously[6]—on one tape about five times as many, including such remarks as these:

'á lər ri gù mu nyai.
[– – – ‾ – ‾‾]
I like read Good Moon Night.
[= *Goodnight Moon*]

síli, ìnɪ?
[‾ _ ‾ _]
Silly, isn't it? [1;7.2]

I had failed to interpret these utterances at first because I was not expecting utterances of such length and complexity, and because the context did not make the

[6] Scollon has also discussed the phenomenon of an investigator gradually being able to 'stretch his understanding' to include previously unintelligible utterances. See Scollon 1973, 1976, especially the discussion of intelligibility.

meaning so obvious as in the *Open the door!* example. The increased proportion of understandable utterances was, nevertheless, still not more than half of what he said. I suspect that if I could have had Minh's mother interpret each tape for me, soon after it was made, I would have been able to make sense of even more of his speech. Unfortunately it was not convenient to arrange such sessions, and at the time I did not realize that such information would have made a tremendous difference to my project.

In retrospect, I think that a large proportion of Minh's speech was aimed at the production of whole sentences rather than at the more classical one-word, two-word, or three-word targets. In fact his mother spontaneously remarked to me, when Minh was about 21 months old [1;8.27 notes], that Minh was not content just to speak one word at a time; rather, he has always wanted to talk in complete sentences. To accomplish this, he seems to have tried to approximate the general gestalt of his target sentence, aiming at such features as number of syllables, intonation (including contours of both pitch and amplitude), as well as certain key segments.[7] His articulation of individual segments was, in general, not particularly clear or consistent, thus helping to explain my continued lack of comprehension. For instance, at 19 months he pronounced the word *horsie* (a word I could understand) in the following ways:

'ɪ xʌdɪ	*where horsie?*	
həsĩ	*horsie*	
xarsi	*horsie*	
ɪf xərsi	*this horsie*	
xatsi	*horsie*	
həˠ t'ɛ xasi	*where the horsie?*	
xɔsĩ	*horsie*	
hɪh həsi	*here horsie*	[1;7.2]

A further characteristic of Minh's two kinds of speech, the Analytic and the Gestalt, is that they were often correlated with a social setting; i.e., the strategy chosen for producing an utterance was related to the function of the utterance. Thus Analytic, clear, one-word-at-a-time speech was generally used in referential contexts: naming pictures in a book (*horsie*, *doggie*), labeling a quality (*hot*, *cool*), and naming a desired object or action (*cookie!*, *milk!*, *up!*) Gestalt speech, on the other hand, was used in more conversationally defined contexts: opening conversations/summonses (*What's that?*, *Uh-oh!*, *Mommy!*), playing with his brother (*Airplane go up*), requesting (rather than demanding) something (*I want milk*), and discussing objects sociably (rather than naming them) (*Silly*, *isn't it?*) I noticed that Minh used both speech styles when looking at books, either with me or with his mother. When he was merely naming pictures in a book, he tended to use one-word utterances (⟨t'ɪt'æ⟩ 'kitty cat') or simple extensions of them (⟨ŋgədi⟩ 'This/Here is doggie.') But sometimes he seemed to be trying to reproduce the gestalt of an adult reading aloud to him. In such cases his utterance length would increase, and

[7] There may be some evidence for this among second-language learners. Evangeline Dunbar reports (personal communication) that she is aware of having used such a strategy when speaking Japanese during her early days in Japan.

intonational factors would become very prominent. An early example of this occurred when Minh was 16½ months old and he was looking at a photograph album with pictures of his family—Mommy, Daddy, Baby, and Mema (the grandmother). Typical remarks include:

```
 ɛm     bébi dyɛm bébi
[ —      —  —  —  — ]
 where baby  x   baby?

 máni  ma       máni
[ —  —  —       —  — ]
 mommy where(?) mommy?

 hí       dædi  dǽdɛʰ
[ —        —  —  —  — ]
 where(?) daddy daddy?                    [1;4.21]
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Two weeks later, again looking at the photo album, he said:

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   ŋ́  hŋ dʌ́nɪ mímɪ bíbm̩ dǽdi
[  —   —  —  —  —  —  —  —  —]
there is  ?   mema baby daddy.  (?)       [1;5.0]
```

A later example of his 'reading' activity can be drawn from a tape made at 19 months when he was looking at the book *Hop on Pop*, at the point that includes 'We are all small', 'We are all tall', and 'We fight all night.' Some of his remarks include:

```
  bʌ wl̩ wi dɛʰ          What will we do.  (?)
[  —  —  —  \ ]

  hɪ pʿʌ pʿa            Hop on Pop.
[  —   —  — ]

  ʾɪ ʾo  du dn̩          Uh oh, fall down.
[  —  —  —  —]

  tɛ́m̩:  nádə           Tell 'em not to.
[  —   —  — ]                             [1;7.2]
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Not only did Minh try to approximate such adult linguistic activities as reading aloud, he also made very creditable attempts at sounding like he was counting, reciting the ABC's, and singing songs. For example, at 16 months, singing the ABC song:

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   æ yi  æ dɪ dɛ dɪ di
[  —  —  —  —  —  —  —]                   [1;4.7]
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The ABC song again, six months later, with a very good approximation of the tune:

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ʾe di vi i kʰi ʾi ʾi / ʾe: bi ʾalmano
[ —  —  —  —  —  —  —  ~~  —  —  —  —  ]  [1;10.23]
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Or, singing 'Davy Crockett' at 22 months:

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   dí: kwə̀kɪ ʾæ ʾæ ʾær di ʾǽr
[  —   —  —  —  —  —  —  —  ]              [1;10.23]
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Minh has always been a musical child. He loves to listen to music, to dance to it, and to try to produce it himself, either by singing or by playing on various instruments that come within his reach (including piano, recorder, harmonica, double bass, and guitar). I have on my tapes a number of recordings of Minh 'playing the piano', and by 22 months he could produce a very creditable gestalt of a piano piece, including clapping and bowing at the end!

3. OTHER EVIDENCE FOR GESTALT LANGUAGE. Although Minh's is, so far as I know, the first explicitly reported case of a child using a Gestalt strategy for early language production, there is implicit evidence in the literature that this strategy is actually much more widespread.

In discussions of children's babbling, of course, it is a commonplace that children seem to pick up and produce intonational patterns before they control other aspects of speech. For instance, Engel 1973 found the equivalent of Minh's Tunes in her son's early speech. She observes that 'the melodic factors appeared before the articulatory ones' (p. 10), and that even with a difficult word the stress and pitch were always right (11).

Minh's use of the preposed syllable ⟨ŋ⟩ is similar to the shwa element found by Bloom in the early constructions of all three children she investigated. Thus she describes Kathryn's /ə/ (at 21 months) as 'a grammatical place holder' in utterances such as 'ə try', 'ə see ball', 'Lois ɔ coming' (pp. 74–5). Gia's early use of shwa (at 19 months), she says (81–2),

> did not signal a particular contrastive meaning, and its interpretation was indeterminate . . . it appeared to represent the child's attempt to extend phonologically the limits of one word utterances.

The third child, Eric, used shwa more than either of the girls. At 19 months (Eric I), Bloom states (105):

> utterances that were longer than one morpheme were most often single words extended phonologically—right to left—with some phonetic element, which was most often /ə/.

At 20½ months (Eric II), the use of shwa in combination with nouns or verbs

> appeared to represent his linearly extending a monomorphemic element—perhaps in an effort superficially to duplicate syntactic speech—without either grammatical or semantic motivation (107).

Perhaps Eric, like Minh, was producing Gestalt as well as Analytic speech. It is possible that the use of stereotyped syllables, such as ⟨ə⟩, ⟨ŋ⟩ or ⟨dʌ⟩, to fill out the gestalt of a target utterance, is actually rather widespread, but has received inadequate attention because our theories have ignored holistic approaches to language acquisition and production.

Bloom also reports that a fairly high proportion of Eric's speech was 'unintelligible' at sampling times I (p. 105) and II (p. 106). She describes him (102) as producing

> extended strings of sounds with recognizable English sentence intonation patterns—but containing few intelligible words, if any . . . Eric's unintelligible production . . . appeared to represent an attempt at imitating the superficial, acoustic aspects of heard speech.

Although this description of Eric's speech seems to describe Minh's speech exactly, there may be a fundamental difference between the two. Bloom feels (personal communication) that Eric's unintelligible speech was not always an attempt at real

communication. For instance, he was content to play a 'dialog' game with her, in which they would take turns producing utterances with sentence-like intonation contours; and it did not seem to matter to him if what she said was nonsense (102). She was also unable to find any plausible targets for most of Eric's unintelligible speech. Minh, on the other hand, seemed to be really aiming at adult speech, since in going over his tapes carefully I often could find plausible targets for much of his previously unintelligible speech. Furthermore, his switch into 'mush mouth' style, after I repeatedly failed to understand him, suggests frustration at a failure to communicate.

Nelson 1973 has proposed a model for learning to talk which includes, as a major component, the child's conception of the primary purpose of language. Ten of the eighteen children she studied seemed to use language primarily to name things; these children she terms Referential. The other eight children used language more to express feelings, needs, and social forms; these children are termed Expressive (pp. 21–2). In a more recent paper (1975:462), Nelson states that the Expressive speakers

> learned and used a large number of phrases and sentences early in the language acquisition period, while the . . . Referential [speakers] did not—they could be described as progressing clearly from a one-word to a two-word stage whereas the Expressive speakers could not be so characterized.[8]

In looking through Nelson's sketches of language-learning histories for four Expressive speakers (1973), we find that they all used phrases as well as single words. Lisa, e.g., made some

> early productions . . . which were idiosyncratic and somewhat vague in reference. At 15 months she produced *not yet* and *see da ball*. She learned and used appropriately such expressions as *thank you, how are you, want a drink of water, that's a shoe*. (107)

A second child, Beth, 'learned words and phrases very readily', including *Good girl* and *You're kidding* (108). Mark was reported to use several 'place-holding' words in the many phrases he used, e.g. *Baby uh-uh*, *my uh-uh*, or *uh-uh down* (111). Robert also used a number of expressive phrases by 18 months, e.g. *What was that*, *There's Daddy*, and *Oh boy*, although his vocabulary 'did not reach the 50-word level until 23 months' (112). The difficulty in trying to infer Gestalt speech from such reports is that the linguist has described language acquisition almost entirely from an analytic point of view—looking at vocabulary counts and acquisition of analytic syntax and phonology, and tending to ignore the holistic attempts at communication, perhaps for lack of a theoretical framework into which to fit them. I look forward to reading more about Nelson's Expressive speakers.

In Minh's case, his language probably would have been labeled Expressive; but the interesting point is that he seems to have developed two distinct ways of talking, to correspond to the two functions that Nelson isolated: Analytic speech for referential (naming) situations, Gestalt speech for expressive (social control) situations. It is interesting to note that, in her earliest descriptions of these two classes

[8] After reading an earlier version of this paper, Nelson wrote me that my experience with Minh 'exactly replicated in many ways [her] own experience with some of the Expressive speakers, including their unintelligibility to [her] but not to mother, the complexity of their early productions, and getting the tune without the words.' But she was extremely cautious about making formal claims that went against the accepted wisdom at that time (late 60's).

of speakers, Nelson used the terms Word-learners and Sentence-learners (personal communication), focusing on a structural feature as the salient characteristic. Later she changed to the terms Referential and Expressive, which imply a functional orientation. Although I, too, initially noticed the same surface phenomena, I later came to view them in terms of processing strategies—Analytic vs. Gestalt. These three characterizations may turn out to be facets of some single more basic distinction.

A second major component of Nelson's model is the match–mismatch factor. The degree to which the child's organization and usage of language matches that of the adults in his/her environment is seen as influencing the direction and rate of the child's language development (102).

Nelson's final major component is the degree to which the major caretaker (usually the mother) accepts or rejects her child's language proposals independently of her general acceptance of the child (103). Although I feel that my own relation to Minh's language was generally mismatched and rejecting, my impression is that Minh's mother used language in ways that were similar to Minh's,[9] and that she was generally quite ready to accept his language proposals. Furthermore, her acceptance of his Gestalt utterances, as shown by her willingness to assign meanings to them and to respond to them accordingly, may have encouraged him to persist with this apparently successful strategy.[10] This may help to explain why Minh's acquisition of language progressed steadily without the serious setbacks which might have been expected had he been as unintelligible to his mother as he was to me!

Nelson's cross-sectional sample and the evidence from Bloom, along with my own data,[11] lead me to believe that there is probably a continuum of children, varying from those who are very Analytic right from the beginning, through those who use mixes of Analytic and Gestalt speech in varying proportions,[12] to those

[9] A number of people who have listened to portions of my tapes have commented on the surprising speed and complexity of the mother's speech to Minh. In my data, she does relatively little simple naming except when reading a book with Minh. Most of her speech to him is rather conversational in nature (Expressive), and is characterized by use of longish sentences with marked intonation contours. She often repeats whole sentences directed to Minh. Perhaps the rapidity of her speech and her repetition of whole phrases were factors causing Minh to concentrate more on the holistic patterns of her speech, rather than on analysis of individual segments.

[10] I would like to thank Lois Bloom for bringing this point to my attention. Further evidence about the role of acceptance or rejection of a language learner's speech in shaping his/her production strategies may come from introspection by adult second-language learners about their own experiences. Evangeline Dunbar has discussed with me an experience she had in Japan, in which a native Japanese speaker's acceptance of and response to a gestalted utterance on her part encouraged her to diverge somewhat from her natural inclination to produce Analytic speech. Her feeling is that, if her initial attempt at Gestalt speech had been negatively received, she would have immediately abandoned the strategy.

[11] Another child who seems to have used a Gestalt strategy is Ferguson & Farwell's K, who is described (421) as producing 'a lot of "babbling" or at least unintelligible speech' and who 'even during the first sessions . . . would occasionally imitate or even spontaneously say three-word sentences'.

[12] There is, e.g., an example cited by MacWhinney 1974 where children initially learn a base plus an inflection as an unanalysed unit, which he calls an 'amalgam' (67). This is similar to the

who may start out with a completely Gestalt approach and have to convert slowly and painfully to a more Analytic approach to language. As Nelson has pointed out, the degree of acceptance of the child's speech by the caretaker will greatly affect how painful such a conversion will be.

Finally, both Gestalt and Analytic strategies of language learning seem to remain available for learning second and later languages. Marilyn May Vihman reports (personal communication) that her own daughter, Virve, was Analytic in learning her first language (Estonian), but Gestalt when she began to learn English at preschool at the age of two. Whether Virve's change in strategy was caused by the difference in syntactic structure between Estonian and English, or by the differences in the typical utterance-length addressed to a one-year-old as opposed to a two-year-old—or by some combination of these factors—would be interesting to investigate.

Krashen 1975 has proposed that adult second-language learners have two modes of language learning, which he has labeled Acquisition and Learning. Acquisition is characterized as subconscious, and dependent on interaction with primary linguistic data; whereas Learning is conscious, and dependent on rule isolation and feedback. It may be that a child's Gestalt and Analytic strategies may somehow develop into an adult's Acquisition and Learning strategies. It would, e.g., be interesting to see if a Gestalt (or Expressive) child developed into a person who preferred to learn a second language by 'feel', while an Analytic (or Referential) child developed into an adult who preferred to learn language 'by the book'.

4. POSSIBLE DEVELOPMENTAL NEUROLINGUISTIC IMPLICATIONS. The terms Analytic and Gestalt were suggested by recent work in neurolinguistics which shows that different parts of the brain process input in correspondingly different ways. I would like to propose that, in addition to Nelson's cognitive and sociolinguistic factors which affect a child's progress in language learning, there may be a neurological factor which relates to the differentiation of the cerebral hemispheres and the eventual lateralization of language.

Although few data yet exist on language-processing at the neurological level in young children,[13] there is a growing body of evidence about neurological specialization for both linguistic and non-linguistic functions in adults. The language-dominant hemisphere seems to be the locus for many kinds of analytic and temporal processing,[14] while the minor hemisphere seems to specialize in gestalt processes such as spatial orientation and pattern recognition. Dichotic listening tests show a

familiar phenomenon exemplified by *wanna* and *gonna* (observed, e.g., by Brown 1973). Since MacWhinney's amalgams are at the word level (though consisting of two adult morphemes) rather than at the phrase or sentence level as in Minh's case, they are rather more toward the analytic end of the continuum.

[13] A few articles on developmental neurolinguistics are just beginning to appear in the literature, but they have hardly begun to scratch the surface; see, e.g., Jacobson 1975, Lecours 1975, and Zangwill 1975.

[14] In most right-handed people and in many left-handed people, the language-dominant or major hemisphere is the left one. For these people, then, the minor hemisphere is the right hemisphere. For all other people, language is in the right (major) hemisphere, and the left hemisphere is the minor one.

RIGHT ear (left hemisphere[15]) superiority for perception of consonant–vowel syllables (Studdert-Kennedy & Shankweiler 1970), function words (Curry & Rutherford 1967), nouns (Borkowski, Spreen & Stutz 1965), and sentences (Zurif & Sait 1970), but a LEFT ear (right hemisphere) superiority for melodies (Kimura 1964), chords (Gordon 1970), environmental sounds (Curry 1967), and filtered intonation contours of sentences (Blumstein & Cooper 1973). (For a thorough review of this literature, see Van Lancker.) Additional evidence from aphasia patients has shown that there are two types of reading impairments, manifested as global (phrastique) vs. phonological (littérale) alexia in languages like French or English (Dubois-Charlier 1972), or as selective impairment of phonological characters (kana) vs. logographic characters (kanji) in Japanese (Sasanuma 1975). Finally, there is evidence from aphasics and hemispherectomy patients that production of intonational contours and so-called 'automatic speech' does not take place in the same part of the brain as other aspects of speech production (whether in the minor hemisphere or in another part of the major hemisphere has not yet been determined; Van Lancker 1975, Zaidel 1975).

The evidence for the separation of Gestalt and Analytic processing of linguistic material, coupled with my observations of Minh's love of music (singing and piano playing), suggests that his Gestalt strategy of language production is perhaps related to the development of his minor hemisphere, while his Analytic strategy is related to major-hemisphere development. The fact that this is so speculative points up our need for further research in developmental neurolinguistics.

5. CONCLUSION. The research just summarized, together with my own investigations, points to four areas in which further work is needed. First, we need to modify our expectations about the nature of early language, and to accept the Gestalt speech-production strategy as something 'real' and worthy of investigation along with the Analytic. Second, we need to develop theories both of language-processing in general and of language development, to account for the existence of two such diverse strategies. Third, we should look for evidence of Gestalt speech both in the existing literature and in new studies. The babbling of children who are already beginning to produce their first Analytic words should prove a very promising area to investigate. Finally, we need to extend neurolinguistic research to children, to determine whether the occurrence of Gestalt and Analytic speech is correlated with language lateralization and other areas of neurological development.

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[15] Although nerve fibers from either ear are connected to both hemispheres, the crossed (contralateral) pathway seems to be stronger than the uncrossed (ipsilateral) pathway. Thus the right ear is more strongly connected to the left hemisphere (which is dominant in most people), and the left ear is more strongly connected to the right (minor) hemisphere.

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