4 THE ROLE OF UNITS IN PRODUCTION

We have just spent two chapters looking at ways in which linguistic units are acquired through extraction and segmentation, and ways in which knowledge of these units and their structural patterns can be used in the comprehension of language. It is not necessary, however, for a unit to be fully segmented (in adult terms), or, indeed, segmented at all, before it can be put to use in the production of new utterances. In fact, treating an unanalyzed or only partially analyzed chunk of language as if it were unitary would allow learners to produce utterances that seem otherwise to be beyond their productive competence.

Although many early productions are easily seen as combinations of two or more adult words, there is a heretofore confusing residue of data that are not so readily seen in this light. If, however, we agree that children may have units in a variety of sizes, from a variety of sources, as well as a variety of ways of combining them, we will find it easier to make sense of these data.

One purpose of this chapter, therefore, is to review some of the data on early productions (some of which we have already looked at in the context of perception and analysis) from the point of view of the combination of long as well as short units. I will proceed by considering a number of strategies children seem to use in producing multi-unit constructions and by seeing the roles played by long units. I will be particularly interested in how the use of long units can make up for both the shortage of cognitive capacity and the incomplete analysis of the language.

Having established that long units may effectively persist well beyond the early stages of language perception, I will move on to the second aim of this chapter, which is to consider the role of long units in adult language. I am interested in such questions as: What happens to a "long unit" (i.e., one that contains two or more morphemes of the adult language) after it has been segmented? Is the fact that it was once perceived as unitary completely lost? Or might at least some of these long units maintain a dual status as units and as analyzed sequences of smaller units? Are new long units ever created (fused) out of smaller units? What might be the role of processing limitations and automatization of patterns of language use in the creation and maintenance of long units? I will defer a discussion of the theoretical consequences of the coexistence of long and short units until the next chapter.

4.1. Children's Multi-Unit Productions

4.1.1. Production strategies using two units

As children develop both cognitively and in gaining control of those units of the language they have isolated, they begin to produce two-unit utterances, that is, to "synthesize" speech. For some children this transition from one unit to two may be very slow and easy to follow (once the observer realizes what is happening). This transparency is increased if the units the child is working with are primarily single adult words. This was the case, for instance, with Brenda, the child studied by Scollon, who went through several discernible stages as she progressed from successive but related one-word utterances, each with its own intonation contour (Scollon's "vertical constructions"), to more fluently produced constructions with a single primary stress and a single intonation contour (Scollon's "horizontal constructions," 1976, chap. 7).

For other children, however, the transition from one unit to two may take place less obviously, and/or the units involved may be relatively long, so that the process is much more difficult for the linguist to trace: When long constituents are prevalent, the linguist constantly has to be making judgments about which parts have been constructed by the child and which parts might be formulaic units (see the discussion in 1.3.1). The possibility that a child might be using long units also forces the researcher to consider whether the child's competence is what it appears to be on the surface or whether it is less. Further difficulties arise when a tendency to produce long sentence like utterances is coupled with garbled phonology, as it was with Minh. In such a case, the transition to two units is virtually impossible to document.

Pseudosynthesis using a "carrier." I felt that Minh sometimes tried to sound as though he were producing sentences, without really synthesizing at all; that is, he was embedding a single information-bearing unit in a lot of sentence like "carriers." For example:

> In some of Minh's early Tunes [i.e., phrases approximated by their intonational melodies], in addition to the fairly well-analyzed parts, there were "filler syllables" which seemed to be used as place-holders to fill out not yet analyzed parts of a phrase. Thus, between 14 and 15 months, when something fell on the floor, Minh would exclaim: <**'ó'o,** dʌdʌdʌ> 'uh-oh, x x x'. . . . The fixed [part, <**'ó'o**>, was] reproduced faithfully; but the variable [part] seemed to be less well analyzed, and [was] represented by place-holders like < dʌdʌ> and < dʌdʌdʌ>. [Peters 1977, 564]

From anecdotes that have been reported to me, I suspect that quite a few children use this strategy, although it has not yet been systematically documented.

Synthesis by juxtaposing two units. Sometimes children seem to be combining two longish units, although more typically there is one long unit and one short unit. Some of the best examples of synthesis with long units come from Clark, who describes a number of phenomena that seem to reflect the fact that children are working with long units. One of these she calls Imitation; another she calls Coupling. She notes that "representations of adult utterances may be stored by children in the form in which they perceive them, without being reproduced immediately. These are imitations in the sense that they owe their form to the fact that they are copied from an adult model, rather than being constructed by the child from elements" *(1977, 341).* She goes on to observe:

> There are two possibilities that have been overlooked in claims that many utterances by children deviate too much from adult utterances to be regarded as faithful or reduced imitations. Firstly, a child's utterance may originate as a copy of a part of an adult utterance; it may be an EXTRACT of an adult utterance. Secondly, a portion of a child's utterance may originate as an imitation, even when the whole utterance does not; this imitated portion may be combined or COUPLED with other material to produce a longer utterance which does deviate from its adult equivalent by more than the omission of elements. [342-3]

Later she remarks, "Many mistakes in the speech of my own two sons can be readily explained in terms of the imitation of elliptical utterances which are then coupled with other constituents to produce a longer utterance . . . The combination entails no internal modification of the parts" *(344).* That is, Imitations are unanalyzed units, and Coupling is the juxtaposition of such units to produce longer utterances. Thus the children seem to have been forming two-unit constructions exactly as expected at this stage, but the units were not single adult words.

Clark illustrates this process with her son Ivan's early use of possessive pronouns:

> The sequence *That's mine* originated as an immediate imitation. He used this for some time, then at about two years of age he began to couple this sequence with noun phrases e.g. *That's mine jam* 2;0.11. To begin with, these combinations had the prosodic characteristics of two successive utterances . . . but gradually he came to produce them with one contour . . . Whilst *That's mine jam* does not appear to be the product of imitation (since it could not be modeled directly on an adult utterance), it seems quite clear that it came about through the imitation of a short sentence, which was then rehearsed frequently, and finally combined with another constituent. Only gradually did the parts become fused within one intonation contour. Once a sequence is established it may be difficult for the child to modify it. He simply incorporates it as it stands into his longer utterances. [344]

It is striking that in this example Ivan's construction *That's mine + jam* seems to start out as a vertical construction (in Scollon's terms - i.e., with two intonation contours) and only gradually becomes a horizontal construction (with a single contour). That is, the process entirely parallels Brenda's early two-word constructions, with only the size of the units being different.

Clark's Coupling is similar to what Moerk and Moerk (1979) refer to as Quotations (copied from nursery books, songs, or nursery rhymes) and Imitations (copied from speech), and what Snow (1981a) calls Expanded Imitations. The following example from

Snow shows imitations of portions of adult utterances being combined with the recently acquired *No:*

(10) M: Oh. king Nathaniel. *wrapping N up in towel*
N: No king Nathaniel.
M: Is Nathaniel a king?
N: No Nathaniel a king.
M: What's Nathaniel?
N: No king Nathaniel. [210. alignment mine]

Another of Clark's examples of Coupling involves the juxtaposition of questions and answers:

> For a period [Ivan] would repeat adult questions rather than answering them. Later he began to answer questions after repeating them, and finally, he would ask the questions himself and provide his own answers, e.g. *Where's Adam? Upstairs* (2;1.17). Having produced the successive utterances, he would then often integrate them in one intonation contour: *Where's Adam upstairs?* [1977. 354]

Questions and answers, of course, regularly occur next to each other in the input (see the discussion of the *What's that?* routine in 3.4.3), so perhaps it is not surprising that a child should incorporate them into a single utterance.

Minh, too, went through a short period of asking a question and then answering it, sometimes including the two within a single intonation contour. There is an example of this in my data at 1;8.20, when he seemed particularly to be working on the question-answer sequence *What's that? That's X.* He had already been using the form [sæ] or [Asæ] for a long time to mean 'What's that?' On this day, however, he used the same phonological form (<sæ>) to mean both 'What's that?' and 'that's' - something he had not done before. (Earlier he had used forms such as <**ŋ**> or <**hɪ**> with a deictic function.) The fact that on this day he was working on the question-answer sequence was suggested to me by his mother, who, referring to my usual practice of spending some time looking at a book with Minh, said. "The ideal situation of course is for him to *read* it by himself - because he does *your* part an' *his* part at the same [time]." And indeed, he did tend to use <**sæ**> both for asking for words he didn't know (seven times) and for pointing out words he did know (thirty-nine times). An example of the use of <**sæ**> to ask for a word he did not know is

AP: What's that?
M: [sæ]?
AP: Fly.
M: fay.

In pointing out words he did know, Minh seemed to be making use of a frame with a single slot: <**sæ**> + N. Whether this was derived from question+answer *(What's that? X)* or from statement+continuation *(That's X)* is hard to tell. A third possibility is that *What's that* and *That's* were as yet phonologically indistinguishable to him and thus perceived as interchangeable. Whatever its source, of the instances of <**sæ**> + N, twenty-five occurred with them both included in the same intonation contour, whereas fourteen were not so incorporated. In one instance the degree of integration seemed to change from one utterance to the next:

AP:	Here's a __		
M:	[sæ? bʊdi]	*nearly one contour*	'What's that? Birdie.'
AP:	Little birdie.		
M:	[sæ bʊdɪh]	*one contour*	'That's a birdie.'

In any case, Minh seems to have been treating <**sæ**>, which by any analysis consists of more than one unit in an adult system, as if it were no different structurally from *birdie* or *fly*: It could be used in synthesis before it was broken down into its adult constituents.

Clark found it necessary to invent the terms "Coupling," "Imitation," and "Extract" in order to describe situations in which a child uses unanalyzed stretches of speech that are no longer than single adult words. From the child's point of view, however, these

phenomena are no different from the juxtaposition of any other units to produce longer utterances.

4.1.2. Production strategies using more than two units

The child's ability to handle language grows in terms of the number of acquired units and length of the constructions that can be synthesized, as well as in terms of grammatical complexity. The strategy of using ready-made wholes, which are either stored as such in the lexicon or extracted from recently heard speech, as a basis for synthesis may nevertheless persist long after the two-unit stage. Just as at the two-unit stage, such a strategy would allow children to make the most of what they know even while their ability to handle complex constructions is still rather limited. At this later stage, however, it is increasingly likely that these ready-made wholes are not completely unanalyzed, but that at least some lexico-semantic extraction and recognition has occurred even if the syntactic details are not yet under full control. In fact, it is the existence of minor syntactic anomalies that gives the researcher clues about the presence of incompletely analyzed chunks. Let us look at the evidence, this time proceeding from more sophisticated to less sophisticated strategies.

Juxtaposing two constructions. In the following examples from Clark's son, Ivan, although he has clearly progressed past the two-unit stage it is not clear exactly how many units there are in each utterance. Clark remarks that they each seem to be "AMALGAMS of two different utterances" (1977, 345):

That's not the right thing I wanted to do. (3;8.22)
Why didn't you allowed to shut the door? (4;5.9)

The spacing I have imposed here is meant to suggest a segmentation into plausible familiar phrases from which Ivan probably constructed these utterances. Although in each case there is a syntactic anomaly where the familiar phrases join, these utterances are both rather sophisticated. Similar examples of this same strategy can be seen in the following, this time from Adam Clark:

(16) Let me down, *ride my bike*.
(17) I don't know *where's Emma one*. [Clark 1974, 6]

Putting a construction in a frame. Some of Adam Clark's utterances seem to have been based on formulaic frames that had slots that could contain whole sentences, for example, *I want + S, Where's + S:*

(14) I want you get *a biscuit for me.*
(20) I want I *eat apple*.
(19) Where's *the boy brought the milk*. *looking for the milk the boy had brought*
[Clark 1974, 5-6, alignment mine]

In a similar manner Kelly Horgan at 2;0 constructed requests for actions by using the frame *How about + S:*

How about daddy go get a hamburger?
How about open more presents? *said the day after Christmas*
How about what do you want to eat? *meaning 'Ask me what I want to eat'*
[Horgan 1980,19, alignment mine]

In these examples the communicative goal is achieved through reliance on known units and formulaic frames well before full syntactic analysis has been accomplished.

Building on a previous (adult) utterance (part of) which is taken as unitary. Another way to take maximal advantage of preexisting units is to build on (a part of) an adult's previous utterance. Ivan Clark used this strategy, which Clark calls Incorporation, in the following examples:[1]

Mother: We're all very mucky.
Child: I all very mucky too.

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[1] Note that we have already seen the first two of these examples in 3 1.2. There, however, our focus was on the perception of units, whereas here we are interested in the uses to which extracted units can be put.

Mother:	Do you	want to get off'?	
Child:	No I	want to get on.	
Mother:	That's	upside down.	
Child:	No, I want to	upside down.	[1974, 3, alignments mine]

In Iwamura's study of the two 3-year-olds Nani and Suzy *(1979, 1980),* we find that one day Nani constructed a sentence in which she seems to have synthesized a (perhaps formulaic) phrase, "I don' wanna," with Suzy's previous sentence, "Don't throw":

1 S: Don't throw. Don't throw.
2 N: I don' wanna don' throw. [1979, 3]

A child can even use such a strategy to construct *yes/no* questions from their major surface constituents without having to learn how to invert subject and auxiliary. As Clark describes it:

> *Yes/no* questions entered Adam's speech at 3;2 when he began to extract question tags from the end of adult utterances. After a few days of regularly copying tags, he began the practice of copying them and then coupling them with other elements, e.g. Adult: It's *cold, isn't it?* Adam: *Isn't it? Isn't it dark, too?* Up to this time the only sequence resembling a *yes/no* question in Adam's repertoire had been *shall we.* This appeared to be an unanalyzed routine, with no internal structure, since he did not use *we* in any other context, and the phrase subsequently dropped out of his speech. [1977, 344]

This is reminiscent of the simple question-construction tactics described in the previous section.

Building on one's own construction. Another tactic for producing utterances whose complexity is just a bit beyond one's productive capacity is to work up to the goal in stages. Clark notes that her son Adam did this; she calls it Buildup, since he would build upon his own previous utterances: "There was a tendency for the whole of the previous utterance to be retained as a constituent of, or framework for, the subsequent utterance" (1974, 2). For example:

	Baby Ivan have a bath.	
Let's go see	*baby Ivan have a bath.*	[2 alignment mine]

This same approach is found in Iwamura, where Nani (2;9) is trying to get an answer to her question and varies only the beginning:

Are	you	come to *our* house, Suzy?	
Do	you	come to *our* house?	
Does	Suzy	come to *our* house, Mommy?	
Is	Suzy	come to *our* house?	[1980, 61]

In another example from Iwamura, as Nani (3;6) struggles with the pronoun *she/her,* she retains the rest of the structure of the sentence until the very end:

I don' wan she		
I don' wan she	to talk to me.	
I don' wan him, she	to talk to me.	
don' wan Suzy	to talk to me.	
I don' wan you	to talk to me.	
don' wan		
don'	talk to me.	[88]

Several strategies at once. Sometimes the linguist is lucky and not only is privileged to hear the fission happen before her or his very ears, but is able to isolate what must have been the clue that allowed it to happen. This is the case with the following complex example (from Clark), which involves incorporation from another's utterance as well as building on the child's own utterance. Clark describes this as an instance of what she calls "the accidental juxtaposition of alternative forms":

> At 2;11 Ivan said, watching me run water into the bath You *want to have a bath?* This seems to have originated as an extract from *Do you want to have a bath?* He then picked up his teddy and produced, apparently through coupling, the sentence / *want teddy have a bath.* A few moments later he modified this to I *want teddy to have a bath,* apparently under the influence of the extract which he had used a minute or two earlier. [l977, 356]

Thus, because of the closeness in time of the two sentences You *want to have a bath?* and I *want teddy have a bath,* Ivan was able to figure out that *to* should be inserted in the latter

sentence to produce a more adult like form. Presumably his first try (I *want teddy have a bath)* was constructed on the pattern I *want* + *S* (which there is evidence - given earlier in this section - that he used). Perhaps the existence of this earlier pattern allowed him to segment his mother's utterance as *Do you want + to have a bath* rather than *Do you want to + have a bath,* or else he might have said I *want to teddy have a bath.* [2]

This quick tour of a number of children's early productions should serve to show how, through use of strategies such as extraction (Imitation) and juxtaposition (Coupling), and with the aid of such elementary syntactic patterns as formulaic frames with single analyzed slots, the child who is capable of only rudimentary synthesis may be able to produce quite sophisticated-sounding utterances. It is an important challenge to the linguist confronted with such data to determine just how far the child's grammatical knowledge actually extends.

The nonunitary nature of units. In most of the preceding examples the long units involved seem to have undergone some segmentation and assignment of meaning, but they were certainly not completely analyzed with respect to their structural details. In the interests of achieving a desired communicative goal it may have been easier to concentrate on the overall appropriateness and to forget about the details. Pronoun shifting seems to be a particularly difficult detail to work out: Phrases containing pronouns are often used just as they were heard by a child; consider, for instance, the */ carry you* and *sit my knee* examples quoted in 1.3.1. Snow has a number of examples of this, including:

(11) M: I'm going to throw Nathaniel away. One two three whoosh. Throw you away.
N: /ɛnə/ throw you away again. / ɛnə/ = 'wanna'

(12) M: Ya gonna get me?
N: /ɛnə/ get me again. [1981a, 210, alignments mine]

Age 2;9. Coming downstairs before breakfast, wearing pajamas with fabric feet in them, N said at the top of the stairs "The pj's you got on are slippery." There had been no mention to him of pj's on that day. His mother had said to him "The pj's you've got on are slippery" as he was walking down the stairs the previous morning. [1981b, 25]

Age 2;9. As he started to climb up on low walls or other objects which required balance to walk on, N would typically say "Let's see you climb up on this one." This was the utterance frequently used by his father in encouraging him to walk on such structures. [1981b, 25]

A gradual transition from unanalyzed to partly analyzed to fully analyzed forms is also supported by Moerk and Moerk's observation that "utterances that were at first obviously imitated after a parental model are re-employed by the child and are slowly incorporated into his spontaneous repertoire. During this beginning mastery period parental models can still serve as 'reinstatements', 'memory help,' or 'releasers', so that the transition is fully continuous." (1979, 47).

Many of the examples that we have been looking at seem to support the notion that partially analyzed chunks of speech can be used in productions as if they were unitary. Might it also be true that, for speed of processing, even fully analyzed units can still be used as if they were unitary? If this is true, then such constructions must be producible in more than one way: as unitary items (retrieved whole from memory) and as constructions (produced by the grammar). I will explore the theoretical implications of this possibility in the next chapter. A further implication, which will concern us here, is that novel constructions may actually be created, and be stored away and retrieved as units in spite of their known nonunitary status.

4.2. Fusion: the creation of new units

Just as linguistic chunks that were originally acquired as wholes can slowly be segmented into smaller constituents, so, too, it seems that language users often build up convenient constructions that they file away as units for future use. Sometimes these constructions eventually acquire such specialized usages that the original meanings are no longer recoverable from their surface structures, in which case they achieve the status of idioms.

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[2] This was pointed out to me by Susan Fischer.

This can happen among a small group of contemporary speakers, as well as across several generations of speakers. In any case, it seems that the original impetus to store away such prefabricated sequences is to achieve maximal expressive effectiveness with minimal processing. I will take a little space to explore how such shortcuts seem to work for adults, both synchronically and diachronically, before looking at evidence for them in language acquisition.

4.2.1. Fused constructions for adults

Considered from a purely practical point of view, if a speaker has found, through trial and error, an expression that seems to convey a particular idea especially effectively, she or he has a strong motivation to remember that construction. Then the next time the speaker is discussing the topic to which the expression is relevant, she or he can use it whole, shortcutting the constructive stage and saving energy for some other aspect of the discourse. Thus Bateson observes that

> virtually all speech is studded with preformed sequences, sometimes only a couple of words long and sometimes full paragraphs long, which, although internally ordered by syntactic rules that would allow their novel generation, are used as single building blocks and are inserted as single items. I do not use written lectures in my teaching, and the selection and organization of topics is different every year, but floating in the stream of new combinations are great lumps that have been used before, some of them many times, which are generally not recognizable as replays to the student who hears them for the first time, because they are governed by the same linguistic code. [1975, 61]

Probably anyone who has tried to express a given idea more than once, whether it be in a classroom lecture, a shaggy dog story, or the recounting of an exciting incident, has (unconsciously) used the strategy of memorizing the parts that went over well in order to have them available the next time. Many people even resort to rehearsal, trying out different wordings in the absence of any audience until a particularly apt one is found and then practicing it until it is smooth enough for quick retrieval.

One of the reasons that fused speech is so difficult to talk about is that it is not an all-or-none affair and there are at least two relatively independent continua involved: one a scale of grammatical transparency/opacity, the other having to do with the size of community for which a particular expression has become fused. Such a community can range from a single person who has memorized especially apt expressions for later retrieval, through intimate societies of two and other small closed groups, on up to large speech communities, for example, all speakers of English who watch certain television shows. On the transparency/opacity scale fused speech can range from the grammatically transparent "lumps" that Bateson called attention to; through collocations such as *I'm so glad you could bring Harry,* which, although formed according to the rules of English grammar, do have certain restrictions on their usage (e.g., Pawley & Syder point out that it is unnatural, although in fact perfectly grammatical, to say *That you could bring Harry makes me so glad* [1976, 33]); to idioms such as *kick the bucket* for which the meaning is not recoverable through grammatical analysis. Such expressions correspond to Hayes-Roth's notion of "assemblies" that can become "strengthened" to the point of "unitization" (1977, 261).

When one carefully considers how these two continua might interrelate, it seems clear that those expressions which an individual has unilaterally stored for her or his own use (which I called "idiosyncratic formulas" in 1.1) must of necessity be grammatically transparent, since they must be analyzable by the hearers. These "formulas" are therefore indistinguishable from newly generated speech (except perhaps on the basis of fluency; see Pawley & Syder 1976). On the other hand, as soon as meaning can be negotiated, as in a linguistic community of two or more, violations of grammar (e.g., ellipsis) can also be negotiated, a process that gives rise to the more syntactically opaque expressions characteristic of intimate speech (Joos 1967), jargon, ritual (Bateson 1975), technical language, and all other kinds of in-group speech. In fact, the very opacity of certain expressions can be used as a sort of verbal fence to include certain hearers who have the knowledge to decode the expressions and to exclude those others who lack that knowledge.

Turning now to diachronic evidence, some of the phenomena I would classify as fusion have been described by other linguists as the formation, through such processes as derivation and compounding, of new word like expressions that are then lexicalized. Bolinger (1975, chap. 5) gives many examples of English words that have recently been fused by such processes. This same drive for efficiency is also evident in sign language, as is apparent in Frishberg's illustrations of the development of compounds in American Sign Language over a period of 100 to 200 years. For example, although the current sign for HOME originally evolved from a transparent combination of the two signs EAT and SLEEP, in contemporary conversational signing this origin is no longer apparent, since the two parts have assimilated to each other in both handshape and location. Frishberg notes that "the tendency for signs to become single units, i.e. not to remain compounds, is very strong" (1975, 710). She also points out that this tendency toward unitization of compounds benefits not only the signer, since "maximizing fluid movement minimizes the signer's articulation difficulties" (710-11), but also the viewer, "by clearly marking the beginning and end of a given lexical item, indicating that it is indeed a single item" (711).

An extreme form of lexicalization of fused forms can be found in the creation (aided by phonological assimilation and reduction) of portmanteau morphemes such as French *de le > du, de les > des,* or German *zu dem > zum, von dem > vom.*

4.2.2. Fused constructions for children

Turning now to the place of fusion in language learning, evidence can be found that children also fuse speech sequences, seemingly as shortcuts to avoid having to construct them anew each time. This strategy, of course, makes perfect sense in view of the evidence that small children are, more than anyone, handicapped by short-term processing limitations, and the belief that they would be glad to take advantage of any available means, including memorization, to help overcome these limitations. Thus we find children adopting stereotyped expressions that are neither copied directly from nor even directly reduced from adult usage, giving evidence that some sort of construction process may have gone on before the expression became frozen.

Before looking at evidence for children's fusions, let us first note that MacWhinney also proposes that combinations generated by the child are stored in the lexicon. In his model of the acquisition of morphophonology he suggests that "once the child is able to produce forms by combination, he is able to pick up forms that he himself has created . . . All combinations that do not lead to disequilibrated pairs [i.e., discrepancies within the child's own system] are placed in file 1 [the child's file of words]" (1978, 12).

An example of a child's fusion can be seen in Minh's expression <kamʊn> (3.3). The constituents were originally extracted from the beginning and the end of "the cow jumping over the moon," but they were subsequently fused with each other and then with the word *Daddy* to form "cow moon Daddy." As I interpret my data, it was through repetition of this last fused phrase that the element <kamʊn> lost its reference to "cow" and acquired its demonstrative/existential character. Another expression that Minh adapted for his own usage, possibly through phonological misanalysis and metathesis, but more probably through combination of <kamʊn> with yet another word, is the title of the book *Good Night Moon,* which he referred to as "Cow Moon Night" (<kamʊn> night) for at least two months (1;7.2 to 1;8.27).

Similarly, Weir discusses two "original compounds" formed by her son Anthony, age 2l/2: "One, *bathing room, is* used in addition to the standard *bathroom.* The new-formation was probably coined by analogy with 'bathing suit', a word well known to the child. The other neologism is *phone call book,* a coinage due to the child's greater familiarity with *phone call* than merely 'phone'" (1962, 75).

In Iwamura's data (1980) we find some nice examples of how these two 3-year-olds, in their back-seat society of two, were capable of evolving fused phrases that had meaning only for their particular dyad (and, of course, for the linguist who eavesdropped on the process). A simple example is Nani and Suzy's transformation of a disagreement into the neologism [nowIs]. On May 13 Suzy (3;8) tried to tell Nani (3;5) what to do, but Nani

successfully managed to turn the interchange into what Iwamura calls an Antonym Game, with Suzy saying "No" and Nani saying "Yes" (four times each). Since Suzy was still trying to influence Nani's behavior, Nani then tried a new tactic; she told Suzy, "I say no and you say no," and again, "You say yes and I say no" (209). Not only was this the first instance of what Iwamura calls the You Say Game, but it also laid the foundation for a follow-up incident a week later (May 20). This time an adult question ("Have a nice day, girls?") produced a chorused "Ye-e-s," after which Nani started to repeat "No-yes" (five times). She then, using the "You say X" format introduced the previous week, instructed Suzy "You say no-yes, no-yes." The idea caught on, and the girls took turns repeating "no-yes" and instructing the other girl to say it:

1. D: Have a nice day, girls?
2.S&N: *(unison)* Ye-e-s.
3. N: *(giggle)* No-yes, no-yes, no yes, no-yes, no-yes.
   You say no-yes, no-yes. 4. S: Say no-yes, no-yes.
5. N: No-yes, no yes, no-yes, no yes. Say no yes, no-yes.
   (short pause)
6. N: You say [nowɪs]. You say, no-yes.
7. {YOU say
   S: {I 'ready say no-yes
8. N: No you didn', I didn' *hear.*
9. S: You say [nowɪs nowɪs].
10. N: No, you say no-yes.
11. S: I *did.*
12. N: I didn't *hear you.*
13. S: *(faster, more slurred)* [nowɪs nowɪs nowɪs nowɪs].
    Your turn say [nowɪsnowɪs]. etc. [120-1]

We can see here exactly how the fusion of "no-yes" to [nowɪs] took place: It was introduced in line 6, but Nani also repeated the full form immediately after, as if to make clear what she meant. Then Suzy picked up the fused form in line 9. Finally, from line 13 on, the fused form seems to have been accepted by both girls.

Iwamura gives another interesting example of the evolution of a fused lexical item in the case of "down-floor-dress." One day when Suzy was 3;9 and Nani was 3;6 they had a long discussion concerning long dresses (muumuus), covering the fact that they were each wearing "a long dress down to the floor" and a clarification of what "down to the floor" meant: " 'Down to the floor' had at least three meanings on 12 June: (I) covering the legs, going toward the floor . . .; (2) touching the floor . . .; and (3) falling down or off' (209). Two days later (June 14) when the topic of long dresses came up again, the girls evolved their own "word" (i.e., fused expression) for the concept:

1. N: Is it a long dress?
2. S: Yes .
3. N: I'm wearing a long dress.
4. S: I { too.
5. N: { Is that one is a down-to-the-floor dress?
6. S: Uh-huh.
7. N: Is it a down-floor dress?
8. S: Uh-huh, mines down. [90]

In order to show the development of the phrase Iwamura diagrams the questions (1,5,7) as follows:

1. N: Is it	a long	dress
5. N: Is that one is	a down-to-the-floor	dress?
7. N: Is it	a down-floor	dress? [90]

She comments:

> In 7, [Nani] reduced "that one" to "it" and "down-to-the-floor" to "down-floor." Thus, the last question in the series was exactly like the first except that "long" was expressed as "down-floor." Nani lexicalized a syntactic unit by removing the functor words to and *the,* thus eliminating the surface prepositional phrase,

> and ended up with a single lexical unit. *Down-floor* was pronounced as a unit (like *pants-suit* or *after-dinner drink)* and was interchangeable with "long" . . . [This example] provides enough history of *down-floor* as a lexical unit to suggest that such shortened forms in children's speech are not always the result of their inability to deal with complex forms . . . The *down-floor* example suggests that a step which can follow the analysis of a whole into its parts may be the deletion of appropriate (i.e., deletable) parts. [91]

Such neologisms by children give tantalizing evidence of the fusion process, and yet to my knowledge they have never been systematically looked at to see what light they can shed on children's need for shortcutting devices and the way they make use of a combination of constructive ability and memorization to achieve the needed relief. (The study of such shortcuts can, however, be confounded by the fact that the creations are often so charming that they are adopted and perpetuated by the family as part of its intimate speech code.)

4.3. Lexical redundancy and automatization of patterns

We spent Chapter 3 looking at how language learners break extracted units down into their constituent sub-units and structural patterns. In this chapter we have been looking at ways in which children and adults make use of or even create long units. If units can be both broken down (fissioned) and created (fused), what is the theoretical status of the notion 'lexical unit" from the point of view of linguistic performance'? That is, is there, as current linguistic theory would have us believe, a single clearly identifiable level of analysis that can be designated as basic for the language user? Or might there be more than one such level? Before we commit ourselves to a position with regard to this question, let us first consider in what ways multiple levels of units could be useful to language users.

What sorts of situations might lead language users to want to be able to store and retrieve chunks of language in more than one way? I will suggest three: Two involve partial but incomplete analysis of chunks by language learners, whereas the third leads to processing efficiency for mature language users .

1. A language learner may have learned a useful chunk of language and may be able to do some identification of sub-units without yet being able to recognize all of the constituent parts. In such a case, the learner will presumably have in her or his lexicon both the whole chunk and those parts she or he recognizes, along with some sort of cross-referencing information.
2. A learner may even have been able to identify all the sub-units within some useful larger chunk without being sure enough of the structural pattern to feel confident of being able to reconstruct the chunk from its pieces. Again, for safety's sake it would seem expedient to keep in the lexicon both the large chunk and the sub-units, together with appropriate cross-referencing .
3. A mature language user may find that certain expressions or variations on expressions are so useful that it would be convenient, as a device for conserving processing time and effort, to be able to retrieve them in as prefabricated a form as possible. Such prefabrications could be in either of two forms: fused and invariant units, and well-rehearsed (automatized) patterns that require a minimum of processing (e.g., in the form of insertion of lexical items into a slot) in order to produce the desired utterance.

This last possibility is consistent with Hayes-Roth's study of "unitization" (1977) which deals with units; Pawley and Syder's exploration of "institutionalized clauses" (1976), which deals with units and frames; and Bisazza's theory of "templating levels" (1978, 78-9), which deals with frames. All three studies are concerned with shortcutting devices in mature or well learned systems of knowledge (see the discussion in 1.1). In addition, the literature on experimental investigations of the facilitative role of chunking in memory storage and retrieval (see, e.g., Wickelgren 1980) seems to be consistent with the existence of multiple levels of analysis in language.

If we accept, then, that there indeed exist motivations for storage of linguistic units at different levels of analysis, we might ask if there are any neurological observations that are relevant to the notion of multilevel analyses. Recent neurological evidence about the human brain suggests that it has a great deal of memory capacity and powerful information-handling capabilities, but is severely limited in processing speed (Crick, 1979,

219). Redundant forms of storage that would save processing time seem particularly adaptive for such an organ.

Processing time and effort can also be economized through automatization, which Whitaker (1979) defines as the gradual development of a skill into a fast, automatic, and consistent sequence of actions. The literature on automatization of skill learning in other cognitive areas (see, e.g., Anderson 1981) suggests that an extension of this notion to language processing would be appropriate. And, indeed, Whitaker hypothesizes that when a young child is learning language every available neuron is recruited, but that as language skills are refined, a more economical repackaging is effected in a core language area. This hypothesis is based on the fact that early brain damage tends to result in global, rather than specialized, aphasia. On the other hand, random brain damage in an adult is not nearly so likely to affect language, but a focal lesion, even though small, can cause a great deal of damage to the language system. This reduction in the size and concentration of the primary language-processing areas of the brain seems to be due to the automatization of grammatical skills, which enables more efficient language processing. Thus it seems that neurological facts are consistent with the existence of multiple levels of units for adults as well as for children.

Evidence from language use also supports this possibility. In the previous section we saw evidence for the fusion of constructed long units by adults. Further support for automatization appears in the following quotation. Olson suggests that

> in performance we are often able to reduce the effective complexity of utterances through the use of preprogrammed routines which represent components of the full description of a sentence as a single label or recoding. For instance, for academicians the subjunctive probably has less effective structural complexity than it does, say, for the hard-hat, since the academician uses it so routinely that it is represented internally as a unitized subroutine rather than as the full set of specific algorithms needed to do the appropriate computation from scratch. [1973, 155]

Barber, in describing the personal experience of trying for the first time to cope with massive doses of spoken Russian, says:

> By the third day . . . the linguist in me was noticing a rising din of Russian in my head: words, sounds, intonations, phrases, all swimming about in the voices of the people I talked with . . . The din of sounds in my head became so intense after five days that I found myself mindlessly chewing on them, like so much linguistic cud, to the rhythm of my own footsteps as I walked the streets and museums . . . The constant rehearsal of these phrases of course was making it easier and easier to speak quickly and fluently; things popped out as prefabricated chunks. [1980, 30]

Thus we may need to agree that at least at a performance level there is not a single basic level of lexical units for mature language users. I will explore some of the theoretical consequences of this conclusion in the next chapter. First, however, let us consider how growing automatization benefits the language learner.

As noted by Iwamura (see 3.1.3) and others (MacWhinney 1976, 403; Wong Fillmore 1976), the stress of an urgent attempt to interact verbally, whether to communicate information or to interact socially, may trigger changes in a child's linguistic system to the point at which an observer may hear analyses taking place before her or his very ears. When such communication pressure is considered more closely, it becomes clear that one thing that is often involved is a processing limitation on the part of the child: There is a limit on the availability of resources, such as working memory, information-handling capacity, processing time, and so on, that can be expended in an interaction. In order to concentrate on one aspect of the communication, shortcuts may have to be made in another. Resource-conserving strategies can thus be seen as important concomitants of analytic breakthroughs.

Such resource-conserving strategies include all those devices which we have discussed so far that allow children to say more than their system would otherwise allow: rote memorization of long chunks, buildup of progressively longer utterances, juxtaposition of prefabricated constructions, fusion of often-used sequences, and automatization of often-used processes. Olson also suggests that "the child . . . learns ways to recode portions of [the structure of an utterance] so as to reduce the computational weight associated with longer, more complex utterances" *(1973, 156).* The resources conserved through using these devices may then *be* available for unraveling some

particularly knotty communicative problem, for instance, the fission of a heretofore unanalyzed chunk and then the synthesis of a part of it into a new construction (see, e.g., Clark's example of I *want Teddy to have a bath* in 4.1.2, and lwamura's example of *l don't want it to be a shawl in 3.1.3*). Just what this problem is will be determined by the urgency of the particular communication situation. Fission and fusion may thus be seen as complementary strategies as determined by the child's processing limitations.