In Advances in developmental psychology (Vol. 2). M. E. Lamb and A. L. Brown (Eds.). Hillsdale, NJ: Lawrence Erlbaum, 1982.

5 Language Change During Language Acquisition

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INTRODUCTION

A perennial puzzle in language acquisition is *why* children's language develops. Very young children appear to communicate successfully, whether relying on gestures, single words, or both at once. Yet they invariably move on within their first three or four years from such rudimentary utterances as *ball* when they want a ball, say, to more complex and adultlike utterances such as *I want to play with that ball*. How do such changes take place? What mechanism would allow for the changes in children's utterances from age 1 to age 4? In this chapter, I will propose a partial answer to the *how* of change in children's emerging language.

During the acquisition of a language, children are learning both to understand and to produce the language spoken around them. These two activities, comprehension and production, so well coordinated in the adult, are nonetheless distinct. They do not develop at the same rate, nor are they necessarily coordinated during development. Numerous studies have noted discrepancies between children's comprehension and their production, for example, in vocabulary (e.g., Goldin-Meadow, Seligman, & Gelman, 1976; Rescorla, 1980), in noun and verb inflections (e.g., Fraser, Bellugi, & Brown, 1963; Keeney & Wolfe, 1972), in derivational affixes (e.g., Clark & Hecht, 1982), and in question forms (e.g., Johnson, 1981), to cite just a few. In many of these studies, comprehension appears to precede production, but in some, production appears to precede comprehension. Such data lend support to the view that coordination between comprehension and production is itself one outcome of the acquisition process.

To coordinate comprehension and production, children need to be able to bring the products of both processes into line with each other. To do this, children need to line up elements of the system used in comprehension (whatever stored representations of words, phrases, or even whole utterances are addressed in memory when the child tries to understand some input utterances) with elements of the system used in production (the stored representations of forms retrieved from memory when the child tries to produce utterances to express his own intentions). One major component required to coordinate these two processes, then, is a mismatch detector. Suppose that a 2-year-old understands both *dog* and *horse*, but produces only *dog* to refer to members of both categories (see Clark, 1983). If he can detect the mismatch between his comprehension and his production, he has taken the first step towards aligning his production repertoire more closely with his comprehension one. The next step is to add the word *horse* to his production repertoire. Or suppose a 4-year-old understands *brought* as the past tense form of *bring*, but produces only *bringed*. If she can focus on the mismatch of her comprehension compared to her production, she has taken the first step towards matching her production repertoire more closely to her comprehension one. The mechanism needed to detect such mismatches, I will argue, is provided by the general capacity to monitor, check, and, when necessary, repair the system being acquired—in this instance, language.

To detect mismatches of language comprehension and production, children must use some standard of comparison. This appears to be provided by their representations in memory for the adult pronunciation of words and phrases, rather than by any representations for their own pronunciations. Consider some examples of what has been called the *fis* phenomenon:

— . . . a child called his inflated plastic fish a *fis*. In imitation of the child's pronunciation, the observer said: "This is your *fis?*" "No," said the child, "my *fis*." He continued to reject the adult's imitation until he was told, "That is your fish." "Yes," he said, "my *fis*" [Berko & Brown, 1960, p. 531].

— . . . a child asked if he could come along on a trip to the "mewwy-go-wound." An older child, teasing him, said "David wants to go on the mewwy-go-wound." "No," said David firmly, "you don't say it wight." [Maccoby & Bee, 1965, p. 67].

Or the following dialogue from Smith (1973):

— Father: Say "jump."
Child: *Dup.*
Father: No, "jump."
Child: *Dup.*
Father: No, "jummmp."
Child: Only Daddy can say *dup!* [p. 10].

The *fis* phenomenon offers strong evidence that children's representations in memory are based on (though not necessarily identical to) the adult forms *fish, merry-go-round,* and *jump* even though the children can't yet produce those forms. Smith (1973) noted, moreover, that adult-based forms were accessed in memory before any child-based ones. For example, at a stage when his son pronounced *sh* as *s*, saying *sip* instead of *ship*, the child consistently identified *sip* said by adults as "when you drink," not as *ship*. The representation based on the adult word took priority.

This question of priority was followed up by Dodd (1975). She found that 3-year-olds were usually much worse at recognizing their own productions of words than the same words said by a strange adult. When the children heard tapes of their own (mis)pronunciations of words, they identified the correct words only 48% of the time, compared to 94% of the time for a tape of an unfamiliar adult saying the same words. These children also listened to tapes of other 3-year-olds and again could identify the words on them only 48% of the time. (The forms each child failed to recognize were consistently further from the adult pronunciation than the words they did recognize.) Although children may also store some representation of their own pronunciations (Morton & Smith, 1974; Slobin, 1978; Platt & MacWhinney, in press), the evidence from these studies suggests that the child's main representation of a word in memory is based on the pronunciation heard from the adult, and that this representation both takes priority over any others and provides the basis for identifying words heard from others.[1] It is therefore comprehension, based on these representations, that seems to provide the standard for comparison in detecting mismatches with production.

Use of this standard of comparison provides the end, but not the means, for coordinating the child's comprehension and production. The means is provided by three factors basic to the coordination process:

(a) A *monitor* to keep track of the sequences of sounds and larger units uttered on each occasion;
(b) A *checker* to see that the sequences uttered match the sequences intended;
(c) A *repairer* for reproducing the requisite elements whenever there is a mismatch between the form intended and the form actually produced.

Monitoring, checking and repairing are ingredients common to a variety of activities collectively labeled 'metacognitive' (e.g., Brown, 1978, 1980; Flavell, 1978, 1979). They appear to have a general regulatory role—that increases with age—in remembering, learning, attending, and carrying out actions, in order to

[1]These representations themselves change over time as children discover more about what is systematic and what isn't within the sound system, for example. And the initial representations that children base on their perception of words uttered by adult speakers will not necessarily coincide with the adult representations for the same words.

achieve particular goals.[2] They seem to play a similar regulatory role during language acquisition (Clark, 1978), and, I will argue, they are therefore central to explanations for change in children's language.

The range of such processes must presumably change with age, as it does in other domains. Early on, children's knowledge of language—its structures and functions—is very limited, so there is relatively little to coordinate. But as children begin to master the systems for marking such things as person, number, case, specificity, identity, possession, and so on, there is more and more to coordinate. At that time, the metacognitive trio—monitoring, checking, and repairing—might best work like a spotlight, focusing only on one or two areas at a time, until children have worked out much or most of a particular system, and then shifting to new areas. This would account for the degree of coherence in what children attend to as they acquire a language and try to coordinate comprehension and production. An alternative to this is that the metacognitive processes work overtime, with children trying to repair every mismatch on every occasion. Such a procedure would pose two major difficulties for children acquiring language: First, the overall mismatch of their language with the adult's is so vast during the early stages that it would surely be impossible to repair everything; and second, such a procedure might make it take much longer for children to discern any systematicities within a language because they would be working on too many things at once. Later, I will consider whether it is possible to decide between the spotlight versus the floodlight views of how these procedures are applied.

What would be evidence for these proposals—that change in children's language results from their trying to coordinate comprehension and production, and that such coordination depends on their use of a general monitor? First of all, there is a large body of data on the many discrepancies found between comprehension and production during early language acquisition (see Clark & Hecht, 1982). These two processes do indeed have to be coordinated at some point. And second, children do indeed acquire language. Over and above these data, there is evidence that children not only monitor their speech from a very early stage in acquisition, but also check what they say and repair utterances that have gone awry. Evidence for the monitor, I shall argue, comes from children's ability to make overt changes in their spontaneous speech in response to requests for clarification. These requests act as a check on what children say, and unless children were monitoring their own speech, they would be unable to respond to them appropriately. Moreover, if children can not only respond to such questions

[2]Although such processes normally seem to involve *tacit awareness* rather than *explicit formulation* (Marshall & Morton, 1978), they can sometimes be made explicit and then used as overt heuristics in learning, say, to solve problems, remember lists, and so on (see Brown & DeLoache, 1978; Brown, Campione, & Barclay, 1979). Throughout this chapter, however, I shall be concerned only with tacit reliance on such processes as monitoring.

from adults, but also make *spontaneous* repairs to their own utterances, there is evidence both for a monitor and for check-and-repair procedures.

In this chapter, I shall examine evidence for these proposals. I shall focus on children's repairs to their own utterances, repairs elicited by adult requests for clarification and repairs made spontaneously. The ability to monitor, detect, and repair mismatches is central to the mechanism for change needed in acquisition. The chapter is divided into four sections. In the first, I describe the repair process, types of repairs, and the steps involved in making a repair. In the second, I take up the evidence from repairs elicited by adults, evidence that children are able to monitor and repair their utterances upon request, from an early age. Elicited repairs testify to the existence of a monitor, but say nothing directly about its role in acquisition. In the third, I turn to children's spontaneous repairs—ones *not* elicited by adults—data that strongly suggest monitoring, checking, and repairing play an active role in acquisition itself by coordinating comprehension and production. In the last section, I discuss the role played by children's "awareness" of discrepancies as they work on mastering their first language.

REPAIRS

Adults and children alike repair their utterances. The difference between them is largely in what gets repaired and what goes unrepaired. Adults tend to repair when they notice any problem—slips of the tongue, "incomputable" noun phrases or pronouns, inappropriate linearization in a story or instruction, and so on (cf. Schegloff, Jefferson, & Sacks, 1977; Schegloff, 1979). Young children appear to repair what adults query (if they can) and whatever subsystem or subsystems of the language they are currently acquiring.

Repairs in Adult Speech

Repairs are quite common in adult interaction. Jefferson (1974) distinguished two main types: (1) *production errors*, defined as the range of "troubles" that speakers may encounter in producing fluent, grammatical utterances; and (2) *interactional errors*, defined as mistakes made by the speaker in his attempts to speak appropriately to some co–participant in a conversation (see also Laver, 1973). "Speaking appropriately" here I will take to include both the speaker's intention to convey a particular piece of information and his tailoring of that information to a particular audience or co-participant by, for example, taking into account past history and mutual knowledge (Clark & Marshall, 1978, 1981).

When adults initiate repairs, they follow a characteristic organization. Repairs may be initiated by the speaker (self-initiated repairs) or requested by others (other-initiated self-repairs). The two differ in the placement of the initiation

phase of the repair relative to the trouble–source (Schegloff, Jefferson, & Sacks, 1977). In self-initiated repairs, the initiation of the repair normally occurs in the same turn as the trouble, as in (1); or it occurs in the transition–space to the next turn, as in (2); or in the speaker's next turn, as in (3); that is, after the turn that follows the "trouble"–turn.

(1) N: She was givin me all the people that were gone *this year* I mean *this quarter* y' know [Schegloff et al., p. 364]

(2) J: He's *stage manager*. (2 sec pause) He's actually *first assistant* but—he's calling the show. They take turns—he and the production manager take turns calling the show. [p. 366]

(3) Hannah: And he's going to make *his own paintings*.
Bea: Mm hm.
Hannah: And—or I mean *his own frames*. [p. 366]

In self-repairs initiated by others, there is only one position in which the initiation appears, namely in the turn that immediately follows the trouble source as in (4) and (5):

(4) D: Wul did'e ever get married 'r anything?
C: *Huh?*
D: *Did G ever get married?*
C: I have no idea. [p. 367]

(5) F This is nice, did you make this?
K: No, Samu made that.
F: *Who?*
K: *Samu.* [p. 367–8]

The techniques for initiating repairs depend on the initiator. When speakers initiate the repair, they rely on a variety of nonlexical signals, e.g., *uh*, an abrupt cut-off of speech, an elongation of the sounds of a particular word, a switch to a hesitant intonation, and so on. All these perturbations indicate trouble but do not specify what it is. Speakers may also rely on editing terms, e.g., *well, I mean, you know*. When others initiate the repair, they rely on devices designed to request clarification: Questions like *huh?* or *what?* as general indicators that some repair is needed; questions like *who, when, where,* to specify which constituent of the utterance needs repair; partial repeats of the initial utterance combined with a question word, e.g., *You went where?;* partial repeats of the trouble source with rising intonation to request confirmation, as in *You went to Tasmania?;* and direct questions, prefaced by *you mean,* that contain a possible interpretation of the prior turn.

Most self-initiated repairs appear in the same turn as the trouble and most are successful. As a result, since the other, at the earliest, can only initiate a repair in the turn that follows the trouble source, most repairs are both initiated and successfully repaired by the speaker, without any intervention by co–participants in the conversation. Both types of repair operate over the same domains. Their respective placements are not just distinct, but are ordered with respect to one another, with priority given to self-initiated repairs. The adult preference, then, is for self-repair (Schegloff et al., 1977).

Finally, techniques for the self-initiation of repairs are primarily techniques to alert the listener to some trouble or problem detected by the speaker (but not necessarily the listener), but they do not tell the listener where the repair is needed nor what kind it will be (see further Schegloff, 1979). In contrast, repairs initiated by others tend to be more precise: They point to particular trouble sources, and the clarification requests often indicate what repair is needed where.

The repair process itself requires one to keep track of speech, of semantic intentions and their expression, and of the appropriate tailoring of utterances to audiences. Monitoring, checking, and repairing are basic to the organization of both self- and other-initiated repair in ordinary adult conversation.

Repairs During Acquisition

Children's repairs differ in several respects from adult repairs. First, children's speech contains many more repairable elements than the speech of the typical adult. Children not only make errors in the coordination of comprehension and production in their own speech, but also errors of coordination with adults. Second, the memory representations children rely on as their standard of comparison may be incomplete, or erroneous, at early stages of acquisition. Third, children appear to monitor their own productions selectively and repair only certain errors, allowing others to go untouched.

What is the status of repairs in children's speech? First, if repairs occur (whether self- or other-initiated), they offer evidence for the existence of a monitoring system. Second, they also provide evidence for an ability to detect mismatches between some representation of what an utterance should have sounded like and the child's own version. Otherwise, children would be unable to repair on demand, and repair appropriately, when asked to. Third, if children also make repairs spontaneously, those repairs would be evidence that monitoring, checking, and repairing play a direct role in the acquisition process: They allow children to coordinate comprehension and production, and thereby introduce changes into their language.[3]

[3]Overall, changes are initiated, of course, by the child's detecting mismatches between the input received from adult language users and the child's own representations used for comprehension. This results in changes in these representations, and these in turn are coordinated with the child's own productions.

OTHER-INITIATED REPAIRS

Adults typically elicit repairs from children by using a clarification request in the turn immediately following the trouble source in the child's utterance. Their clarification requests usually fall into one of three categories: (1) they ask general questions like *what?, huhn?,* or *what did you say?;* (2) they ask for confirmation by repeating the child's utterance with a rising intonation; and (3) they request repairs for specific constituents by repeating part of the child's utterance and inserting a question word at the point where the trouble occurred. Do young children respond to clarification requests? The answer is yes. Their responses at different ages and under different circumstances have been examined in several studies.

One of the first to look systematically at other-initiated repairs was Gallagher (1977). She looked at the responses to 20 *what?* questions posed at random during recording sessions with three children at each of Brown's MLU stages I, II, and III (aged 1;9–2;5) to see whether and how they responded. (The *what?* questions weren't necessarily put to the children when they had produced some unintelligible sequence.) The *whats* elicited three main types of self-repairs: Children repeated what they had said before, revised what they had said before, or gave no response. Repetitions were normally louder than the original, which suggests the children could detect nothing wrong and so attributed the clarification request to the addressee's having not heard the original utterance. Revisions were of several kinds. First, children made phonetic revisions, usually adding consonants to words that lacked them. This was commoner in the children at stage I than at stage III (by 62% to 54%), but all the children made substitutions of one segment for another, usually achieving a more adultlike form in the process. They elaborated constituents, as in the change from *sit there* to *he sit there;* or they reduced constituents in their revision, sometimes substituting new words for them, as in *there* instead of *on the table.*

There was a general pattern of development in what children repaired. Stage I children produced more phonetic repairs than children at stage II or III. Children at stages II and III produced more constituent reductions than did the children at stage I (but stage I children produced much shorter utterances on average, so they couldn't reduce them much anyway). And children made more constituent substitutions at stage III, than at either stage I or II. One difficulty in interpreting these trends is that the *what?* questions were posed at random. It is unclear whether the clarifications children offered are the same as those they would offer for adult requests prompted by real misunderstandings.

Other studies have looked at the naturalistic elicitation by others of repairs from young children. In them, the focus has been either on actual episodes of misunderstanding and their sequels, or on the forms of clarification requests used by adults. Garnica (1977), using videotape records, noted that even the youngest children (aged 1;6) would modify their speech in the face of misunderstanding. Stokes (1977) analyzed children's responses to clarification requests by comparing the child's utterance before a clarification request with the utterance that followed it. He also found that even the youngest children (again, 1- and 2-year-olds) repaired their utterances by correcting their pronunciation and expanding the constituents that were queried. Käsermann (1980) found similar results for Swiss German parents and their young children. The important point is that Gallagher, Stokes, and Käsermann all found that 20- to 24-month-olds changed sounds in words significantly more often towards the adult model than away from it.

From the one word stage onwards then, children demonstrate some ability to repair their utterances in response to explicit requests for clarification. Their repairs generally result in utterances closer in form to the adult model than the original. The repairs they make appear to change with age: Children at the one word stage make more phonological repairs to segments and word forms, as well as to volume, stress pattern, and intonation, than do slightly older children. Older children make more substitutions and additions to the constituents of their original utterances than younger ones.

Stokes (1977) suggested that clarification requests served to make children focus on what they are saying and to monitor it. However, the ability to respond to such requests suggests that children are *already* monitoring; otherwise they would be unable to make any repair upon demand (see also Käsermann & Foppa, 1981). However, if children are not monitoring the whole system, but only parts of it, then clarification requests may focus their attention on other parts of the system that have not yet been acquired. Noncomprehension by adults, under this view, would guide the child to focus on new systems or subsystems.

The kinds of clarification requests adults make also appear to change with the age and linguistic skill of the child. Gallagher (1981) found that these requests fell into three categories. The largest was requests for confirmation (69% of clarification requests to 2-year-olds), e.g.:

(6) Child: Build something.
Adult: Build something? [p. 54]

or

(7) Child: More brick.
Adult: Some more brick? [p. 54]

Some parents of the nine children Gallagher followed used such requests as much as 94% of the time in asking for clarification. Neutral or general requests for clarification (*what?, huh?*) were much less frequent (13% on average). The third category was of requests to clarify a specific constituent, e.g.:

(8) Child: After came a knock at the door.
Adult: After came what? [p. 54]

This category varied even across the small age-range studied, with more being asked of the children who were more advanced linguistically.

Corsaro (1977) reported similar observations for three children, two under 3 and one aged 5. There were many more clarification requests addressed to the two younger children, and 65% of these were requests for confirmation—repetitions, with rising intonation, of what the child had said (see also Cherry, 1979). For the 5-year-old, only 2% were requests for confirmation of this type.

In summary, children's ability to respond to clarification requests from the one-word stage on offers strong evidence that they can monitor their own speech and use that ability in making repairs. However, the fact that children can monitor their speech does not, on its own, indicate what role such a procedure might play in acquisition.

SELF-INITIATED REPAIRS

Although there have been only a few studies of self-initiated or spontaneous repairs in children's speech, many studies of children's early vocabulary comment on the number of self-initiated repairs or attempts at words by young children between age 1 and 3 (e.g., Bohn, 1914; Brandenburg, 1915; Snyder, 1914). Recent diaries have confirmed these observations. Scollon (1976) described numerous spontaneous repairs from a 19-month-old child, Brenda, who was trying to make herself understood to her interlocutor. The following is a typical example:

(9) Brenda: [š] (holding up mother's shoe)
[šɪ]
[š]
[šɪš]
[šu]
[šuˀ]
[šuš]
Mother: Shoes! [p. 150]

With each repair, Brenda got closer to the adult *shoes,* as is eventually shown by her mother's recognition and repetition of the word she was trying to say (see also Grégoire, 1937). Young children also make self-initiated repairs to inflections added to words. Three-year-olds will correct pronoun forms, e.g.:

(10) She had a silly putty like *me had*—like *I*—
like *I did.* [Slobin, 1971, p. 54]

and they also correct for number and tense in verbs, e.g.:

(11) There *isn't* any—there *aren't* any. [Brandenburg, 1915, p. 116]
(12) I *sticked* it in—I *stuck* it in. [Jespersen, 1964, p. 131]

In Russian, Zakharova (1973) noted frequent self-initiated corrections when young children were constructing case forms for unfamiliar words, and "independent corrections of grammatical forms constructed from familiar words as well [p. 284]." Other diarists like Leopold (1949) noted such spontaneous repairs as the following, from Hildegard (5;4), speaking German:

(13) Zweimal, das ist das *dreite*—das *dritte.* [Vol. 4, p. 14]

The diary and vocabulary studies also record that children correct their choice of words, adding modifiers or substituting new words, presumably in an effort to be more precise. On occasion, they also spontaneously correct their word order. Snyder (1914) made a rough classification of the self-initiated repairs she observed in one 2½-year-old's speech. This child added modifiers and changed the word first chosen, as in (14):

(14) a. Bo . . . sailboat on water.
b. Dat water . . . dat dirty water.
c. Might take paddle out boat . . . might take paddle out canoe. [p. 421]

Another type of repair occurred where collocations like *throw away* + *old things* "got in the way," as in (15):

(15) I want throw dat ol . . . dat big stone way. [p.421]

Another group of self-initiated repairs involved word order, as in (16):

(16) a. All gone tail . . . pony tail all gone.
b. Down sand beach I been . . . I been down sand beach. [p. 422]

Lastly, Snyder noted additions to the original utterance, as in (17):

(17) a. Don't let way out . . . don't let oar way out.
b. All gone . . . frog all gone. [p. 422]

The additions in (17), like the changes in wording in (14), seem to serve to make the child's meaning more precise. The repairs in (17) are very similar to the replacement sequences described by both Braine (1971) and Bowerman (1973), as in (18) and (19) respectively:

(18) a. Truck fall down . . . make truck fall down.
b. Stevie soldier up . . . Mommy make Stevie soldier up.
c. Stand up . . . cat stand up . . . cat stand up table. [p. 17]
(19) a. Horsie . . . horsie . . . horsie sleeps.
b. Kristin . . . Kristin sit chair.
c. Kendall innere . . . Kendall innere bed. [p. 204]

TABLE 5.1
Percentage of Each Repair Category for Each Child

	Total # Repairs	*Repair Category*			
		Phonological	*Morphological*	*Lexical*	*Syntactic*
Sean (2;2–2;11)	280	40	18	32	10
Kate (2;8–3;1)	132	9	17	53	20
Zelda (2;11–3;8)	151	7	18	51	24

Many self-initiated repairs in children's speech, like the ones noted by Rogers (1978), Reilly (1981), and Ramge (1973), have direct counterparts in the kinds of repairs adults make (e.g., Maclay & Osgood, 1959; DuBois, 1974).

Categories of Repairs

Although repairs have often been noted in the language acquisition literature, virtually no studies have kept a record of the kinds of repairs children make, or of whether these repairs change with age or linguistic sophistication. I therefore looked at data from three children recorded over periods of five to nine months. The data consist of each child's self-initiated repairs:

(a) Sean, aged 2;2,16 to 2;11—280 self-initiated repairs from 9 hours of recordings;
(b) Kate, aged 2;8 to 3;0,5—132 self-initiated repairs from 6 hours of recordings;
(c) Zelda, aged 2;11,20 to 3;7,14—151 self-initiated repairs from 5.25 hours of recordings.

The 563 repairs were sorted into four major categories: phonological, morphological, lexical, and syntactic (see Clark & Andersen, 1979). The percentage of each type of repair for each child is shown in Table 5.1.

All three children made numerous self-initiated repairs. Most of these repairs seemed unnecessary from the listener's standpoint since the child's utterances were easily understood. Unlike other-initiated repairs, these repairs were not in response to any query, sign of miscomprehension, or request for clarification. (The latter were also present, of course, in each corpus.) The rate of repair was high: Sean produced an average of 31 per hour of recording, Kate an average of 22 per hour, and Zelda an average of 29.[4] And what each child repaired seemed

[4]It is very easy to miss repairs when transcribing children's tapes. As listeners, we act much as we do in conversation, hearing only the appropriate form and screening out (and immediately forgetting) any others. The present tapes were transcribed very carefully with continual checking and rechecking of the transcription. About half the tapes were also checked by an independent transcriber to make sure all the repairs were being caught.

to change somewhat with age. There were more phonological repairs and fewer lexical and syntactic repairs from the youngest child, Sean, than from Kate and Zelda. The number of morphological repairs didn't change across the three children, probably because all three were just beginning to acquire noun and verb inflections.

The main types of phonological repairs are illustrated in Table 5.2. The commonest repair was the addition of a final consonant. Out of 111 phonological repairs made by Sean, 65% fell into this category (see Table 5.2.a–d). The children also adjusted medial consonants (5.2.h–i), but this was rare, as were adjustments to vowels (5.2.j–k). The only other type of repair, also rare, was the addition of syllables omitted in the child's first attempt (5.2.l–m). The major type of repair, the most frequent in these corpora, involved the addition of final consonants.

Typical morphological repairs are illustrated in Table 5.3. Among these, there were a number of repairs to pronouns where the children corrected pronoun gender (as illustrated in Table 5.3.a–d). Gender in most such cases was pragmatically determined by the child who had assigned a name of a specific gender to a toy. The child might start out with a reference to *it* and then switch to *he* or *she* as appropriate (see 5.3.c and d). All the children also repaired pronoun forms for case (*I* versus *me*, *we* versus *us*), for person (*I* versus *you*), and for choices of personal versus possessive forms (*I* versus *my* or *mine*). Repairs to pronouns

TABLE 5.2
Phonological Repairs: Some Typical Examples[a]

Addition of final consonants:			
(a)	S	(2;3,21)	Where's that *anima*—where's that *animal* who come a out an' a garbage?
(b)	S	(2;4,25)	Because it *waa*—because it *want* the purse.
(c)	S	(2;4,25)	*W—w—where's* a big ones?
(d)	S	(2;5,14)	Hair *o—on* your arms?
(e)	K	(2;9,7)	You sit down and watch this and *may—make* song.
(f)	K	(3;0,5)	Dis is de *kin'* of milk—dis is de *kind* of milk I like.
(g)	Z	(3;6)	I better *wor*—I better *work* now.
Adjustment of medial consonants:			
(h)	S	(2;3,21)	I *mood* a—I *move* it.
(i)	S	(2;9,7)	It's a *mun—monkey.*
Adjustment of vowels:			
(j)	K	(2;11)	Hey, tickle my back, *mum—mommy* lion!
(k)	Z	(3;1)	They don't wear clothes to *bee*—to *bed*!
Addition of syllables:			
(l)	K	(2;11,21)	Dat's a flower *bas—basket.*
(m)	Z	(3;1)	Yes, I'm *muth*—I'm a *mother.*

[a]The repairs are indicated orthographically, with spelling adjusted to give the child's approximate pronunciation.

TABLE 5.3
Morphological Repairs: Some Typical Examples

Pronoun gender:		
(a)	K (2;8,21)	*It's—it's—he's* too big.
(b)	K (3;0,5)	*It's—he's* finished his dinner.
(c)	Z (3;2)	. . . but *it—he* climbs up—*she* climbs up in it.
(d)	Z (3;2)	While I put *it—her* on.
Pronoun case:		
(e)	K (2;9,21)	P'iceman, our car crashed into somebody's car *an' us—and*—an' *we* had problems.
Verb form:		
(f)	Z (3;7,14)	You know what they *ate of*—eat out of?
(g)	Z (3;7,14)	She *want*—she *wants* to go to sleep.

made up some 24% of Sean's morphological repairs, 43% of Kate's, and 59% of Zelda's.

Repairs to verb inflections included some corrections for number agreement, mainly with third person singular present tense (*want* to *wants*), and for past tense (5.3.f and g), addition of the copula (or an appropriate form of the copula), and correction for pragmatic number (as determined by the reference in context). There were also a few repairs for aspect, usually the addition of *-ing*, in Sean's corpus. Repairs to verb inflections made up 38% of Sean's morphological repairs, but the numbers were negligible for the other two children, who rarely made any mistakes on *-ing*, third person singular present *-s*, or the past tense *-ed*.

Typical examples of syntactic repairs appear in Table 5.4. The largest category for all three children involved repairs to their choice of subject. This kind of syntactic repair accounted for 64%, 82%, and 84% respectively of Sean's, Kate's, and Zelda's syntactic repairs. In nearly all cases, the child started out with one noun phrase (*the boy*, say), paused, picked up a new noun phrase as

TABLE 5.4
Syntactic Repairs: Some Typical Examples

(a)	K (2;8,7)	*The kittycat* is—de—de spider's kissing *the kittycat's back.*
(b)	K (2;11	*Dat's*—he gave you *dat meat.*
(c)	K (2;11,14)	*She*—he didn't give *her* any food.
(d)	K (3;0,5)	*He* went into—he put *the fish* into a flowerpot.
(e)	Z (3;5)	E: Do we have a dog? Z: *We have*—all these *are our* animals. . .
(f)	Z (3;5)	*Is that* your—*that's* your box?
(g)	Z (3;6)	*Your*—these are *your* pets. . .
(h)	Z (3;6)	E: What do donkeys eat, Z? I don't know what to feed him. Z: Umm, *they*—my mommy said *donkeys* eat oats.

subject (*the girl*), produced the verb (*saw*) and than re-inserted the original subject as the object of the same utterance (*the girl saw the boy*). These reassignments of surface subject and object sometimes appear to be a result of the child's getting stuck because he lacked a passive construction (see 5.4.a–e). Occasionally the original subject noun phrase was embedded in a later, lower clause (see 5.4.h). The only other types of syntactic repair were additions of constituents or of clauses, used only rarely by these three children, and a few word order changes, mostly involving inversion or switching back to a noninverted auxiliary verb and subject in *yes/no* questions (as in 5.4.f). There were no instances of this in Kate's speech, but Sean and Zelda both made several repairs of this type.

Table 5.5 presents examples of lexical repairs. The largest category for all three children was the substitution of a second (presumably more precise) word in lieu of the first word chosen for picking out a particular object. This accounted for over 67% of lexical repairs for all three children (see 5.5.a–e). Included among these repairs are errors of reference, where the child misnamed something in context and then corrected the misnaming. The remaining categories, small for all three children, consisted of making references more specific: The children would substitute a more specific word than the one originally produced, e.g., *animal* went to *dog*, *shoe* to *sandal*; or they would add some kind of qualifier. Instead of talking about *the animals* they would talk about *all the other animals*, or *the big animals* (as in 5.5.f and g). They also occasionally filled in pronouns with full noun phrases, thus identifying the referent more precisely (see also Cotton, 1978). This type of repair appeared to be more frequent when the referents of two pronouns could be confused (see 5.5.i–k).

The repairs made in these categories conformed exactly to the characterization

TABLE 5.5
Lexical Repairs: Some Typical Examples

Word choice:		
(a)	K (2;8,7)	*What—who's* that?
(b)	K (2;9)	You have to *squeak—squeak—scrape* it.
Word choice + 'I mean':		
(c)	K (2;9,21)	Add *Jeffier*'s—I mean *Antonia*'s blue.
(d)	K (3;0,5)	Dey have *little*—I mean *big* turtle hands.
(e)	Z (2;11,21)	Not the—I don't mean the *new* one. The *old* one.
Addition of modifiers:		
(f)	K (2;9)	We are gonna see at the zoo big houses and *scary—the spookiest spooky* house.
(g)	Z (3;2)	*These animals* are—*all these animals* are small.
Filling in proforms:		
(h)	K (2;9,21)	*It* got—*the wheel* got out. (= came off)
(i)	Z (2;11,21)	It's good that *it—the page* doesn't get it on your fingers. (talking about a picture of a coal truck full of coal)
(j)	K (3;0,5)	*He*—um—has splinters in him—*that animal.*

given by Schegloff and his colleagues for self-initiated repairs. They were introduced spontaneously by the child, nearly always within the same turn, or—very rarely—in the child's following turn.

Changes With Age

The types of repairs summarized in Table 5.1 suggest there are general shifts with age in the categories into which most repairs fall. Phonological repairs made up the largest category in Sean's speech, but the smallest in Kate's and Zelda's. Lexical repairs increased substantially from Sean's speech to Kate's and Zelda's, and the proportion of syntactic repairs doubled. The only category in which there was little change was that of morphological repairs.

These patterns are even clearer when the repairs are broken down by age for each child. As Table 5.6 shows, there is a steady drop in phonological repairs alongside an equally steady rise in syntactic repairs. Morphological repairs remain at much the same level from 2;0 to 3;8, while lexical repairs, the largest category overall, show only a slight tendency to increase with age.

These quantitative changes with age become even more striking when the qualitative nature of the repairs is examined more closely. Not only are there more phonological repairs, for example, at lower ages, but the kind of repair made differs. The earliest phonological repairs (below 2;8) were mostly repairs that added the final consonant or consonants of words (see Table 5.2). Later phonological repairs were more likely to involve consonant clusters, and adjustments to vowels or unstressed syllables. By this stage, very few words are produced with missing final consonants.

These data strongly suggest that the monitor children rely on is more of a spotlight than a floodlight. Instead of trying to repair everything at once, children focus first on getting the overall shapes of words pronounced right (see also Käsermann, 1980). Their earliest attempts at words generally preserve the initial consonant and vowel. But to make their words really recognizable, they need the whole word shape. This very often means adding the final consonants. To articulate a sequence of three or four sounds in succession is more complicated

TABLE 5.6
Percentage of Repairs in Each Category by Age

	Repair Category			
Age	*Phonological*	*Morphological*	*Lexical*	*Syntactic*
2;0–2;4	32	21	44	3
2;5–2;8	42	19	25	14
2;9–3;0	18	15	52	19
3;1–3;4	2	17	53	28
3;5–3;8	6	25	52	23

than articulating just two, and children take some time before they are able to manage more complex articulatory "programs" (see Kiparsky & Menn, 1977). If children make use of a monitor, though, they can check the word shape produced, and, where they can, repair it. The child plays the spotlight on a system or subsystem until he has it almost automatically "under control." He can then move that spotlight to another area and work on that. Without such a spotlight, it would be difficult to explain what gets repaired and what does not. The spotlight can also be focused or adjusted by clarification requests from another. And the most general clarification requests (*what?, hm?*) appear to focus it on what the child can repair on his own. With the youngest, this tends to be the word shapes themselves.

The morphological repairs in my corpus also shift over time. Most of Sean's repairs for the first half of the corpus were repairs to pronoun person (especially for *I* and *you*) and pronoun case (*I, me, mine; he, him, his*). In the second half of his corpus, and in the corpora from Kate and Zelda, most repairs to pronouns (still quite frequent) were to gender and number (*he, she, it; they, these, those*). There was also a shift in the repairs to verb forms. Sean made a number of repairs for past tense (*-ed*), for aspect (*-ing*), and for third person singular present (*-s*) forms, and left many erroneous forms unrepaired. The two older children, in contrast, made few errors on these forms and very few repairs.

Within lexical repairs, it is much harder to discern any pattern of changes. This is probably because lexical repairs reflect a variety of different organizational principles in storage and in retrieval: Operations for grouping words with like meanings or related meanings, organizing them into hierarchies or partial hierarchies, and so on, as well as grouping them on the basis of sound structure. If one could focus on repairs in particular semantic domains or phonological sets, one might see changes as visible as those in the phonological and syntactic forms children are learning to use.[5] Many lexical repairs involved greater specificity of reference, but others did not. Both of these presumably reflected greater precision in what the child had intended to talk about. But since the only access one has to such intentions is through the utterances produced, there is no independent way to assess whether these repairs are closer to what adults would say.[6]

[5]The proportion of lexical repairs overall may be even higher than the figures in Tables 5.4 and 5.6 suggest. Omitted from the tabulations of repairs were all instances of word searches—where the child paused for two seconds or more, used place-holders (*uh, um*) between pauses and finally either came up with a word or abandoned the utterance altogether. These word searches were not included because of the absence of any *overt* repair. Schegloff et al. (1977) argued that word searches are also repairs, but covert ones, problems detected before any word has actually been uttered. But the problems may be in the retrieval process itself, rather than being a reflection of the speaker's deciding not to utter a word already retrieved. The status of such retrieval difficulties as repairs appears much less clear.

[6]Lexical repairs, like all other repairs, may be made for the listener too. If the listener might misunderstand what the child was trying to say, then the child might repair variously the form of the

Repairs to lexical choice and repairs to syntactic structure are both central to the speaker's attempt to linearize the ideas expressed and to present them in an organized fashion (see Schegloff, 1979; Karmiloff-Smith, 1980, 1981). Repairs to syntax, which increase as children get older, involve both local organization—where to put what within a particular utterance or turn—and more global organization. In conversations, the current speaker needs to tailor his contribution both to what has been mentioned already and to what he wants to contribute to the interchange. In narratives, the speaker needs to keep track of the different episodes and characters, and make sure that his listeners can likewise keep track (see Karmiloff-Smith, 1981). Similar factors are at work in giving instructions. Repairs to global and local linearizations are likely to differ somewhat. At the global level, the speaker will have an overall goal in mind, while at the local level, he has to fit his utterance into what has already happened.[7]

Most of the syntactic repairs in my corpus appeared to be local repairs. They involved moving information to another nearby position. The commonest repair was to move the noun phrase originally chosen as the sentence subject to another position, either the object of the main clause (as in Table 5.4.a), or the subject or object of a lower clause (as in Table 5.4.h). In many instances, these changes in construction appeared to avoid such syntactic forms as the passive, for example, a construction not yet used by the child. However, the absence of a syntactic construction from a child's speech doesn't necessarily mean that the repair was made in order to avoid that construction. It may simply signal that the child couldn't proceed with that particular linearization.

The shifts with age in what gets repairs are also supported by data from older children. Two children McTear (1981) followed from age 4 to 5 produced virtually no phonological repairs, continuing the trend noted for Kate and Zelda. But they did produce a substantial proportion of lexical and syntactic repairs. (McTear included repairs to morphology under syntax.) Rogers (1978), using a corpus of 65 self-initiated repairs from 5- and 6-year-olds, argued that there were changes with age in their spontaneous repairs. The 5-year-olds made more morphological repairs, e.g., to pronouns (*me go* to *I go* for pronoun subjects; *hisself* to *himself* for the reflexive) and to verb forms (*they go* to *they are going* for aspect; *was* to *were* for plural agreement) than they did syntactic repairs. The 6-year-olds, by comparison, made more syntactic repairs that required re-ordering various elements, e.g., for questions (*what you're doing* to *what are you doing*). They made many fewer morphological errors overall and made fewer morphological repairs than the younger children.

problem word (its pronunciation or its morphology), the syntactic frame in which it occurred; or the child might even replace it with a better word for the speaker's (and hence his addressee's) purposes (see Clark & Andersen, 1979, Käsermann & Foppa, 1981).

[7]Repairs, then, provide one datum for the analysis of the planning and execution of utterances in speech production (e.g., Clark & Clark, 1977; Fromkin, 1971, 1973; Garrett, 1975).

Finally, Andersen (1977) found that 5- 6-, and 7-year-olds who were role-playing with puppets in two or more contrasting roles at a time made numerous repairs. Their phonological repairs were mainly to alter voice pitch, volume, and intonation contour to mark the contrasting roles (e.g., small child vs. father), but occasionally to change adult word forms to a babyish pronunciation to mark a child role. Other repairs for the roles they were taking were mainly to lexical and syntactic choices. Lexical repairs introduced role-specific vocabulary; these became more frequent with the older children, as in these examples from Clark and Andersen (1979):

(20) a. L. P. (6;7) as doctor speaking to father: So what you're gonna do is—you're gonna wait out in the *hall*—in the *waitingroom* with your wife and . . .
b. A. B. (7;0) as grandmother speaking to child: *Hi—hello.* [p. 9]

Syntactic repairs were mainly to the particular form chosen in a particular role. They were most apparent in the requests addressed to different participants in the role-playing, for example, repairs from imperatives to politer forms:

(21) a. M. R. (5;3) as child speaking to father: Daddy, take—could you please take me to school?
b. L. P. (6;7) as nurse speaking to doctor: Look—would you like to look at the X-rays, doctor? [p. 10]

These repairs appear to represent another dimension of language acquisition: Children seem to monitor their speech for what would be appropriate to particular roles in the different scenarios being enacted.

In summary, what gets repaired at different ages appears to be linked to what the child has already mastered and what he's on the verge of mastering. Most repairs by the youngest children are to their word forms: They restore or adjust segments within words. Once the words they produce not only match the forms they have stored for comprehension, but also the forms of the adults around them, children appear to focus more of their attention on perfecting other parts of their language. Many of the repairs made between age 2 and 5 or 6 are to various systems of morphology: nouns, pronouns, and verbs, and the various paradigms each belongs to.

Even more repairs between 2 and 5 are to choices of lexical items. These repairs appear to reflect in part the massive organizational efforts children must make to the increasing numbers of words acquired (from approximately 200–400 by age 2 up to some 14,000 by age 6, according to Templin [1957]). Finding the right word, before their lexicon is fully organized semantically, morphologically, and phonologically, for the multiple access routes needed, should pose problems, problems that are clearly reflected in the large numbers of lexical repairs.

Lastly, as children get older, they begin to make more syntactic repairs, repairs to the larger repertoire of structural options for linearization that are being acquired. The syntactic repairs I have considered were all repairs within a single turn, usually within a single utterance. But as children get older, they also have to deal with the expression of more information at a time, in longer turns, and also in narratives, instruction-giving, and other more complex forms of communication. In each case, a large amount of information has to be linearized and presented in collaboration with preceding and following speakers. The syntactic repairs made by 2- to 3-year-olds represent only some of the first steps in organizing information for presentation to others.

CONCLUSIONS

I have argued that other-initiated repairs offer strong evidence that children monitor what they themselves say. Because of this, children are able to repair efficiently those utterances queried by adult listeners. Their other-initiated repairs consistently go towards better approximations of adult forms (Käsermann & Foppa, 1981). And children may even produce more advanced forms (closer to the adult's) first in response to clarification questions, and only later in their spontaneous speech (Reilly, 1981). These data are strong evidence against another view of these repairs—the view that children simply remember what they just said and in response to queries go back to forms of language they feel more certain of. This view predicts that repairs should be regressive, but the data show they are in fact progressive. The directionality of repair, then, supports the view that children monitor their speech. This evidence, though, does not reveal what role, if any, the monitor plays in the actual process of acquisition.

Self-initiated repairs, on the other hand, suggest that the monitor plays a direct role in acquisition. Even very small children repair their utterances spontaneously, and they do this in the absence of requests for clarification on the part of their listeners. And their repairs, again, nearly always yield forms nearer to the adult model. To account for this, I have argued that children rely on a monitor, check, and repair system: they monitor what they say, check it against some standard for what they had intended to say, and repair elements that fail to meet the standard. While other-initiated repairs require a monitor, self-initiated repairs do more: they require that the monitor be put to work in the actual process of acquiring a language. This is because monitoring, checking, and repairing are integral to the coordination of children's production with comprehension.

To coordinate production with comprehension demands some standard of comparison. That standard, I have argued, is provided by children's memory representations for words and even utterances heard from adults. Children rely on these representations for comprehension and constantly add to them as they are exposed to more adult language. These representations provide both the

standard of comparison when children monitor and check their utterances, and also the targets children aim at when they attempt self-repairs, either spontaneously or in response to requests for clarification.[8] In gradually coordinating their own comprehension and production, children also coordinate their language with that of the adults around them. Coordination, then, results in change.

The path of change during acquisition, of course, is neither smooth nor straight. Children may follow different routes and focus on different subsystems. In representing adult forms in memory, they may make mistakes in their analyses of forms and of meanings, representing too much or too little because they don't yet know all the details of the adult language. Also, the assumptions they make about forms and functions in a particular language may have to be modified as they learn more (Slobin, 1973, 1977). And learning more, in turn, may lead to late-occurring errors as children add further phonological, morphological, or lexical information about particular domains (e.g., Bowerman, 1978).

Some of the ups and downs on the path of change may be attributed to the spotlight nature of the monitor. Initially, the mismatch between adult and child uses of language is too extensive for children to keep track of any but the smallest number of elements. Both in their storage of adult-based forms for comprehension and in their own early productions, children are selective. They monitor certain systems and ignore everything else. And what they monitor first is presumably selected on the basis of earlier conceptual development as well as any general operating principles they bring to language learning (e.g., Clark, 1983; Slobin, 1973).

The changes in children's language as they coordinate their production and comprehension are encouraged by the language community at large. Children hear very similar speech from all the adults that speak to them. This helps them establish memory representations for comprehension all the more firmly. The speech they hear also plays a direct role, I would suggest, in changing what they monitor. First, as children show signs of understanding more, they are offered more complex language. This leads them to add further memory representations for comprehension. Second, they may be compelled by adult requests for clarification to focus on new parts of language, to train their spotlights on new systems (Stokes, 1977; Cherry, 1979). Both factors, adult input in general and clarification requests in particular, lead them to add to their store of representations for comprehension. And, this in turn leads them to monitor new domains of production for coordination with comprehension.

In summary, I have argued that children change their language by relying on a monitoring system. They change in order to coordinate what they produce with what they understand. Their efforts at coordination can be seen in both other-

[8] At times, the child may take some of his own erroneous productions as the source for some representations and thus be checking against non-adult forms as well (cf. Platt & MacWhinney, in press).

initiated and self-initiated repairs. Their self-initiated repairs, where there is no communicative pressure to change anything, show that they don't change simply so as to communicate better. Rather, they change as a result of attempts to coordinate production with comprehension. They change their language of their own accord. And little by little, their changes lead them to acquire the language spoken around them.

ACKNOWLEDGMENTS

The preparation of this chapter (and my own research reported in it) was supported in part by the National Science Foundation (BNS75–17126 and BNS80–07349) and in part by The Spencer Foundation. I would like to thank M. Catherine O'Connor, Ruzica Kapetanović, and Randa C. Mulford, who helped check and recheck tapes so thoroughly for repairs; Herbert H. Clark for many discussions of the acquisition process; and Annette Karmiloff-Smith and Ann L. Brown for their comments on earlier versions of this paper. I am also grateful to the Max-Planck-Institut für Psycholinguistik for providing space for reflection during the summer of 1981 while this chapter was planned.

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