Slips of the Hands

5 Experimental evidence from studies of coding and processing signs in short-term memory is consonant with the analysis into formational components described in earlier chapters. While such evidence is certainly of interest in its own right, it is not always easy to make explicit the connection between behavior in a special experimental situation and behavior in everyday language production.

The intrusion errors in the memory studies were all *actual* ASL signs. The data collected in these studies cannot, then, shed any light on the issue of whether the sublexical structure posited for ASL extends outside of the lexicon. That is, are particular formational values only incidental characteristics of a closed set of actual lexical items in the language, or do they represent independent elements in an autonomous formational system not tied to any meaning?

Analysts of spoken language have found evidence for sublexical organization by looking at a special set of errors in language production called slips of the tongue. These unintended, unconscious reorderings of language elements occur in predictable (regularly classifiable) ways:

In *metatheses,* the classic form of slips called spoonerisms, complete two-way exchanges between elements in an utterance occur:
  (a) Intended: Seymour sliced the *salami* with the *knife.*
      Uttered: Seymour sliced the *knife* with the *salami.*
  (b) Intended: *Keep* a *tape.*
      Uttered: *T*eep a *c*ape.

In *anticipations* an element in the utterance is replaced by one that shows up later on in the string:

This chapter was written in collaboration with Don Newkirk and Carlene Canady Pedersen.

   (a) Intended: An *analysis* of perceptual *confusions*.
      Uttered: A *confusion* of perceptual confusions.
   (b) Intended: A *Canadian* from *Toronto*.
      Uttered: A *T*anadian from Toronto.

In *perseverations* an element shows up in an utterance not only in its intended location but also later on, where it takes the place of another element:

   (a) Intended: *Studies* of slips in spoken *languages*.
      Uttered: Studies of slips in spoken *studies*.
   (b) Intended: How the *leaflet's written*.
      Uttered: How the leaflet's *l*itten.

Such reorderings (when unintended) are all classified as speech errors, but they are distinguished from errors in articulation which are due to lapses in motor control; they are also set apart from changes resulting from regular assimilations between adjacent segments, which—though in some situations perhaps stylistically inappropriate—are nonetheless not speech errors. Examples of nonerroneous assimilations in speech production are:

   (a) Formal: Why don't you?
      Informal: Why'n'cha?
   (b) Formal: Does he?
      Informal: Duzzy?

One diagnostic characteristic of slips of the tongue is that the changes (the reordering, presumably at a prearticulatory level) occur with intervening linguistic material left intact between affecting and affected locations in the utterance; the normal assimilations attributed to motor-articulatory influence tend to stretch over adjacent segments.

Slips of the tongue have furnished useful insights into the organization of spoken language (Fromkin 1971, 1973; Garrett 1975). The fact that whole words are sometimes exchanged provides concrete evidence that words are ordered in language planning as discrete units, which can misbehave independently of their phrase contexts. That single sounds are misordered attests to the psychological independence of linguistic units smaller than words and syllables, that is, phonological segments. That single features of such segments are sometimes misordered provides evidence of the psychological independence of linguistic units at that level.

In addition to providing strong evidence of the reality of discrete elements at various levels in the planning of speech output, spontaneous speech errors provide evidence of regularities in the structure of words in specific languages. As Fromkin 1973 puts it: "Although 'slips of the tongue' can be incorrectly uttered as 'stips of the lung,' it cannot be uttered as 'tlip of the sung' because the sound 'tl' is not allowed as the

beginning of an English word. It is not the inability to say 'tl' that inhibits such errors; we can say it easily enough. Rather it is a grammatical constraint in the English language. It is in this sense that speech errors are predictable and non-random."[1] (p. 113)

In the several hundred hours of conversational narrative signing videotaped during our studies of ASL, we have observed certain errors in signing that are clearly not just instances of sloppy or incomplete signs. Sometimes signs occur in whole or in part in some other order than the signer intended. In a good many cases the signer corrects himself after making an error, thus indicating what he intended to sign. Occasionally the items incorrectly produced are actual signs of ASL; far more often they are not. These slips of the hands are, like slips of the tongue for spoken language, valuable as spontaneously occurring data from everyday signing behavior which provide clues to the organization of sign language and to the way signs are coded.[2]

The Corpus

Our working corpus of 131 signing errors was compiled from two main sources: 77 from careful viewings of the videotapes of conversational narrative signing; 54 from reported observations by researchers connected with the laboratory. Ninety-eight of these errors were judged, by the signers who made them, to be deviant from their intended forms; either there was immediate self-correction (43 errors) or the signer later reported the deviance during a review of the videotape (55 errors). Further, all 131 errors were reviewed on several occasions by at least two native deaf informants and judged to be in fact unintended slips of the hands and not explainable as any sort of regular articulatory assimilation that occurs in fast ongoing signing, as incidental lapses in muscular control (fumbled fingers), or as individual mannerisms in signing. Many candidates for the corpus were rejected on just such grounds.[3]

The errors were recorded in two ways for analytical purposes: first, on videotape, either in the form of a direct copy from the videotapes in which they were observed or as reconstructed from reports; and second, in a notation system devised for the purpose, in which ten descriptive components of the intended and signed forms could be clearly displayed and compared. The linguistic context in which the error occurred was recorded whenever possible.

Method of Analysis

The signing errors were analyzed descriptively in much the same way as speech errors are but with special accommodation to the specific structural elements of signs. Rather than attending to sequen-

tially ordered sound segments of words, the analysis focused on the simultaneously realized, separately abstractable values of parameters that constitute a sign: the major parameters hand configuration, place of articulation, and movement, and the minor parameters hand arrangement, orientation, and contacting region.

For each of the errors, we drew a parametric chart that included values for all of the relevant structural components of both the intended signs and the forms actually produced. The errors were categorized according to (1) which parameter(s) showed value substitutions, (2) the type of exchange involved, whether metathesis, anticipation, or perseveration, and (3) the number of intervening signs between the error sign and the source of the value substituted. In addition, the error signs were all evaluated as to whether they were *actual* ASL signs (with meanings different from those of the intended signs); *possible* signs—that is, gestures composed of parametric values valid for the system and combined according to the structural rules of ASL, yet not currently lexical items in the language (an analogous form in English would be something like *teep,* from *teep the cape,* which does not violate any combinatorial rules of English but is nonetheless not an existing word); or *impossible* signs, that is, gestures composed of parametric values combined in such a way that particular combinatorial rules are violated (an English example might be the hypothetical *tlip* referred to earlier).

Independence of Major Parameters

If American Sign Language were, as some previous observers have thought, made up of global representational gestures, one might expect signs to be organized (for production as well as in analysis) at a primary level: that of the entire sign as a unitary object. If signs were so coded, involuntary deviations in performance from the intentions of a signer (aside from those resulting from temporary motor difficulties) should result in only whole signs being exchanged. In fact, our corpus does include a few exchanges of whole signs (9 out of 131 slips). For instance, a signer intending to sign TASTE, MAYBE LIKE! ('Taste it and maybe you'll like it') signed instead LIKE, MAYBE TASTE!

However, far more frequently (and more significantly, for the nature of signs and of constraints on their formational properties) a parameter value of one sign is erroneously realized in another sign. Our corpus of slips of the hands includes 65 instances of substitutions of HC prime values, 13 of PA primes, and 11 of MOV components. When we exclude instances where a slip affected more than one of the parameters (major or minor), there remain 49 "pure" substitutions in the HC parameter, 4 in the PA parameter, and 5 in the MOV parameter. Thus the corpus of

slips provides evidence for independent coding of ASL major parameters.

The best evidence for such independent coding comes from completed metatheses, because they reveal all of the building blocks of the intended signs (but misordered in their production): no bit of structural material is lost in the linguistic output. In speech production, these completed exchanges of individual sounds between two words (nicknamed "spoonerisms" after the Reverend W. A. Spooner of New College, Oxford, who was famous for his special penchant for making them) provide evidence that in the planning stages underlying the production of the speech string, both of the sound units involved were independently prepared for but at some prearticulatory level were somehow affected so as to be misordered in the final production. Thus, one can account for all of the sounds in the error *noble tons of soil* uttered instead of the intended phrase *noble sons of toil* on an individual basis, since neither of the words *tons* or *soil* is a word of the intended phrase: only the sounds /s/ and /t/ are misordered.

Our corpus of sign production errors includes several examples of complete metatheses of sign parts. Table 5.1 lists some completed metatheses according to the parameters involved and includes examples of exchanges in all three major parameters, hand configuration, place of articulation, and movement, and of the minor parameter hand arrangement. A sign having undergone a slip and the parameter involved are indicated by a subscript *sl:* following the sign.

Just as the *tons of soil* example shows how individual sounds can exchange places in the production of a speech sequence, each of the metatheses in our corpus represents the misordering of an individual structural element of the signs. For instance, in the phrase SICK[ID:

Table 5.1 Slips of the hand resulting in metatheses of primes.

Parameter	Glosses	Values exchanged	
Hand Configuration	SICK[+]$_{sl:HC}$ BORED$_{sl:HC}$ BE$_{sl:HC}$ CAREFUL$_{sl:HC}$	/8/ /B/	/G/ /K/
Place of Articulation	RECENTLY[+]$_{sl:PA}$ EAT$_{sl:PA}$	/3/	/U/
Movement	IN$_{sl:M}$ FLOWER$_{sl:M}$ TASTE$_{sl:M}$ GOOD$_{sl:M}$	/×/ /×··/	/×>×/ /×⊥/
Hand Arrangement	CAN'T$_{sl:HA}$ SEE$_{sl:HA}$	Base-hand sign	One-handed sign

Figure 5.1   Metatheses of Hand Configuration primes.
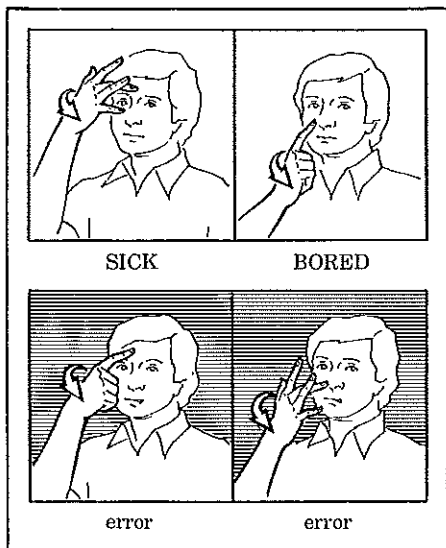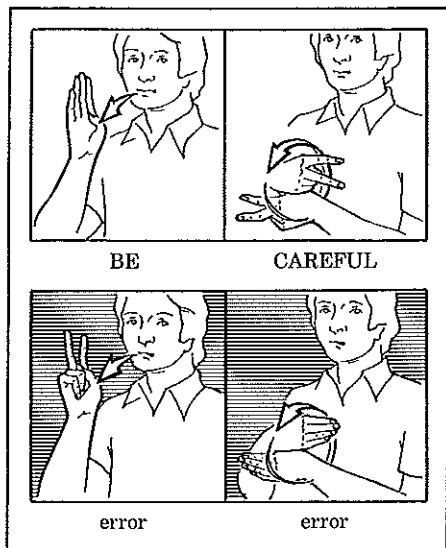
(a)   (b)
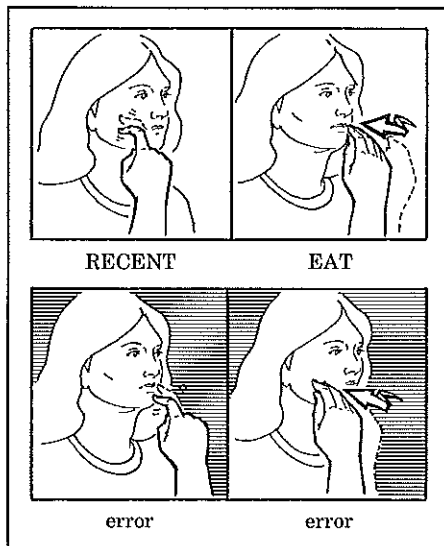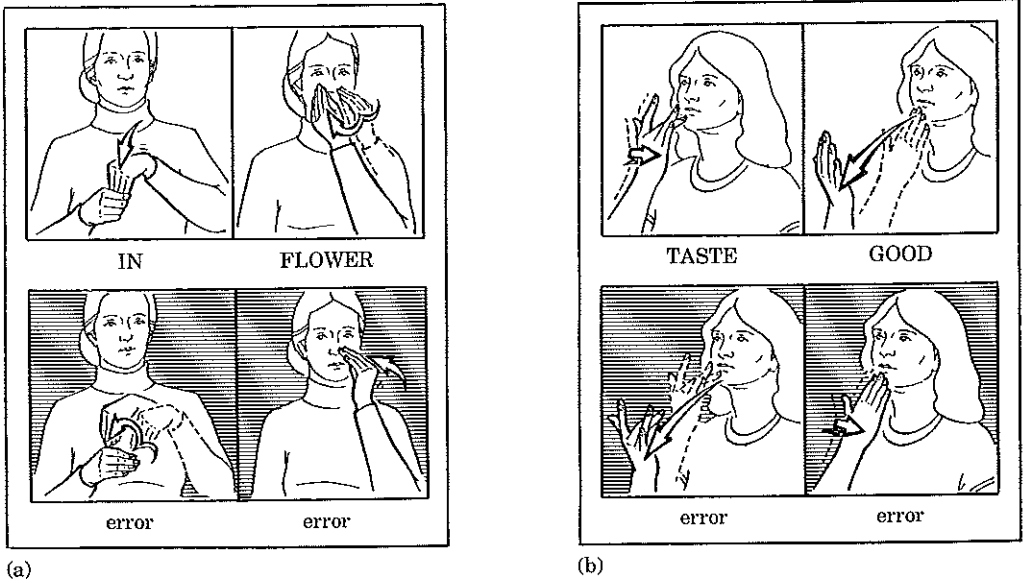
Figure 5.2   Metathesis of Place of Articulation primes.

Figure 5.3   Metatheses of Movement components.

IN	FLOWER
error	error
(a)	

TASTE	GOOD
error	error
(b)	

'sick of it']$_{sl:HC}$ BORED$_{sl:HC}$ (meaning 'sick and tired of it'), only the values for the two intended hand configurations are exchanged, with all other properties of the signs remaining as intended;[4] the sign SICK[+]$_{sl:HC}$ is made with the pointing index-finger HC intended for BORED, while BORED$_{sl:HC}$ is made with the curled mid-finger HC of SICK[+]. As figure 5.1a shows, neither the PAS, MOVS, nor any other parameters except HC are affected in this error. In the example BE$_{sl:HC}$ CAREFUL$_{sl:HC}$, again only the HCS are exchanged; all other parameters remain as intended (see figure 5.1b).

A place of articulation metathesis between RECENTLY[+] and EAT in the sentence (ME) RECENTLY[+]$_{sl:PA}$ EAT$_{sl:PA}$ FINISH in a similar way justifies the claim that PA is an independent structural parameter in ASL. Figure 5.2 shows how the HCS, MOVS, and other parameters of the two signs are preserved, though RECENTLY[+]$_{sl:PA}$ is made on the mouth where EAT should be, and EAT$_{sl:PA}$ is made on the cheek where RECENTLY[+] should be.

The third major parameter, movement, is exchanged in two metatheses. In one, IN$_{sl:MOV}$ FLOWER$_{sl:MOV}$ GROW PLACE ('in the garden'), the single-contact MOV of IN is replaced by the two-touch (touch–move–over–touch) MOV of FLOWER, while FLOWER$_{sl:MOV}$ is made by a single touch in its accustomed PA, all other characteristics of both signs remaining constant (see figure 5.3a). A second MOV metathesis involving the phrase TASTE GOOD affects two signs made in the same PA, both
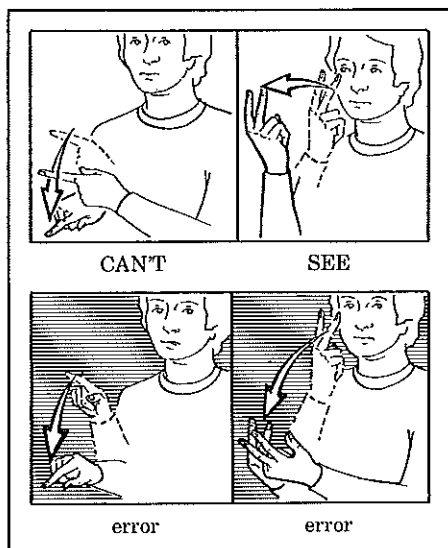
Figure 5.4   Metathesis of hand arrangements. (CAN'T is changed to a one-handed sign and SEE to a two-handed sign with one hand acting on the other as a base, in symmetrical HCS.)

on the mouth. The MOV of TASTE, an iterated contact, is exchanged with the MOV of GOOD, a single straight diagonal movement away from signer (see figure 5.3b).

In one metathesis, a base-hand sign and a one-handed sign exchanged only their hand arrangement, all major parameters remaining as intended. The signer intended to sign CAN'T SEE; CAN'T is a two-handed sign made with the index finger of the active hand moving down past the index finger of the base hand; SEE is a one-handed sign, with the hand moving outward from the cheek. In the error, the active hand of CAN'T$_{sl:HA}$ went through the intended motion but without a base hand, making CAN'T$_{sl:HA}$ a one-handed sign; in SEE the outward-moving active hand instead acquired a base hand (see figure 5.4). Note that there is symmetry of HCs in the error SEE$_{sl:HA}$, just as there is symmetry of HCs in the intended sign CAN'T. In the error, the base hand acquired by SEE copies both the HC and orientation of the active hand.

Completed metatheses of individual parameters clearly indicate the independent organization of these parameters in sign production. However, completed metatheses are far outnumbered in our sign-error corpus, as in the reported corpuses of speech errors, by the single-direction substitutions called anticipations (production errors in which a specific intended parametric value is replaced by one appearing in a

sign that occurs later in the signed sequence) and perseverations (production errors in which a specific intended parametric value is replaced by one appearing in a sign that occurs earlier in the sequence). Although the overall amount of misordering in substitutions of these types may not be so striking to the eye as in metatheses, the net effect on the affected sign is equivalent: a gesture is produced whose holistic description differs in one element from that of the intended sign, and in most cases it differs from any other conventional sign (thus ruling out lexical substitution as the cause of its appearance in the signed sequence); further, each of the major structural parameters, HC, PA, and MOV, is represented by a systematically valid prime, two of which are identical to those intended for the sign, the third being found in another sign in the string.

The corpus includes 26 examples of anticipation of HC primes in which the PA and MOV values remain as intended. In one example of HC anticipation, a signer meant to produce FEEL *C-O-N-F-I-D-E-N-T* THAT . . . The sign $FEEL_{sl:HC}$ was produced in the PA and with the MOV appropriate to FEEL, but with the HC of $THAT_{inf}$ (see figure 5.5). The sign that presumably influenced the slip is indicated by subscript *inf* following the sign. The corpus also includes 20 examples of perseverations of HC primes. In three of these, one or two signs intervene between the source of the HC used and the sign in which it intruded. For instance, in the intended phrase COFFEE MIX WITH WINE the proper HC of $WINE_{sl:HC}$ was replaced by that of $COFFEE_{inf}$, though the PA and MOV were realized as intended. The existence in our small corpus of such clear cases of prime perseveration, where linguistic material intervenes between the two signs involved, provides added evidence of the independence of these parameters in the organization of signs.

Other major parameters also exhibit anticipations and perseverations as well as whole exchanges (metatheses). In one of two PA perseverations an intended sentence included the list MAN, FATHER, GIRL . . . ; the sign $GIRL_{sl:PA}$, properly made on the cheek, was made instead on the forehead, the PA of $FATHER_{inf}$, while HC and MOV were not affected (see figure 5.6).[5]

Examples of movement component slips are particularly interesting because of the vast differences between some movement categories; simple contact, brushing contact, orbiting revolution, axial rotation, opening or closing of the hand, and wiggling of the fingers are among the movement primes that occur in signs. Our small corpus includes ten examples of changes in movements alone. One of these, a perseveration, was made when a signer intended to sign (HE) PLEASE HELP ('He will be glad to help'); the movement of PLEASE is a circular

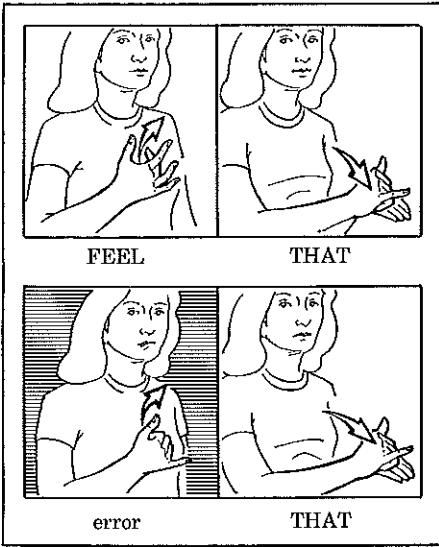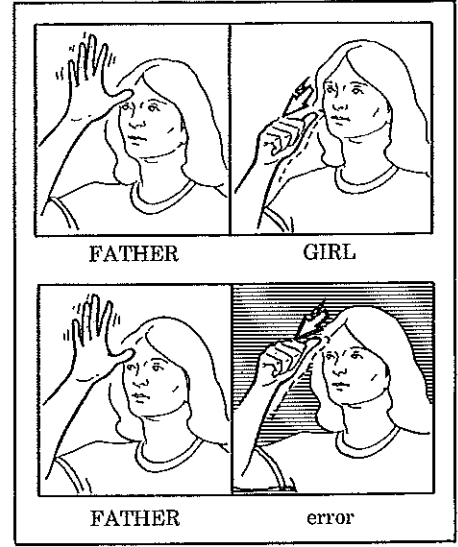Figure 5.5
Hand Configuration anticipation.

Figure 5.6
Place of Articulation perseveration.

| FEEL | THAT |
| error | THAT |

| FATHER | GIRL |
| FATHER | error |

brushing on the chest; HELP is made by one hand approaching the other from the bottom and lifting it up slightly: two acutely distinct types of movement. In the error, however, the circular brushing of PLEASE was substituted for the MOV of HELP, with the intended HC and PA remaining unaffected (see figure 5.7).

There is in our corpus little evidence of slips involving only orientation. Of the three orientation-only slips, all affect only the base hand.[6] Two explanations present themselves: one, of course, is the small size of our corpus; the other is that orientation is not particularly autonomous in the structure of signs. Although orientation minimally differentiates a small number of otherwise similar pairs of signs, specific orientations may generally be tied inextricably to the other parameters and thus exhibit lesser structural independence.

The minor parameter of hand arrangement shows considerably more independence. This parameter prescribes how many of the two possible articulators are used to make a sign and whether one or both are active; signs may be made with one hand active, with two hands active, or with one hand acting on the other as a base. The complete metathesis of hand arrangement in CAN'T SEE, already described, is persuasive evidence of this parameter's independence.

The corpus includes also four hand arrangement anticipations and four perseverations in which the only change is in the number of hands used; all other structural parameters preserve their values. In two slips, one-handed signs add a second active hand, under the influence
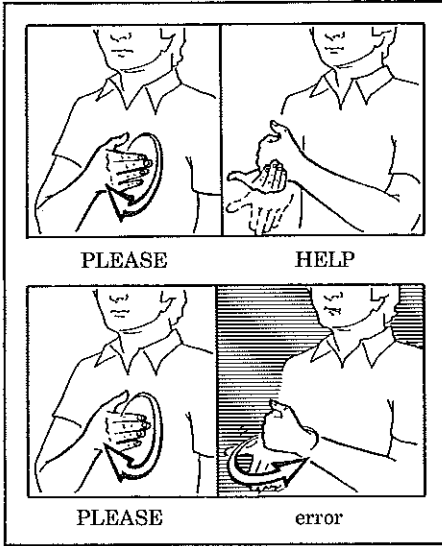
Figure 5.7
Movement perseveration.

of a following two-handed sign: for example, when a signer produced KING SAY, *A-L-L* GIRL MUST$_{sl:HA}$ TRY$_{inf}$, the sign MUST$_{sl:HA}$, normally a one-handed sign, was made with an added hand, anticipating the two-handed arrangement of TRY (see figure 5.8). In both examples,
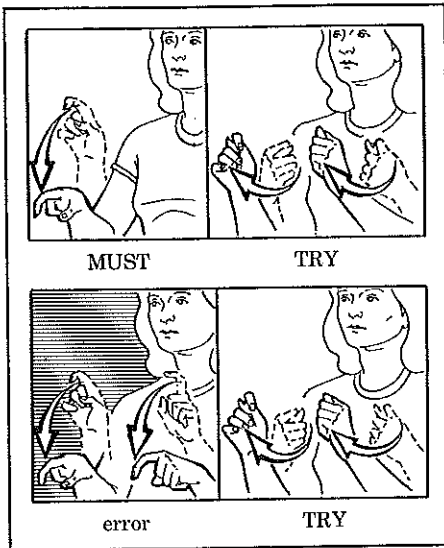


Figure 5.8
Hand arrangement anticipation.

the second (added) hand was identical to the first in HC and MOV, exhibiting the symmetry characteristic of two-handed signs in ASL (see chapters 2 and 3). Two other anticipations change base-hand signs into one-handed signs. Four hand arrangement perseverations show two-handed signs losing a hand or one-handed signs gaining a hand in straightforward ways. Again, when active second hands are added, they are symmetrical with the first. The corpus includes 13 additional examples of hand arrangement changes involving major parameter changes as well, especially in the place of articulation.

The signing slips in our corpus, then, provide evidence for the independence of the three major structural parameters and for the minor parameter hand arrangement in sign language production.[7]

Other Issues of Structural Organization

Analysis of slips of the tongue in spoken language has provided evidence that individual phonological segments are themselves coded as bundles of discrete features, such as voicing, stridency, and nasality. A

Figure 5.9   Invented featural exchange (spread and nonspread are exchanged in the invented error).

[5]   [H]

[B]   [V]
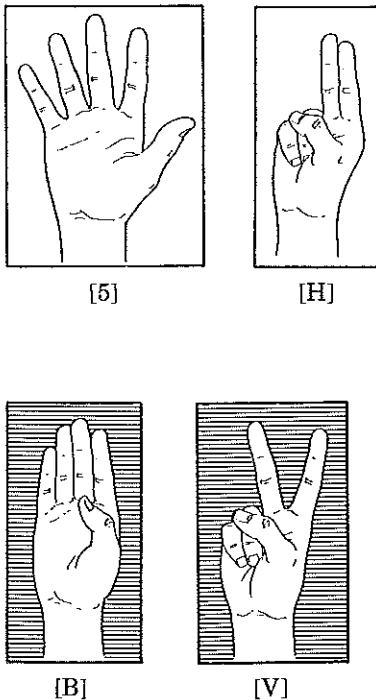
very small number of errors in our corpus suggest a possible feature-level analysis of handshapes of signs. The strongest evidence for this hypothesized feature level of structure is more highly restricted than that for the parameter level; not only do the examples have to show substitutions for specific parametric primes, but the resulting values should be different from either of the intended primes. In spoken English an exchange that is evidence of feature misordering is the example *clear blue sky* transposed to *glear plue sky*. This is a metathesis of the single feature, voicing; the voiceless /k/ has become a voiced /g/, and the voiced /b/ has become a voiceless /p/ (Fromkin 1973). Unequivocal examples of slips of the tongue involving only features (as opposed to whole segments) are relatively rare in the various corpuses that have been reported.

In order for a slip of the hand to count as the strongest kind of evidence for a feature substitution rather than a prime value substitution, the slip must be one in which the error was not an entire prime value of either sign but, rather, appeared to be composed of specific within-prime characteristics of one or both. For instance, suppose a signer intended to sign a sentence in which one sign had a spread flat hand /5/ and another sign had a nonspread two-finger hand /H/, but instead used a nonspread flat hand /B/ in the first sign and a spread two-finger hand /V/ in the second sign (see figure 5.9). The error might be described as a metathesis of values of a feature, in this case, a putative feature ±spread.

Hand Configuration Features

Among the HC substitutions in our limited corpus only one qualifies as a feature substitution rather than a substitution of a whole prime, and that one is not a metathesis.[8] In the sequence $MUST_{sl:HC}$ SEE_{inf} ('I must see about it'), MUST ordinarily would be made with the bent index finger /X/ HC, and SEE with the nonbent /V/ HC; in the error, $MUST_{sl:HC}$ was made with a bent V HC: the middle finger of /V/ was added to the index finger of /X/ but in the bent form (see figure 5.10). Here the +bent quality of one HC is applied to another HC. Because this is not just a slip of whole HC primes, it offers some initial support for a feature-level analysis of hand configuration for ASL signs.[9]

Movement Clusters

In our earlier discussion of the movement parameter, we cited examples of entire movement substitutions (which could be combinations of movement components). The movements posited in the DASL can occur as sequential combinations (for example, contact/move/contact) or simultaneous combinations (movement away from signer while
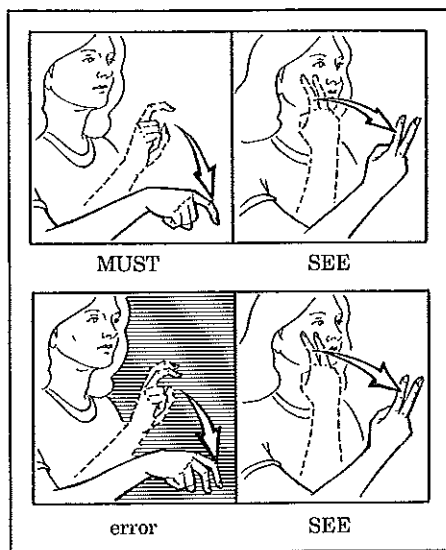
Figure 5.10   Hand Configuration substitution at the featural level. (HC of MUST is changed from one- to two-fingered but the bent feature is preserved.)

opening the hand). We call these combinations movement clusters (see chapter 2). Such movement clusters are sometimes involved in slips of the hand as whole movement substitutions, as in figure 5.3a, where a contact is exchanged with a contact/move/contact movement. But some movement parameter exchanges appear to involve addition or deletion of *parts* of clusters, rather than whole movement substitutions.

For instance, a signer intended to sign the sentence (ME) HAVE BLACK WHITE TABLE TV ('I have a black and white portable TV'), but instead of making the sign BLACK with a simple lateral movement in contact with the forehead, he added the closing movement found in WHITE (figure 5.11). The visual impression of the resultant movement is not that of an exchange of whole movement types, but rather a hybrid, combining components of movement from both intended signs.

Another example occurred when a signer slipped in signing a translation of the song "Let Me Call You Sweetheart." The sign (ME) is made by a single contact of the index finger on the chest; the sign SWEETHEART in the song version is made by the hands in contact, the thumbs wiggling first on one side then on the other side of the signing space. In the error, however, the sign (ME)$_{\text{sl:MOV}}$ was made not as a single contact but as a touch–move-over–touch movement on the torso.[10] Here, as in the BLACK$_{\text{sl:MOV}}$ WHITE$_{\text{inf}}$ example, the resultant
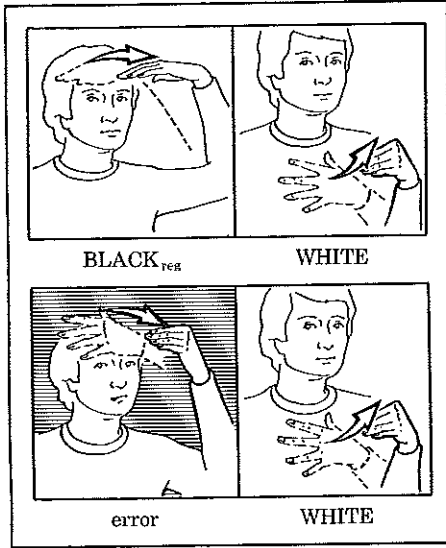
Figure 5.11   Slip combining movement components. (Brushing movement of BLACK combines with closing movement of WHITE.)

movement was not an exact copy of the source movement; rather, the movement cluster produced combined components of both intended forms.

In a final example of this kind, a signer produced the sequence BIRD$_{inf}$ RUN$_{sl:PA,MOV}$ meaning 'the bird ran away.' BIRD is properly made by closing movements of the fingers while the hand is in contact with the chin; RUN is made by moving the hands away from the body while the index fingers wiggle repeatedly. In the error, RUN$_{sl:PA,MOV}$ kept its wiggling movement but was made instead on the chin and remained stationary rather than moving away.

The three examples of movement-cluster interference illustrate (1) the addition of movement to form a simultaneous cluster, (2) the addition of movement to form a sequential cluster, and (3) the deletion of movement to decompose a simultaneous cluster. Thus the types of slips that occur suggest that some clusters of values for movement are independently organized.

Two-Part Signs: The Question of Bisyllabic Structure

Thus far in our discussion of slips of the hand we consider simplex signs as single segments, simultaneously comprising a single HC prime, a single PA prime, and one or more MOV components. Unassimilated compound signs (formed of two existing signs) in our corpus were clearly treated as two-part signs in which either part could be indepen-

dently involved in a slip of the hand. A small number of ASL signs that are not compound signs require two PAS in their specification (sometimes accompanied by a consequent change in orientation). A sign such as TOAST, made with a bent V hand, contacting first the back of the hand and then the palm, is not a compound and yet could be considered a two-part sign. Other such signs are SPAIN, PROGRAM, NUN, INDIAN, each requiring two specifications for PA. Evidence from slips of the hand might bear on the question of whether such signs should be analyzed into two discrete parts.

Our corpus of slips provides three clear examples that would support an analysis of certain signs as having two-part structures. In two HC slips and one PA slip, only one part of a two-part sign was altered, leaving the other intact. In one example a signer intended to sign the two-sign sequence CHEESE TOAST ('grilled cheese sandwich'); that sequence became scrambled, but in a very straightforward way. The intended sign CHEESE, a simplex sign, is made by one hand in a loose /5/ HC (the spread hand) mashing into the palm of a flat /B/ base hand. TOAST, a two-part sign, is made with an active bent V hand, [V̈], touching first the back of a flat base hand, then its pronated palm. In the error, CHEESE, with its mashing movement, was skipped over: the first part of TOAST was produced as intended; then, in the second part, the /5/ HC of CHEESE was substituted for the bent V of TOAST, with the contact movement of the proper second half of TOAST preserved (see figure 5.12).

Another such example occurred with the intended signs PROGRAM DEAF (meaning 'program for the deaf'); PROGRAM, like TOAST, involves two different locations (on the palm of the hand and then on the back of the hand). Again the two parts were treated as segmentable. The signer made the first segment of PROGRAM and then, instead of making the second contact on the back of the base hand, made a contact, still with the active /K/ hand of PROGRAM, on the cheek, the PA of DEAF.

These examples in our corpus, in which only one part of a two-part sign is affected in a slip, suggest some degree of independent planning for each of the two parts of such signs (two-part signs made in two PAS).[11]

Morphological Exchanges

There is one last category of slips that has been treated in investigations of speech errors: Garrett (1975) considers them to be the stranding of "syntactically active" morphemes when the word roots to which they are attached are reordered, as in *I'm not in the* read *for* mood*ing*. Our corpus does not contain any examples of such slips, although they
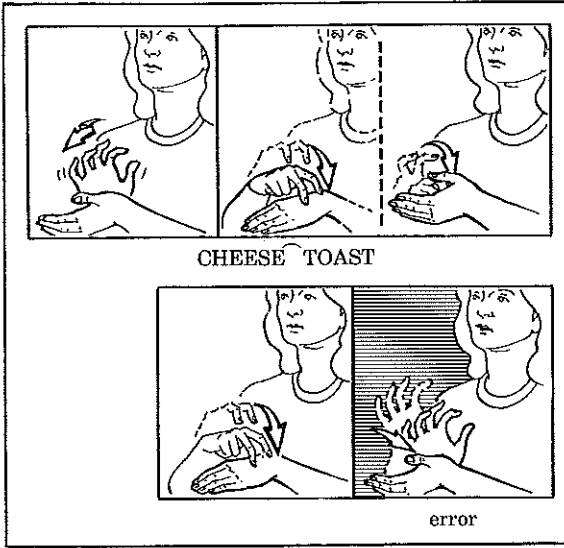
Figure 5.12   Slip indicating independence of parts in a two-part sign.

could in principle occur. Chapters 11 and 12 deal with morphological processes in ASL which involve simultaneous changes in the movement of signs. In an informal memory study in which lists of uninflected and inflected signs were intermingled, subjects sometimes recalled the sign correctly but misplaced the inflection. It may be that the small size of our corpus militates against the occurrence of such slips.

Morpheme Structure Constraints: Actual, Possible, and Impossible Forms

The analysis of language production errors can provide evidence not only of the independence of individual structural elements at several levels in the planning process but also of the rules for combining these elements. Linguists studying spoken language errors have noted that "a slip of the tongue is practically always a phonetically possible noise" (Wells 1951)—that is, phonetically possible in terms of the language in question. Even if at some planning stage the individual sounds in a language are misordered, the combinatorial rules of that language persist in adjusting the output in predictable, rule-governed ways. The persistence of these rules rather than physical impossibility renders forms like *tlip of the sung* highly unlikely and would account for the additional adjustments made in a slip of the tongue that produces *shreudian flip* for *Freudian slip,* with [š] rather than [s] (mentioned in Fromkin 1973). Further, although there are many examples of actual

Table 5.2   Actual signs produced in slips of the hand.

Parameter	Glosses	Signs produced
Hand Configuration	CAN'T$_{sl:HC}$ SLEEP$_{Inf}$ BUT$_{Inf}$ WHAT$_{sl:HC}$ DEAF$_{sl:HC}$ WOMAN$_{Inf}$ HOME$_{sl:HC}$ WORK$_{Inf}$ MUCH$_{sl:HC}$ LARGE$_{Inf}$ SUPERIOR PAPER$_{sl:HC}$ GOOD ENOUGH$_{Inf}$ MEET$_{Inf}$ READY$_{sl:HC}$	THAN CUT PARENTS MENSTRUAL-PERIOD LARGE FILL[M:habitual] DIFFERENT
Place of Articulation	BIRD$_{Inf}$ RUN$_{sl:PA,MOV}$ CREAM$_{Inf}$ SUGAR$_{sl:PA}$ RECENTLY[+]$_{sl:PA}$ EAT$_{sl:PA}$	WHO BUTTER RED HOME
Movement	TASTE$_{sl:MOV}$ GOOD$_{Inf}$	DELICIOUS
Hand Arrangement	WILL$_{sl:HA}$ TRY$_{Inf}$	PAY-ATTENTION

words produced in slips, many more are meaningless though, for all linguistic purposes, possible word forms.

Our corpus includes at least a dozen clear examples of actual, commonly used, signs resulting from substituting for a parametric value in an intended sign an equivalent value from some other sign. Table 5.2 categorizes these according to the parameters involved and shows that the meanings of the signs produced are usually far different from the meanings of those intended.

The overwhelming majority of slips in our corpus, however, take the form of possible combinations of parametric values which happen *not* to have conventional meanings associated with them. One example of this kind comes from the anticipation of a HC in the slip FEEL$_{sl:HC}$ *C-O-N-F-I-D-E-N-T* THAT$_{Inf}$ (see figure 5.13a) where the HC of THAT occurs as a substitute for the HC of FEEL, resulting in a possible but nonexistent sign. Another example, this one a PA substitution, involved the last sign in the sentence STILL SOUND$_{Inf}$ FUNNY$_{sl:PA}$. Instead of being made by brushing downward twice on the nose, the sign FUNNY was made by brushing the ear, the location of SOUND (see figure 5.13b). In a third example, the sequence THAT CHARACTER$_{Inf}$ MEAN$_{sl:MOV}$ ('that's the characteristic meaning'), the signer borrowed the movement of CHARACTER—a cluster of circling followed by contact —for the sign MEAN (see figure 5.13c). None of the forms produced by these three slips has any conventional meaning, but we can claim that
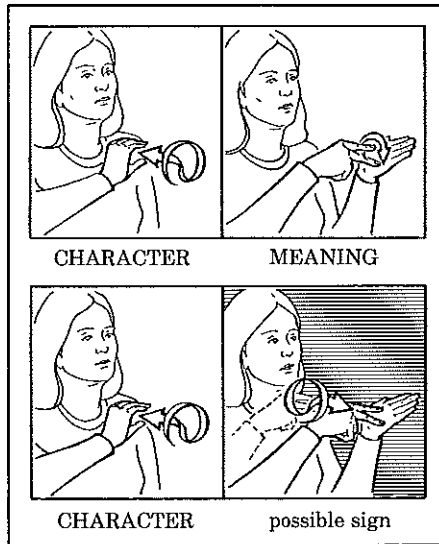
Figure 5.13   Possible but nonexistent signs produced in slips of the hand.
(a)   Possible ASL sign combining PA and MOV of FEEL with HC of THAT.
(b)   Possible ASL sign combining HC and MOV of FUNNY with PA of SOUND.
(c)   Possible ASL sign combining HC and PA of MEANING with MOV of CHARACTER.
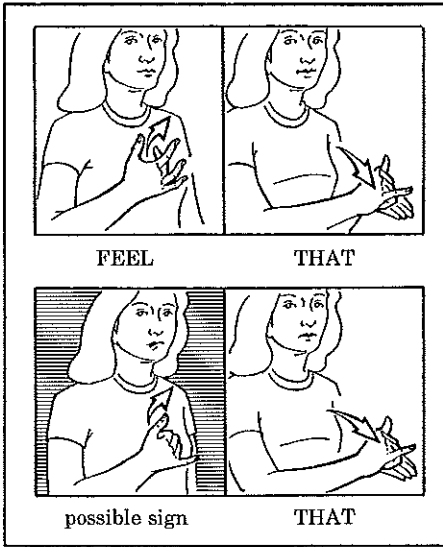
(a)
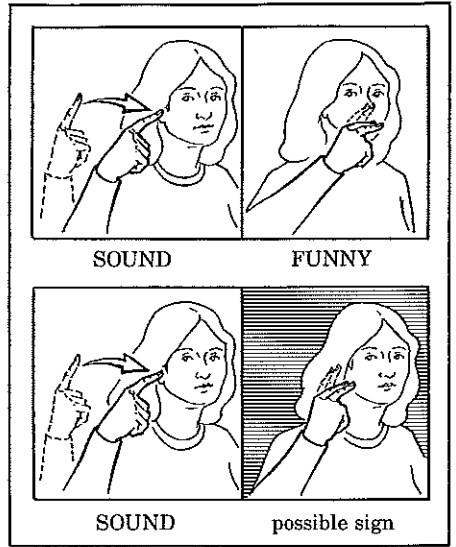
(b)

(c)

each is a possible sign in ASL because (1) the values for each of the structural parameters utilized in them are chosen from the catalog of possible values and (2) the final combinations of values are all allowable under the structural constraints of ASL.[12]

Some of the data from our corpus suggest how combinatorial rules can come into play in shaping the final forms of slips of the hands. One kind of constraint governs the use of specific contacting regions for particular HCs in particular PAs. In several slips an unintended substitution of an active HC is accompanied by the change to a contacting region compatible with it and different from that of the intended HC. For example, in the HC metathesis between SICK[+]$_{sl:HC}$ and BORED$_{sl:HC}$ the index-finger contact of BORED was not preserved when the HC of SICK[+] was used (see figure 5.1), since the appropriate contacting region for the bent mid-finger /8/ HC is the tip of the middle finger only. Index-finger contact with this HC is ruled out.[13]

In another example, the signer intended DEAF WOMAN, and signed DEAF$_{sl:HC}$ with the HC of WOMAN (see figure 5.14). The intended sign DEAF has a /G/ HC with the extended index finger contacting near the tip. In the error, the /5/ HC of WOMAN was substituted instead (all five fingers extended and spread). The /5/ handshape in ASL signs does not permit index finger contact, however, and in fact in the slip the contacting region was changed to the thumb tip, an appropriate contact for the /5/ HC.

On a different organizational level, a process of symmetricalization operates in signs made with two active hands so that both hands will exhibit symmetry of HC and MOV. In 21 out of 22 slips in our corpus where the affected sign was either already a two-handed sign in its intended form (13 cases) or made into a two-handed sign in the slip (8 cases), the Symmetry Constraint applied. (In the one exception, symmetry of MOV does occur even though symmetry of HC does not.) Such adherence to known structural constraints in slips provides supportive evidence of their psychological reality in sign-language formation.

Finally, in our entire corpus only five errors were felt to be impossible, or extrasystemic, gestures; that is, they were signs in which combinations of parametric values violate specific structural constraints of the language.[14]

For example, in the intended phrase TO SCRATCH, instead of the HC of TO the signer produced the HC of SCRATCH$_{inf}$ (a change from two /G/ hands to two bent /5/ hands). The normal contacting region with /G/ hands is the index fingers; with bent 5 hands the contacting region could be all five fingertips. The particular contact used in the error maintained index-tip contact only, which is not possible between two bent /5/ hands in ASL.
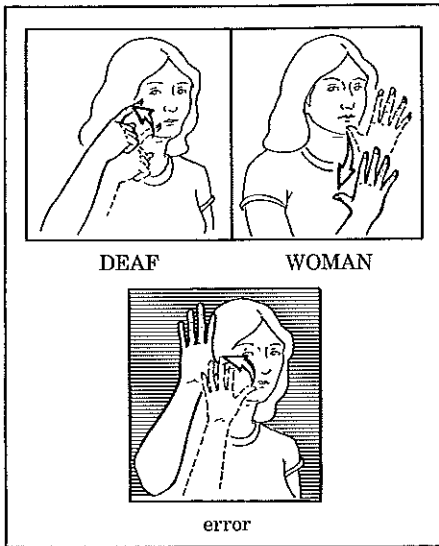
Figure 5.14   Contacting region substitution accompanying an HC substitution. (The error has not only the HC but the contacting region of the influencing sign.)

Thus, rare slips produce combinations of formational elements that are not allowable in ASL, and some slips produce actual though unintended signs. However, the great majority of slips of the hand(s) produce possible, though nonexistent, signs that accord with known rules for the combination of parameter primes. Such slips provide evidence of rules for combining abstract formational elements into lexical units in the language.

The speech errors called slips of the tongue have furnished evidence for the combinatorial units and rules that constitute spoken language. We have found that their counterparts, slips of the hand, provide equally valuable clues to the organization of sign language for deaf signers. As in the case of intrusion errors in short-term memory experiments (see chapter 4), the nature of slips of the hand was captured readily by an analysis that treats a sign as a simultaneous composite of separately abstractable values. There is a basic difference in the source of the errors in the two studies. In the short-term memory experiments the errors were always actual ASL signs; this of course was expected since the task for the subjects was to recall actual signs. In the study of spontaneous slips the errors were generally gestures that are not actual signs of ASL. But of most interest to us is the fact that, with very few exceptions, these gestures were forms that we had independently

predicted would be possible signs of ASL, as opposed to impossible signs of ASL, and were judged as possible signs by native signers. Similarly to the case of slips of the tongue in spoken language, readjustments in some parameter values (particularly those for contacting region) accompanied some of the structural substitutions to bring the error forms into conformity with hypothesized constraints on the combination of parameter values in ASL.

Slips of the hand provide striking evidence for the psychological reality and independence of individual parameters of ASL: they are behavioral evidence from everyday communication that a sign is organized sublexically and thus that this language of signs exhibits duality of patterning and, at certain levels of organization, arbitrary relations between form and meaning.