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Language in the Body:
Iconicity and Metaphor in American Sign Language

by

Sarah Florence Taub

B.A. (Williams College) 1988
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Fall 1997


Language in the Body:
Iconicity and Metaphor in American Sign Language

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by

Sarah Florence Taub

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... as imagination bodies forth
The forms of things unknown, the poet's pen
Turns them to shapes and gives to airy nothing
A local habitation and a name.

--William Shakespeare, *A Midsummer Night's Dream* V.i.14-17

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Preface

How did a hearing linguist with no Deaf friends or family come to study and write about American Sign Language?

It all began when a hearing friend who was studying ASL began to tell me fascinating things about the language: spatial inflections on verbs, classifiers, facial adverbs, and more. I asked about creative signing and poetry. He told me about some of Ella Mae Lentz's poems, how handshapes and movements can be chosen to fit the thematic content of the poem -- the patterns of form ("rhyme", if you will) and the patterns of meaning (metaphors, themes) unified rather than separate as in spoken languages. I was hooked. The next ASL class started two months later, and I was in it.

As a long-term metaphor researcher and cognitive linguist, I found that ASL was full of wonderful phenomena that cried out for a cognitive linguistics analysis. Classifiers invoked mental imagery abilities; role shifts created new mental spaces; abstract concepts were expressed metaphorically. Raising all this to a new level of excitement was the remarkable iconicity of ASL signs: I could actually see images sketched in space, mental spaces set up in different areas, signers' bodies "becoming" the bodies of those they described, spatial relations shown directly by the relative locations of signs, abstract concepts expressed through concrete visual images. This book is an exploration of some of these topics. (Other linguists have begun to give

cognitive linguistics explanations of these phenomena as well, e.g., Scott Liddell, Karen van Hoek, Sherman and Phyllis Wilcox -- a trend which I hope continues.)

Along with my enthusiasm for the beauty and elegance of ASL, I am committed to working with and empowering the Deaf community. For too many years, linguists have treated minority languages simply as "data" and users of the languages as "informants" to be paid and dismissed. Language is not an abstract set of facts; it is a system used by real people in their daily lives, and linguists who profit from that system must not ignore the struggles and concerns of those people. One way in which I am trying to "give back" to the Deaf community is by keeping my work as accessible and free from jargon as possible. This both gives Deaf people access to the latest professional thinking on their language, and makes it easy for hearing people to find out about the beautiful language and culture of the American Deaf.

I see this book as an outreach device to create a larger community for doing similar research. It prepares ASL linguists to start doing cognitivist work on signed languages, and it encourages cognitivists to incorporate signed languages into their theories. The Deaf community will have a new way to analyze and appreciate the forms of their language; and the world at large will begin to see the beauty and complexity of conceptual structure and its visible manifestations in signed languages.

Chapter 1: **A Glimpse of the Material**

The Abundance of Visual Imagery in American Sign Language

Imagine that you are taking part in a conversation using American Sign Language, the language of the American Deaf community.¹ You are about to see linguistic strategies and a potential for visual imagery barely hinted at in spoken languages.

The signer is telling you about her kitchen. She sketches the four walls in space, then quickly identifies the appliances and furnishings. As she names each one -- refrigerator, sink, cabinets, and so on -- she places it within the sketched outline of the kitchen, punctuating each location with a special head-nod. Before long, a virtual map of the room floats in the space between you.

Now the signer is describing a conversation she had with her six-year-old son. She names her son and points to a spot on her right. Her body shifts to face rightward and her signing angles down toward where a six-year-old's face and body would be, as she reports how she asked her son to get

¹ I follow the usual convention of using "Deaf" as a cultural label, and "deaf" as an audiological label; that is, Deaf people participate in the community and culture of Deafness (which has its own folklore, customs, and language; cf. Lane et. al. 1996), while deaf people are those with a severe hearing loss, regardless of whether they participate in mainstream or Deaf culture.

her a towel; then her body shifts to face upward to the left as she gives his assent. The relative heights and locations of the signer and her son are completely clear in your mind's eye.

The woman goes on to describe how her son ran about the house to find the towel. Her index finger is extended upward from her fist, and she traces a complex path through the air with that handshape. The twists and turns of her hand sketch out for you the path her son took around the house: rapid and somewhat random.

Later, she is explaining to you how hard it can be to get the child to understand what she wants. Once again she uses the straight index-finger handshape; it moves from her temple toward her son's "spot" on her right, hits the palm of her other hand, and bounces off. (An English speaker might have said, "I can't get through to him.") Eventually, the son understands; now the finger moves from temple to hand and penetrates between the index and middle fingers. You can see the woman's thoughts metaphorically portrayed as objects traveling from her head to her son through a barrier.

All of these features of the conversation are perfectly normal, conventional features of ASL. They are not mime or play-acting; you will find each one in standard ASL textbooks and dictionaries. But like mime, they contain vivid visual representations of physical forms. These signs and

grammatical features bear a striking resemblance to the things they represent: they are *iconic* forms. (The fourth example is more complex; as we shall see, it is metaphorical as well as iconic, a fact with interesting implications.) This book investigates the stunning variety of iconic and metaphorical forms in signed languages, compares them to their tamer counterparts in spoken languages, and explores the implications for linguistic theory.

The Sign Is Not Always Arbitrary

Why should we care about iconic and metaphorical types of signing -- other than their intrinsic beauty, of course? One answer is because they tell us a lot about the nature of language itself.

For a long time, the doctrine of the "arbitrariness of the sign," attributed to de Saussure (1983 [1915]), has held sway in linguistics. A *lack* of connection between a word's form and its meaning has been seen as the highest property of language, the thing which raises humans above beasts. Any creature, this reasoning goes, could imitate a dog's bark and use that sound to mean *dog*; any creature can growl when angry and yip when frightened; humans alone have detached these sounds from immediate, intuitive associations and fashioned

an elegant system of symbols from them. These symbolic forms, no longer restricted by the need to physically resemble their referents, are what allow us to talk about anything from amnesia to ethics.

According to this view, iconic forms are limited to play-acting, imitations, and the rare onomatopoeic word, and their meanings can never be sophisticated or abstract in any way. As we shall see, this view is completely mistaken. Unfortunately, the intense prejudice against iconic forms led to prejudice against signed languages. People claimed for many years (some still do) based on the iconic aspects of signed languages that they were merely mime, play-acting, imitations: not true languages at all, and incapable of expressing abstract concepts. This is wholly untrue, as linguists from Stokoe (1960) onward have shown. Nevertheless, part of the enterprise of proving ASL to be a language has focused on minimizing and discounting its iconicity to make it seem more like "true" languages --that is, supposedly arbitrary spoken languages (e.g., Hoemann 1975, Klima & Bellugi 1979; cf. McDonald 1982).

This enterprise, though understandable, is misguided. The relative scarceness of iconicity in spoken language is not a virtue -- it is merely a consequence of the fact that most phenomena do not have a characteristic noise to be used in motivating a linguistic form. In particular, three-dimensional spatial relationships, so crucial to language in many ways (e.g., Talmy 1985a, 1985b; Lakoff 1987; Langacker 1987; Johnson 1987; Regier 1996), cannot be represented iconically using the one-dimensional sequential medium of sound.² Even so, researchers are now finding (Haiman 1985a; Hinton, Nichols, & Ohala 1994) that iconicity is common enough to be of serious interest in the spoken languages of the world; if sound were not so limited in what it can iconically represent, they would no doubt have even more iconicity. Signed languages, created in space with the signer's body and perceived visually, have an incredible potential for iconic expression of a broad range of basic conceptual structures (e.g., shapes, movements, locations, human actions), and this potential is fully realized.

Metaphor Lets Iconic Signs Have Abstract Meanings

² We can speculate on what spoken language might be like if, like dolphins, we had highly-developed abilities to localize objects in space using sound, and if we could create sound patterns that appeared to be

An exciting development in signed language research is the discovery (e.g., Wilbur 1987, Holtemann 1990, Wilcox 1993) of signs that combine metaphor and iconicity. *Conceptual metaphor* is the consistent use of one basic conceptual area to describe another, perhaps less self-evident area. For example, English consistently uses language about throwing and catching objects to describe communication of ideas (e.g., "I couldn't catch what you said;" "We were tossing ideas back and forth;" "It went over my head").

It has been argued (e.g., Lakoff & Johnson 1980, Lakoff & Turner 1989, Lakoff 1992) that these patterns of metaphorical language reflect how we think about abstract concepts: since we have no direct sensory contact with ideas and their communication, we reason and talk about them based on what we know about throwing and catching objects -- a directly perceived activity that is easily accessible to other people. It is easy to believe that we share knowledge, and can thus share language, about an event like catching a ball, but harder to develop similar shared terminology about a communicated and understood idea. Since the two activities are analogous in certain ways, it makes sense that the

coming from specific locations. In such a species, sound-based language

concrete one is used to talk about the non-physical one.

A great many ASL signs for abstract concepts -- emotions, ideas, personal interactions, and so on -- incorporate a visual image of a concrete thing or activity. For example, the signs described in 1.1 above, roughly glossed as THINK-BOUNCE and THINK-PENETRATE (Figs. 6.1 and 6.5), give a visual depiction of communication as objects moving from one person to another.³ Anger can be shown as fire in the abdomen or as explosions; affection can be shown as closeness of articulators; authority can be shown as height, to name only a few other examples.

Not only do these signs demonstrate that metaphor exists in ASL, they shed light on the innumerable twists and turns and connections within the ASL user's conceptual system. A vast array of concepts are linked by metaphor to concrete concepts; a great deal of meaning can therefore be expressed

might be highly iconic in unexpected ways.

³ There is no standard writing system for ASL, and the proposed writing systems use various combinations of symbols that are not part of the regular alphanumeric set. For convenience in writing, and to keep papers on signed languages accessible to the non-specialist, many sign linguists use *glosses* to represent signs. The convention is to choose a word of the relevant spoken language to represent the sign in question; the word should have roughly the same meaning as the sign. Glosses are written in capital letters; various additional diacritics have been developed to handle grammatical features of the signed language.

Though certain choices of English words for ASL signs have become fairly conventional, there is no standard "glossing dictionary" for ASL; thus, it can be difficult to recognize a sign from its gloss. Moreover, the semantic match between the gloss and the sign can be quite poor. For this reason, for all my crucial examples (and wherever else space permits), I have presented a photographic illustration and a semantic description of the sign along with the gloss.

by visual images of concrete objects and actions. Metaphorical signs can be taken as evidence for conceptual connections between pairs of domains of thought.

Conceptual Mappings Explain Iconicity and Metaphor

The work in this book will show in detail how iconicity and metaphor are based on *conceptual mappings*: sets of correspondences between domains of thought and linguistic forms. Each domain or form has some structure (e.g., scenario, participants, shapes, movements); and we can link parts of the structure of one domain to the structure of another. For example, one of ASL's iconic mappings is shown in Fig. 3.8: a pair of fingers iconically represents a pair of human legs. The fingers have a structure consisting of two long thin objects connected at the top; the same is true for the legs. The mapping between the two images links the left finger with the left leg, the right finger with the right leg, and the connection at the hand with the connection at the hips.

For a metaphorical example (given in detail in Chapter 6), consider again the communication examples mentioned above. These examples show us exactly how the domains of *communicating ideas* and *throwing objects* are linked for English speakers: the *idea* corresponds to the *object*; *telling*

or *explaining* the idea corresponds to *throwing* the object to someone; and *understanding* the idea corresponds to *catching* the object. Once again, relevant pieces of one domain are "mapped" (to borrow a term from mathematics) onto relevant pieces of the other domain.

These mappings are not random; we do not, for example, map the right fingertip onto the left knee-joint, or the process of explaining onto the tossed object. Instead, the mappings used in iconicity and metaphor preserve the part/whole structure of each domain or form. Thus, in iconicity, the parts of the referent are represented by analogous parts of the linguistic form; and in metaphor, on the whole, participants are mapped to participants, relationships are mapped to relationships, and processes are mapped to processes.

As we shall see, mappings give a precise and pithy explanation of how iconic linguistic items can exist, and why linguistic metaphors come in groups with consistent patterns. The most popular current linguistic theories, however, have no room to accommodate conceptual mapping in language.

Mappings and Linguistic Theory

The most widely accepted linguistic theories are

formalist, as opposed to *cognitivist* (see also Chapter 2): they treat language as a set of arbitrary symbols that are manipulated according to rules or constraints, arranged in allowable patterns, and assigned meaning by some interpretation mechanism. These theories usually divide language up into a number of components such as the *lexicon* or word list, the *phonology* or acceptable physical forms, the *syntax* or rules for arranging words in acceptable orders, and the *semantics* or rules for assigning meaning to sentences. Components are seen as *autonomous*; that is, rules for one component do not affect any of the others.

Such a model has no mechanism whereby the semantic component can influence the physical forms of language. It is thus not capable of handling the intimate form/meaning connection in iconic words, signs, and grammatical inflections, nor can it handle other forms of motivation such as metaphor. Cognitivist models of language, on the other hand, are particularly apt for describing networks of conceptual connections and their influence upon linguistic forms.

Because iconicity and metaphor pervade signed languages and are not rare in spoken languages, I will argue (Chapter 10) that an accurate theory of language requires a cognitivist approach; or at the very least, some type of approach that can handle conceptual structure and its impact

upon language.

A Preview of the Book

The rest of this book illustrates and expands on the themes that I have brought up here. Chapter 2 gives an introduction to the issue of *motivation* in language, and provides some background material on cognitive linguistics. Chapter 3 goes in detail through a few examples of linguistic iconicity, and outlines the progress of thought on how iconicity functions in ASL. In Chapter 4, I present a new theoretical treatment of iconicity, the Analogue-Building model. Finally, Chapter 5 provides a comprehensive survey of types of iconicity in signed and spoken languages.

In Chapter 6, we begin to discuss metaphor. There I give examples of ASL metaphors (and English ones, for comparison), and show how to describe them using *mappings*, or lists of correspondences; we will see how metaphor and iconicity are linked in signed languages. Chapter 7 shows how different aspects of a single sign can be motivated by different metaphorical and iconic mappings. Chapter 8 looks at four ASL metaphors that all draw on a single concrete domain: the vertical scale. In Chapter 9, I show how metaphor and iconicity are intertwined with the grammar of

ASL, and in particular, ASL's system of spatial verb agreement.

Finally, the last chapter delves into the implications of this work for linguistic theory. Chapter 10 suggests that metaphor and iconicity account for the remarkable degree of shared grammatical structures in the world's signed languages. Given the omnipresence of metaphor and iconicity in signed languages, and their substantial presence in spoken languages, there is no doubt that linguistic theories must be able to handle them. Theories that cannot accommodate these processes will not be successful in explaining and describing the human language capacity.

Chapter 2: **Motivation and Linguistic Theory**

Arbitrary, Predictable ... Or Motivated?

Let us return to the implications of metaphor and iconicity for linguistic theory.

As we have seen, iconic linguistic items are related to their meanings through physical resemblance. We should note, however, that there are many different possible iconic representations of a single visual or auditory image; for example, one could represent different parts of the image, use different scales or perspectives, or preserve different levels of detail. As Klima and Bellugi (1979) observed, the signs meaning *tree* in ASL, Danish Sign Language, and Chinese Sign Language are all equally iconic, but different in form: in ASL *TREE* (Fig. 3.1), the hands and forearms are positioned to resemble a tree growing out of the ground; the Danish equivalent uses the hands to trace the outline of a tree's branches and trunk, top to bottom; and the Chinese sign meaning *tree* uses two curved hands to trace the outline of a tree trunk, from the ground up.

Clearly, the meaning tree and the associated visual image do not *determine* the signs' forms, as they are all different -- but neither are the forms unrelated to the meaning. Instead, the forms all bear different types of physical resemblance to the image of a tree. The nature of these forms, given their meaning, is neither arbitrary nor predictable, but rather *motivated*.⁴

In using the term "motivation," I intend that two conditions be met: that one can observe a *tendency* rather than a strict rule, and that one can attribute the tendency to some *reason*. If there is no general tendency, only a single example, then any number of stories could be told about that example -- it could easily be due to chance, or some unusual and idiosyncratic circumstances that would not shed light on other linguistic phenomena; scientific linguists would certainly not wish to base their theories on these cases. But once a pattern exists, one can certainly look for common factors that might cause the pattern: in my data, these might consist of conceptual metaphors, iconicity or physical resemblance, semantic associations, and so on.

It is actually quite common for linguistic phenomena to

4 ASL does have a system for iconic "representative elements" which we will be discussing in detail: the classifier system (see Chapter 3, Chapter 5). Within that system, the choice of element for a particular referent (e.g., a V handshape for a "2-legged" human) is completely determined (that is, signers have a fixed set of choices within that

be motivated rather than strictly predictable. Spoken language has less iconicity than signed language, but it exhibits many other kinds of motivation in its patterns of form and meaning. For example, individual word roots are usually not iconic (e.g., there is nothing about the form "dog" to motivate its connection to the meaning *dog*), but their extensions to new meanings, on the whole, are motivated by natural human processes of conceptual association.

To continue the example, once the form "dog" has taken on the meaning *dog*, there are perfectly good reasons why it is extended to uses like "dogged persistence:" we believe that dogs are patient and persistent, and it is natural and common to use a creature's name to describe an associated characteristic. Nevertheless, we could not have said with certainty that any term meaning *dog* would take on that new meaning. The original form/meaning connection is arbitrary, but the extension to a new meaning is motivated.

As a second example, consider the English word "back." The original meaning (ca. 1000 AD) was *the outer surface of a vertebrate which is nearest to the spine*. After a few hundred years, the word began developing meanings such as *the area behind a person or object*, prepositional uses such as "in back of the house," adverbial uses such as *returning*

system). My point here is that the system itself is motivated but not

along the same path previously traveled, and verbal uses such as "to back up." It even came to refer to earlier times, as in "We can't go back in time." All of these extended meanings are motivated. There are good reasons for each extension: the spinal area of a human being is *behind* that person, and thus associated with the area behind that person, and the path that the person has traveled to reach their current location; there is a common metaphor where the past is referred to as behind us. Moreover, English (and other languages) uses these same kinds of extension over and over (cf. "side," "front," "head").

As we can see, spoken languages are highly motivated. Signed languages use the same kinds of semantic motivations that spoken languages do, e.g., association and metaphor. The main difference is that in addition, many or most basic word roots and inflections are iconically motivated.

The Goals of Linguistic Theory

If these processes are not completely predictable, should a linguist even be bothering with them? Shouldn't linguists restrict themselves to describing the predictable,

determined by the actual shapes of the referents.

rule-governed parts of language? As we will see, there is a difference of opinion on this matter.

Language and human communication is such a complex area that it is hard to know how to begin studying it. Language is deeply interwoven with our experiences of the world: our social interactions, our cultural institutions, even our thoughts, are often framed and mediated by language. The structure of language is not easy to discern; there are patterns at many levels, and the boundaries between levels are not clear. In a sea of complex interacting phenomena, where can a scientific inquiry start?

Chomsky (e.g., 1957, 1965, 1981) pioneered an approach to this problem that has dominated the field ever since. The proper area of a linguist's inquiry, he said, is the language user's knowledge of the structures of his or her language. This knowledge consists of a grammar of the language, and the grammar can be modeled as if it were a system of exceptionless rules. Language is to be treated as completely separate from other human cognitive abilities; no factors from outside the linguistic system can affect the rules of that system.⁵ Moreover, language is divided into several components: the *lexicon* (or word list), the *phonology* (or

⁵ The end product of the system can be constrained by factors such as memory load; e.g., humans cannot use sentences with three or more levels of embedded clauses, because such sentences are too complex to

smallest meaningless elements), the *syntax* (or ordering of words), and the *semantics* (or meanings), and each component itself is considered to be autonomous from the others.

The effect of this set of assumptions was monumental. Linguists were freed to look at each aspect of a language separately, without having first to understand how all the aspects fitted together. Moreover, they were handed a powerful modeling tool with which to describe each aspect. At last, the problem of language seemed tractable; decades of intense modeling efforts ensued, based on Chomsky's assumptions (which I will call the *formalist* approach to language).

Chomsky's approach is a typical one in the physical sciences: if a system is too complex to understand, break it down into parts and try to understand each part. The hope is that once each part is understood, the pieces can be put back together to yield an understanding of the whole. It is a powerful strategy, and physicists have successfully modeled many complex systems using it; yet it has limits. It only works when the parts of the system are truly independent enough that they can be understood on their own.

The danger of this "piecewise" approach is that if the autonomy assumptions are not well founded, they can lead to

process. But the grammatical rule systems themselves cannot be

models where the true explanation of a phenomenon is not allowed to figure in the rules describing that phenomenon. These models are descriptively accurate, to be sure, but they simply reproduce by fiat what a truly explanatory theory would attribute to external causes. This, many argue, has been happening in linguistics.

As a case in point, Ohala (1983) found that many types of sound change in spoken languages could be explained by perceptual similarities of the sounds involved. For example, in many languages, /kw/ becomes /p/, but not vice versa (e.g., Proto-Indo-European **ekwos* became Greek *hippos* "horse"). Ohala noted that the two sounds are extremely similar in their acoustics, with /kw/ possessing an extra set of frequencies that /p/ lacks. If noise happens to interfere with those frequencies, then /kw/ can easily be mistaken for /p/. But the reverse error, where /p/ would be misheard as having /kw/'s extra frequencies, is quite unlikely (as Winitz et. al. 1972 [cited in Ohala 1983] demonstrated in the laboratory). Children making these errors would incorporate the "incorrect" /p/'s into their vocabularies. In a theory where the phonology is strictly autonomous, this change could only be stipulated by rule; yet human perceptual errors plus the sounds' properties easily explain this sound change and

structured by such considerations.

its direction.

This and many other examples show that language is not in fact autonomous from the rest of human cognition. Unfortunately, the autonomy claims that justify the formalist school's approach have been elevated to the status of doctrine. Rather than being seen as a set of simplifying assumptions that are intended to help tame a complex system, they are now taken as truths about the nature of language. Linguists routinely argue (e.g., Bickerton 1981, 1984) that language is a completely self-contained system, with genetically pre-programmed modules that interact with each other and other cognitive processes only through well-defined interfaces.

The years of work based on assuming the autonomy of language and its components have not been wasted; our understanding of many complicated linguistic structures has advanced a great deal. But it is time to take the evidence seriously, and to begin building theories that treat the complex interconnections of language, perception, and cognition.

Another difficulty of rule-based linguistic theories is the assumption that these rules should have no exceptions. But this leaves no room for the vast range of linguistic phenomena that are motivated: not fully predictable, yet far from random. As we noted above, a linguist could not have

guaranteed that a word like "back" would take on the meaning *the area behind something* -- yet given the frequency with which body part terms become prepositions in the languages of the world, and the conceptual association between the body part and the area near it, the linguist certainly would not have been surprised. There must be a place in linguistic theory for consistent, less-than-predictable tendencies that happen because of clearly-describable reasons.

A number of linguistic "schools" have moved away from treating language as a self-contained, rule-based formal system, and are looking for external explanations for linguistic phenomena. One group is the *experimental phonologists* (e.g., Ohala 1983, 1990; Ohala & Jaeger 1986; Kingston & Beckman 1990), who work on the sound component of spoken languages. They look for explanations of sound patterns in the characteristics of the human vocal and auditory systems, plus the acoustics of the sounds themselves. Another group is the *functional linguists* (e.g., Givon 1979, 1984; DeLancey 1981; Hopper & Thompson 1980, 1985). They seek to understand language by looking at the functions that it serves in communication; thus, they are concerned with motivations for both the form and the meanings or uses of linguistic items.

A third group is the *cognitive linguists*, who try to describe linguistic phenomena in ways that are consistent

with (and motivated by) what is known about the human cognitive apparatus. This book is written in the cognitivist framework, and so I will spend some time discussing its assumptions and procedures.

Cognitive Linguistics

The aim of cognitive linguistics is to build a theory of language that is consistent with current knowledge about the mind and the brain. Cognitive linguists draw on results from cognitive psychology and neuroscience on memory, attention, categorization, sensory perception, and the neural underpinnings of thought. Rather than inventing a new kind of rule-system for every aspect of language, we try to build our theories using the kinds of processes that are known to occur in other areas of cognitive functioning. This leads to a number of differences between cognitivist theories and formalist theories.

First of all, language is not assumed to be autonomous from other cognitive functions. Of course, there will be language-specific structures (dealing with, e.g., the language's word ordering), but they will be the same *kind* of structures that one sees in other parts of the mind. For example, Langacker (1987, 1991a, 1991b) uses general

cognitive functions such as *figure/ground* structure, *scanning*, *viewpoint*, and *schematization* in his theory of language.

This assumption, it should be noted, leads to a different notion of theoretical economy. All scientists want their theories to be as simple as possible, while still explaining the data. The formalist notion of simplicity is (roughly speaking) to have as few formal rules and exceptions to the rules as possible. Simplicity is calculated for each component, however, and different components can have completely different kinds of rules. Cognitivists, on the other hand, think that an economical theory is one that uses processes that are known to be part of mental functioning; we prefer not to create new types of rules for language and its substructures.

Just as language is not assumed to be autonomous from general cognition, the pieces of language are not seen as autonomous from each other. First of all, *meaning* is not separated off from *form*. Of course it is possible to consider the form patterns of a language (e.g., what sounds a spoken language allows) and the meaning patterns of a language (e.g., how many color distinctions it makes) separately from each other; these constitute the phonology and semantics of cognitivist theories. But there is no autonomous syntax, where forms are arranged into patterns

without regard to their meaning. All linguistic items, even syntactic structures, are considered to be meaningful (even if only in a very schematic way). Meaning is a primary determiner of how linguistic items are fitted together to create larger structures.

Second, most cognitivist theories make no ironclad distinction between *lexical* items, *morphological* items, and *syntactic* items. That is, words, inflections, word-orderings, and so on are all seen as form/meaning pairs. For formalist theories, the lexicon is the repository of all "exceptions," things that must be stipulated; it should be possible to generate everything else by rule. For cognitivist theories, every conventional item in the language, be it a word, an inflection, an idiom, or a clause structure, is remembered separately, along with the generalizations that link them.⁶ This makes it easy to accommodate tendencies and partial generalizations such as the ones discussed in the first section of this chapter. Cognitive linguists are not much concerned with "redundancy" in our theories. It is known that the brain has immense memory capability; there is room for exceptions and generalizations at all levels of structure.

⁶ It is not that the word as such has no status in cognitive linguistics. Rather, there is no radical difference between syntax and

There are no rules or derivations in cognitive linguistics. Complex structures (e.g., clauses, sentences, inflected words) are of course formed from combinations of simpler structures; but there is no assumption that this is done as a sequence of steps. Instead, cognitivist theories allow these combinations to occur "all at once." Linguistic items have slots or "elaboration sites" (Langacker 1987) where they can incorporate or combine with other items (e.g., verbs have slots for their main participants); this combination process can be based on form, on meaning, or on both. This is motivated by the fact that the time-depth of language processing is extremely short, on the order of 500 milliseconds or 100 neural "steps:" there is no time for lengthy derivations (Rumelhart et. al. 1986).

The lack of derivations also means that cognitivist theories don't name one structure as "primary" and others as "derived" from it (e.g., passive sentences as derived from active sentences). Both structures are formed in the same way, by combination of simpler linguistic items.

Another important precept of cognitive linguistics has to do with the nature of linguistic categories (i.e., forms, such as English phonemes; meanings, such as the concept *green*; and form/meaning pairs, such as the word "dog," the

morphology; patterns at both levels, though different in their

subject-predicate sentence structure, or the syntactic class "verb.") Linguistic categories are categories of human cognition, and display all the same characteristics.

We know a lot about the nature of human categories; they are not like the categories of logic, strictly bounded with necessary and sufficient conditions for membership. Instead, their boundaries can be fuzzy and they show prototype structure (see, e.g., Rosch 1977, 1981; Rosch & Mervis 1975): there are better and worse members of the category. This structuring shows up in a number of psycholinguistic tests devised by Rosch and her associates.

To illustrate the notion of prototypes, consider the category *chair*. There are many types of chairs, some more familiar than others. Yet if English speakers are asked to visualize a chair, they will probably form a mental image that has four legs, a seat, and a back. This is the *prototype* of the category: loosely speaking, the best example, the one that comes first to mind. (See Lakoff 1987 for different kinds of prototypes.) Armchairs and lawn chairs are different in various ways from the prototypes, but are still felt to be good members of the category. Beanbag chairs, on the other hand, while they still serve the same function as other chairs, lack most of the typical qualities;

specifics, are expected to be similar in kind.

they are highly non-prototypical category members.

Cognitive linguists assume that all linguistic categories may show prototype structuring. This has been largely exploited in theories of semantics (e.g., Lakoff 1987, others), but theories of other linguistic phenomena have begun to use this fact. For example, it is possible to come up with a semantically based definition of the classes "noun" and "verb," if one treats them as categories with prototype structure; the prototype of "noun" is simply a *thing*, and the prototype of "verb" is an *action* (cf. Langacker 1991b, Hopper & Thompson 1985).

Finally, cognitive linguists place a great deal of emphasis on semantics. Some theories (e.g. Langacker's Cognitive Grammar) might even be called "semantics-driven," unlike the "syntax-driven" formalist theories: rather than having meaningless sentences generated by the rule systems of autonomous syntax, the meanings of linguistic items guide how the pieces of utterances are put together. There is much common sense to this approach, given that the purpose of language is to communicate meaning.

Formalist theories of semantics often focus on the "truth conditions" for sentences: the approach is to pin down the circumstances under which a sentence would be true, and to consider those circumstances to be the "meaning" of the sentence. Thus, a sentence like *The cat is on the mat* would

be true if a particular cat actually were on a particular mat; and it would be considered to "mean" that configuration of feline and textile. This approach has a number of drawbacks; the most significant one is that it has no place for viewpoint or perspective. Active and passive sentences with the same truth conditions, for example, would be considered to have the same meaning, though they clearly focus attention on different aspects of the same event.

Semantics as treated by cognitive linguists does not focus on what is "true" in the world; instead, it focuses on the conceptual system of the language user. A word or utterance picks out a piece of conceptual structure to focus on. Thus, English "cat" picks out the knowledge we have about domestic feline creatures; in particular, it draws attention to our category of *cats*, and especially to a prototypical member of that category. This is not an "objectivist" theory of semantics; it is not rooted in a theory of objective truth.

The usual opposite of "objective" is "subjective": if linguistic meaning is not grounded in the truth of reality, people have claimed that it must be completely random or arbitrary. This is a subjectivist view of meaning: that linguistic concepts could just be "anything at all," that there are no constraints on possible nouns, verbs, and grammatical inflections. The subjectivist approach to

meaning is popular in many academic circles, but it is not the view held by cognitive linguists.

To cognitivists, meaning is neither based on objective "reality" or completely arbitrary and subjective. Instead, conceptual structure and linguistic semantics are grounded in our *experiences* as embodied beings. Humans share the same kind of sensory apparatuses, neural structures, and bodily experiences; these experiences shape the kinds of concepts that we develop and that we attach to our linguistic items.

A good example of this comes from the color terms of the world's languages. At one point, it was believed that color words were completely subjective; that is, they could carve up the spectrum in any way at all. Berlin & Kay (1969) found that though languages differ greatly in their basic terms for colors, there are remarkable regularities. They asked speakers of many languages to pick out from a chart of 320 color chips the *best example* of each basic color word. It turned out that virtually the same best examples were chosen for all languages. In other words, all languages with a basic term in the blue range would choose the same best example, regardless of the boundaries of the term; if the language's basic term covered the ranges of English "blue" and "green," the best example would not be something like turquoise, in the middle of the two ranges; instead, it would be the same as either the best example of English "blue" or

of English "green."

Why should all languages have the same best examples of their color terms? Kay & McDaniel (1978) found an answer for this question, based on the neurophysiology of color vision. There are three types of cells in the retina: red/green detectors, blue/yellow detectors, and light/dark detectors. The red/green and blue/yellow detectors respond most strongly to particular wavelengths of light. Loosely speaking, those wavelengths constitute the best examples of the world's most basic color terms. Thus, the nature of the human perceptual system has a significant impact on the sorts of concepts we develop; color concepts are neither objective (i.e., existing independent of humans) or subjective (i.e., completely arbitrary), but based on experience.

Semantics, meaning connected with language, is not separable from all our other kinds of knowledge; it incorporates many of the myriad structures in our conceptual systems.⁷ The most successful models of human knowledge group what we know into substructures: e.g., Fillmore's (1982) *frames*, Schank & Abelson's (1977) *scripts*, or Lakoff's (1987) *idealized cognitive models*. All these terms refer to the fact that concepts tend to cluster together in related

⁷ As Slobin (1996) suggests, we may have to modify or cast our thoughts in a certain way to fit them into the specific semantic categories that

groups. As Fillmore (1982) says, "By the term 'frame', I have in mind any system of concepts related in such a way that to understand any one of them you have to understand the whole structure in which it fits....(p.111)." For example, to understand the concept of a *menu*, one had better know about *restaurants*, *waiters*, *ordering food*, and so on; all these concepts group together in the frame of *eating at a restaurant*. Cognitivist theories of semantics draw heavily on frames and their relationships; other semantic tools include *metaphor* and *conceptual mappings*, terms which will be defined (and used) in future chapters.

To sum up, cognitive linguists treat the language capacity as a part of the general human cognitive capacity. We seek to use general cognitive operations such as conceptual mapping, sequential scanning, knowledge structures or schemas, and mental imagery in describing linguistic phenomena, and we believe that linguistic categories are categories of human cognition, with the same types of prototype-based, fuzzy structures. In addition, we believe that linguistic structures at all levels of complexity (roots, inflections, word orderings, discourse patterns) carry meaning, and that the interactions and behavior of these structures are usually motivated by the interactions of

our language manifests; nevertheless, semantic categories can clearly

their meanings.

The cognitive linguistics framework is especially apt for the treatment of iconicity and conceptual metaphor (the main focus of this book). As we shall see, iconicity involves an intimate interrelationship between form and meaning; this is easy to describe in cognitivist theories, which do not separate off linguistic form from meaning. Moreover, iconicity and metaphor do not *determine* the nature of the linguistic items we will discuss; but they surely *motivate* the nature of those items. Cognitive linguistics has a place for the two aspects of iconic and metaphorical motivation: the less-than-fully predictable patterns (the *tendency*), and the conceptual structures that cause the patterns (the *reason*). Describing these patterns is definitely part of the linguist's job.

contain large amounts of conceptual information and structure.

Chapter 3: Iconicity Defined and Demonstrated

Iconicity and Resemblance Defined

In this chapter, we will begin to look closely at iconicity in language: after establishing a definition of iconicity, we will examine some examples of iconicity in signed and spoken languages in some detail. Once we have gotten a sense of how iconicity manifests itself in language, we will briefly review how linguists have treated iconicity. This discussion focuses on iconicity in signed languages, and traces a development of sophistication in sign linguists' theories. The next chapter will present a cognitive model of iconicity in signed and spoken languages, and the following chapter (Chapter 5) gives a survey of types of iconic items in both modalities.

Iconicity is common in both signed and spoken languages, and it is present at all levels of linguistic structure, including morphology and syntax as well as individual words. It is not a "simple" matter of resemblance between form and meaning, but a sophisticated process in which the allowable phonetic resources of a language are built up into an "analogue" of the referent. This process involves a substantial amount of conceptual work, including *conceptual mapping* and *schematization* of items to fit the constraints of

the language. This complex and pervasive process should no longer be ignored; successful linguistic theories must explain and accommodate iconicity.

Let me begin by strictly defining those items which I consider purely iconic. In iconic items, some aspect of the item's physical form (shape, sound, temporal structure, etc.) resembles a physical referent. That is, a linguistic item which involves only iconicity can only represent a concrete, physical referent.⁸ Thus, ASL TREE (Fig. 3.1), whose form resembles the shape of a prototypical tree, is purely iconic: its form directly resembles its meaning.

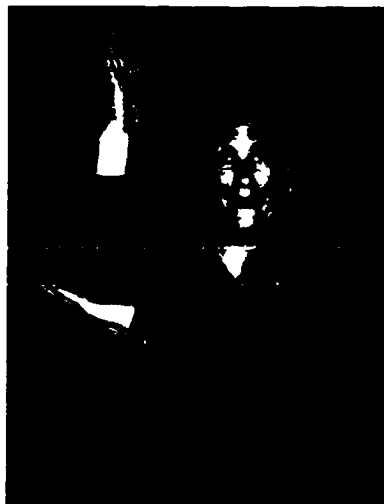


Fig. 3.1: TREE

⁸ As the preceding sentence suggests, by "concrete" and "physical" I mean the sort of thing that we can perceive more or less directly with our sensory systems. This includes sounds, sizes, shapes, body postures and gestures, movements and locations in space, durations, and so on. I do not mean only those things that are solid and tangible.

There is more than just iconicity, however, in signs such as THINK-PENETRATE (Fig. 3.2), whose form resembles an object emerging from the head and piercing through a barrier. THINK-PENETRATE, which can be translated as "s/he finally got the point," has a non-concrete meaning. The image of an object penetrating a barrier is used to evoke the meaning of effortful but ultimately successful communication (cf. the discussion in Chapter 6). This use of a concrete image to describe an abstract concept is an instance of *metaphor*, and THINK-PENETRATE is thus metaphorical as well as iconic.



Fig. 3.2: THINK-PENETRATE

To begin with, we will be looking only at iconic items that describe concrete objects or processes: sounds, shapes, durations, locations, etc.; discussion of metaphorical iconic items will be delayed until Chapter 6. This strict separation of metaphor and iconicity allows for a cleaner

treatment of both processes; it lets us apply Conceptual Metaphor theory (e.g., Lakoff 1992) to metaphorical items in a straightforward way (see Holtemann 1990, Wilbur 1987, Wilcox 1993 as well).

Our next task is to take apart our intuitive notion of "resemblance." There is no such thing as "resemblance" or "similarity" in the absence of an observer who makes a comparison: resemblance is not an objective fact about two entities, but a product of our cognitive processing.

Specifically, when we compare two entities (for similarity), we attempt to set up *structure-preserving correspondences* between our *mental models* of the two entities. This means that for each entity, we figure out its relevant parts and the relations between the parts: this is the perceived structure of the entity. Then, given the structure of one entity, we look for corresponding structure in the other entity. The more correspondences we can find, the more we believe the two entities resemble each other.

For example, take the process of comparing a pair of human legs (Fig. 3.3a) and the index and middle fingers extended from a fist (Fig. 3.3b). The human legs consist of two thin parts, approximately three feet long (for an adult), each with a joint in the middle; these two parts are joined at the top and have perpendicular pads (i.e., feet) at the bottom. The extended index and middle fingers consist of two

thin parts, approximately three inches long, each with two joints along their length; these two parts are joined at one end and have hard surfaces (i.e., nails) near the other.

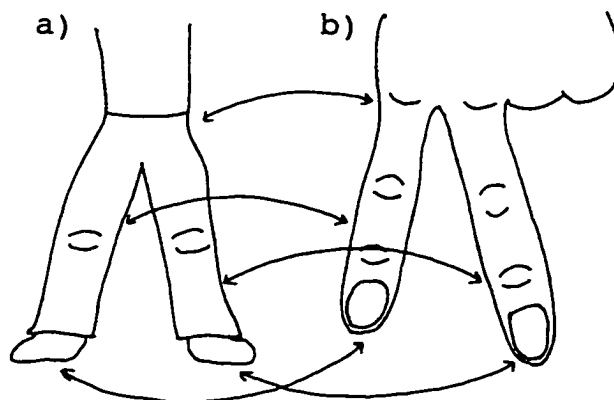


Fig.3.3: Structure-preserving correspondences between
a) human legs and b) extended index and middle fingers.

We could in theory set up correspondences between these two entities in an unlimited number of bizarre ways -- e.g., the right foot could correspond to the middle finger's second knuckle, the left knee could correspond to the entire index finger, and so on -- but the most natural thing to do when comparing is to set up correspondences that *preserve structure*. This enables us to note similarities and differences in the most efficient way: once we have a good sense of how (if at all) the two structures correspond, we can see at once how they differ in corresponding sub-areas (Gentner & Markman 1996 called these *alignable differences*.)

For example, the right foot is the bottom-most part of the right leg, which in turn is half of the leg-pair structure. There are parts of the finger-pair structure that bear an analogous relation to the structure as a whole: e.g., the middle finger's pad and nail area is the endmost part of the finger, which in turn is half of the finger-pair structure.

The lines in Fig. 3.3 show a set of structure-preserving correspondences: each leg with each finger, the hips with the knuckles of the hand, the feet with the fingertips. Based on these extensive correspondences, we can say that there is a strong resemblance between the legs and the fingers. We can also identify clearly some ways in which the two entities differ: in size, in number of joints, in having or lacking perpendicular (foot-like) ends, and of course in function.

It is the notion of alignable differences that provides concrete support for this structural view of similarity. Gentner & Markman (1996) found, for example, that subjects could list alignable differences more easily than other differences, and that they used alignable differences more in judging degree of similarity. They argue that these results are not consistent with other models of similarity (e.g., models based on "mental distance" or shared features), which,

since they are not based on structural alignment, cannot distinguish alignable and non-alignable differences.⁹

A set of correspondences between two entities is often called a "mapping." Thus, linguistic iconicity can be redefined as *the existence of a structure-preserving mapping between mental models of linguistic form and meaning.*

Examples of Spoken-language Iconicity

The following examples illustrate some of the vast range of ways in which linguistic items are iconic. (See Chapter 5 for a more complete survey of iconicity in signed and spoken language.) Examples are taken from English and ASL, not because these languages are special or specially related, but because they are likely to be familiar to the reader.

We start with a spoken-language lexical item: the onomatopoeic English word, *ding*, which refers to the sound of a bell. Fig. 3.4a shows an amplitude waveform plot of the sound of a bell being struck; note the sharp onset, the

⁹ Gentner & Markman (1996: 21-23) do note that we may judge similarity differently when performing different mental operations. For example, while the comparison process seems to rely on alignment of entities' structures, the process of similarity-based retrieval from long-term memory may be based on shared surface similarities rather than shared structural relations. G&M refer to this as the "plurality of similarity." I will assume that the structural alignment model of similarity is the appropriate one for iconicity.

initial loud tone, and the long, gradual fade of the sound. Fig. 3.4b gives the waveform of ding /dɪŋ/ spoken by an American woman; as we can see, the phonetic resources of English have been assembled into a remarkably faithful analogue of the sound. The stop /d/ provides a sharp onset; the vowel /ɪ/ is a loud, clear tone; and the nasal /ŋ/ furnishes a muffled die-off. The connecting arrows between 3.4a and 3.4b show the mapping between the two sound images. Note how not only the allowable *sounds* of English but also the *time ordering* of the sounds has been exploited in creating this linguistic item: the sound representing the onset, /d/, occurs first while the sound representing the die-off, /ŋ/, occurs last.

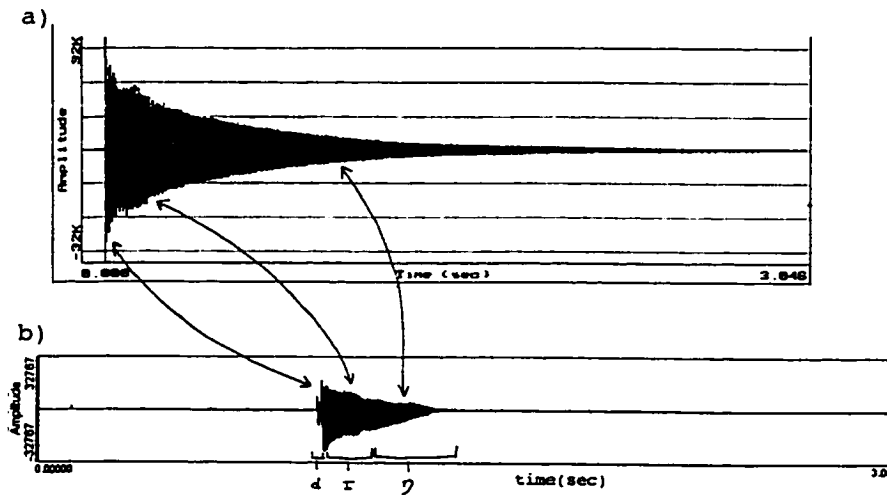


Fig. 3.4: Amplitude waveforms of a) a Japanese bowl-shaped bell's sound, and b) an American woman speaking the English word "ding"; arrows indicate correspondences

At this point we should notice a few things that are true of all iconic linguistic items. First of all, this form *ding* uses the phonetic resources of English, and conforms to English phonotactic constraints. The average English speaker can certainly use his or her vocal tract to create a more faithful or realistic rendering of the bell's tone -- most likely, that would involve eliminating the vowel and elongating the nasal, while holding the voice at a single pitch: /dŋŋŋ/.¹⁰ Such an imitation, however, could never be accepted as an English word, as it violates several phonotactic constraints: the need for a vowel in a monosyllabic word, and the standard length and pitch contours of English utterances. (See Rhodes 1994 for a discussion of these issues.) Thus, onomatopoeic words are not "mere" vocal mime.

Second, *ding* is an established part of the English lexicon. Though there are a number of other ways to represent the bell sound that conform to English's rules (e.g., *ting*, *doon*, *pim*), none of them has become conventionally established as an English word. This point is important because it further demonstrates the difference between free mime and iconic language. Clearly, an English

¹⁰ Some people are more gifted at sound imitations than others; would-be imitators are often strongly influenced by the phonotactics of their native language. See Chapter 5 for more discussion of imitations.

speaker does not re-invent a word like *ding* each time she or he wants to talk about a bell; instead, she or he uses the conventionalized items of the language. The speaker may not even notice in the moment that *ding* is iconic. However, there is also a productive system (analogous to but weaker than classifier systems in signed language) that allows English speakers to invent and use such "nonce-words" as *ting* and *pim* to describe the details of particular sounds in ways that conform to English phonotactics.

In *ding*, our first example, sounds represent sounds and time-ordering represents time-ordering in an English lexical item. The second example is a syntactic construction that is present in nearly all languages: when one clause precedes another, the default interpretation is that the event described by that clause occurs *before* the second clause's event. That is, if I say *I jumped into the pool and took off my shoes*, people listening to me will assume that my shoes got wet (see Fig. 3.5). Haiman (1985b) showed that if languages want to override this default interpretation, they must do something special: for example, add an explicit time-ordering word like *before* or *simultaneously* to one of the clauses.

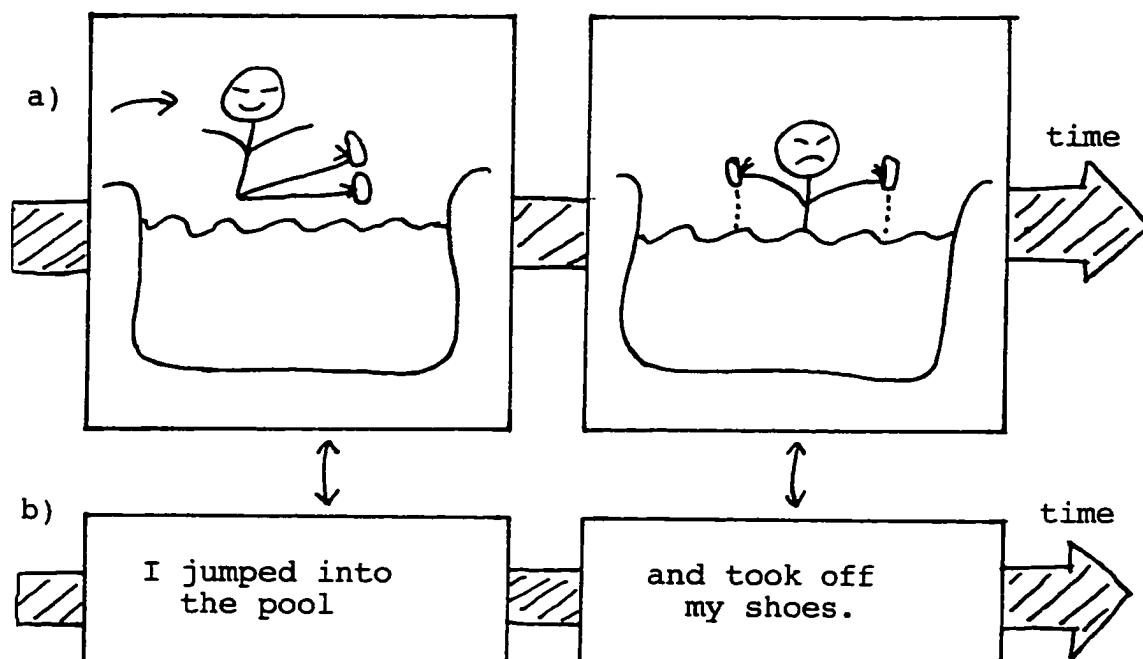


Fig. 3.5: The parallel temporal structure of a) a specific sequence of events and b) an English two-clause sentence that describes them; arrows show correspondences

Fig. 3.5a is a sketch of two specific events in sequence: a person jumping into a pool, and then taking off shoes. 3.5b gives the two-clause sentence quoted above that describes this sequence. The connecting arrows between the sketched events and the clauses show how their parts correspond.

Note that this iconicity is purely temporal: the only parameter of the sentence that maps onto its meaning is the temporal ordering of its clauses. The individual words in the sentence need not be iconic at all. Moreover, this example shows that iconicity does not manifest itself only in

lexical items: the *S1 and S2* sentence structure is itself an iconic form/meaning pair.

Fig. 3.5 shows the iconic mapping for a specific sentence and its referent; Fig. 3.6 gives the general case, treating the syntactic structure itself as a meaning-bearing element of the language. 3.6a gives an model of two generic events in sequence, and 3.6b gives the two-clause construction. Again, the connecting arrows show how the parts correspond.

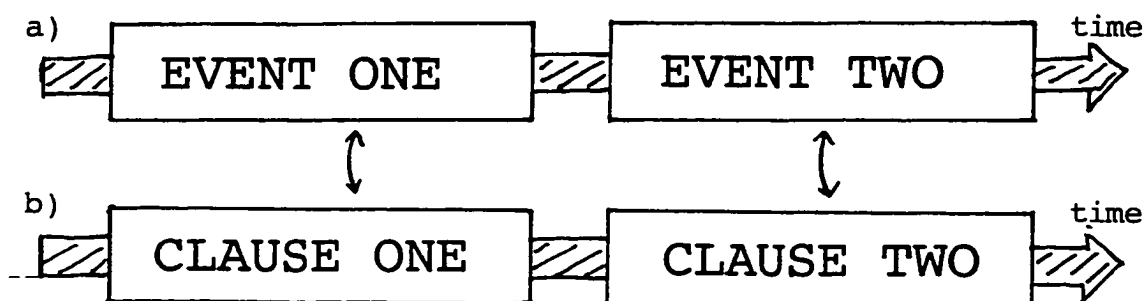


Fig. 3.6: The parallel temporal structure of a) a generic sequence of events and b) an English two-clause syntactic structure for describing such sequences; arrows show correspondences.

Examples of Signed-Language Iconicity

We have seen how sound and time can be used iconically in spoken languages, at both the lexical and syntactic levels. Now let us consider some examples from signed languages.

Before getting into form/meaning correspondences, I will give a quick introduction to the form component of signed languages. Signed languages are articulated with the hands, arms, upper body, and face. The area from roughly the signer's waist height to just above the head, and from the body forward to arms' length, is known as the *signing space*; this is where signs are made. Most people know that configurations of hands and arms are used to create signs; it is less generally known that facial expressions (including brow raises, eye blinks, and various mouth configurations), head nods and tilts, and shifts of the body and shoulders have grammatical functions in signed utterances.

One popular way to describe the structure of signs was pioneered by Stokoe (1960). In Stokoe's model, signs are simultaneous combinations of *handshape*, the configuration of the hand and fingers; *location*, the place on the body or in space where the sign is made; and *movement*, or motion of the articulators in space. Later theorists added the parameters of *orientation*, the direction that the palm "points"; and *non-manual signals*, lexically and grammatically significant facial expressions or body postures. The illustrations show pairs of signs that differ only in one of these parameters. Fig. 3.7a, THINK, and Fig. 3.7b, KNOW, differ in their handshape; Fig. 3.8a, SUMMER, and Fig. 3.8b, DRY, differ only in their location; Fig. 3.9a, AIRPLANE, and Fig. 3.9b, PLANE-

FLY, differ in their movement; Fig. 3.10a, BRIEF, and Fig. 3.10b, TRAIN, differ in their orientation; and Fig. 3.11a, LATE, and Fig. 3.11b, NOT-YET, differ in their non-manual signals.

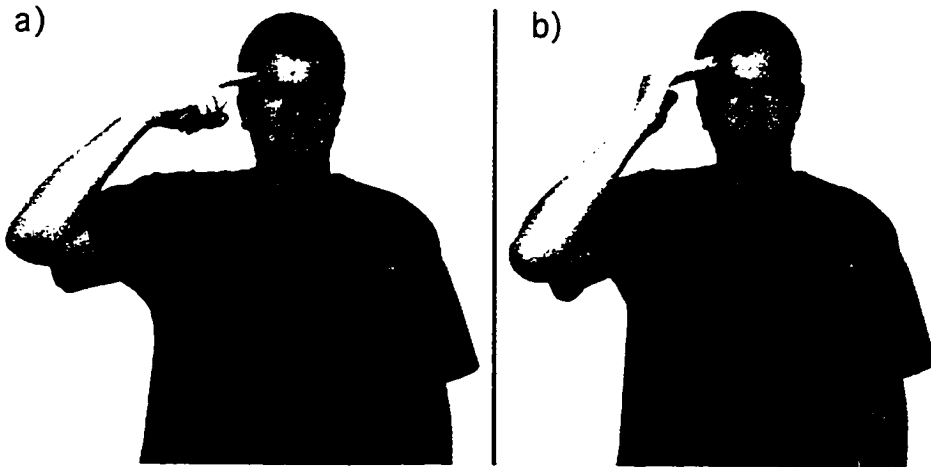


Fig. 3.7: Two signs differing only in handshape: a) THINK, b) KNOW

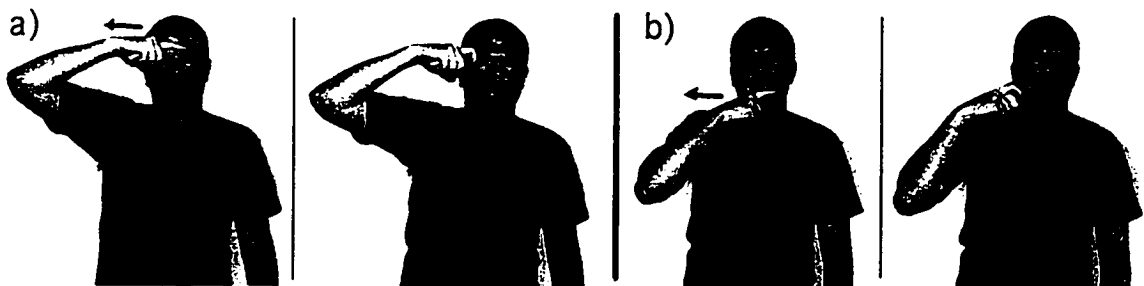


Fig. 3.8: Two signs differing only in location: a) SUMMER, b) DRY

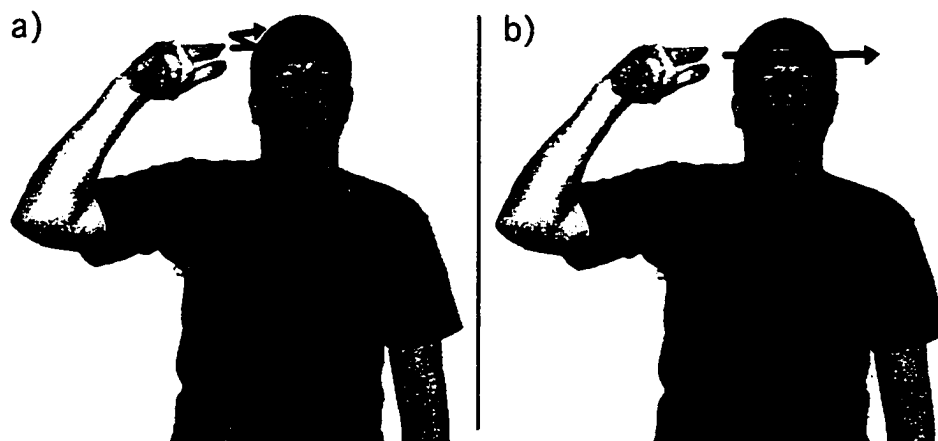


Fig. 3.9: Two signs differing only in movement: a) AIRPLANE, b) PLANE-FLY

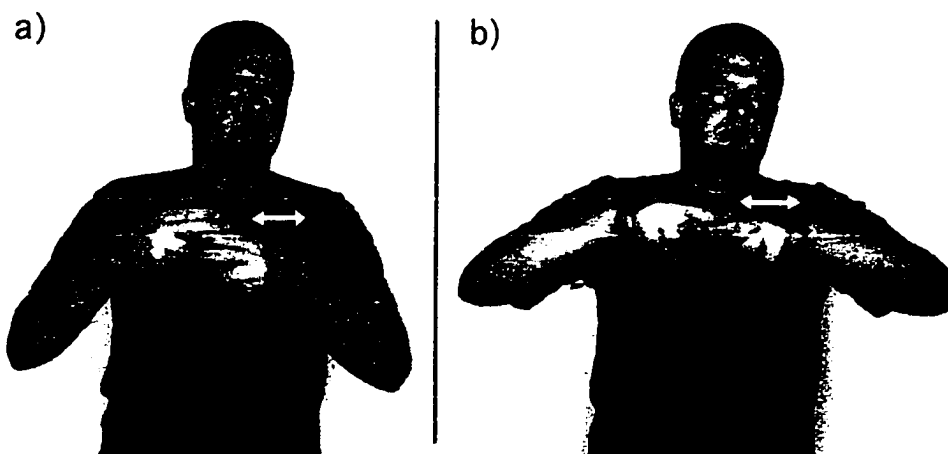


Fig. 3.10: Two signs differing only in orientation: a) BRIEF, b) TRAIN

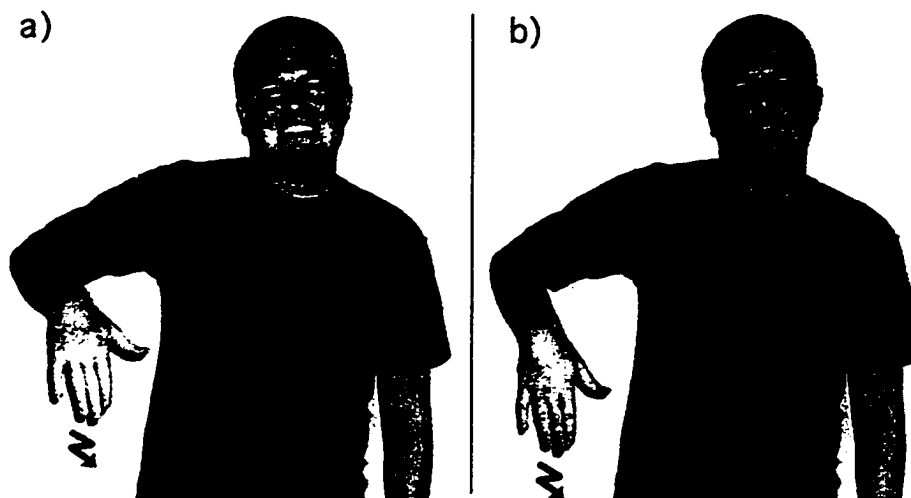


Fig. 3.11: Two signs differing only in non-manual signals:
a) LATE, b) NOT-YET

ASL phonologists have of course added many details to this brief description of sign structure; notably, Liddell & R. Johnson (1989) developed a model for treating signs as a sequence of "holds" and "movements" at, to, and from locations in the signing space. But this brief introduction will suffice for our purposes here.

The first example of signed-language iconicity is on the lexical level: the ASL sign TREE. Fig. 3.12a gives an image of a "typical" tree. We can note that it grows out of the ground, has a straight, bare lower trunk, and then spreads out into a network of branches. ASL TREE, in Fig. 3.12b, provides an analogue of those three elements, using the shapes of the hand and forearm articulators: the horizontal non-dominant forearm represents the ground, the vertical

dominant forearm represents the trunk, and the spread fingers of the dominant hand represent the branches.

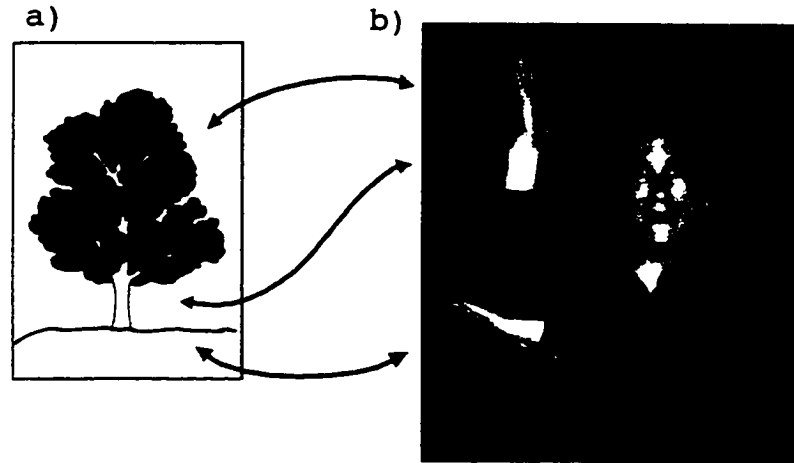


Fig. 3.12: Structure-preserving correspondences between a) a prototypical image of a tree and b) ASL TREE

This is probably the most-often cited type of iconicity in signed languages: where articulators make a "picture" of some referent. But the process is more complex than it appears. First note that not all trees look like Fig. 3.12a -- some do not grow straight, some have different kinds of branches, some grow out of cliff walls instead of level ground -- yet the same sign TREE represents them all. 3.12a is an image of a *prototypical* tree, one that serves as the category's exemplar. This choice of image is conventional and language-specific.

Second, note that the image in Fig. 3.12a could have been represented with articulators in a number of ways, incorporating different details. For example, the branching structure could have been shown in more detail, perhaps with two hands, and the ground could have been ignored, or vice versa; or the tree's verticality and the ground's flatness could have been shown by an upright index finger beside a flat palm-down hand.

In fact, different signed languages do exactly this: Klima & Bellugi (1979: 21) give the signs meaning "tree" in a number of languages, and all are iconic representations of an image like Fig. 3.12a, but each realizes different details of the image in different ways. The choice of iconic representation, especially for frozen signs like TREE, is an established though somewhat arbitrary fact about the language.

Finally, we must note (as we did for *ding*) that TREE uses only phonetically acceptable forms of ASL: the spread-fingered handshape, the straight forearms, the allowable contact between the dominant elbow and the back of the non-dominant hand. All iconic form/meaning pairs that have become part of a language conform to the phonotactics of their language, even if it is humanly possible to create a more "realistic" analogue (i.e., one that has more correspondences with its referent).

In TREE, the shapes of the articulators represent the shapes of the referent (what Mandel 1977 calls "substitutive depiction," and what I prefer to call "shape-for-shape iconicity"). With this kind of iconicity, the movement of the articulators is free to represent the movement of the referent; thus, the upright forearm can sway from side to side to show the tree's movement in the wind.¹¹ But there is a second type of iconicity in ASL ("virtual depiction" in Mandel 1977; "path-for-shape iconicity" here) where the articulators trace the shape of the referent: here the *path* that the articulators "create" in space is what resembles the referent, not the articulators themselves. One example of this is the ASL sign DEGREE, which consists of an iconic representation of a diploma (a salient image associated with academic degrees).

¹¹ In practice, this option is only available for a conventionally-limited subset of shape-for-shape iconic forms.

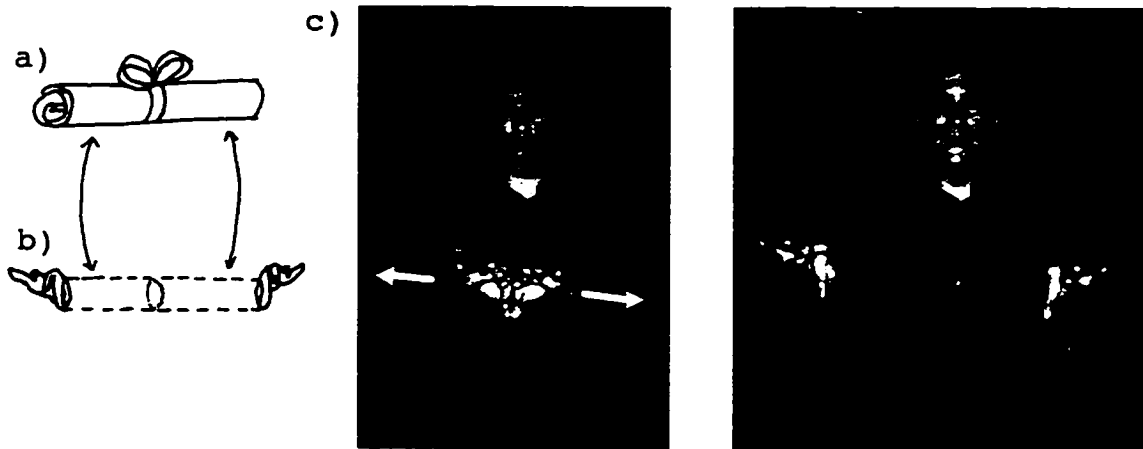


Fig. 3.13: Structure-preserving correspondences between a) a prototypical image of a diploma and b) the reified cylinder traced out in c) ASL DEGREE

Fig. 3.13a gives a prototypical image of a diploma: paper rolled into a cylinder and tied with a ribbon. 3.13c shows DEGREE: both hands assume the F-shape (index finger and thumb create a circle; other fingers are spread); starting near each other, they separate, so that the thumb/index circles trace out a horizontal cylinder. 3.13b shows the shape of the reified trace. The arrows show the points of correspondence between the two images, 3.13a and 3.13b.

We can note first of all that this type of iconicity draws on our ability to track an object's path through space and see it as an independent entity. Note also that the representation is a featureless cylinder; no other distinguishing characteristics, for example the festive

ribbon, have been retained. The sign's form is clearly more schematic than a mental image of a typical diploma.

Moreover, if someone did not know the meaning of this sign, that person would have no reason to assume that the image represented was that of a diploma; it is an equally good representation of, say, a stick.

Finally, notice that the cylinder is traced with a very specific handshape. Although there are many ways to create circles using the hands and fingers, and all of these would leave a cylindrical trace, ASL has singled out particular hand-circles as its conventional tracers. In particular, the F-hand is used for relatively long and thin cylinders. A different shape (for example, the 7, where thumb and ring finger touch) would not create a legitimate ASL sign.

Iconicity can also appear in the morphology and syntax of signed languages. ASL's temporal aspect system, for example, consistently uses time iconically: the temporal structure of most aspectual inflections reflects the temporal structure of the event types they describe.

The example we will look at in detail is what Brentari (1996) calls the *protracted-inceptive* (or *PI*) inflection. According to her, this inflection can occur on any telic verb; it denotes a delay between the onset of the verb's action and the accomplishment of that action -- in effect, a "protracted beginning" of the action. PI's phonetic form

involves an extended hold at the verb's initial position, while either the fingers wiggle (if the handshape is an open 5) or the tongue waggles (if the handshape is more closed); after this hold, the verb's motion continues as normal.

Fig. 3.14 demonstrates this inflection with a specific verb. 3.14a shows a situation where PI is appropriate: a person who intends to leave the house is temporarily delayed (perhaps by another person needing to talk); eventually the person does leave. 3.14b shows two phases of the sign LEAVE inflected for PI: first the long initial hold, and then the verb's normal movement.¹² The associated time lines explicitly show the temporal structures of both form and referent.

¹² This sign is often given the more colloquial English gloss SPLIT, since a different sign with similar meaning is often glossed as LEAVE. I have not followed this tradition, as the gloss SPLIT might be confusing to people unfamiliar with ASL or colloquial English.

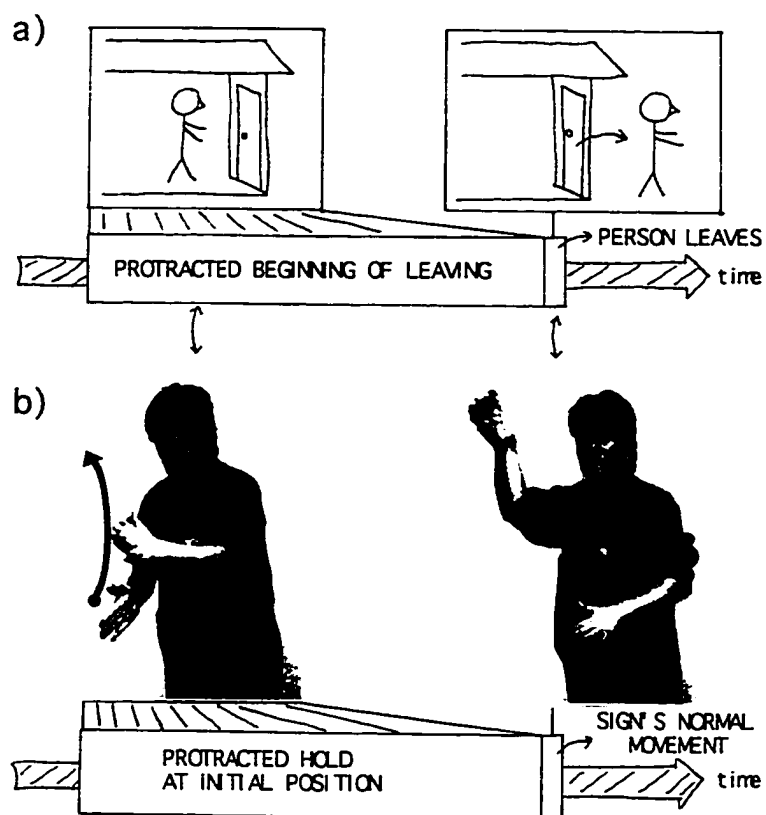


Fig. 3.14: Structure-preserving correspondences between the temporal structure of a) a situation where a person is delayed but eventually leaves and b) the sign LEAVE inflected for PI

It is easy to see the correspondences between the two temporal structures. A delay in leaving (referent) is represented by a delay in the verb's normal motion (form); similarly, the eventual accomplishment of leaving (referent) is represented by the eventual performance of the verb's normal motion (form).

Since PI is an inflection that can apply to many verbs, Fig. 3.15 diagrams its iconicity in a more abstract, verb-independent way. 3.15a presents the concept of a delayed event, 3.15b describes the hold/movement structure of the inflection, and the connecting arrows show how form and referent have similar temporal structures.

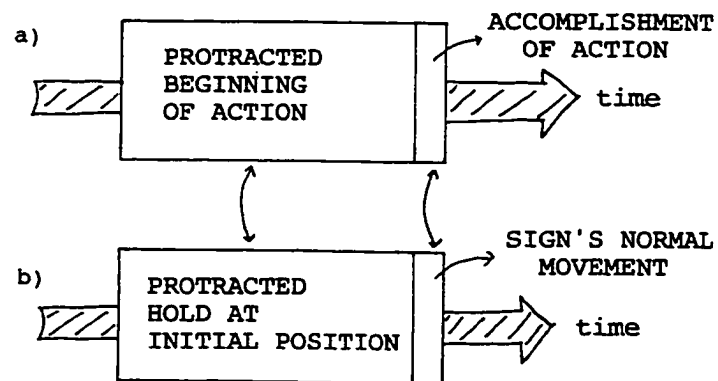


Fig 3.15: Structure-preserving correspondences between the temporal structure of a) a situation where an action is delayed, then carried out and b) the hold/movement structure of the PI inflection

We must touch on one last issue in our introduction to the iconicity of signed languages. Signed languages have two main types of iconic signs: the highly productive *classifiers*, and the less-productive *frozen signs* (Supalla 1978). Our two examples of iconic signs, TREE and DEGREE, are both frozen signs;¹³ it is useful now to contrast them with ASL's classifier system.

A classifier system is basically a set of iconic building blocks for the description of physical objects, movements, and locations (see, e.g., McDonald 1982, Supalla 1986, Wilbur 1987, Engberg-Pedersen 1993 for several different analyses of this type of sign).¹⁴ Signers can freely create new signs from this set to describe a huge variety of different situations. For example, to describe a person walking up a hill on a winding road (Fig. 5.3; see also discussion there), an ASL signer could choose a handshape (index finger vertically extended from a fist) that represents a human, a back-and-forth movement pattern that represents movement of a referent from side to side, and an upward direction that represents upward movement. Putting these components together, the signer would have a classifier

¹³ TREE can function as a classifier under some circumstances, however.

¹⁴ Of course, spoken languages have classifier systems as well (e.g., the Native American languages); these are not iconic.

form involving a extended-index-finger handshape moving on a winding path that slants upward. To show a second person accompanying the first, the signer could extend the middle finger as well; to show an up-and-down path, the hand would move upward and downward.

There are different appropriate classifier forms for each type of referent; in general, the choice of classifier is based on perceptual properties such as size and shape, and interactional properties such as how the referent could be handled by a human. (Wilbur et. al. 1985 have shown that this is typical of classifier systems in the world's languages.) Moreover, classifier forms are not universal; different signed languages have different forms and different criteria for applying them to referents.

Iconic frozen signs often use the same set of building blocks as classifiers, but they cannot be freely varied to show differences in their referents. (It is for this reason that they are called "frozen.") For example, the sign TREE would not be made differently to show a tree growing out of a hillside; and the frozen sign HOUSE represents the image of a pointed roof and walls, even if the house in question has a flat roof. Frozen signs tend to represent a whole category, rather than a specific referent; the image that is chosen to represent the category can be a prototype or salient category member, or it can be an action or item metonymically

associated with the category.

Approaches to Iconicity in Linguistic Theory

The preceding examples have served to demonstrate a few major types of iconicity in signed and spoken languages. Before proceeding to give my account of linguistic iconicity (Chapter 4), I will spend some time on how other linguists have treated this topic. My main thrust will be on the development of thought about signed-language iconicity, with a few words on spoken-language iconicity.

There is a long tradition (mentioned in Chapter 1 and Chapter 2 above) of minimizing and dismissing iconicity in language. I have already cited de Saussure's doctrine of the "arbitrariness of the sign"; this doctrine was embraced by most linguists who followed him. Even Peirce, founder of the field of semiotics, accepted this view.

Peirce devoted a great deal of attention to iconicity, creating a taxonomy of things he considered iconic. According to him (Peirce 1932, cited in Haiman 1980), "An icon IMAGE is a single sign which resembles its referent with respect to some (not necessarily visual) characteristic: ... commonly cited examples are ... in language, onomatopoeic words. An iconic DIAGRAM is a systematic arrangement of

signs, none of which necessarily resembles its referent, but whose relationships to each other mirror the relationships of their referents ... While conceding the arbitrary and unmotivated character of the individual linguistic sign in isolation, a number of grammarians, most notably Roman Jakobson, have explicitly drawn attention to the near universality of diagrammatic iconicity in the grammars of various languages." (p.515)

It should be clear from the definition I gave above, and the examples we have just seen, that this book is most concerned with iconic *images*, not iconic *diagrams* (though Peirce might have regarded the examples of temporal iconicity as diagrams). As we can see from this passage, Peirce (like de Saussure) discounted the importance of iconic images to language, while acknowledging the importance of diagrams in motivating linguistic forms.

Through the years when formalist theories (e.g., Chomsky 1957, 1965, 1981) dominated the field of linguistics, iconicity continued to receive little attention. Given the assumptions of formalist linguistics, the dismissal of iconicity made sense. Formalists believe that language and its components are strictly autonomous from each other (cf. Chapter 2); there is no convenient way to describe form/meaning resemblances in that framework. Linguists of this type were hard at work modeling language with formal

systems; there was always more to do with the data they had. Iconicity in spoken languages is limited enough that it seemed reasonable to ignore it.

The functionalist and cognitivist schools of linguistics, not sharing the autonomy assumptions and being interested in motivation of all sorts, were not content to leave linguistic iconicity unexamined. Starting in approximately the 1980's, papers, books, and conferences began to come out on this topic. Typical examples are Haiman (1985a), *Iconicity in Syntax*, and Hinton et. al. (1994), *Sound Symbolism*. Though both books include phenomena that would not fit the definition of pure iconicity given here (i.e., they involve metaphor or some other kind of motivation), they present a concerted effort to seriously address iconic motivation. Haiman (1985a) consists of papers on how iconicity manifests itself in the syntax of spoken languages. Among the many points addressed is the fact that word order or order of morphemes in a polysynthetic word is often iconic for order of events, or degree of perceived "conceptual closeness" (a metaphorical use of iconicity). Hinton et. al. (1990) takes a serious look at sound-for-sound iconicity in spoken languages. The introduction gives a useful classification system; the papers investigate sound symbolism in many languages and show that, just as in ASL, each language has a system within which words resemble their

meanings yet conform to the language's phonotactics. Thus, even without the impetus of signed languages, some linguists were beginning to investigate and incorporate iconicity in their theories of language.

Sign linguists, unlike "speech linguists," never had the option of ignoring iconicity; iconicity is simply too pervasive in signed languages. Even the lay observer (perhaps, *especially* the lay observer) can immediately notice the resemblance between some signs and their meanings. This led to trouble for signed languages and Deaf people.

The earliest attitude toward signed-language iconicity (and one that many people still believe) was that signed languages were simply a kind of pantomime, a picture language, with *only* iconicity and no true linguistic structure. Stokoe discredited this attitude in 1960, with his proof that ASL does have formal linguistic patterning: with its own lexicon, phonology, morphology, and syntax, ASL is a true language. Over the years, however, sign linguists have had to work hard to fight the entrenched myth of signed languages as pantomime. Even now, talking about iconicity to Deaf people and sign linguists can be a touchy matter -- as if admitting that signed languages do have a lot of iconicity is tantamount to agreeing that they are not languages.

Sign linguists, at least in the early days, took two basic approaches to iconicity: strongly arguing against its

presence/importance (with the goal of proving ASL etc. to be true languages); and reveling in its multifarious manifestations, excited by the differences between signed and spoken languages. Over the years, understanding of ASL's iconic items has grown and changed: it is quite clear now that the items are there, and that they form a linguistic system.

As I have mentioned above (Chapter 1), studies like Frishberg (1979), Klima & Bellugi (1979: 1), and Hoemann (1975) were among those that downplayed the presence of iconicity in signed languages. These studies showed that historical change could disrupt the iconicity of signs (Frishberg 1979; but cf. Chapter 10 below), and that nonsigners could not readily guess the meaning of signs from their forms (Klima & Bellugi 1979:1, Hoemann 1975), which meant that signed languages were conventional as well as iconic. It was of course important to demonstrate that signed languages have linguistic systems as well as iconicity, but the devaluation of iconicity exceeded what was strictly necessary.

Other studies were more enthusiastic about signed-language iconicity. Mandel (1977) and DeMatteo (1977) are among those who marveled at the differences between signed and spoken languages. Mandel (1977) wholeheartedly embraced the existence of iconicity in ASL and set out to catalogue

the devices used. By comparing a number of ASL forms and their meanings, he put together a list of the ways in which signs are iconic, arranged into a hierarchy of types. He noted that in some signs the articulators sketch the outline of an image; in others, the articulators themselves resemble the referent; and in a third type, the articulators point out a referent (for example, a body part) that is present in the signing situation.

Mandel's classification scheme is still quite useful (and my discussion in Chapter 5 is loosely based on it); but as later workers (e.g., McDonald 1982) pointed out, he saw the motivation but missed the system. Knowing a sign and its meaning, he was able to see ways in which the two are related; but he did not work out ASL's self-consistent system for representing physical objects iconically.

DeMatteo (1977) argued that ASL's iconic forms are truly analogue representations of visual imagery. He noted the presence of forms that seemed to vary in an unlimited number of ways in correspondence with their meanings; for example, the verb MEET, with two hands coming together in the "1" shape, can be varied to express meanings like *almost meet*, *turn away*, and so on.

DeMatteo sketched out a model to handle these phenomena. It involves mental images of varying schematicity; a set of rules that maps aspects of the image onto a linguistic form

(including pragmatic selection of the most important aspects); and a set of analogue rules that tell us how the sign is to be modified in representing variations on the image. There is much that is useful in this proposal (and indeed it resembles to some degree the proposal of Chapter 4); its main flaw is that, like Mandel's work, it misses the existence of a system of iconic elements.

Klima & Bellugi 1979 set forth a measured compromise between the iconicity enthusiasts and detractors.¹⁵ They affirmed the presence of iconicity in ASL on many levels, but noted that it is highly constrained in a number of ways. The iconicity is conventionally established by the language, and not usually invented on the spot; and iconic signs use only the allowed forms of the sign language. Moreover, iconicity appears not to influence on-line processing of signing; it is "translucent," not "transparent," in that one cannot reliably guess the meaning of an iconic sign unless one knows the signed language already. To use their phrase, iconicity in signed languages is submerged -- but always available to be brought to the surface and manipulated.

Boyes-Braem's (1981) dissertation fits into this early stage of figuring out how to handle signed-language

¹⁵ The citation above (Klima & Bellugi 1979:1) refers specifically to their earlier work on the transparency of ASL vocabulary, reviewed in the first chapter of this book.

iconicity. This work was a survey of ASL's handshapes and their uses. She noted that while much of the time, handshapes were meaningless formational components of the language, certain groups of signs with similar meanings also shared handshapes (cf. Frishberg & Gough 1973 on "sign families"). Many of these groups used the handshape as an iconic representation of a physical referent.

Boyes-Braem gave a model of how this iconic representation was created. For her, a concept was first given a "visual metaphor"; in my terminology, a visual image associated with the concept. Next, ASL handshapes were selected to represent this "metaphor," either by convention or in a new way. Finally, the handshapes could manifest in different ways, due to allophonic variation (i.e., regular processes internal to the form component of the language). The major advance over DeMatteo's model is the recognition of the role of *convention* in choosing iconic representation. As we will see, the model of iconicity in Chapter 4 shares a lot with Boyes-Braem's model. At the time when she was writing, however, the study of linguistic semantics was not far advanced. For example, she did not have a thorough explanation of similarity, based on structure-preserving mappings between mental images; instead, she broke images down into features (e.g., +linear, +surface, +/- full) and relied on matches between these features.

At this stage, linguists began to investigate the *system* that underlies sign language iconicity. There was somewhat of a backlash against the theories of Mandel and DeMatteo, notably by Supalla (1978, 1986, 1990) and McDonald (1982); at this time, an understanding of signed languages' classifier systems began to emerge.

McDonald made the point that for a linguistic analysis, it does not suffice to say that a sign resembles its referent, or even *how* it resembles it. The iconic signs of ASL fall into a *language-internal system*; for example, (as we saw for ASL DEGREE) one kind of circular handshape (the F) is consistently used to trace out thin cylinders; other shapes are not grammatical. Without understanding the system, one cannot know the grammatically correct way of describing a scene with classifiers; one can only recognize that correct ways are iconic (a subset of the myriad possible iconic ways). She argued against focusing on the signs' iconicity; though the system is clearly iconically motivated, linguists would do better to spend their energy on figuring out the rules for grammatically-acceptable forms. McDonald also disagreed with DeMatteo; iconic signs are not true analogue representations, but instead present discrete categories of shape, size, and movement.

Supalla (1978) was even more direct in discounting the importance of iconicity. In refuting DeMatteo's notion that

ASL uses "continuous visual analogues," he wrote, "We have found that these verbs are composed of internal morphemes (hand classifiers, movement roots and base points) along with external morphemes that add further meanings to the verb form in terms of number or aspect, or change it into a noun. We have also found that these morphemes are discrete in form and meaning like those in spoken languages, and that the meanings of these morphemes are much like those found in many spoken languages (p.44)." These words reflect a continuation of the effort to prove that ASL is like spoken languages, and thus a true language.

One of Supalla's ongoing projects (e.g., 1978, 1986, 1990) has been to establish the nature of ASL's classifier system; indeed, he was one of the first to apply the term "classifier" to that system. His 1986 paper is a catalog of types of classifiers in ASL; at every stage of description, he points out the places where classifiers' iconic representations are "parametrized." For example, in Supalla (1978), he introduces a list of seven "movement roots," each with a specific meaning, which classifiers combine to yield more complex movements; and he describes a closed set of six ways that the non-dominant hand can be used to describe landmarks in a motion event. In all cases, he provides evidence that these are discrete units with specific meanings, not a continuously-varying free-form mime system.

Supalla's intent seems to be (at least in 1978) to show that iconicity is largely irrelevant to the classifier system, as the system is composed of units just like the non-iconic units of spoken languages. He does note, however, that there are times (such as describing a precise path or a particular, unusual shape) when signers use "continuous" rather than "discrete" movements; he links this type of signing to specific purposes and claims that it occurs much more slowly than normal, "discrete-morpheme" uses. This confirms (as Klima & Bellugi suggested) that iconicity is still accessible in the conventionalized, parametric classifier system.

At this point in the history of signed-language research, cognitive linguists begin to appear on the scene. Researchers such as Liddell (1990, 1992, 1995), van Hoek (1996), Wilcox (1993, forthcoming), and Brennan (1990, 1994) began to introduce the concepts of visual imagery, conceptual structure, and metaphor to descriptions of signed language in a systematic way. Though earlier accounts of iconicity simply appealed to the notion of "imagery," we can do better now, with the tools of cognitive linguistics. The structure of signed languages is an enormously fruitful area for cognitivist research.

The next chapters will constitute a step forward in the understanding of metaphor and iconicity in signed and spoken

languages; we will see that linguistic iconicity works in the same way, regardless of modality. The early models of DeMatteo and Boyes-Braem will be revisited in light of new developments in cognitive linguistics. Mandel's catalogue of signed-language iconicity will be expanded and compared to a similar catalogue of spoken-language iconicity. Finally, the connection between iconicity and conceptual metaphor in signed languages will be clearly defined and described.

Chapter 4: **The Analogue-Building Model of Linguistic**

Iconicity

The Analogue-Building Model: Image Selection, Schematization, and Encoding

The examples of Chapter 3 have shown that both signed and spoken languages have iconicity, and that it manifests not only at the lexical level but also at morphological and syntactic levels. Form/meaning resemblance should be included on the list of phenomena that all reasonable linguistic theories must explain. How do iconic items arise? How is the form-meaning resemblance modeled in users' minds? Are new iconic items created on-line? How does iconicity interact with other ways in which meaning motivates form? This chapter presents preliminary answers to some of these questions.

The purpose of this chapter is to provide a general framework and a set of tools for precise description, modeling, and analysis of iconic linguistic items. Earlier descriptions of iconic items as simply "looking like" their referents have been too vague to be useful. As we shall see, this framework can be applied equally well to iconicity in either the spoken or signed modality, and at any level of linguistic structure. The fact that iconicity is more common

in the signed modality easily falls out of this framework as well.

To fully model iconicity, we need to talk both about structure-preserving mappings of meaning onto form, and creation of particular forms ("analogues") that are amenable to such mappings. In most iconic items, we create an analogue of the referent's image out of the phonetic "stuff" of our language: sounds, movements, shapes. How exactly do we determine the form of that "stuff"? What processes would be necessary to create a valid linguistic form that nonetheless preserves the structure of its referent?

I offer here some tools for thinking about how iconic items arise in languages, in the form of an "analogue-building" model of iconicity. The model owes a great deal to Boyes-Braem's (1981) and DeMatteo's (1977) thinking about ASL's iconic forms; it is more general than these treatments, however, and incorporates recent cognitive linguistics work on semantics.

The basic model is diagrammed in Fig. 4.1, using ASL TREE as an example; it can be summarized as follows: to create an iconic item, one *selects* an image to represent; modifies or *schematizes* that image so that it is representable by the language; and chooses appropriate forms to show or *encode* each representable part of the image. Moreover, when modifying the image or "translating" it into

linguistic form, one makes sure that the new image preserves the relevant physical structure of the previous stage.

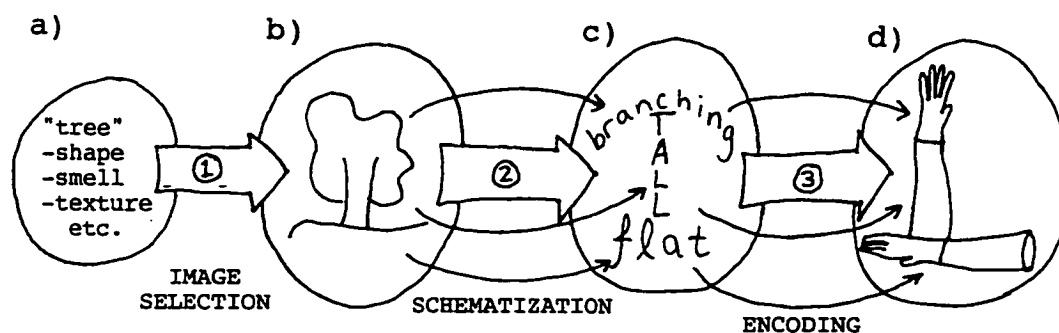


Fig. 4.1: Analogue-building process for ASL TREE, showing a) the initial concept "tree", b) prototypical visual image of a tree, c) image schematized to fit ASL's categories, and d) image encoded as TREE, and the three processes of 1) image selection, 2) schematization, and 3) encoding; arrows show structure-preserving correspondences between (b), (c), and (d).

I would like to make it clear that this model is not intended to represent what goes on in a language user's mind each time he or she utters an iconic items. This is a model for the *creation* of iconic items; once created, these items can be stored and used just like any other linguistic item. Moreover, though the model is presented as having "stages," I am not making a claim that the stages represent a *sequence* that the language user goes through. For the purposes of exposition, it is easiest to separate out the aspects of analogue-building into stages; but the cognitive processes for each aspect could easily occur simultaneously: for

example, the aspects could be viewed as providing sets of constraints that could be integrated together and satisfied all at the same time.

Image selection

Let us go through the model slowly. The analogue-building process begins with a concept that needs a linguistic representation. Such concepts are potentially multi-modal and densely packed with information. For example, the concept "tree" probably contains images from many different sensory modalities:¹⁶ visual images of various tree species and individuals; tactile images of how bark and leaves feel; auditory images (for hearing people) of leaves rustling and branches groaning in the wind; kinesthetic images of climbing trees or cutting wood; even images of smells and tastes associated with trees. Along with this plethora of sensory images, there is no doubt encyclopedic information about how trees grow from seeds or cuttings, their life cycles, their uses, and so on.

¹⁶ In this paper, I am not taking any stance about the "boundaries" of concepts in the mind: it matters little to my theory whether the concept "tree" contains these sensory images, or is merely closely linked to them.

Out of this potentially vast amount of information, we select an sensory image to stand for the entire concept. This image must be in a modality that the language can directly represent -- e.g., auditory for spoken languages, visual for signed languages, temporal for either one. For ASL TREE, the image is as described in Chapter 3, a tree growing out of flat ground, with branches atop a bare trunk.

Note that there are often a number of appropriate images to choose from, and the choice can vary from language to language and culture to culture. The particular image used for a given language represents a choice made by the user(s) of the language who created that iconic item; that choice of image may be somewhat arbitrary (within the appropriate alternatives), but it becomes conventionally established in the language.

The image selected by ASL for "tree" is fairly typical for our culture, though (as pointed out above) there are many kinds of trees that look significantly different. Nevertheless, that single image has achieved the special status of representing the concept "tree" in general for ASL.

Selecting a single image to stand for a complex associated concept is an example of the cognitive process *metonymy*, which has been treated by a number of cognitive linguists (Lakoff & Johnson 1980, Fauconnier 1985, etc.). The association between image and concept can be more or less

direct and compelling: in the case of *ding*, for example, where the concept in question is simply "the sound of a certain type of bell," it would be absurd to choose any auditory image other than our image of that sound itself. In the case of TREE, the image chosen is a prototypical exemplar. For DEGREE, the image chosen is a visual representation of an important object associated with the degree: a diploma. The degree itself is a non-physical title, rather than a physical object, and so a salient object is chosen for the purposes of creating an iconic sign. The different types of metonymic associations between concept and selected image deserve study and comparison with the types of metonymic links between English words (catalogued by Leite 1994).

Schematization

Now that an appropriate image has been selected, we set about representing it using the resources of our language. The first step in that process is to make sure that the image is in a form that our language can handle. If there is too much vivid detail in the image, we must chunk it or otherwise modify it so that every significant part fits a semantic category of the language. Moreover, we must be guided by a sense of the level of complexity that the phonetic resources

of our languages can handle. This process of pulling out important details is called *schematization*.

In our example, the relatively vivid image of a tree growing out of the ground is distilled into three main components: a flat level surface, a tall vertical shaft emerging from it, and a complex branching structure atop that shaft. More vivid details, such as the contour of the ground, the shapes of the branches, and the existence of leaves on the branches, are all lost; nevertheless, the resulting schematic image preserves most of the structural relationships of the original (presumably the most important ones in some language-specific sense -- the ones the language cares most about).¹⁷ We can still set up a structure-preserving mapping between the two images.

We should note that the original sensory image is *already* schematized to some degree, due to the constraints of our perceptual and cognitive systems. The process of interpreting sensory signals into a coherent image involves a great deal of schematization (see, e.g., Marr 1982's model of vision). Moreover, even though we may perceive many vivid

¹⁷ There is, I do not doubt, a set of important features and relationships which is language-neutral and depends only on the human cognitive equipment. But languages focus in on specific members of this set, either "arbitrarily" or in a way that is harmonious with the rest of their structure.

details of specific images, over the long term we tend to retain only an generic image.¹⁸

Even such a schematic image, however, often cannot be directly encoded into linguistic forms. For one thing, we cannot *fit* everything we know into the linguistic signal. Thus, there must be some kind of weeding-out process in which we retain only those details important to our language.

For example (Choi & Bowerman 1991), when analyzing spatial relations between objects, English speakers learn at an early age to pay attention to whether one object is contained within another; this schematic notion of *containment* governs the use of the preposition *in*. Korean speakers, on the other hand, do not class together all instances of containment; instead, they look (among other things) for cases where two objects fit tightly together, and represent those situations using the verb *nehta*. *Nehta* would describe, for example, a ring fitting tightly on a finger or a videocassette inside its case, but not an apple sitting in a large bowl; as we can see, tightness of fit is not a parameter that English speakers tend to use. ASL signers, of course, would divide up these cases in yet a different way,

¹⁸ This is attributable to the nature of neural network systems, which are good at generalizing from specific examples. (See, e.g., Rumelhart et al. 1986.)

choosing appropriate classifier handshapes and locations to give an iconic representation of each situation.

Slobin (e.g., 1996) has called this categorization process *thinking for speaking*, where we cast our thoughts into the specific mold that our language finds easy to represent. Our sensory images, like any concept that we wish to communicate, must be reformulated in terms of a *language-specific system* of schematic semantic categories.

Encoding

The next step is to encode our schematic image into linguistic form. We have already analyzed the image into pieces that fit the semantic categories of our language; now, we choose a physical form to represent each piece, and we make sure that this substitution process preserves the overall structure of the original image. The result of this process is an iconic linguistic form/meaning pairing.

In our example, the schematic image of a tree consists of a branching structure above a tall, thin support, which rests on a flat surface. Reviewing the allowed forms of ASL, we note that a spread hand can represent the branching structure, an upright forearm can represent the tall support, and a horizontal forearm and palm can represent a flat surface. Moreover, we see that these different articulators

can be arranged in a way that preserves the spatial structure of the original image: fortuitously, the hand grows out of the forearm in just the way that the branching structure grows out of its support, and the other hand and forearm can easily be placed beneath the first one just as the flat surface supports the tall shaft. Putting these things together, we arrive at the iconic linguistic form of ASL TREE.

It is crucial to note that there are two levels at which languages make somewhat arbitrary choices about how the encoding process will work. These are the levels of choosing particular iconic building blocks for linguistic forms, and of choosing particular composites of these building blocks to retain as lexical or syntactic items in the language. These language-specific choices are an important part of what makes the encoding process different (more *constrained*) than free mime or imitation.

First of all, each language has its own set of conventionally-chosen iconic "tools" for representing the pieces of schematized images. Each tool consists of a link between a semantic category (e.g., *flat*, *branching*, *tall*) and a phonetic form (e.g., *horizontal forearm*, *spread hand*, *upright forearm*). Table 4.1 shows a number of these tools for ASL and for English.

Table 4.1: Selected iconic "tools" for ASL and English:
conventional building blocks for iconic forms.

English

initial <i>p-</i> , <i>b-</i> , <i>pl-</i> , <i>kl-</i> , <i>kr-</i>	<->	abrupt onsets
fricatives	<->	noise of air turbulence
medial - <i>N-</i>	<->	low-pitched sounds
temporal order	<->	temporal order
(see Rhodes 1994, Oswald 1994)		

ASL

forearm	<->	flat surface
V-shape	<->	legs
path of F	<->	cylinder
spatial arrangement	<->	spatial arrangement
temporal order	<->	temporal order
(see, e.g., Supalla 1986, McDonald 1982)		

Note first of all that each tool is based on a structure-preserving correspondence between form and meaning: in every case, the phonetic form resembles (or even is an *example* of) the semantic category.¹⁹ Putting these tools together in an appropriate way will of course result in a linguistic form that resembles its referent.

¹⁹ It would be interesting to look closely at the exact types of relationships between semantic category and phonetic form in these iconic "tools": e.g., is there always at least some superordinate category that both belong to? For example, though the "V" handshape is not an example of the category "legs," both are members of the category "branching structures."

But also notice that these tools are highly language-specific²⁰. As discussed in the previous section, the semantic categories are language-specific (though in a broad sense, they may be similar cross-linguistically because of universals in the human perceptual system); the phonetic forms are taken only from the allowable forms of that language; and the language uses only a conventionally-established subset of the form/meaning pairs that resemble each other.

To demonstrate the second point, note that ASL uses an extended index finger as one way of representing long, thin objects. This use is clearly motivated by the resemblance between an extended finger and a long, thin object. Yet ASL would never use an extended ring finger for the same meaning, even though the resemblance is equally good: a fist with ring finger extended is not an allowable handshape of ASL. Similarly, English would never use a velar fricative to represent noise, because velar fricatives are not part of English's phonetic inventory.

To demonstrate the third point, consider ASL's conventional "tracers." As we saw in the sign DEGREE, ASL

²⁰ Of course, not all tools are peculiar to a particular language. The temporal dimension may well be used iconically in all languages in analogous ways, and there may be other iconic universals within the spoken or the signed modalities, if not across modalities. (My thanks to Eve Sweetser for this point.)

uses the F handshape -- thumb and index finger touching in a ring, other fingers spread -- to trace out long, thin cylinders. Clearly, it is the path of the thumb/index ring through space that is crucial in creating a cylindrical trace. Now, notice that ASL has three other allowable handshapes where a single finger (middle, ring, pinky) forms a ring with the thumb -- yet none of these handshapes can be used as cylinder-tracers. We must conclude that the allowable iconic tools (basic form/meaning pairs) of a language are conventionally established; they are chosen in a somewhat arbitrary way from the set of possible iconic form/meaning pairs.

We should also note that there is a continuum of conventionalization: certain iconic tools may be very common in a language, while others might occur only a few times (possibly not even meriting the status of "tool"). For example, ASL TREE uses both very common tools -- the flat-surface/horizontal-forearm and tall-thin-object/vertical-forearm pairings -- and a relatively rare one -- the branching-structure/spread-hand pairing. The use of that rare pairing may have been motivated by the nice way in which it preserved the structure of the original image, as the hand is conveniently located at the end of the forearm.

We have seen how languages have specific sets of iconic tools. As mentioned above, there is a second level at which

conventional, language-specific choices become important: the preservation of particular combinations of tools as a permanent representation of a meaning. For example, ASL users are aware of the language's iconic tools, and can use them on-line to construct new representations of objects in space (i.e., the classifier system); and similarly, English speakers can invent new words like *ting* and *kaboom* to describe sounds (cf. Oswald 1994 on comic-book sound words). These forms come and go, and can be invented as needed. A single image could have several equally valid iconic descriptions of this type. But these transient iconic representations can also become "frozen," conventional parts of the language. When a permanent association develops between a referent image and a particular representation of that image, the iconic representation is now part of the language's repertoire.

For example, there are many ways in which ASL users can put their iconic tools together to encode the flat/tall/branching schematic image. They can use an index finger to show the tall trunk and a curved claw-shaped hand to show the edges of the branching structure, for example, or use tracers to sketch out the outlines of the image. Either of these ways is a valid ASL encoding of the image, and indeed we may find ASL users creating forms like these to describe specific trees in specific situations. But only one

iconic representation has developed a long-term, conventional association with the concept "tree": the double-forearm/spread-hand form. As always, the choice of conventional representation for a concept is somewhat arbitrary, within the alternatives allowed by the system; factors such as ease of articulation can influence this choice as well.

The same kind of conventionalization occurs in spoken languages. Though in the moment, an English speaker may say *splooosh* or *ka-toosh* to represent various different sounds created by a rock falling into water, the iconic item that has been elevated by convention to the status of an English word is *splash*, and it covers all cases of noisy falls into liquid.

Once a form/meaning pair has been conventionally adopted as part of a language's lexicon or grammar, users may stop accessing its iconic origins on-line, and it may even undergo changes that make it less transparently iconic (cf. Klima & Bellugi 1979). One clear example is the "opaque" sign HOME, where an O-shaped hand touches the cheek first near the mouth and second near the ear; this sign developed as a compound of the iconic signs EAT (O-shape at the mouth) and SLEEP (spread hand's palm at the cheek, suggesting a pillow).

These changes are not at all surprising, as we see the same effects for any sort of derivational morphology.

Derived items of all sorts can take on semantic nuances not predictable from their parts. At that point, users of the item are clearly not re-deriving it on-line each time they use it, but instead have given it some kind of independent representation. Over time, any such items can become so remote from their derivational origins that typical users would not know how the item arose. This does not prove that those derivational patterns are no longer productive in the language, or perhaps never even existed; it simply means that items can become dissociated from the processes that created them.

It is useful to note, in addition, that iconic items often *resist* regular changes that affect all other items of the language (e.g., Hock 1986). Thus, for example, the English "Great Vowel Shift" altered Middle English vowels so that all stressed syllables containing /i/ shifted to the diphthong /ai/: *eye* was previously pronounced /i/, *high* was /hi/, and so on. When this change took place, the original forms with the vowel /i/ were lost. Yet notice that to describe a soft, high-pitched noise, English has two words: the older *peep* or /pip/, and the newer *pipe* or /paip/. In this case, the original form (with the high front vowel /i/ that English uses iconically to represent high-pitched sounds) was retained in the language. It seems that the iconicity of some items is important enough to language users

that it is preserved even when all similar items are undergoing regular rule-governed change.

Additional Demonstrations of the Model

This concludes the step-by-step discussion of the analogue-building model. I will now give more examples of how to use it in describing iconic items, including grammatical structures and items from spoken languages.

Let us think again about English *ding*, a word representing the sound of a particular sort of bell. The analogue-building process for this word is diagrammed in Fig. 4.2. Our starting point is the concept "the sound of a bell" (4.2a); as noted above, this concept is relatively simple and concrete (as compared to "tree" or "degree"), and the obvious image to select in the auditory modality is that sound itself, shown in 4.2b. This sound image has a relatively high pitch, and resonates for a long time.

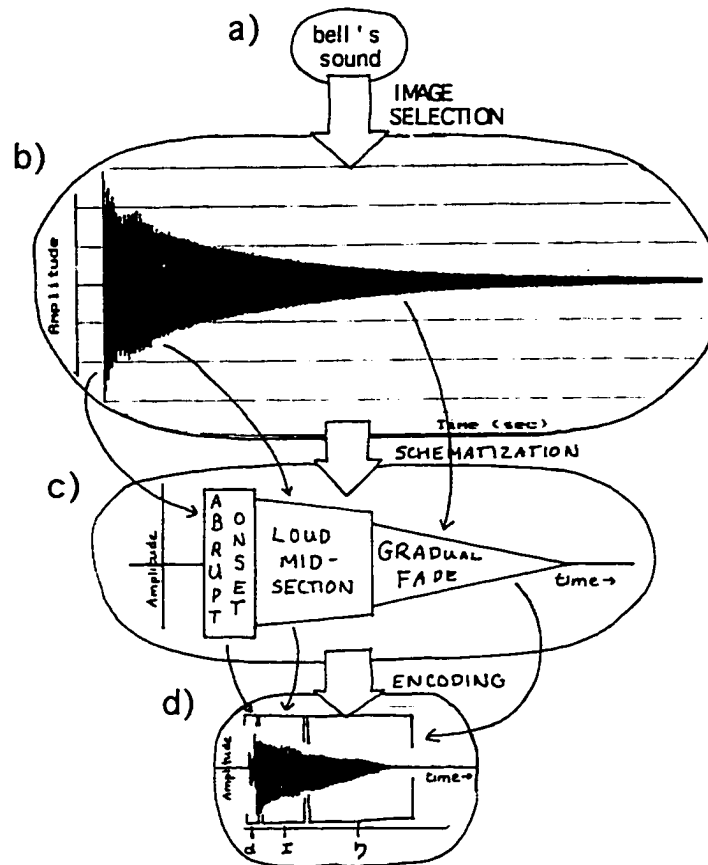


Fig. 4.2: Analogue-building process for English *ding*, showing a) initial concept, b) auditory image of bell's sound, c) image schematized to fit English's categories, and d) image encoded as *ding* /dɪŋ/; arrows indicate structure-preserving correspondences between (b), (c), and (d)

Fig. 4.2c shows the bell's sound after it has been schematized to fit the categories that English uses for iconic descriptions of sounds: the schematic image consists of an *abrupt onset*, a *loud, high-pitched mid-section*, and a *gradual fade*. Note how the temporal structure of the schematized image matches that of the original auditory

image; there is clearly a structure-preserving mapping between the two.

Finally, 4.2d shows the result of the encoding process. English conventionally uses initial stops to represent abrupt onsets; vowels with significant high-frequency components (high second formants; e.g., /ɪ/, /u/) to represent high-pitched sounds; and final nasals to represent long, resonant sounds.²¹ (As usual, the phonetic forms chosen to represent these categories are in some sense themselves exemplars of those categories.) In this case, the stop chosen is /d/, the vowel is /ɪ/, and the nasal is /ŋ/; arranged in the proper order, they give us the iconic form *ding*. Other equally well-formed English representations of the sound can be created (e.g., *ting*, *pim*), but *ding* is the form that English speakers have adopted for this kind of bell sound.

The Analogue-Building Model works in a straightforward way to describe the sketching type of iconicity in signed languages as well as the shape-for-shape type we have seen demonstrated for TREE. Fig. 4.3 diagrams the model for ASL DEGREE.

²¹ It is instructive to note that English and French have made different language-specific choices on how to represent the long, resonant die-off of bell sounds: English uses the velar nasal /ŋ/, as in *ring* and *ding-dong*, while French uses the bilabial nasal /m/, as in *bim bom*.

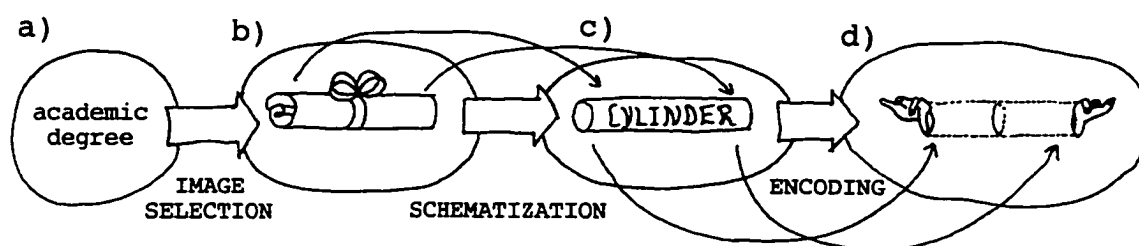


Fig. 4.3: Analogue-building process for ASL DEGREE, showing a) initial concept, b) prototypical visual image of a diploma, c) image schematized to fit ASL's categories, and d) image encoded as DEGREE; arrows indicate structure-preserving correspondences between (b), (c), and (d)

The initial concept, an academic degree (4.3a), is fairly abstract -- it is a social marker of respect bestowed on those who have completed a course of study. The concept is no doubt connected with much knowledge about classes and study and achievement, but these are too abstract to be of use in constructing an iconic form. There is, however, a physical symbol of achieving a degree, and that is the *diploma*. Traditionally, the diploma is presented as a rolled-up scroll to a new graduate. It is the visual image of this scroll, shown in 4.3b, that ASL has chosen for creating its iconic sign DEGREE.

4.3c gives the schematized image used in this sign: a simple cylinder. It should be noted that it is not impossible to use the resources of ASL to give a more detailed representation of a diploma, ribbon and all. But such a representation would be long and unwieldy as a lexical

item. The actual sign DEGREE might represent a distillation of the most salient aspects of a diploma into a form that is quick and easy to articulate. Thus, ease of articulation as well as the need to fit the language's semantic categories drives the schematization process.

Finally, in 4.3d we see the creation of a virtual cylinder in space via the tracing action of two thumb/index-finger circles. The original image and the schematized image can clearly both be mapped onto this cylinder in a structure-preserving way. The tracing of this cylinder has become, via the process outlined here, the conventional ASL item meaning "degree."

Our final example is grammatical rather than lexical: the iconic ordering of clauses to represent the temporal ordering of the events described. Though most if not all languages display this pattern (Haiman 1985b), we will once again discuss it as it manifests in English.

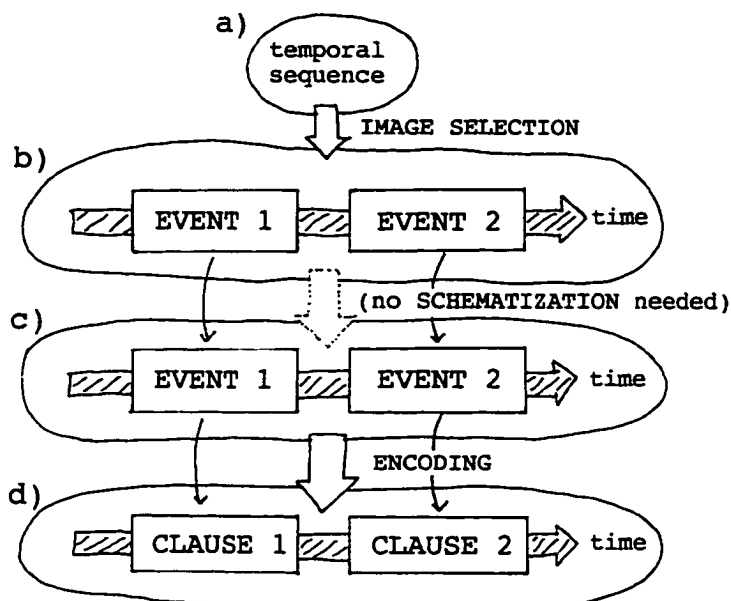


Fig. 4.4: Analogue-building process for English's iconic clause-ordering construction, showing a) the initial concept of temporal sequence, b) and c) the already-schematic temporal image of two events in sequence, and d) the image encoded as the clause-ordering construction; arrows indicate structure-preserving correspondences between (b)/(c) and (d)

The initial concept is simply *temporal sequence*: events happening in a particular order (Fig. 4.4a). This concept was perhaps derived from many experiences of specific events occurring in an order, but now the details have been abstracted away to leave a general notion of temporal ordering. The sensory image chosen to represent this concept (4.4b) is a *temporal image*: it relies on our ability to localize events in time and perceive their sequentiality. 4.4b uses the device of a time line to represent our temporal

sense; the particular temporal image is of an event followed by another event.

It should be noted that our temporal sense is not nearly as vivid or precise as our visual or auditory senses. To us, time has only one dimension: the sense of how long it has been since a particular event occurred. People vary on how accurately they can measure durations without the help of a timepiece or other external aid; although some people may have a highly refined sense of duration, others do not. Language tends to represent time using rough approximations of relative durations (i.e., *long* or *short* times) and notions of simultaneity and sequence (i.e., ordering of events). Though words for more exact measures of time (e.g., *minutes*, *seconds*, *years*) do exist, such notions are rarely (if ever) presented in the grammatical structure of a language (cf. Comrie 1985, Talmy 1987).

Our initial concept, temporal sequence, is in fact one of the basic notions about time. The image of one event following another that represents the concept is already highly schematic, containing no specific details about how long each event took and how much time elapsed between them. No further schematization is needed, as this image already fits the time-describing semantic categories of English. The diagram reflects this by simply repeating 4.4b ("sensory image") as 4.4c ("schematized image").

The final stage, encoding, exploits the fact that English words themselves are articulated in a sequential order. English (and most other languages) has set up a convention where the order of elements in an utterance can represent the order of elements in a temporal image. In this case, the entire cluster of elements representing the first event (i.e., the clause describing that event) will come before the cluster of elements describing the second event. The iconic linguistic item created here (4.4d) is a two-clause construction expressing temporal ordering.

Iconicity and Mime Compared

At this point, it is fruitful once again to compare linguistic iconicity and non-linguistic mime or imitations. The two processes do resemble each other in many ways: both are in fact analogue-building processes. But the crucial difference is that linguistic items are constrained to fit the semantic and phonetic categories of the language, while mime is constrained only by the imitator's conceptualizing power and physical skills.

Let us contrast linguistic and non-linguistic iconic representations of the bell's sound pictured in Fig. 3.4. This particular sound results from the striking of a bowl-

shaped bell; the tone is fairly high-pitched and steady, begins loud, and fades away over a long period of time. As we have already seen, the iconic word *ding* (4b) is an analogue of that sound which fits the phonotactic constraints of English: it contains a vowel, and its pitch and duration are typical of English words. But an imitator would be free to create a sound that adhered much more closely to the actual sound image. The imitator could match the pitch of the bell's tone and the temporal fade in a way that violates English constraints, and there need not be a shift in vocal quality from vowel to nasal: the whole sound could have the same quality, just as does the original. Fig. 4.5 presents the waveform of an imitation of the bell, transcribable as [tɨɨɨ].

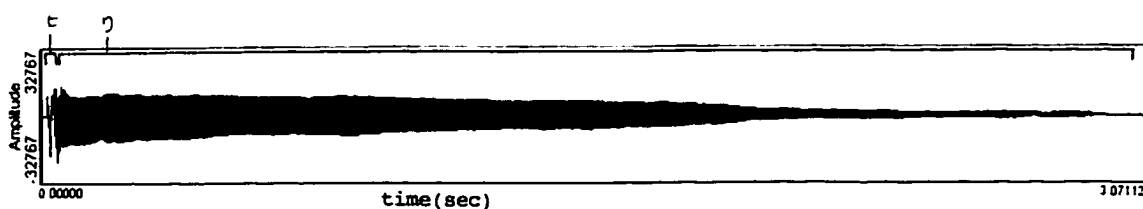


Fig. 4.5: Amplitude waveform of an American female's imitation of the bell sound in Fig. 3.4, transcribable as [tɨɨɨ]

We can compare the mime process, diagrammed in Fig. 4.6, with the linguistic analogue-building process (Figs. 4.1-4 above).

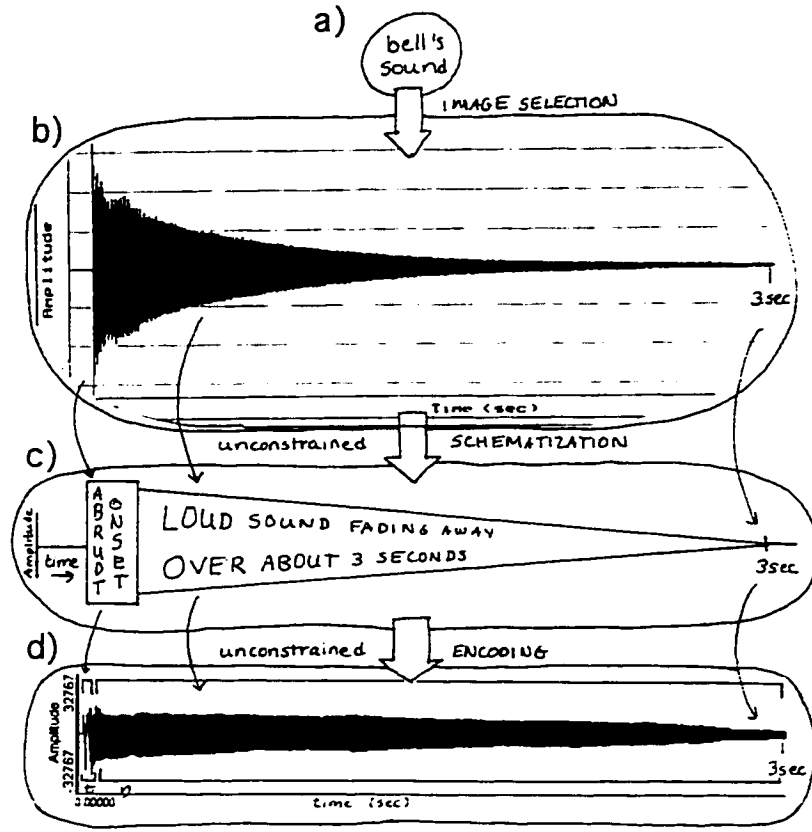


Fig. 4.6: *Mime* analogue-building process for [tʰɪŋ], showing a) initial concept, b) sensory image of bell's sound, c) image schematized without regard for English's constraints (e.g., retaining the image's exact duration), and d) image encoded as [tʰɪŋ]; arrows show structure-preserving correspondences between (b), (c), and (d)

Note that many of the stages are the same: both imitator and language user start with a concept to communicate, select a sensory image to represent that concept, and create an

analogue of that image in some modality (visual, auditory, temporal, etc.); in both cases, the end-product preserves significant parts of the structure of the original image. But at every stage, in mime, the element of *conventionalization* is lacking. The imitator gets to choose any image she or he wishes to represent the concept, in any modality; there is no shared tradition influencing the choice. At the next stage, the imitator must pick out salient aspects of the image to produce; but she or he is not constrained by linguistic categories, and may be as detailed or fanciful as desired. And at the encoding stage, the only limitation on the imitator's form is the imitator's skill in controlling his or her voice or body. The end-product of the mime process may bear no resemblance whatsoever to forms of the imitator's language; in fact, it may not even be in the same modality (for speakers creating visual/gestural mime).

Languages have devices for incorporating free mime into sentences, even though these imitations may not fit the structure of the language; this serves as an acknowledgement that mime is something that language users may occasionally want to do, even though they have the powerful linguistic system to draw on for expressing their thoughts. As Langacker (1987) noted, the English *go [NOISE]* construction lets the speaker insert any sound imitation (or even a gesture) into the [NOISE] slot: *the bee went [bzzz], the gun*

went [kts], the girl went [hand on hip pose]. Similarly, the ASL device called the *body classifier* (Supalla 1986; see Chapter 5) allows the signer to temporarily imitate any upper-body movement that another person performed.

It should be noted as well that imitations often conform at least partially to the phonotactics of the imitator's language. For example, it is fairly common for English speakers to imitate cats' sounds using the form [mraw]. This violates English's structure in that [mr] is not an allowable initial cluster; on the other hand, [m], [r], and [aw] are in fact allowable sounds of English, though the human vocal tract could have produced a less English, more cat-like imitation. Rhodes (1994) invented terms that are useful for describing this partial conformity: forms that fit a language's structure are called *tame*, while forms that do not completely fit are *wild*. A form like [mraw] for cats' sounds is wilder than /miaw/, but tamer than [ŋɣɣɣ], which uses only non-English sounds.

The analogue-building model of linguistic iconicity, as presented thus far, seems to suggest that a tame iconic form/meaning pair would only arise directly from the *linguistic* schematization and encoding process diagrammed in Figs. 4.1-4: that is, that the very first time a person wants to express an image iconically, he or she creates a form that fits perfectly into the semantic and phonetic constraints of

his or her language. It is clear that the process *often* happens in this way; for example, the classifier system in ASL is basically a means for on-line production of linguistically correct iconic representations. But it may also happen differently: a piece of mime -- a wild form like [mraw] or [kts] -- will get *re-schematized* and *re-encoded* until it fits the language's constraints.

Re-schematization and re-encoding involve elements of both the mime and linguistic analogue-building processes. Fig. 4.7 shows how it might work. The first four stages are just the normal process of developing an imitation: image-selection, schematization and encoding that are not subject to the language's constraints. Let us say that the result is a form like [tηηη] for a bell's ringing.

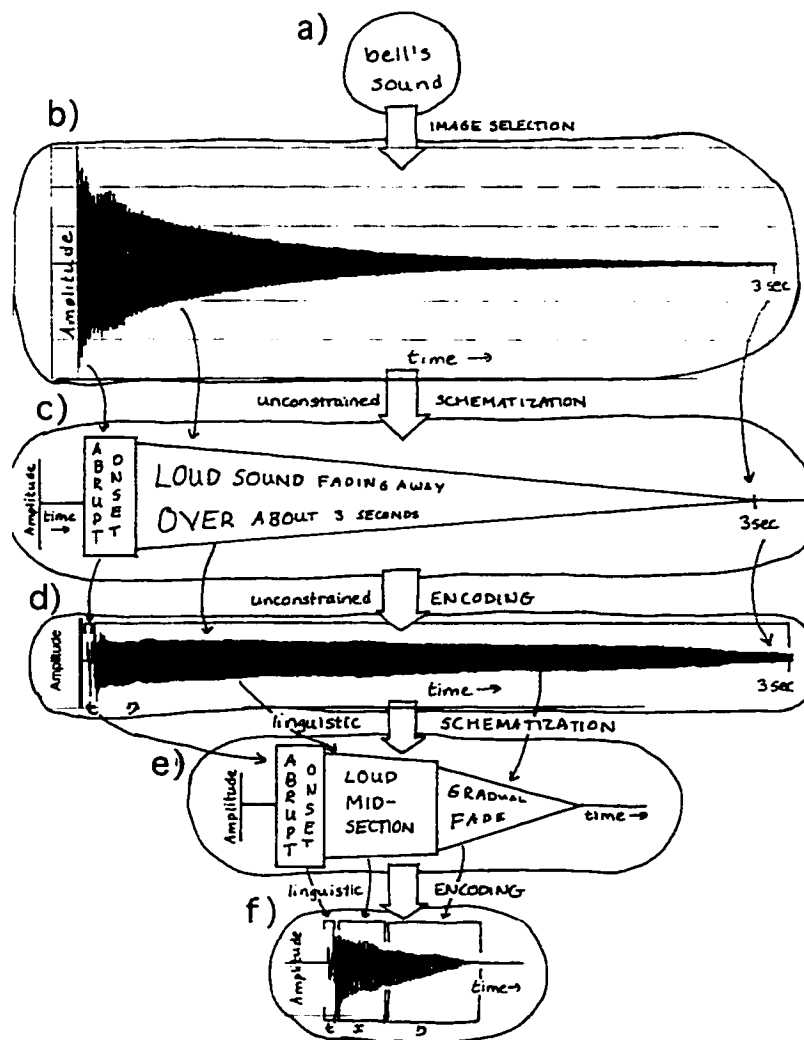


Fig. 4.7: Re-schematization and re-encoding of the imitation [tɪŋ] into the English form *ting* /tɪŋ/, with stages a) the initial concept, b) the auditory image of the bell's sound, c) the image schematized without regard to English's categories, d) the image encoded as [tɪŋ], e) a re-schematization of the image to fit English's categories, and f) the image re-encoded as /tɪŋ/, an allowable English word; arrows show structure-preserving correspondences between (b) through (f)

Now the non-linguistic imitation itself is re-schematized: its sensory image is taken as the input to the

linguistic schematization process. In our example, [tŋŋ] is re-schematized as a high-pitched sound with an abrupt onset and a gradual fade (4.7e). This new schematic image is then encoded according to the phonotactic constraints of the language; the resulting tame form, /tŋ/ (4.7f), preserves the structure both of the original image and the wild form, but it possesses a vowel and conforms to English's standard pitch and durational patterns.

It may well be that if a particular wild form becomes popular among users of a language, there will be a tendency for that form to be re-schematized and re-encoded as a tame form. One reason for this would simply be that users of a language get used to formulating and expressing their thoughts in ways that conform to the language's structure; the more a wild form is used, the more it may get "hooked in" to the language-specific representation process.²²

This process of re-schematization and re-encoding may even continue for tame forms that fit the language's categories perfectly well: the forms may continue to change until they approximate some "norm" or "typical" structure for

²² This process can also explain/underlie the *nativization* of (non-iconic) borrowings from other languages: the sound image which does not fit the constraints of the new language is re-schematized and re-encoded into the new language's categories. For example, the basic Japanese syllable canon requires consonants and vowels to alternate; English words borrowed into Japanese become significantly restructured, as in *beisuboru* for *baseball*. The English /beysbal/ is treated as a sound image to be represented by Japanese allowed combinations.

the language (instead of using "odd" or marked phonetic elements). It seems fairly clear, in fact, that this process of further taming is at work in ASL. Frishberg (1979) showed how over time, iconic signs become more "typical," e.g. by moving to a more central location in signing space, or by becoming more symmetrical.

Although wilder forms may have a tendency to become tamer, even at the cost of giving up some correspondences with their referents, this does not mean that languages have a tendency to become less iconic overall. For one thing, many or most languages have productive or semi-productive conventional means of producing tame iconic form/meaning pairs -- e.g., ASL's classifiers, English's onomatopoeic words -- and there is no reason why these systems should die away. We see individual lexical items undergoing further change that hides their origins, not destruction of the productive iconic formational processes themselves. For another, iconicity at the grammatical level -- e.g., temporal structure of clauses and inflections -- doesn't seem to be further tamed in the same way that unusual sound or shape combinations can be. It may be that only certain types of iconic items are affected by the taming process.

Implications of the Analogue-Building Model

The purpose of presenting this analogue-building model has not been to make a definitive statement about what goes on in the mind/brain of a person creating an iconic linguistic item; that of course must be discovered through experiments, not introspection. Instead (to paraphrase Langacker 1987:6), the purpose has been to bring out the phenomena that must somehow be involved and give linguists a framework in which to discuss them. My major points have been: that iconicity is common in both signed and spoken modalities, and at both lexical and grammatical levels of structure; that iconic items are language-specific, systematic, and conventional; and that iconicity involves the *selection, schematization, and encoding* of sensory images in a way that preserves the structure of the original image. I have unpacked the notion of "similarity," shown that it is based on establishing a structure-preserving mapping between two images, and worked that notion into a model of the production of linguistic forms that resemble their referents while still meeting the semantic and phonetic constraints of their languages.

Iconic items appear to be far more common in the signed modality than in the spoken modality; it was this very tendency, coupled with official disdain for iconicity, that

led to such difficulty in recognizing signed languages as true languages. Now that we have a reasonable model of how iconic items arise, we can easily explain this tendency.

Recall that the first step in the analogue-building process is to select a sensory image that is somehow associated with a concept, and in a modality appropriate for the builder's language. It is a simple fact that we have far more visual and kinesthetic images associated with many more concepts than we have auditory images: all objects we interact with, all spatial relationships, and all human and animal motor programs generate in us either visual or kinesthetic images, or both; on the other hand, relatively few objects, spatial relationships, or motor programs have a characteristic sound. As Liddell (1992) has said, it is difficult to sound like a carpet or a wall.

Thus, users of a visual/gestural language will be able to draw on a far wider range of sensory images than users of aural/oral languages. A much greater percentage of the language's concepts have the potential for iconic representation.

This only shows that signed languages have a greater *potential* for iconic items. The fact that signed languages actually do have a huge number of iconic items suggests that there is some motivation for realizing that potential. It would not be out of line to propose that *languages are as*

iconic as possible, given the constraints of their modality (cf. Liddell 1992's "motivated form principle"). Only the relative poverty of auditory imagery in our experience, and the lack of precision in our auditory and vocal systems (e.g., in creating and detecting localized sounds), has kept spoken languages from being richly iconic; and recent work has shown that such languages have found other rich ways to motivate their structures based on cognitive processing (e.g., Langacker 1987, 1991a; Lakoff 1987). Iconicity is clearly not a flaw in signed languages; rather, it is the general tendency of all languages, frustrated and redirected in the spoken modality.

I wish to note in closing that the cognitive linguistics framework which has been employed here is particularly apt for describing linguistic iconicity. Iconicity is clearly a process that involves the manipulation of mental imagery: in particular, the creation of a valid linguistic form to more or less "match" a referent image. As we have seen, the cognitive linguistics framework contains all the tools needed to fully describe this phenomenon: mental imagery itself, the notion of mappings between images, tools for analyzing language-specific semantic categories, and ways of discussing language's iconic encoding patterns. These tools have come together in a reasonable working model of iconicity.

Formalist linguistic theories, as we have seen in Chapter 2, posit a sharp boundary between the language capacity and general cognitive abilities, and treat language as a set of autonomous "modules," with one module handling phonology, another syntax, and yet a third handling semantics. Such theories would have a difficult time treating iconicity in such a natural way as it has been treated here.

Iconicity by its very nature involves an intimate connection between form and meaning. The construction of an iconic form must be guided at every step by an awareness of the referent image -- otherwise, how could the resulting form end up resembling its referent? A theory with strictly autonomous phonological and syntactic components would have a difficult time showing how the autonomous semantic component could participate enough in the creation of forms to make iconicity *possible*, let alone *common* (as it is in many languages). If semantics really were a separate module, one would not expect to find iconic linguistic items. The existence of linguistic iconicity supports theories that integrate form and meaning.

Chapter 5: **Survey of Iconicity in Signed and Spoken Languages**

Introduction

Now that we have a basic understanding of the type of conceptual machinery needed to create iconic linguistic items, let us turn to a survey of the iconic patterns that we can see in signed and spoken languages.²³ This survey will focus on the iconic "tools" that are standard in different languages: the conventional ways in which forms are chosen that preserve the structure of schematic mental images.

In surveying these tools, we will be looking at both "frozen" and productive examples of their use.²⁴ As we saw in Chapter 3, while the tools can usually combine in a relatively free and productive way, combinations of tools can become established parts of a language's lexicon. I will assume that these no-longer-productive, frozen combinations derived from an earlier, more-productive stage of tool use, and continue to use them as exemplars of the language's tools.

²³ We will not be looking at iconicity in writing systems here, though there is a fair amount of evidence pointing to the iconicity of, e.g., Chinese characters.

²⁴ For ASL, the productive forms are classifiers, and the no-longer-productive forms are frozen signs (cf. Chapter 3).

In this survey, we will see both the range of imagery that can be represented iconically by the modality, and the range of form parameters that are exploited in these tools. The survey will not present an exhaustive list of the iconic tools of any language; for example, there won't be a list of all the ways in which English uses its consonants to represent onsets of sounds. Instead, we will note general principles; e.g., the fact that spoken languages do use initial consonants to represent the beginnings of sounds. Most specific examples are drawn from English, for spoken languages, and ASL, for signed languages. This section relies heavily on Haiman (1985a), Hinton et. al. (1994), Mandel (1977), and Supalla (1978, 1986).

Iconicity in Spoken Languages

The discussion of iconicity in spoken languages will bring few surprises, since we have already seen examples of the main types in Chapter 3 (i.e., *ding* and *S1* and *S2*). Basically, the aural/oral modality is suited for iconic representations of *sound images* (including sounds of animate origin, such as human or animal vocalizations, and sounds of inanimate origin, such as explosions or bells), *temporal*

images, and *human speech* itself.²⁵ Speech is listed as a separate category, though it is definitely an animate sound, because the phenomenon of quoted speech has some special characteristics (e.g., its potential complexity of word choice and voice quality).

Sound images are represented via what we might call "sound-for-sound" iconicity. As we have seen through our discussion of *ding*, spoken languages have conventional ways of choosing speech sounds to fit the pieces of an auditory image. The resulting words can be treated as normal nouns and verbs, as they are in English, or they can be separated off into a special adverb-like class (sometimes called *ideophones*), as in many African and Asian languages (see, e.g., Alpher 1994). Words of this class can serve important functions in the language; for example, in Japanese, they are used to show subtle distinctions of meaning. According to Shibatani (1990), "In comparison to English, many Japanese verbs have very general meanings. *Naku*, for example, covers all types of crying that are expressed in specific English verbs such as *weep* and *sob* This lack of specificity of the verb meaning is compensated by the presence of onomatopoeic words." He lists the following combinations

²⁵ In principle it is possible for spoken languages to use mouth gestures iconically: the biting, chewing, and sucking motions of the

with *naku* along with their closest English equivalents, commenting that "... one may argue that the differences [in meaning] between *weep* and *sob* ... are more expressive in Japanese." (p.863)

Table 5.1: Japanese Onomatopoeic Words for Weeping

cry	<i>waa-waa naku</i>
weep	<i>meso-meso naku</i>
sob	<i>kusun-kusun naku</i>
blubber	<i>oi-oi naku</i>
whimper	<i>siku-siku naku</i>
howl	<i>wan-wan naku</i>
pule	<i>hii-hii naku</i>
mew	<i>een-een to naku</i>

"Time-for-time" iconicity occurs when the temporal characteristics of the speech stream are used to represent temporal characteristics of referent images. This happens both within individual words and on a larger scale, in the ordering of clauses in a sentence or sentences in a story. On the word level, as we saw above, speech sounds that represent parts of a referent sound are arranged in the same temporal order as their referents: e.g., initial consonants represent onsets while final consonants represent ends of sounds. In addition, an unusually long vowel can be used to

mouth articulators could be used to represent concepts with similar

emphasize the long duration of an event, as in *We had to wait a loooong time*. Repetition, another kind of lengthening of the utterance, can also be used to signal long duration, as in *We waited and waited*, or *We waited a long, long time*.

On the sentence level, the order of clauses often represents the order in which the events in each clause occurred. Notice that this is an example of iconicity in the *grammar* of spoken languages.

Another type of linguistic iconicity that we have not yet discussed shows up in spoken languages. This is the ability to use language to represent other language -- that is, the ability to directly quote other people's speech. For example, English speakers can say *John said*, and immediately follow the verb of speaking with the words that John used. This too is a grammatical rather than a lexical device.

Quoted speech fits well into the analogue-building model of iconic processes. The sensory image to be encoded is the speaker's memory of an earlier speech event: what that person said, the quality of his or her voice, the emotional affect, and so on. This image is basically already in an encoded form: the speaker need only attempt to reproduce, with his or her own voice, the words that were said and (to some degree) the way in which they were said. Note that speakers are free

meanings, or even similar event structure.

to reproduce more or less of the original person's intonation and affect; a quoted tirade can be presented in a flat, bland way, or it can incorporate the loud pitch, angry intonation, and even the angry facial expressions and gestures of the original speaker.²⁶

Spoken languages also have ways to "quote" not just speech, but also sounds or even gestures. One such example is the English GO + NOISE construction, noted by Langacker (1987), as in *John went, "No way!," The baby birds went [i], [i], [i], or And then she went, [speaker puts hands on hips and frowns]*. In this construction, speakers can follow the verb *go* with a reproduction of the referent person's words, sounds, or gestures.

Relation between Concept and Image in Spoken-Language

Iconicity

We should recall that these iconic devices are means of encoding schematic sensory images. Though the types of *images* representable via iconic means in spoken languages are limited to sound images, temporal images and quoted speech,

²⁶ Acting (e.g., in plays) is thus also iconic, according to my model: it is a representation of human behaviors that resembles the behavior

the types of *concepts* given iconic representation are not so limited. This is because any concept that is somehow associated with these kinds of sensory images can enter into the analogue-building process.

Thus, a concept such as "the destructive impact of one thing into another" can be named by the iconic English word *crash*. This concept is not primarily an auditory one, but such impacts nearly always have a characteristic sound image associated with them. It is that sound image that receives iconic representation as *crash*. Then the iconic word is used to talk about the concept as a whole. Even abstract concepts that can in some way be associated with a sound image can thus be represented iconically in spoken languages (cf. Oswalt 1994).

It turns out, of course, that the vast majority of concepts are not closely enough associated with a sound image, as we saw in Chapter 4. For this and other reasons, iconicity is less common in spoken than in signed languages. There are fewer concepts that are appropriate for iconic representation in the spoken modality; and, as we will see in the following section, there are far fewer parameters that the spoken modality can exploit. The smaller amount of iconicity in spoken languages, which has been attributed to

itself. This is a *culturally* conventional form of iconicity, rather

the inferiority of iconic representations, could just as well have been attributed to the inferiority of the spoken modality in establishing iconic representations.

Iconic Devices in Signed Languages

As we know, many different kinds of concepts have associations with visual images or body actions. We will explore now the vast range of signed-language features that can be exploited to create iconic representations of these concepts, using ASL as an example. The signed-language examples are from ASL; cross-linguistic surveys show that many of these devices are shared by other signed languages (e.g., Newport 1996); and we can expect other new and interesting devices in other signed languages. That is, this is not an exhaustive account of the possibilities; it will serve, however, to get the newcomer acquainted with the vast iconic potential of signed languages.

In brief, ASL's iconic devices draw on our perception of hands, arms and fingers as having overall shapes, locations and movement; our ability to "see" the path that a moving object traces out in space; our knowledge that the signer's

than one that is purely based on *linguistic* devices.

body is a human body, in shape and function like other human bodies; our additional knowledge that animal bodies often resemble human bodies in shape and function; our ability to recognize the body movements that go along with particular activities; our perception that body gestures take place over time and in space; and our knowledge of the movements of signing itself. I will illustrate each of these points using both frozen signs and classifiers, wherever possible, and including both lexical and grammatical examples.

Physical entities represent themselves

Objects and people that are actually present during a signing event can be understood as representing themselves in the discourse. On some level, this is true for any communication, spoken or signed; thus, to refer to a person standing nearby, one can always point to that person. (This is called *direct deixis*.²⁷) But signed languages incorporate this pointing into their grammar and vocabulary in conventionalized ways: there are many kinds of signs that consist basically of pointing in a specific way at a meaningful location or thing.²⁸ For example, some ASL frozen signs for body parts use the fact that the signer's body is

²⁷ Thanks to Kevin Moore for comments on the topic of deixis.

always present during signing, and name the body part by pointing to it in a conventional way (e.g., NOSE [Fig. 5.1], BODY, HEAD). Another example comes from Providence Island's signed language, which uses deictic or pointing signs as names for entities such as the ocean or the island's town; signers are always aware of where these places are, and there are few enough notable locations around that pointing is not ambiguous (Washabaugh, Woodward, & DeSantis 1978).



Fig. 5.1: NOSE

A third, more complex example is the type of pronoun system used by ASL and most other signed languages (Newport 1996): pronouns consist of "pointing gestures" directed at the spatial location of their referent. As we will see in detail in the section on space below, pronouns can be directed at non-present but *projected* referents as well as at

²⁸ Mandel (1977) referred to this as *presentation*.

present ones. This can easily be seen as deriving from direct deixis: once the image of the referent has been projected onto signing space, it is available to be pointed at.

Shape of articulators represents shape of referent

We turn now to cases where the signed material is not simply a pointing gesture directed at a known referent, but in some sense "creates" an image of that referent. One major way in which signed languages can do this is by focusing on the shapes of the articulators themselves, and using them to encode images of similar shapes. (Mandel 1977 referred to this as *substitutive depiction*, in that the articulators are "substituted" for the parts of the image; I prefer the term *shape-for-shape iconicity*.) Many of ASL's classifier forms work in this way: certain handshapes and hand-forearm configurations have been conventionally selected as the proper way to represent particular shapes of objects. These same configurations and a few others are used in iconic frozen signs as well. In each case, signers know by convention which parts of the articulators encode which parts of the referent; they also know which parts of the articulators "don't count" -- that is, do not participate in the iconic mapping.

Our example of Chapter 3 and Chapter 4, the frozen sign ASL TREE (Fig. 3.1), uses this kind of iconicity. As described in detail there, the non-dominant hand and forearm represent the ground, the dominant forearm represents a tree-trunk, and the spread dominant hand represents the branches. The upper arms and the rest of the signer's body are not part of the iconic mapping and do not encode any part of the image of a typical tree. Similarly, in the sign BOOK, two flat B-hands touching at the pinky edge repeatedly come together at the palms and open again; here the flat handshapes encode the cover and pages of a book, while the wrists, forearms, and so on "don't count" in the mapping.

Some shape-for-shape iconic representations are more detailed and exact than others; that is, some signs and classifiers of this type have more iconic correspondences with their referents than others do. In terms of the Analogue-Building Model, we could say that the referents' visual images are schematized to different degrees. At the highly schematized end of the continuum, we have semantic classifiers (Supalla 1986) representing broad classes of referents. Examples are the *vehicle classifier* (illustrated in Fig. 5.2), in which the "3" handshape (thumb, index, and middle fingers extended from a fist) with thumb pointing upward represents a vehicle of some sort, and the *person classifier*, in which the "1" handshape (index finger extended

from a fist) pointing upward represents a person. Here, the only match between referent image and linguistic form is the broad outline (i.e., horizontal oblong vs. vertical rod).



Fig. 5.2: The sideways-3 vehicle classifier

At the weakly-schematized end, we have signs like TREE and classifiers like the V for human legs (Fig. 3.3) which preserve a fair amount of the referent image's structure. Somewhere in the middle are the element classifiers (Supalla 1986) where, to take one example, spread hands with wiggling fingers can represent moving water or flames.

Movement of articulators represents movement of referent

Another form of iconicity frequently appears together with shape-for-shape iconicity. When the articulators

themselves are configured to represent a referent's shape, the signer can move that configuration around to represent movement of the referent (Mandel's *temporal motion*). Thus, signing the PERSON classifier (index finger extended upward from fist) and moving it upward in a zigzag path represents movement of an actual person upward in a zigzag path, most likely on a winding road up a hill. (Fig. 5.3 illustrates this classifier construction.) Similarly, an articulator can be placed at a particular point in signing space to represent the existence of the referent at a particular point in space. So, for example, the passage of a car or truck along a wall can be represented by a sideways-3 VEHICLE classifier moving along and past an unmoving tall, flat object classifier (flat hand with fingers upward).

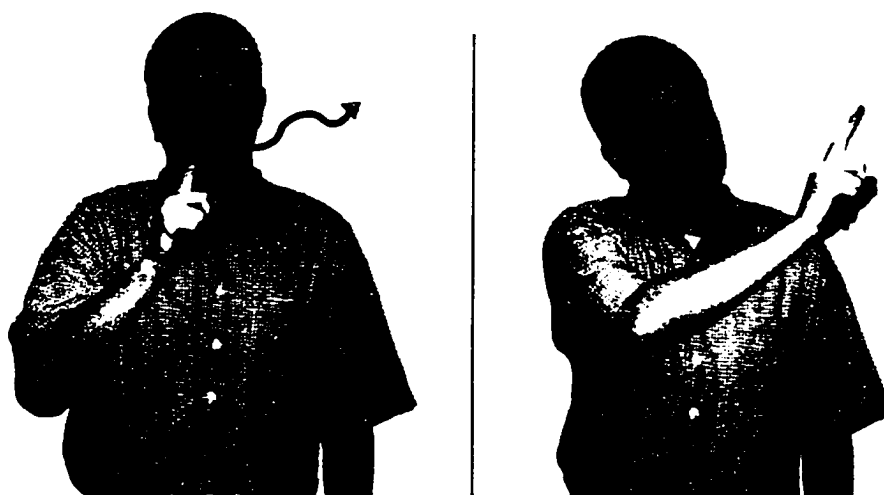


Fig. 5.3: The upright-1 person classifier moving upward left on a winding path

It should be noted that, just as certain parts of articulators conventionally "don't count" as part of the iconic image, certain movements "don't count" either. These are the movements that are necessary for "setting the stage," so to speak. They are distinguished from iconic movements by special path-shapes and non-manual signals such as eye-gaze and head-nodding (cf. Engberg-Pedersen 1993 for Danish Sign Language). For example, the fist with thumb extended upward is used as a classifier for movable objects. If the signer wishes to state that an object is in a particular location, she or he will move the fist classifier to the corresponding location in signing space; the movement will arc downward to that spot and end abruptly there, and the signer's head will nod as the fist reaches the location that "counts" iconically.

How schematized are iconic uses of motion? That is, how freely can an articulator's motion imitate the motion of its referent? This is a matter of some debate. Signers do certainly create a vast number of movement paths. Early researchers (e.g., DeMatteo 1977) argued that any movement can be freely imitated. Supalla (e.g., 1978), on the other hand, argues that only a small range of "movement morphemes" are allowed, and that their combinations generate most of the paths that signers actually produce. For example, in Fig. 5.3's representation of a person walking on a winding path up

a hill, signers would combine an "upward" movement, a "forward" movement, and a "back-and-forth" movement to produce a relatively simple uphill path. The exact details of the path's twists and turns would usually not be shown, though Supalla does admit that if a signer wishes to be extremely exact, she or he can show every twist and turn of the path. Supalla shows as well that when the dominant and non-dominant hands both represent entities located in space, they can be in only six or eight relative locations; all scenes described in this way must be schematized to fit these relative locations.

It is certainly consistent with the Analogue-Building model that paths should be schematized into simpler, language-specific elements; the schematic nature of ASL's movement elements does not detract from their iconicity. It underlines once again, however, the difference between linguistic iconicity and non-linguistic imitation: linguistic iconicity is constrained by the language's system. Interestingly, in certain cases the system can be suspended to some degree in order to give an exact description of a particular path. Future research should investigate whether this is seen as "non-linguistic" by signers (and perhaps analogous to spoken-language elaborations of onomatopoeic words).

A special set of patterns: representation of body parts

Shape-for-shape iconicity (and its corollary, movement iconicity) can be used, as we have seen, to encode the shape of just about any kind of physical object. There are some interesting patterns in ASL, however, where the signer's body parts are assigned to represent human or non-human body parts in systematic ways. Some of these patterns are based on shape similarity alone; others are based as well on similarity of function between articulator and referent.

The patterns fall into several types: the signer's articulators can represent human body parts of the same type (e.g., hands representing hands); animal body parts that correspond to the signer's articulators based on an overall mapping between the two body types (e.g., hands representing forepaws); and human or animal body parts that do not correspond to the signer's articulators (e.g., hands representing human feet).

There are a number of standard ways in ASL for parts of the signer's body to represent different human body parts, or unrelated animal body parts. In these cases, the articulators in question often both "look like" the referent and move like or share some other higher-level structure with the referent. For example, hands attach to arms via wrists

in much the same way as feet attach to legs via ankles, and so it makes sense that one conventional way to represent feet is with the signer's hands. (This pattern shows up in frozen signs like WALK or SHOES as well as in productive, classifier-like depictions of people moving their feet.)

Another example of this sort is illustrated in Fig. 3.3, which shows structure-preserving correspondences between the "V" handshape (index and middle fingers extended from a fist) and human legs. ASL uses this handshape as a classifier to show the movement and position of *human legs*, and it occurs as well in frozen signs such as FALL and TOSS-AND-TURN. The "V" shape with fingers bent can also represent *animal legs* (both fore and hind), as shown in Fig. 5.4.



Fig. 5.4: The bent-V "four-legged" classifier

There are many more instances of this kind of iconicity. To name just a few more, the dominant forearm and hand can encode an *animal's tail*; both index fingers together can encode *human legs*; and two "F" handshapes (thumb and index finger form a circle, other fingers extended) held near the eyes can encode *eyes and eyelashes*. Most of the time, these forms are used productively to show the movement and location of their referents. Fig. 5.5 shows the use of the two index fingers for legs, in a construction denoting *effortful walking* (as in slogging through mud).



Fig. 5.5: The double-index-finger *legs* classifier used to show *effortful walking*

The next group of cases draw on the fact that many other animals have the same general body-type as humans: four

limbs; a torso; a head with eyes, nose, ears, and a mouth. Because of this, it is natural for us to see correspondences between certain animal body parts and certain human body parts, the ones that have analogous structural relationships to the whole body (cf. Chapter 4, Gentner & Markman 1996). Moreover, it is natural to use human body parts to refer to the corresponding animal body parts, and signed languages like ASL have incorporated this tendency into their linguistic forms. For example, to represent a cat washing its paws and face, a signer could mime licking the backs of his or her curved and flat hands and rubbing them against his or her face.²⁹

Sometimes an animal's body parts can look significantly different from the corresponding human body parts (e.g., pointy ears, long trunks for noses); they can also have parts that humans do not possess (e.g., fur, whiskers). ASL signers can combine two kinds of shape-for-shape iconicity to show these body parts. The hands (being mobile and easily positioned in the appropriate place) will represent the shape of the animal's body part (e.g., an F-shape for whiskers); that shape will then be placed at the part of the signer's body which corresponds to the referent's correct location on

²⁹ This could be considered an extension of the *body classifier*, discussed later in this section, to non-human referents: once the

the animal's body (e.g., the signer's cheek, to represent whiskers). This kind of sign draws on both general shape-for-shape iconic devices and the correspondence between animal bodies and the human body; both kinds of devices are part of ASL's set of iconic tools.

As another example, to show large elephant ears waving forward and backward, a signer could place flat B-hands (for the ears' basic shape) at his or her own ears, to show that the hands represented large, flat ears, then angle them forward and back. Also, to show animals eating or biting, a handshape appropriate to the size and shape of the animal's jaws can be placed in front of the signer's mouth; for each bite, the handshape and the signer's mouth open and close.

Signs for kinds of animals are often made using this type of combined iconic mapping; they encode a salient body part of the animal, which then is associated metonymically with the concept of the animal itself. Examples from ASL include *whiskers* in the sign CAT (Fig. 5.6), *ears* in HORSE and MULE, and a *beak* in BIRD and DUCK.

mapping between signer's body and animal body is established, the signer's movements freely represent the animal's movements.



Fig. 5.6: CAT

Finally, the signer's body can be used to represent a human body; the signer's movements and poses can be understood to represent the movements and poses of a human being. These forms draw on our ability to recognize the motor programs our bodies use in daily life. This natural mapping from signer's body to referent's body shows up in a number of ways in ASL, ranging from free, mime-like imitations of human actions to highly conventionalized and frozen names for particular human activities.

The most mimetic, least stylized instances are called *body classifiers* by Supalla (1986). Here, signers are free to do any action at all, with the understanding that their movements represent the actions of some referent person (i.e., someone else, or themselves at a different time). This iconic device is roughly analogous to quoted speech in spoken languages -- but for signed languages, what is

reported is not sound but body movement, both linguistic and non-linguistic (i.e., both signing and other actions). Thus, body classifiers are often used to show, e.g., someone waving arms, frowning, standing with hands on hips, signing, and so on.³⁰ (See the section below on "role shift" for additional discussion.)

Frozen versions of body classifiers are often used to name sports or activities. Thus, KARATE is signed with flat hands on straight wrists circling as if performing a stylized karate block; and a sign glossable as EAGER (Fig. 5.7) is made by rubbing the palms together and leaning slightly forward. Most signs of this type are *metonymic*, in that they use a *part* of the sport or activity (e.g., the karate block, or a stereotypical gesture associated with eagerness) to name the *whole* concept.

³⁰ Of course, in describing a situation with body classifiers, the signer may not represent *exactly* what the person did in the situation; instead, the signer may choose, for example, to represent an angry yet expressionless person by giving an exaggerated frown. This is again analogous to reported speech in spoken languages.



Fig. 5.7: EAGER

More conventionalized are forms known as *instrument classifiers* (Supalla 1986). In these, the signer describes or names objects by showing interactions with them. In many or most cases, the object itself is not directly represented by the articulators; instead, the articulators form stylized versions of the handshapes and body movements needed to manipulate the object. For example, to show manipulation of a smallish flat object, ASL signers would bring their fingertips and thumb together in a flattened "O" shape; this is a language-specific schematic version of a hand configuration that people actually use in picking up, say, an index card. Notice that no part of the hand corresponds to the object itself; instead, the hand as a whole represents the hand of a person grasping the object. Movement of the hand will then show how the object is manipulated. In other

examples, to show the manipulation of small rounded objects, ASL uses an "F" handshape (thumb and forefinger together, other fingers extended); and to show grasping of a handle, ASL uses a fist handshape.

Frozen versions of instrument classifiers can name actions, sports, and objects; they often combine with body classifiers and shape-for-shape iconicity. So, for example, BASEBALL (shown in Fig. 5.8) uses two fists touching as if gripping a baseball bat ready to swing; TEA uses the "F" handshape moving around above a curved C-shaped hand, as if swishing a teabag around inside a cup; and the verbs FIND, GIVE (Fig. 9.3), and MOVE all use handshapes derived from instrument classifiers.



Fig. 5.8: BASEBALL

The use of body and instrument classifiers is strongly motivated by the distinctiveness of body actions: sometimes it is easier to produce and recognize body movements associated with an object than an analogue of the object itself. For example, showing the action of turning a crank makes it clear that the long, thin object in question is in fact a crank. Similarly, showing the way that an object must be lifted can give us the shape and size of that object more clearly than a "sketch" of the object itself. The existence of these forms shows that we categorize things in our environment not just by shapes, sizes, or other "objective" criteria, but also by the way we interact with them.³¹

³¹ There is some evidence that in the early stages of a signed language's development, signers use instrument classifiers or other motor-based forms in a large number of situations, but that in later stages, they become more restricted in use. Senghas (1995) notes that in the development of Nicaraguan Sign Language, instrument classifiers were first used to describe any kind of object or situation; but later, they became restricted to cases where the signer wishes to emphasize some agency or human action on the object. Shape and size classifiers took over the simple description function. Thus, to convey the meanings *The man had feathers on his arms* and *The man put feathers on his arms*, at the early stage signers would have used instrument classifiers in both cases; but in later stages of the language, they use instrument classifiers only for the second meaning. Senghas cites Kegl (1985) for a similar distinction between motor-based and shape-based iconicity in ASL.

The heavy early use of motor-based iconicity in signed languages suggests that these motor programs are indeed highly distinctive and recognizable.

Shape of articulators' path represents shape of referent

So far, we have looked only at cases where the articulators' shape and configuration represents the referent's shape; now we turn to ASL's second major iconic strategy. Here, the signer's articulators trace out a *path* in space whose shape resembles the referent's shape. This strategy is possible because of our general cognitive ability to look at a moving object and perceive the shape of its path as a whole. Note that while using this strategy, the signer has no way to represent the referent's movement through space; the articulators' movement shows static extent in space rather than movement of the referent over time. (Mandel 1977 called this *atemporal motion*.)

ASL uses a number of conventional handshapes as "tracers," as we saw in Chapter 3 in our discussion of ASL DEGREE. For example, index fingertips trace out lines, flat hands with fingers together (the "B" shape) trace out planes, curved hands (the "C" shape) trace out curved surfaces, and thumb-and-forefinger circles (the "F" shape) trace out small cylinders. Just as with shape-for-shape iconicity, only certain parts of the articulators are understood as "counting," i.e., leaving behind a trace; for example, the extended three fingers of the F handshape leave no trace when the thumb-and-forefinger circle traces out a cylinder. And

just as with path-for-path iconicity, only certain parts of the motion "count" as part of the path; movements required for set-up are not included.

As Mandel points out, this method (which he calls *virtual depiction*) enables signers to make their clearest, most detailed specification of shapes: they are not limited to the general outlines of fingers, hands, and arms, but can "sketch" in the air many details and subtleties.³² For example, a description of a floor lamp might begin with the lexical sign LAMP, followed by both F-hands sketching out a vertical cylinder, and then both spread hands tracing the shape of the lampshade; this sequence is illustrated in Fig. 5.9. Once the lamp has been described, subsequent references to it might use the less-detailed shape-for-shape classifiers; in particular, the fist with thumb extended upward (for moveable objects) or the fist with index finger extended upward (for tall, thin objects).

³² The degree of detail depends partly on the signer's choice, and partly on conventional schematization of the referent image. It is not clear whether there are form-based constraints on the complexity of path-for-shape paths.



Fig. 5.9: A classifier-based description of a floor lamp; the signer first articulates LAMP, then traces a long, thin vertical cylinder, and finally traces a ruffled conical section at the top of the cylinder

Path-for-shape iconicity is very common in the description of physical objects, as might be expected; the example of the floor lamp above is typical. Quite a few path-for-shape descriptions have become frozen signs naming particular referents; our familiar example DEGREE is of this sort, as is HOUSE, where both B-hands trace the silhouette of a pointed roof and vertical walls. (This is the schematic image of a prototypical house; it is used whether or not the roof is actually pointed.)

Shape-for-shape and path-for-shape iconicity can combine in interesting ways. Recall that ASL has a number of conventions through which the signer's hands and fingers represent human and animal body parts (the "special patterns" discussed above). All of these conventions can combine with

path-for-shape iconicity. As we know, the signer's body parts can represent *non-corresponding* human or animal body parts (e.g., hands for feet, fingers for legs, etc.); when the signer wants to specify that the body parts have a particular shape, the hands can sketch out a path that gives the details of the shape. One example is the usual way of describing high-heeled shoes: the dominant hand sketches the outline of the heel and toe on the non-dominant hand, which represents a foot.

Similarly, signer's body parts can represent *corresponding animal* body parts; path-for-shape iconicity can again give additional information about the shape of these parts. The frozen sign ELEPHANT (Fig. 5.10), for example, traces the elephant's trunk starting at the signer's nose; and a classifier-based description of a lion's claws would sketch them out at the signer's non-dominant hand. Finally, path-for-shape iconicity can show the exact shape of a *corresponding human* body part or accessory. One example of this is the frozen sign EYEGLASSES, where the thumbs and index fingers of both hands trace the approximate shape of lenses in front of the signer's eyes; another, more productive use is the usual way of showing hairstyles and lengths, by tracing the outline of the hairstyle on the signer's own head and body.



Fig. 5.10: ELEPHANT

Locations in signing space represent locations in mental spaces

There are a number of different mapping systems by which locations in signing space can represent locations in some mental space, either real or imagined; these systems are more or less "comprehensive," in that they can set up correspondences either with a very limited chunk of signing space, with the entire space around the signer, or with some intermediately-sized section of signing space.

Let us start with a use that can be fairly limited. The "space for space" iconic principle is deeply involved in both shape-for-shape and path-for-shape iconicity: in both cases, there is a structure-preserving mapping between signing space and some imagined space, such that relative distance and direction between locations is preserved. This mapping may be limited to the area of space occupied by the iconic sign or classifier. For example, in TREE, the spread fingers of the dominant hand are above and adjacent to the dominant forearm, rather than directly adjacent to the non-dominant forearm; this corresponds to a mental image in which the tree's branches are above and adjacent to the tree's trunk. Similarly, in HOUSE, the sketched diagonal planes are above the sketched vertical planes, corresponding to the way in which a roof sits on top of a house's walls. In both of these examples, the area occupied by the sign maps onto the area occupied by the referent in some mental space; but no further iconic mapping attaches to locations that are outside that area.

We also see this principle at work in path-for-path iconicity, where the movements of articulators through various locations in signing space represents the movement of an entity through locations in some real or imagined space. In this case, more of signing space can be assigned meaning;

the area through which the articulators move is usually mapped as part of an iconic "landscape."

There are uses of classifiers, however, that involve a comprehensive and thorough mapping between most of signing space and a mental space. In these cases, the signer is explicitly describing a complicated scene or landscape. A typical example is the description of a room; the signer can establish in space the limits of the room, and proceed to name objects and place them in the signing-space locations that correspond to their real-world locations. Generally, a large percentage of signing space gets used for these descriptions.

Another use of space-for-space iconicity is woven into ASL's verbal and pronominal agreement system. Locations in space, or *loci*, are set up to represent people or places in a discourse; Liddell (1990) has shown that in many cases, a full-scale iconic image of the referent is mapped onto the locus.

Liddell's paper deals with ASL anaphora and verb agreement, which involve (loosely speaking) associating a place in signing space with a particular referent, and displacing signs' locations toward that place to indicate pronouns' referents or verbs' arguments. Liddell showed that these places often "contain" full-sized mental images of the referent.

The evidence is as follows. ASL verbs and pronouns can also be directed at a person who is present in the signing context; in those cases, verbs have a characteristic "height" -- they are directed toward a specific area on the person's body. For example, GIVE is directed at the person's chest, and ASK at the person's chin. Thus, the taller the person in question, the higher the sign's endpoint is articulated (see Fig. 5.11).



Fig. 5.11: The sign I-GIVE(TO)-YOU, inflected for agreement with a) an addressee of the same height as the signer and b) a shorter addressee

Liddell noted that even when the referent person was not present, the height of the verb still reflected the referent's actual height (see Fig. 5.12): verbs agreeing with a taller person were still directed at a higher level in space. The only way for this to happen would be if signers were actually accessing a mental image of the person, height and all, and mapping it onto signing space. Different parts of the mental image were being mapped in a structure-preserving way onto adjacent pieces of signing space (Fig. 5.13).³³

³³ Note that this is much like the process involved in iconicity, where an image of the referent can be mapped onto an image of the form; it's enough like it that I prefer to treat projection of images onto signing space as a form of iconicity. The difference between the image projection in anaphora and in "normal" iconicity is that in the latter case, the articulators provide a physical configuration on which to ground the image, while in the former case, all the conceptual work is done by the mapping process.

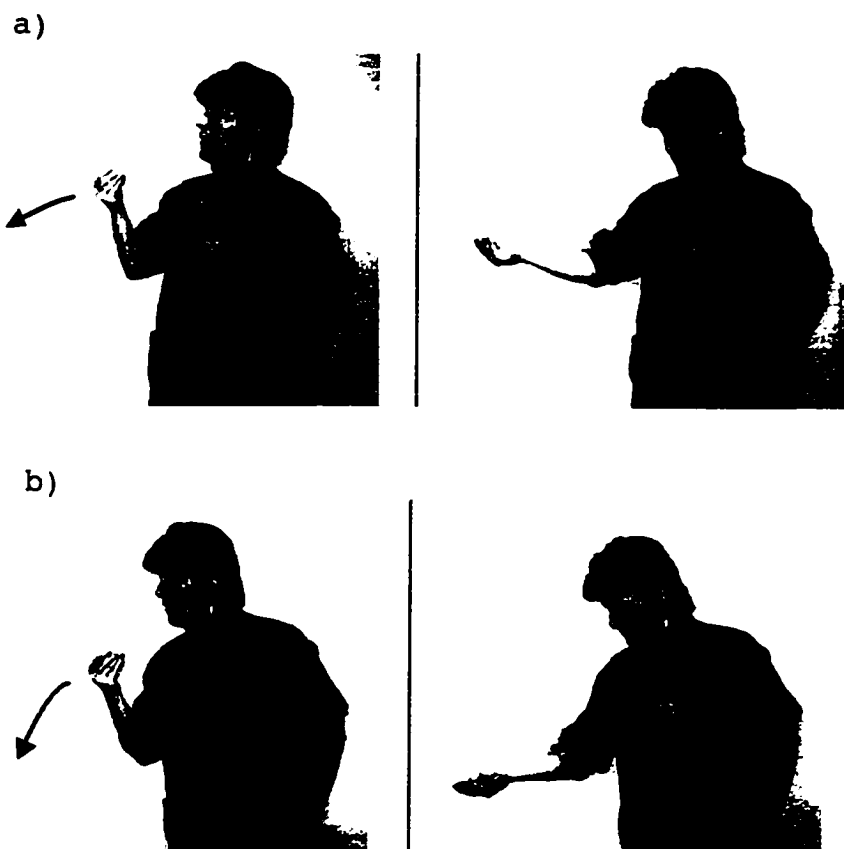


Fig. 5.12: The sign I-GIVE(TO)-HIM/HER/IT, inflected for agreement with a) an absent person of the same height as the signer and b) a shorter absent person

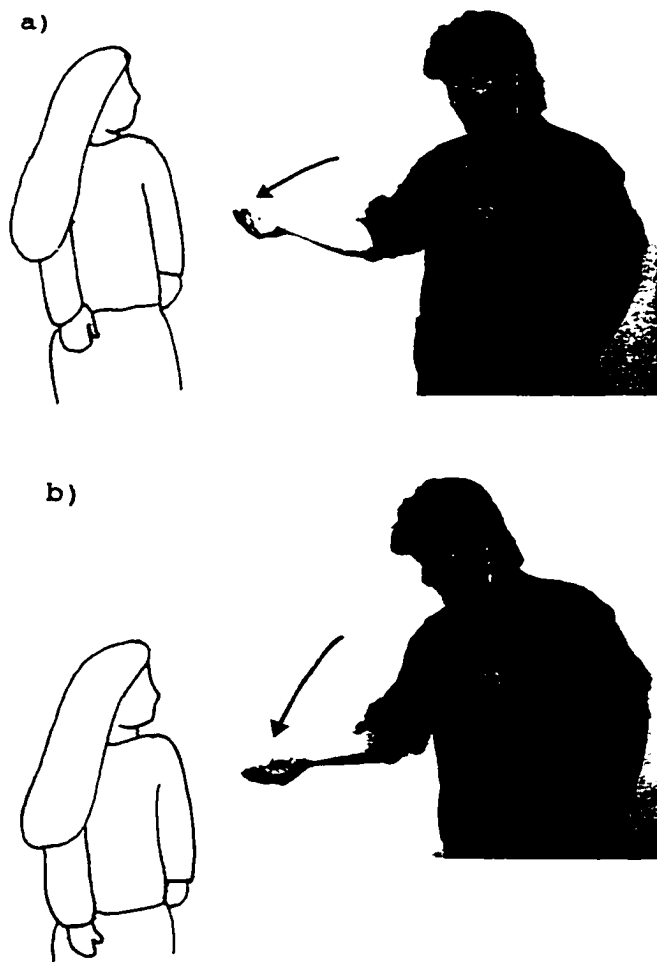


Fig. 5.13: Projection of a) same-height person and b) shorter person onto signing space, with appropriate adjustment of I-GIVE(TO)-HIM/HER/IT

But the space between loci need not be iconically mapped in any way; if the signer establishes one referent to the left, and another to the right, she or he is not necessarily

claiming that the two referents are in fact located in that spatial configuration.

It has been claimed (e.g., Klima & Bellugi 1979; Poizner et. al. 1987) that ASL uses space in two ways: the grammatical agreement system, where referents are iconically established at points in space, but the rest of signing space has no iconic meaning; and the locative system, where space, direction, and relative location are all iconically

significant.³⁴ These ways have been considered to be completely separate systems. But as we can see from the above discussion, this does not seem to be the case. Rather, there is a continuum of iconic uses of space, from the least-iconic grammatical uses (where the spatial loci themselves are all that is mapped) to the most-iconic descriptive uses (where the majority of signing space is given iconic meaning). Many uses are intermediate on the continuum.

One major place where the strict separation of two uses of space has been posited is ASL's verbal system. ASL's verbs have been historically classed into those which take spatial agreement with grammatically-determined subject and object, and those which agree with iconically-determined locations (e.g., Padden 1988). However, Padden herself discussed data (noted by Liddell 1990 and Engberg-Pedersen 1993, among others) which suggests that the two are not strictly separable. When a referent is established at one locus in signing space, and then is shown (via the spatial description system) to have moved, grammatically-agreeing verbs will then agree with the new location, not the old one, showing that they can draw on the spatial description system as well. Thus, for this situation, a single locus can control grammatical agreement *and* take part in a more

³⁴ These are usually referred to as *syntactic* and *topographic* uses of

comprehensive mapping between signing space and a mental space. (For more on verb agreement, see Chapter 9.)

It should not be surprising to find all variations along the continuum, from strictly "grammatical" loci which map perhaps only a single point in signing space, to weakly-spatialized loci (mapping perhaps only the general spatial relations between several entities), to strongly iconic uses of loci which participate in a comprehensive mapping between signing space and a mental scene. If classes of verbs need to be distinguished, a better distinction might be in degrees of conventionalization of different layers of meaning -- the strictly spatial (e.g., for instrument classifiers) versus the frame or scenario-based (e.g., for lexicalized verbs like GIVE).

Size of articulation represents size of referent

In both shape-for-shape and path-for shape iconicity, the size of the shape created can iconically represent the size of the referent. We need to consider two different aspects of this process: representing *relative* sizes of the referent's parts, and representing the *absolute* size of the referent as a whole.

space, respectively.

In general, the shapes created by path-for-shape iconicity are proportionally accurate -- that is, the relative sizes of each part of the shape correspond well to the relative sizes of parts of the referent image. This is less true for shape-for-shape iconicity, since the shapes created are more schematic, and limited to the shapes of the articulators themselves; yet for complex shape-for-shape signs like TREE, the sign's parts still correspond remarkably well to the referent image's parts.

The *absolute* size of the image can be represented in several ways. The first two strategies depend on contextual information. If the iconic sign uses the signer's body to represent body parts, then the body provides the context for us to figure out the referent's size. For example, if classifiers are used to sketch a bracelet around the signer's non-dominant wrist, we understand that the bracelet is about the same size as the wrist. Second, if a signer has set up an entire scene in signing space, we can rely on the scene's context to establish the relative sizes of objects within it. Thus, if we know that the signer is giving a classifier-based description of a bedroom, with windows, bed, dresser, and desk all located in signing space, we can easily figure out the probable absolute sizes of each piece of furniture.

The third possibility is for the signer to explicitly indicate the absolute size of the object. Generally, when

employing this strategy, the signer will either use a lexical sign such as BIG or SMALL, or indicate the object's general dimensions using flat "B" handshapes or extended index fingers.

Size-for-size iconicity shows up in the non-manual component of ASL as well.³⁵ For example, let us look at the ways in which lips and mouth encode relative sizes in ASL. We will be considering two separate paradigms, and both involve a contrast between compressed, smaller mouthshapes and relaxed, wider mouthshapes. The first paradigm is used for descriptions of distances and times: when discussing a short distance or brief time, the signer must squint and tighten the lips in a tense "smile"; this is illustrated in Fig. 5.14a with the sign CLOSE. In contrast, to indicate long distances and times, the signer's mouth relaxes and opens wide, as shown in Fig. 5.14b for the sign FAR. The second paradigm is used when describing the size of objects. For a small item, the signer squints and purses the lips (as if saying "oo"), as in Fig. 5.15a for the sign SMALL. To indicate that an item is large, the signer opens the mouth

³⁵ Although we have not addressed this issue in this book, there is a large literature on the non-manual components of signed languages: shifts of the body, head nods and tilts, direction of eye gaze, raising and lowering of eyebrows, eye blinks, mouth configuration, and other facial expressions carry a great deal of grammatical information. For example, in ASL, questions that can be answered by "yes" or "no" are marked with brow raise and forward head tilt. See, e.g., Baker & Cokely (1980) for more information.

wide (as if saying "cha"), as we can see in Fig. 5.15b with the sign BIG. Within both paradigms, the smaller, tenser mouthshapes indicate smaller referents, while the larger mouthshapes indicate larger referents.

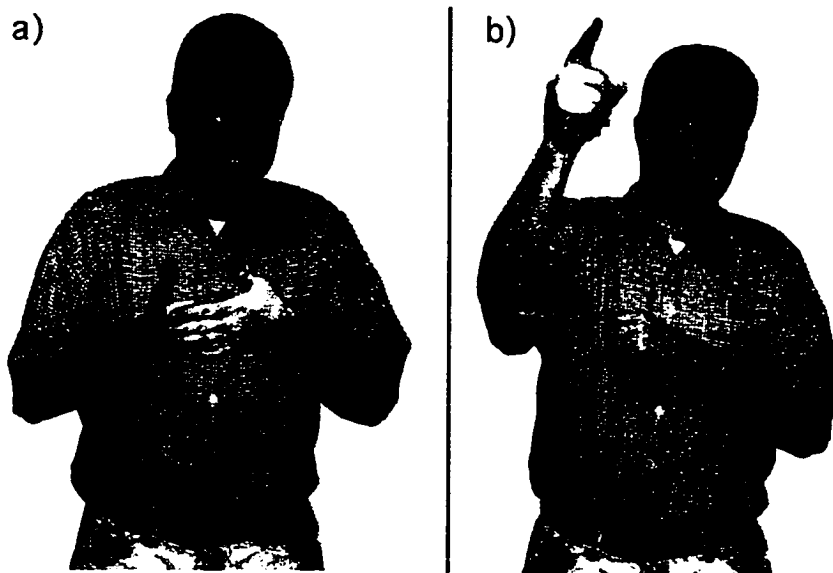


Fig. 5.14: a) NEAR, b) FAR

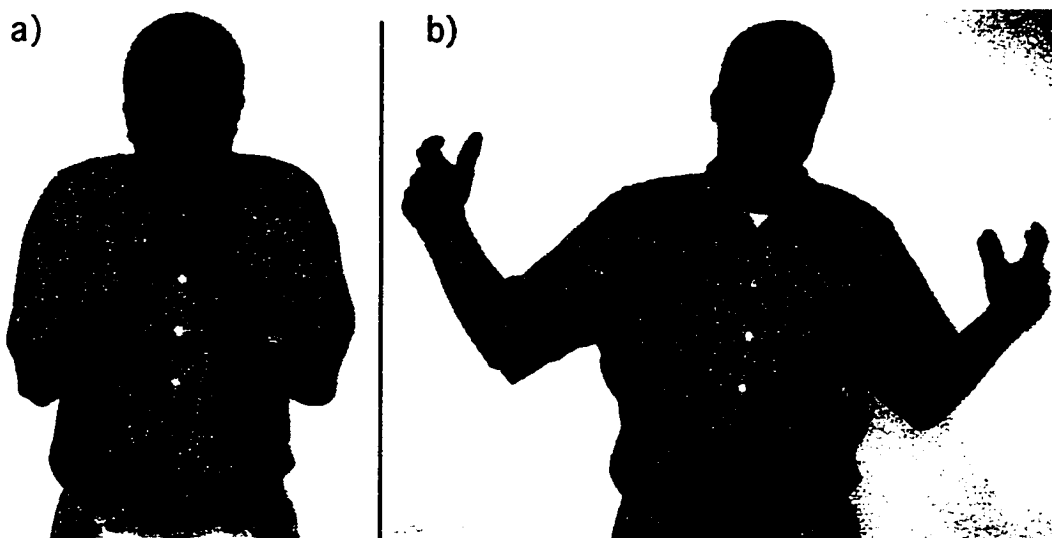


Fig. 5.15: a) SMALL, b) BIG

Number of articulators represents number of referents

There are cases where the number of articulators present in a sign represents, more or less directly, the number of referents. As we will see, the upper limit on number-for-number iconicity depends on the number of articulators available; for the most part, ASL restricts itself to the fingers of one hand, so numbers higher than *four* or *five* cannot be represented in this way.

To give a simple example, the ASL signs for numbers *one* through *five* each consist of a handshape with the appropriate number of fingers extended.³⁶ Another example is what Supalla

³⁶ It should be noted that these signs are conventionalized as well as iconic: to correctly articulate the ASL number signs, one must extend not simply the correct *number* of fingers, but specifically the exact

(1986) calls *pluralized classifiers*. For example, the fist with the index finger vertically extended is a classifier representing one person; with the index and middle fingers extended, it represents two people. The one-to-one correspondence between fingers and people works for up to four referents; beyond that, a signer uses both hands with four fingers extended on each one, as a classifier representing *many* people.

"Number-for-number" iconicity has also worked its way into the grammar of ASL, though (as usual for grammar) the numbers represented are more limited: in the grammar, we find iconic representation of the numbers *one*, *two*, and *many* (Padden 1988). We can see these numbers in the spatial agreement patterns of verbs like GIVE. If the situation to be described involves one recipient, GIVE's movement is directed toward a single locus in space, representing the recipient. If the situation involves two recipients (as in *I gave it to two people*), GIVE will take on a *dual* inflection: the verb will move first from donor to one locus, and second

fingers required by the language. A noteworthy example is ASL THREE. Most American English speakers, when indicating the number *three* by gesture, will touch thumb to pinky and raise index, middle, and ring fingers; this is in fact the ASL sign SIX. THREE is made by extending the thumb, index, and middle fingers and folding down the ring finger and pinky. As this description suggests, the ASL signs for numbers greater than five are not iconic in any simple way.

from donor to a second locus.³⁷ Finally, if the situation involves many recipients, the verb will have a *multiple* inflection: from donor, it will sweep across a wide arc of signing space; this arc can be understood as containing a large but unspecified number of recipient loci.

Finally, number-for-number iconicity is at work in the ASL phenomenon known as *number agreement*. Basically, in number agreement the handshape of a sign varies according to how many referents are being described; the handshape becomes the shape of the appropriate ASL number sign. For example, the sign HOUR, illustrated in Fig. 5.16, is usually articulated with an extended index finger (ASL ONE). It can be modified, however, to mean TWO-HOURS, THREE-HOURS, and so on, by adding the additional appropriate fingers to the handshape; Fig. 5.17 illustrates TWO-HOURS, with its two extended fingers. Up to *four* or *five* (and in some cases, up to *nine*) referents can be agreed with in this way. There are several sub-types of number agreement; Liddell (1996) has made an extensive analysis of the phenomenon. Number

³⁷ The dual inflection in ASL takes on a number of forms. According to Padden (1988), "i) The verb stem is executed twice, with the inflected end point displaced the second time. or: (ii) The verb stem is doubled to a two-handed form and executed either: (a) simultaneously or (b) twice in sequence." All of these forms incorporate an iconic representation of *two*.

The dual movement pattern (directing the verb first toward one and then toward another locus) is in fact an inflected utterance of a single verb rather than uttering the same verb twice. The dual movement pattern repeats the verb stem with a second final locus; two utterances

agreement can combine with other types of iconicity; this will receive further treatment at the end of Chapter 7.



Fig. 5.16: HOUR

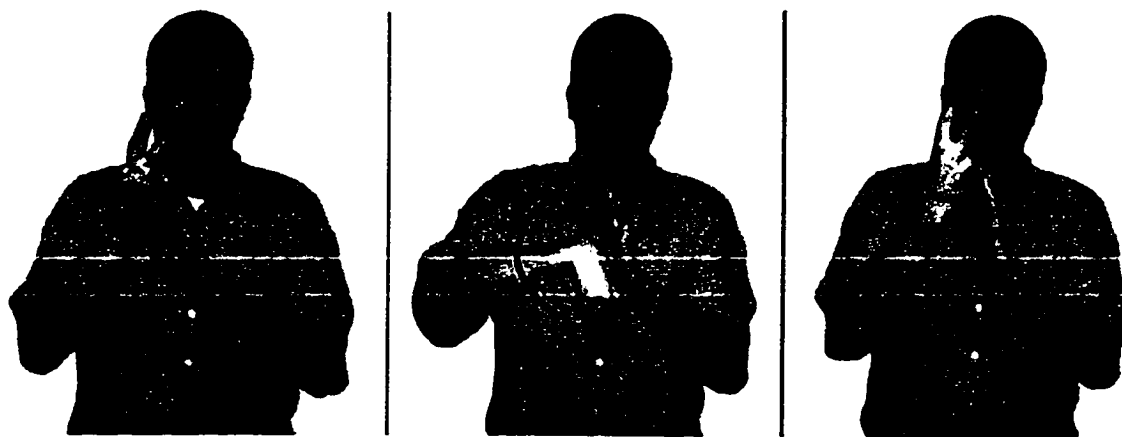


Fig. 5.17: TWO-HOURS

of a verb with a singular object would involve repeating the initial locus as well as the verb stem.

Temporal ordering of signing represents temporal ordering of events

The preceding sections have summarized the set of resources for iconicity, based on size, shape, and movement, that are specific to the signed modality. Now we return to a few types of iconic resources that signed and spoken languages share. The first of these is *temporal ordering*: elements which are signed first can be understood as occurring earlier in time.

Just as with spoken languages, temporal ordering can be iconic either within an iconic description of a particular event, or at the level of the grammar, within morphological and syntactic structures. The first case happens with shape-for-shape and path-for-path iconicity: when the movement of an articulator represents the movement of a referent, the time course of the articulator's motion is understood as representing the referent's position over time. For example, if a PERSON classifier (index finger extended upward from fist) moves progressively closer to a "B" classifier representing a wall, we understand that in the event being described, a person starts far from a wall and over time, moves progressively closer to it.

Our discussion of the protracted-inceptive inflection in Chapter 3 gives an example of how time-for-time iconicity

seeps into ASL's grammatical inflections for aspect: a time delay in a sign's movement iconically represents a time delay of the referent event. To give a syntactic example, a clause which is signed first can be understood as describing the first of two events. Thus, the sentence glossed as YESTERDAY, MY FRIEND COME-TO MY HOUSE, US-TWO PLAY BASKETBALL will usually be understood to mean that the friend came over before we played basketball.

Signing represents signing

Finally, we come to what might be called "quoted signing," since it is analogous to quoted speech in spoken languages. Here, the signs and phrasing used by the signer are intended to be a "direct report" of the signs and phrasing used by some referent person.

Though in spoken languages it is possible to directly portray a referent's speech, tone of voice, sounds, and sometimes even gestures, the quoted-speech mechanism is fairly limited. Not so in signed languages: the quoted-signing mechanism is part of a larger system (cf. the discussion above of *body classifiers*) where the signer's body actions can iconically represent the body actions of a referent person. Quoted signing is the special case in which the actions are linguistic in nature.

Quoted signing often combines with the phenomenon known as *role shift* or *referential shift* (Engberg-Pedersen 1993). This is a device used for reporting actions and statements made at a different time or by other people. A shift begins when the signer's eye gaze moves away from the addressee and the signer's body shifts slightly to one side; at this point, the signer "takes on" some other persona or character. Signers can represent several characters and their interactions in a single discourse: each character will have a characteristic gaze direction, and perhaps a facial expression or posture. At times, taking on a characteristic expression is enough to signal the start of a role shift.

Thus, for example, in reporting a conversation between a mother and a small child, the signer might use three different postures and eye-gaze directions. Let us say that the child's locus has been established to signer's left, and the mother's locus to signer's right. When reporting the child's speech and actions, the signer would shift slightly to the left, and look upward and to the right; when reporting the mother's speech and actions, the signer would shift slightly to the right, and look downward and to the left. Finally, when acting as "narrator," the signer would return to center and make eye contact with the addressee. Figs. 5.18 and 5.19 demonstrate the body shifts for this example: in Fig. 5.18, the signer shifts into the child's role and

signs MOTHER as if addressed to the mother; and in Fig. 5.19, the signer takes on the mother's role, and shows the mother signing SON to her child.



Fig. 5.18: The sign MOTHER, articulated as if quoting a child signing to an adult



Fig. 5.19: The sign SON, articulated as if quoting an adult signing to a child

In role shift, the space near the signer represents the space near the referent person. If the signer is describing an interaction between two or more people in some imagined space, and is taking on each of their personae in turn, each persona will create a different mapping of the imagined space onto signing space: objects will be treated from the current persona's point of view. (Liddell 1994, 1995 uses Fauconnier's 1985 theory of *mental spaces* to describe how these different mappings correspond to each other in regular ways -- how they are, in fact, representations of two perspectives on the same imagined scene.)

For example, consider the case discussed above of a signer describing a conversation between mother and child. Let us assume that in the original conversation, the mother and child were facing each other, and they were standing next to a kitchen table. If the table is to the left of the child, it would be to the right of the mother. Let us say that during the course of the conversation, the child put a toy on the table, and the mother picked it up. How would the signer report this? Recall that the child's locus is to the signer's left; the signer would shift his or her body to the left, taking on the child's persona. The table's surface would be to signer's forward left, and fairly high in signing space. The signer would use an instrument classifier to show the release of an object onto that surface. Next, the signer would shift slightly to the right, to take on the mother's role. At this point, the table's surface would be located to signer's forward right, and lower in signing space; once again, the signer would use an instrument classifier located at that surface to show the grasping of an object there.

Relation Between Concept and Image in Signed-Language

Iconicity

We have just gone through the many ways in which signed languages can represent visual, spatial, and kinesthetic imagery; this corresponds to the *encoding* stage of the Analogue-Building model, where forms of the language are chosen to create a linguistic analogue of a schematic mental image. It is useful to spend a few moments on the *image selection* stage of the model, just as we did for spoken languages, and ask: how are these mental images related to the concepts that the iconic signs eventually represent?

In discussing this topic, we will find that classifiers and frozen iconic signs behave in different ways. Classifiers are essentially descriptions of visuo-gestural images -- objects, things people do, and so on -- and the relation between concept and image is quite direct: they are basically identical. Frozen signs, on the other hand, often have meanings that are less purely visuo-spatial. For example, a use of the instrumental classifier involving a flat-O handshape (thumb and fingers together, fingers bent only at the first joint) will simply mean that a human held and moved a flat object. But a use of the verb GIVE, which involves the same handshape, does not necessarily entail physically handling an object; instead, it invokes a complex conceptual model of *giving* that can involve change of possession and abstract entities as well as movement and manipulation of physical objects (Wilcox, forthcoming).

Thus, for frozen signs, the relation between concept and image is more complex: the image itself can no longer incorporate the entire meaning of the sign. We can thus focus on describing and looking for patterns in how concepts and images tend to be related. This topic deserves an extended treatment of its own; nevertheless, there is space to make a few observations here. Iconic frozen signs in ASL display at least the following added links in the chain between what is iconically portrayed and what is actually referred to.

One common pattern is for *parts* to stand for *wholes*. If the concept is a category of things that all have roughly the same shape, sometimes the selected image is a memorable part of that shape. This is a common way to name types of animals. For example, the sign CAT (Fig. 5.6) consists of the F-shaped hand (index finger and thumb touching, other fingers extended) brushing against the signer's cheek; the thumb and index finger touch the cheek, and the palm is directed forward. The image presented here is of the cat's whiskers, a well-known feature of a cat's face.³⁸

If the concept is a category of physical objects that come in many sizes and shapes, sometimes the selected image

³⁸ Note that here it is the extended middle, ring, and small fingers that "count" in encoding the iconic image. In the other signs we have discussed that use the F shape (DEGREE and tracers for cylinders), it is

is a *prototypical* member of the category. This is the case for HOUSE and TREE (Fig. 3.1): houses and trees come in many sizes and shapes, but the image in both signs is of a prototypical member of the category. For HOUSE, the prototype has a pointed roof and straight walls; for TREE, the prototype grows straight out of the ground, with a large system of branches above a relatively extended trunk.

Categories consisting of both physical and non-physical events can also be represented by an image of a prototypical case, if the prototype is physical. For example, the verb GIVE (Fig. 9.3) uses the image of handing an object to a person. Not all types of giving involve physical movement with the hands, but the prototype does.

In many cases, the image chosen for a concept will be of a typical body movement or action associated with the concept. The ASL names for sports are often of this type. Thus, BASEBALL (Fig. 5.8) uses the image of a person holding and swinging a bat (encoded via fist-shaped instrument classifiers), and KARATE uses a person performing a stylized karate block (using body classifiers). These actions are a subset of the actions that people perform when playing baseball or practicing karate.

the circle formed by thumb and index finger that "counts," and the other fingers are irrelevant.

Body movements can also name an object that is associated with the movement; for example, CAR uses an image of a person turning a steering wheel (again encoded with

Finally, if some physical object is strongly associated with the concept, then the image of that object may be used to represent the concept. This is what we saw for DEGREE (Fig. 3.13): the image of the diploma, an object ceremonially presented when a degree is granted, is used to represent the degree itself.

This brief set of observations barely scratches the surface of the different kinds of associations between image and concept that ASL displays; but a deeper analysis must be left for future research.

Moreover, there is an entire category of iconic signs that has not yet been addressed, as they are the topic of the next chapter: *metaphorical* iconic signs, or those which name an abstract concept using a structured set of correspondences between the abstract concept and some physical concept. We will turn to this category shortly.

Conclusion: One Phenomenon, Many Manifestations

The purpose of this chapter has been to demonstrate the many forms that iconicity takes in the lexicon and grammar of

signed and spoken languages, and to show how signed languages are far more rich in iconic devices than spoken languages. At this point, we can reiterate the basic insight of the Analogue-Building Model: despite its many forms, iconicity is a single process, characterized by *image selection*, *schematization*, and *encoding*. The richness of signed-language iconicity can be explained by the extra possibilities in the image selection process, and the many additional encoding resources that are available.

Chapter 6: **Metaphor in ASL: The Double Mapping**

Conceptual Metaphor Theory

The crucial insight of conceptual metaphor theory (e.g., Lakoff & Johnson 1980, Lakoff & Turner 1989, Lakoff 1992) is that metaphor is not a rare, poetic device; it is not limited to formal or "colorful" speech or to artistic language. Rather, people use metaphors all the time in everyday speech; in fact, there are some topics which are almost impossible to discuss without metaphor.

For example, consider how English speakers talk about communication; sentences 1-6 are typical.

- (1) We were *tossing* some ideas *back and forth*.
- (2) I couldn't *catch* what you said.
- (3) That *went right by me*.
- (4) I couldn't *get* my point *across*.
- (5) I can't *get* that idea *into my head*.
- (6) I finally *got through* to him.

These completely natural and commonplace sentences all share one thing: they use the vocabulary of *throwing and catching objects* to talk about *communicating ideas*.

In fact, one can set up a single coherent system of correspondences between the conceptual domains of *sending objects* and *communicating ideas* that would explain every one

of these sentences; such a system, or *mapping*, is presented in Table 6.1 below. The domain to which the language literally refers is usually called the "source" domain, and the metaphorically represented domain is called the "target."

Table 6.1: COMMUNICATING IS SENDING

SOURCE	TARGET
objects -----	ideas
sending object -----	articulating idea in language
catching object (and ----- putting it in head)	understanding idea
sender -----	communicator
receiver -----	addressee
difficulties in sending or --	difficulties in
catching	communication
throwing object too high -----	articulating idea in a
or far, making it	way difficult for
difficult to catch	addressee to understand
failure to catch object -----	failure to understand
	the idea
object bouncing off wall -----	unsuccessful communication

All of the metaphorical sentences above (and many more; see, e.g., Reddy 1979, Sweetser 1987) are predictable from the mapping in Table 6.1. For example, the scenario of *tossing* [things] *back and forth* involves at least two people who take turns at successfully sending objects to each other; the verb *toss* also implies that the sending is leisurely and informal. Metaphorically, repeated successful sending represents repeated successful communication; thus, for people to *toss*

ideas back and forth is for them to take turns successfully communicating ideas to each other, in an informal manner.

Because all of examples 1-6 draw on the same mapping, conceptual metaphor theorists prefer not to refer to them as "different metaphors." Instead, the term *metaphor* is reserved for the underlying mapping between conceptual domains, and individual sentences that use the mapping are called "metaphorical expressions." Typically, metaphors are given a name of the form TARGET IS SOURCE; the metaphor above has been called COMMUNICATING IS SENDING.³⁹

The mapping, or statement of correspondences, represents one of the advances of conceptual metaphor theory over other ways of analyzing metaphors. A well-constructed, well-justified mapping amounts to a proof of the existence of a conceptual metaphor in the conventional resources of a particular language. The essential elements of a mapping include: a list of entities (people, things, concepts), relationships, and actions or scenarios from the source domain; a similar list from the target domain; a statement of how the elements in each list correspond to each other; and (most important of all) a metaphorical expression that gives an example of (and thus justifies) each correspondence.

³⁹ It is also known as the CONDUIT metaphor, since one major treatment, Reddy (1979), used that name.

These explicit statements of correspondences show clearly that metaphors in language are consistent and systematic, and that they link two domains in a way that preserves the structure of both domains. They are also useful tools for showing that a given mapping does not exist, or that a given expression does not fit in with others that are superficially similar: if a list of metaphorical expressions seems to share a source and target domain, but no consistent mapping can be established between the two domains, then the expressions on the list cannot derive from the same conceptual metaphor. Theories of metaphor that do not emphasize a precise statement of correspondences have great difficulty teasing apart these differences.

The Double Mapping of ASL Metaphorical Signs

In looking at sentences (1) through (6), we can see a familiar characteristic of English metaphor: words from the source domain, including nouns, verbs, and prepositions, are used to refer to the target domain. In (1), *tossing* refers not to throwing objects but to expressing ideas; in (3), *went right by me* refers not to a missed throw but a lack of understanding. (Notice that the data are richer than the typical philosophical/literary treatments of metaphor

acknowledge; these tend to deal only with noun-based expressions such as *Man is a wolf*.) The situation for ASL's metaphor usage is different, in that it is rare for frozen lexical items from one domain to be used to describe another. What does ASL do instead?

We are now intimately familiar with ASL's resources for iconic descriptions of physical objects. In an ingenious chain of conceptual mappings, ASL hooks those resources up with conceptual metaphor. A large number of ASL's metaphors have concrete, physical source domains; it should come as no surprise that ASL represents those source domains iconically using all the resources discussed in earlier chapters. Thus the powerful communicative tool of iconicity is harnessed to the equally powerful tool of metaphor, allowing ASL signers to express a vast range of abstract and concrete concepts using vivid visual imagery.

In essence, ASL metaphorical signs are shaped by two mappings: a metaphorical mapping from concrete to abstract conceptual domains, and an iconic mapping between the concrete source domain and the linguistic forms that represent it (Holtemann 1990). The result is that the target domain is actually presented using an iconic depiction of the source domain. For example, the metaphorical sign THINK-BOUNCE (Fig. 6.1) consists of an iconic depiction of a projectile bouncing off a wall. It denotes a failure of

communication, and is roughly equivalent to the English metaphorical sentence *I can't get through to him*; but as we can see, the English sentence uses non-iconic source domain nouns and verbs, while the ASL sign uses a metaphorical extension of its iconic classifier system. (The next section will describe the two mappings in much more detail.)

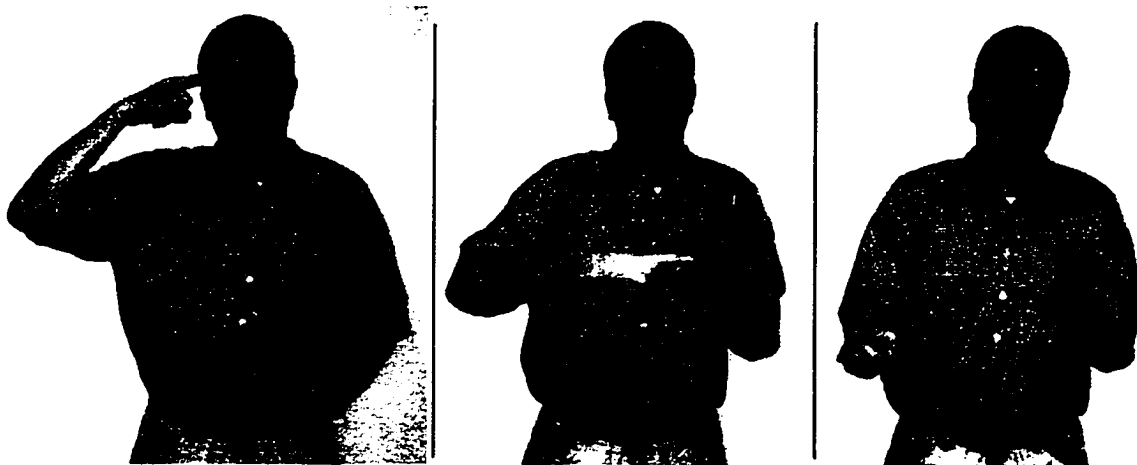


Fig. 6.1: THINK-BOUNCE

Rather than promoting the metaphorical use of existing signs (as in English), ASL's metaphorical/iconic system tends to either 1) create new signs; 2) allow creative modifications of existing signs; or 3) allow the establishment of a metaphorical "scene" or "object," which can be manipulated meaningfully throughout a discourse. The next section will present some established metaphorical/iconic signs from the domain of communication,

demonstrating tendency (1); and the following section will show how a different set of communication signs can be modified creatively, demonstrating tendency (2). The discourse-level establishment of a metaphorical object will not be treated here in depth; for a detailed example, see Wilcox (1995).

COMMUNICATING IS SENDING in ASL

ASL has many signs which are motivated by a metaphorical mapping similar to the one presented in Table 6.1 (Wilcox 1993).⁴⁰ Some of these signs are COMMUNICATE (Fig. 6.2), COMMUNICATION-BREAKDOWN (Fig. 6.3), INFORM (Fig. 6.4), THINK-BOUNCE (Fig. 6.1), and THINK-PENETRATE (Fig. 6.5). In the following discussion, I will show how these signs use an iconic representation of a concrete domain (i.e., *sending objects*) to refer to an abstract domain (*communicating ideas*). It will become clear how these signs share a pattern

⁴⁰ The COMMUNICATING IS SENDING signs have been discussed by Wilcox (1993); Wilcox described their iconicity and the metaphorical pattern that they share, but did not explicitly set out the iconic and metaphorical correspondences between articulators, source, and target domains.

This chapter presents my analysis of a number of ASL metaphors. Where these metaphors have been noticed before, I provide citations; in most cases (except for Wilcox 1993, Holtemann 1990), the metaphors have simply been named without detailed analysis. In all the metaphors presented here, I am the first to set forth explicit mappings.

that gives evidence for the iconic and metaphorical double mapping.



Fig. 6.2: COMMUNICATE

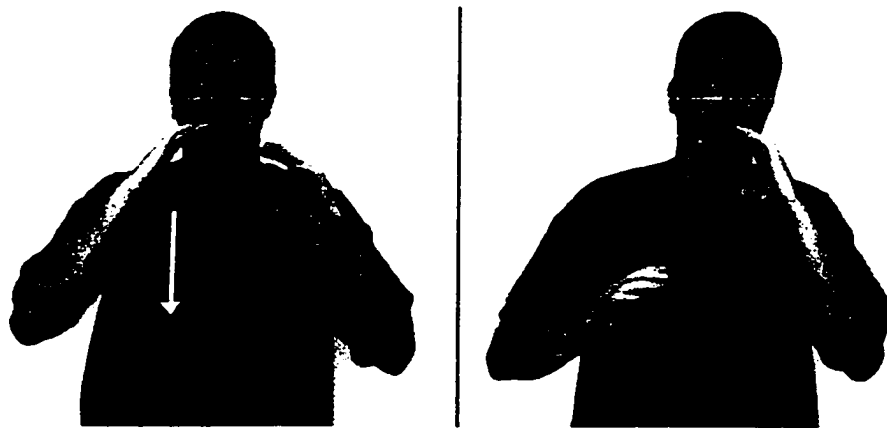


Fig. 6.3: COMMUNICATION-BREAKDOWN



Fig. 6.4: I-INFORM-YOU

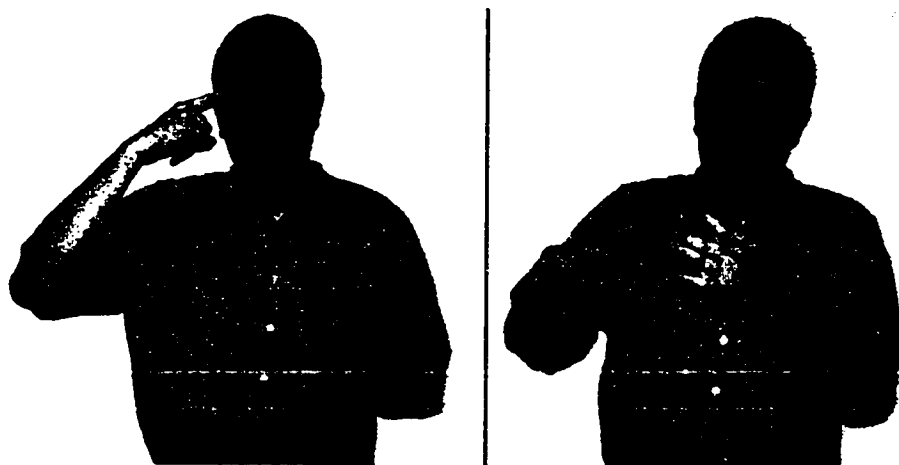


Fig. 6.5: THINK-PENETRATE

Let us look closely at the sign INFORM, shown in Fig. 6.4 in the inflected form I-INFORM-YOU. In this sign's articulation, both hands begin in a closed, "flat-O" shape; the dominant hand's fingers touch the signer's forehead,

while the non-dominant hand is in the "neutral space" in front of the signer. Both hands move toward the addressee while the fingers spread open.

The form that the articulators take in this sign is far from random. The flat-O shape, as we have seen in Chapter 5, has meaning in ASL's classifier system; it represents the handling of a small flattish object. If I-INFORM-YOU were purely a classifier description of some concrete scene, it would denote the signer taking a flat object out of the forehead and tossing it at the addressee.⁴¹ Table 6.2 gives an explicit list of the iconic correspondences between linguistic form and referent that this involves.

Table 6.2: Iconic mapping for I-INFORM-YOU

ARTICULATORS	SOURCE
[null]	objects
forehead	head
flat-O handshape	holding an object
flat-O touches forehead	object located in head
flat-O moves toward locus of addressee and fingers open	sending an object to someone
signer's locus	sender
addressee's locus	receiver

⁴¹ The non-dominant hand is slightly idiosyncratic -- it "echoes" the dominant hand at a lower height. It is actually fairly common in ASL for the non-dominant hand to "fall away" from its presumed proper height. Some signers produce INFORM with the non-dominant hand symmetrical to the dominant hand; others do not add the second hand at all.

Of course, I-INFORM-YOU does *not* mean that objects were taken out of the signer's forehead and thrown to the addressee. It means that the signer is communicating information to the addressee. Should we then assume that the form of the sign is completely arbitrary and unmotivated, and its resemblance to classifier forms is a coincidence?

Let us look at a second example. Consider the verb THINK-PENETRATE (Fig. 6.5). Here the dominant hand's index finger, extended from a fist, begins at the temple and travels toward the location established for the verb's object. On the way, it encounters the non-dominant hand in a flat B-shape, palm inward, but the index finger penetrates between the fingers of the B. If this sequence were to be interpreted as a classifier description, it would denote a long thin object (the index finger or "1->CL") emerging from the head, moving toward a person, encountering a barrier, and penetrating it. Table 6.3 shows the iconic mapping for this scenario.

Table 6.3: Iconic Mapping for THINK-PENETRATE

ARTICULATORS	SOURCE
1->CL ----- forehead -----	an object head
1->CL touches ----- forehead -----	object located in head
1->CL moves ----- toward locus of addressee	sending an object to someone
non-dominant B-CL ----- 1->CL inserted ----- between fingers of B-CL	barrier to object penetration of barrier
signer's locus ----- addressee's locus -----	sender receiver

It is useful to note the similarities between THINK-PENETRATE and the sign DRILL, shown in Fig. 6.6. In DRILL, the dominant hand assumes an "L" shape, with index finger and thumb extended; the non-dominant hand again forms a flat B-shape. The index finger of the L penetrates between the fingers of the B. The image chosen to stand for the piece of equipment known in English as a "drill" is that of a long thin object with a handle penetrating a surface; the L, of course, iconically represents the long thin object (or drill), and the B represents the surface pierced by the drill. This is a case of pure iconicity (plus metonymic association). The iconic mapping is given in Table 6.4.



Fig. 6.6: DRILL

Table 6.4: Iconic Mapping for DRILL

ARTICULATORS	SOURCE
dominant L-shape	long thin object with handle (in particular, a <i>drill</i>)
non-dominant B-CL	flat surface
L inserted between fingers of B-CL	penetration of surface

Unlike DRILL, and like I-INFORM-YOU, THINK-PENETRATE does not in fact describe a physical scene. Its actual meaning can be translated as *to get one's point across or for someone to understand one's point*. Thus, we now have two signs whose forms are nearly identical to classifier descriptions of objects moving from the signer's head toward an addressee. Moreover, if we look closely at the meanings of the signs, we see that both contain the element of

communicating information to another person. This parallel should make the linguist suspicious that there might be a consistent pattern motivating the forms of these signs. When we consider as well the signs THINK-BOUNCE, OVER-MY-HEAD, and IT-WENT-BY-ME, all of which both resemble classifier descriptions of objects moving to or from heads, and all of which pertain to communication of ideas, we begin to have strong evidence for a metaphorical mapping between the domains of *sending objects* and *communicating ideas*. As we can see, the metaphorical mapping used by these signs is very similar to the English mapping in Table 6.1 above.

We can now show precisely how I-INFORM-YOU and THINK-PENETRATE use classifier-type descriptions of space to refer to communication of ideas. Tables 6.5 and 6.6 list again the iconic mappings of these two signs (linking the linguistic form to the concrete conceptual domain); then, for each line of the mapping, they give the corresponding element of the abstract conceptual domain.

Table 6.5: Double Mapping for I-INFORM-YOU

ARTICULATORS	Iconic mapping SOURCE	Metaphorical mapping TARGET
[null]	objects	ideas
forehead	head	mind; locus of thought
Flat-0 handshape	holding an object	considering an idea
Flat-0 touches forehead	object located in head	idea understood by originator
Flat-0 moves toward locus of addressee and opens	tossing an object to someone	communicating idea to someone
signer's locus	sender	originator of idea
addressee's locus	receiver	person intended to learn idea

In Table 6.5 we can see clearly how each articulatory element of I-INFORM-YOU corresponds to an element of the domain of *communication*, through the medium of the double mapping. The signer's location corresponds to the communicator's location; the imaginary object held in the flat-0 hand corresponds to the information to be communicated; and the movement of the hand from signer toward addressee corresponds to the communication of that information to an intended recipient.

Table 6.6: Double Mapping for THINK-PENETRATE

ARTICULATORS	Iconic mapping SOURCE	Metaphorical mapping TARGET
1->CL forehead	an object head	an idea mind; locus of thought
1->CL touches forehead	object located in head	idea understood by originator
1->CL moves toward locus of addressee	sending an object to someone	communicating idea to someone
non-dominant B-CL	barrier to object	difficulty in communication
1->CL inserted between fingers of B-CL	penetration of barrier	success in communication despite difficulty
signer's locus	sender	originator of idea
addressee's locus	receiver	person intended to learn idea

Table 6.6 shows us the double mapping for THINK-PENETRATE. Notice again that the iconic representation of the source domain in THINK-PENETRATE differs from that in I-INFORM-YOU: THINK-PENETRATE represents the object directly using the 1->CL, while in I-INFORM-YOU, the object is implied by the instrument classifier. But we can see that in both signs, the moved or transferred object, however it is represented, corresponds to the notion of an *idea*. Once again, the explicit statement of the mappings involved proves that the two signs use the same source/target metaphorical mappings, though their source/articulators iconic mappings differ.

There is one exception: the mapping for THINK-PENETRATE has an *additional* metaphorical correspondence; it treats a difficulty in communication as a barrier to be penetrated. This new correspondence is completely consistent with the mapping for I-INFORM-YOU. It is not unreasonable to claim that the same metaphorical mapping motivates both signs, and that I-INFORM-YOU contains no iconic barriers because its semantics makes no reference to difficulties in communication: only the relevant portions of the conceptual domain are given metaphorical/iconic representations.

It is important to note that not just I-INFORM-YOU and THINK-PENETRATE, but *all* of the signs mentioned in this section have the same, consistent way of using the domain of *sending* to refer to the domain of *communicating*: in all of them, the object corresponds to the idea, the source of the object corresponds to the communicator, and the intended recipient of the object corresponds to the person intended to understand the idea. Thus, all of the signs can provide evidence for the same metaphorical mapping; taken together, they provide a good argument that ASL has the metaphor COMMUNICATING IS SENDING as part of its conventional resources. If each sign had a different way of using *sending* to refer to *communicating* (e.g., having the object correspond to the formulator of the idea, or having the source correspond to the person intended to understand the idea),

the signs would not give evidence for a consistent metaphorical mapping between the domains. One would conclude either that the signs were non-metaphorical and their forms were a coincidence, or that the particular metaphors that they drew on were not conventional parts of ASL's system. It is crucial to have at least two and preferably more data points to justify claiming that a language has conventionalized a particular metaphorical mapping.

We should note as well that signs which share a metaphorical source/target mapping need not share an iconic source/articulators mapping. Just as signers can represent the concrete, physical world in several different iconic ways, so too can they use these different iconic means to represent the concrete source domain of a metaphor.⁴² This fact shows that the double-mapping model is a useful way to describe metaphorical/iconic phenomena in ASL: a single-

⁴² In particular, different signs represent the idea/objects as if they had different shapes: by a 1-CL, as if pointlike or long-and-thin, or by instrument classifiers such as flat-0 (for flat objects), F (for small, rounded objects), and A_g (for objects to be grasped by a fist). Wilcox (1993) has argued that these different shapes represent different special cases of the COMMUNICATING IS SENDING metaphor, and that different thought processes metaphorically treat ideas as objects to be manipulated in different ways: ideas to be selected or discriminated are seen as small, rounded objects; ideas to be discussed and ordered are seen as flat objects; and ideas to be controlled are seen as graspable in a fist. But it may be that the process (or even just the verb) of selection is what requires the selected objects to be small and round; the process or verb of control which requires fist-graspable objects, etc. I would guess that these verb-frames have their own metaphors, specifying shapes of objects, which then get combined with IDEAS ARE OBJECTS; IDEAS ARE OBJECTS by itself need not supply the shapes. (Cf. Grady et. al. 1996 on "primitive" and "compound" metaphors.)

mapping model, which described signs in terms of a direct mapping between articulators and an abstract conceptual domain, would miss what THINK-PENETRATE and I-INFORM-YOU have in common (i.e., the source/target mapping); it would also miss the fact that the source/articulators mappings are often identical to the mappings used by ASL's productive classifier forms.⁴³

Earlier discussions of signed-language metaphors (e.g., Wilbur 1987, Brennan 1990, Wilcox 1993; Holtemann 1990 is an exception), despite their insights, either did not recognize the need for explicit mappings, or did not spell out the details of both the source/target and the source/articulators mappings. The mappings presented here give both a more substantial justification of these ASL metaphors' existence and a more complete characterization of their nature and scope.

⁴³ Some double mappings may be so common and simple that they function as direct links between the articulators and an abstract target domain; in particular, the simple "one-parameter" metaphors such as THE FUTURE IS AHEAD, to be discussed in Chapter 7, may function in this way. Psycholinguistic studies could be developed to determine how entrenched and seemingly direct the connections between articulators and abstract domain have become. I still claim, however, that the articulators/target mapping is mediated, at some level, by the articulators/source and source/target mappings.

TOPICS ARE LOCATIONS

Let us look at another metaphor for communication. The sign POINT (Fig. 6.7) has both hands with index finger extended (1-shape). The non-dominant hand's 1 is upright, palm out, while the dominant 1 points forward directly at the top of the non-dominant 1. This sign can be translated as the *point* of the conversation, the *topic*, the *moral* of the story.



Fig. 6.7: POINT

In a second sign, MAKE-DIGRESSIONS (Fig. 6.8), the non-dominant hand's shape and location are the same, while the dominant 1 repeatedly moves away from the non-dominant 1 and back to it, first to one side and then to the other. A good

translation would be *to make repeated digressions from the point.*

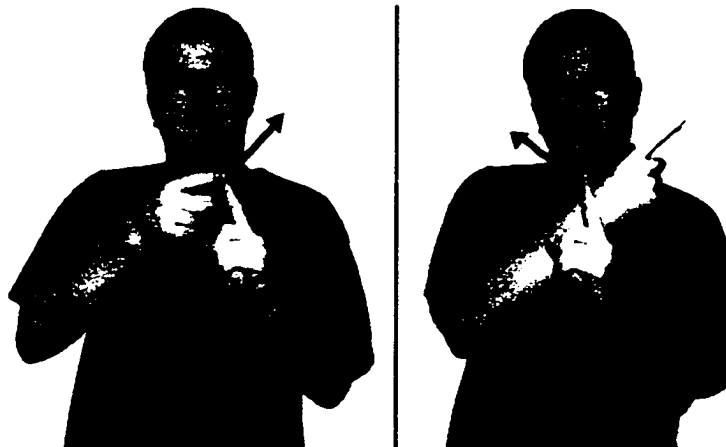


Fig. 6.8: MAKE-DIGRESSIONS

These two signs share both an iconic mapping and a metaphorical mapping. First, let us look at the metaphor (one that is shared by English to some degree). The "point" or proper topic of conversation is thought of as an entity located at a particular place. The conversation or talk itself is seen as an object that travels to different locations. When the conversation is "on topic," the conversation/object is metaphorically seen as directed/located at the proper topic. When the conversation digresses (we might say *wanders* in English), this is metaphorically represented as the conversation/object moving away from the topic entity. Resumption of the proper topic

(*returning* or *coming back* to the topic) is represented as the conversation/object moving back toward the topic entity.

The iconic mapping may already be obvious to the reader, but for completeness I will spell it out. The non-dominant upright 1 (or 1↑) represents the topic entity,⁴⁴ while the dominant horizontal 1 (or 1->) represents the conversation/object and its movements toward and away from the topic entity.

The iconic and metaphorical mappings together are shown in Table 6.7; the unit might be called TOPICS ARE LOCATIONS. (Wilcox 1993 includes these signs in a broader metaphor she calls THOUGHT IS A JOURNEY; I am not convinced that the mappings of these signs fit with the mappings of the other THOUGHT IS A JOURNEY signs.)

⁴⁴ It is actually common in ASL for this upright 1 to represent an abstract entity of some sort; this is an example of a very general metaphor, ABSTRACT ENTITIES ARE CONCRETE ENTITIES.

Table 6.7: Double Mapping for TOPICS ARE LOCATIONS

ARTICULATORS	Iconic mapping SOURCE	Metaphorical mapping TARGET
locations in signing space	locations	possible topics of discussion
non-dominant 1↑	 located entity	intended topic or focus of talk
dominant 1->	 moving entity	the talk itself
location of 1->	location of entity	actual topic of talk/discussion
movement of 1-> from place to place	movement of entity from place to place	change from one topic to another in the talk
1-> directed at 1↑	moving entity at same place as located entity	talk focusing on intended topic
1-> directed away from 1↑	moving entity at different place from located entity	talk focusing on unintended topic
distance between 1-> and 1↑	distance between moving entity and located entity	difference between intended and actual topics
1-> returning to 1↑	moving entity returning to located entity	talk changing back to intended topic

There are several other signs that use this same pair of metaphorical and iconic mappings: MAKE-SINGLE-DIGRESSION (Fig. 6.9), MAKE-COMPLEX-DIGRESSION (Fig. 6.10), and RETURN-TO-POINT. In all three signs, the non-dominant hand presents the 1↑ classifier, metaphorically representing the topic of conversation. For the first two, the dominant hand starts in a fist handshape, palm toward the signer and back of the hand against the non-dominant 1↑; in MAKE-SINGLE-DIGRESSION, the

index finger "bursts" outward from the fist to point toward the non-dominant side, while in MAKE-COMPLEX-DIGRESSION, all four fingers burst out in that direction. As might be expected, the first sign denotes a situation where someone goes off the expected topic; the second sign is used when the person goes through several unrelated topics before (presumably) returning to the main topic (e.g., a physics teacher unexpectedly lecturing her class about football, horseback riding, cooking, etc.). Finally, in RETURN-TO-POINT, the dominant 1-> classifier starts at one edge of signing space and moves so that the index fingertip points forward and nearly touches the non-dominant 1↑.

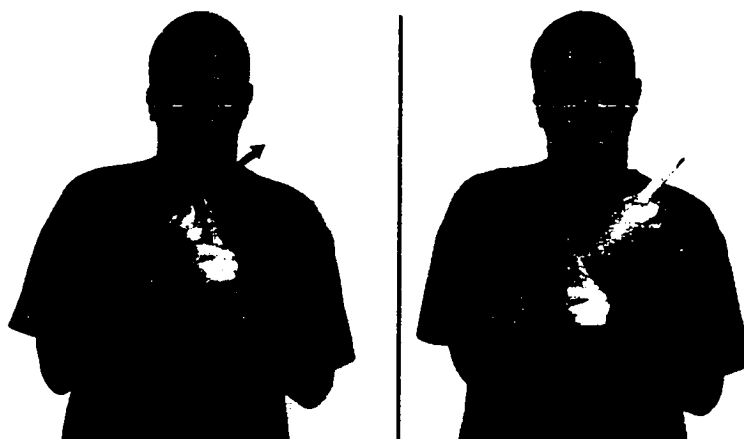


Fig. 6.9: MAKE-SINGLE-DIGRESSION

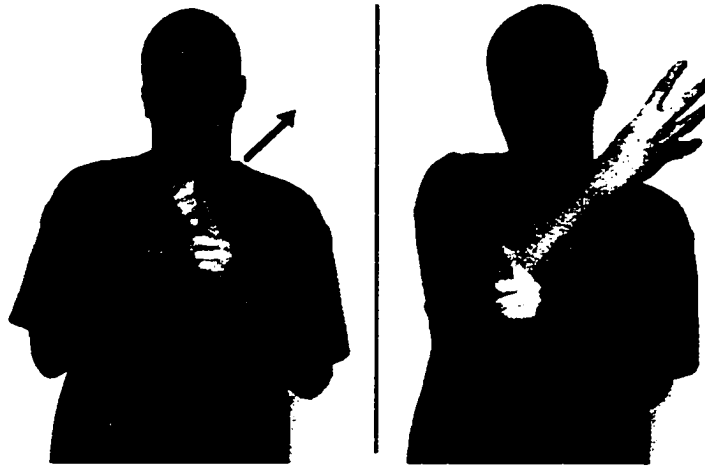


Fig. 6.10: MAKE-COMPLEX-DIGRESSION

This iconic/metaphorical pair of mappings is in fact something that signers can play with and use for expressiveness. For example, a long, involved digression can be shown by the dominant 1-> moving a long distance from the non-dominant 1↑. Adverbs that emphasize this distance can be added: an open mouth indicates that the distance is long, and a shaking and twisting of the 1-> as it moves indicates high speed. (Once again, these are part of the normal ASL system for describing movements in space.) Clearly, the same mappings from source to target and between source and articulators are used here; but the form of the sign is not frozen; it can be adapted creatively to express the nature and length of the digression.

Analogue-Building Model of Metaphorical Iconicity

Now that we have seen clearly the double mappings of some ASL metaphorical/iconic signs, we can begin to discuss how a language user might invent such signs. Once again, we can use the Analogue-Building model to structure the discussion. As before, I am presenting this model not as a claim that the process works in exactly this way, but in the spirit of setting out the issues connected with metaphorical iconicity that must be addressed.

First, we must look at the question of how metaphorical mappings arise and become entrenched parts of a language's conceptual structure. Most conceptual metaphors in language link a deeply familiar, simple, or concrete source domain with a more abstract or more complex target domain (Lakoff & Johnson 1980, Lakoff & Turner 1989; Lakoff 1992). Metaphorical source domains tend to be *directly experienced*: that is, experienced through the body, early in childhood development; they include domains such as *movement and location, up-down orientation, handling objects, vision, and hunger*. Metaphorical target domains tend to be less concrete, and less accessible to direct observations through the senses; common target domains are *progress, emotions,*

*communication, and social interactions.*⁴⁵

How do these particular pairs of domains become linked? One major way, it seems, is for the two domains to "co-occur" in our experience; for example, the domains of *communicating* and *sending objects* are strongly linked in our everyday experience of sending and receiving mail. We know that if we wish to communicate with a person who is far away, we can write down our thoughts in a letter, and send the letter to that person; if the letter reaches the person, and if the person reads the letter, our ideas will have been successfully communicated to that person. Situations like this one form the *experiential basis* or *grounding* for the metaphor COMMUNICATING IS SENDING: they provide a common, well-defined experience in which the structure of *sending objects* is perfectly matched to the structure of *communicating ideas*.

It also seems that some metaphors are not directly grounded in our experiences, but instead "piggyback" on other metaphors. In Chapter 7, we will see how MORE IS UP, a metaphor grounded in our experiences with piles of objects,

⁴⁵ There are exceptions to this generalization: cf. Morgan's (1996) work on metaphorical "families," or groups of domains that can function as source or target for each other (e.g., in English, BUSINESS, WAR, and SPORTS are all in the same family). This is a special case, where each domain contributes a different perspective on the other domains when used as source domain; none of the domains is more abstract than the others. It is unlikely that ASL will have such families, since nearly all ASL metaphor uses a concrete domain to describe an abstract domain.

is the indirect basis for metaphors such as POWERFUL IS UP and IMPROVEMENT IS UPWARD (cf. Lakoff & Johnson 1980).

The grounding of conceptual metaphor is a topic of much current research among metaphor theorists. Grady and C. Johnson (forthcoming) are attempting to derive the metaphor system of English from basic early experiences that link two domains; they call these experiences *primary scenes*. The main point to remember, for the purposes of our discussion, is that metaphorical links between conceptual domains are not random; instead, they are highly motivated by our experiences interacting with the world as physical creatures.

Now that we have some understanding of how metaphorical links between domains arise, we can start to incorporate these links into the Analogue-Building model. The metaphor COMMUNICATING IS SENDING and the sign THINK-PENETRATE will be our ongoing example.

The Analogue-Building process models how an iconic linguistic item is developed to represent a particular concept. Up to now, the concepts we have discussed have been *concrete* ones, such as body actions, sounds, shapes, and so on. Let us say, instead, that the concept that the innovative language user wishes to represent is *abstract*; for example, let us say that an ASL signer wishes to talk about *communication*. If a metaphorical mapping exists that connects the abstract domain to a concrete domain, and if

that concrete domain can be represented iconically by the language in question, the language user is in luck: he or she can construct a metaphorical/iconic linguistic item to represent the concept. Since COMMUNICATING IS SENDING is part of the resources of ASL, our hypothetical ASL signer will be able to express concepts related to *communicating ideas* by creating an iconic form depicting *sending objects*.

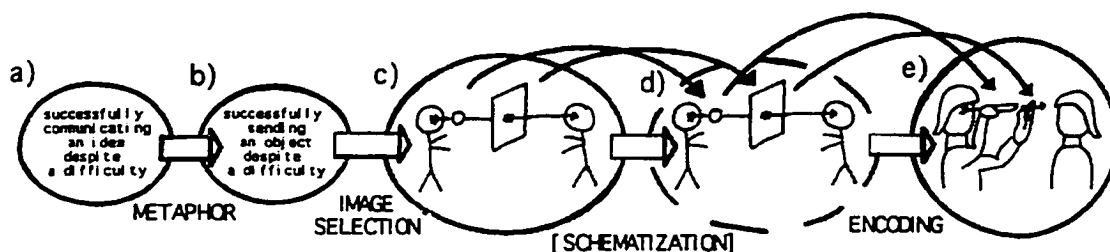


Fig. 6.11: Analogue-building process for ASL THINK-PENETRATE, showing a) initial abstract concept, b) corresponding part of concrete source domain, c) and d) the already-schematic associated image, and e) the image encoded as THINK-PENETRATE; arrows show structure-preserving correspondences between (c)/(d) and (e)

Let us go through that creation process in detail; Fig. 6.11 diagrams the stages. The process begins with a specific abstract concept to be expressed; in our case, the concept is *successfully communicating an idea despite a difficulty* (Fig. 6.11a). The ASL user will know what part of the concrete source domain corresponds to this target-domain concept. In the COMMUNICATING IS SENDING mapping, *successfully communicating an idea* corresponds to *successfully sending an*

object from one's head to another person; difficulties in communication correspond to difficulties in sending. Thus, the ASL user will be creating an iconic representation of successfully sending an object from one's head despite a difficulty (Fig. 6.11b).

At this point, the language user has a choice to make: the concrete source-domain concept is still quite general, and the Analogue-Building process requires a specific sensory image. First, there are many possible ways to send an object to another person: by mail, by handing it to them, by sending it through the air. The choice is made here to use the image of sending an object through the air; the image focuses in particular on the projectile movement of the object. Next, there are many different possible difficulties in sending objects through the air: the object could be aimed too high, it could go off in the wrong direction, or it could hit a barrier. Each difficulty can be overcome, sometimes in several ways: the receiver could jump or run to catch a badly-aimed object, or the object could be thrown hard enough to penetrate the barrier. In the case of THINK-PENETRATE, the specific difficulty chosen is the *barrier*, and the specific way of overcoming it is to *send the object with sufficient force*. (Note that this gives the sender the credit for overcoming the difficulty; this carries over into the target domain as well, since THINK-PENETRATE also credits

the communicator, not the addressee, with the success in communicating.) Thus, the complete image that is selected is of *projectile motion of an object from one's head through the air toward another person; the object hits a barrier with sufficient force to penetrate it* (Fig. 6.11c).

The image-selection stage of the Analogue-Building process is now complete. The next stage of the process is schematization of the image. This stage, however, is rarely needed for metaphorical/iconic signs, because the metaphorical mapping "pre-schematizes" the sensory image. That is, the mapping between source and target domain has picked out certain aspects of the source domain as particularly relevant. For our example, our sensory images of objects hitting barriers can be as specific as our memory or imagination allows (e.g., *a blue Nerf ball breaking through a stack of toothpicks*), but we already know which aspects of the image are essential for the creation of this metaphorical/iconic sign: we do not really care what kind of object or barrier is involved, as long as the crucial events and relationships are represented. Fig. 6.11d, the "schematization stage," is thus drawn with dashed lines, to show that it is not necessary here.

Finally, the last stage is the encoding of the schematic image into linguistic form. This stage is the same for metaphorical/iconic signs as for purely iconic signs:

appropriate articulators are chosen that preserve the structure of the schematic image. In some sense, once a schematic sensory image is established, there is no difference in ASL between metaphorical and non-metaphorical iconic signs: they both use the same sets of iconic "tools" for encoding, and they cannot be distinguished by their forms, but only by their meanings.

In our example, the different parts of the schematic image are encoded using the highly-productive classifier system. The sender's head is represented by the signer's head, through body-for-body iconicity. The moving object is represented by the tip of the extended index finger, a common ASL form for small moving objects. Finally, the barrier is encoded by the non-dominant flat "B" handshape, and penetration of the barrier is encoded by the dominant index finger passing between the non-dominant index and middle fingers. The result is the metaphorical/iconic sign THINK-PENETRATE (Fig. 6.11e).

With this example, I have demonstrated the extension of the Analogue-Building process to metaphorical/iconic signs. As we have seen, the main difference between these signs and purely iconic signs is in the image selection process: the conceptual mapping between source and target domain guides the selection of a concrete sensory image to represent an abstract concept. Moreover, little additional schematization

of this image will be needed, since the source/target mapping will highlight the important parts of the image.

We should at least note in passing that metaphorical/iconic words and constructions also exist in spoken languages, and can be handled with a double mapping and the Analogue-Building process in the same way as metaphorical/iconic signs. Some examples of metaphorical iconicity in English include *lengthening* to represent *emphasis* (e.g., a *baaaad* idea), and *temporal ordering* to represent *order of importance* (e.g., topic/comment structures such as *Pizza, I like.*) Again, metaphor and iconicity are conceptual-mapping-based processes that function in the same way for signed and spoken languages; it is the richness of the signed modality's iconic resources that accounts for the greater frequency of iconic forms in signed languages.

Summary

It is now clear that we can give a unified treatment of iconicity in signed and spoken languages; that we can fruitfully separate off pure iconicity from metaphorical iconicity; and that once that separation is made, the expertise of conceptual metaphor theory can be applied to the analysis of metaphorical/iconic signs. The double-mapping

approach to metaphorical iconicity lets us treat the facts in an appropriate way: signs can share both iconic and metaphorical mappings (as in POINT and MAKE-DIGRESSIONS), or they can share a metaphorical mapping but not an iconic mapping (as in I-INFORM-YOU and THINK-PENETRATE). The iconic representation of the concrete source domain can draw on all the varied iconic resources of the language in question.

Chapter 7: **Many Metaphors in a Single Sign**

Single-Parameter Metaphors

So far we have looked at metaphorical iconic signs that present complete pictures of little scenes; for example, I-INFORM-YOU (Fig. 6.4) is in effect a portrayal of ideas being taken out of one's head and tossed to someone else. In these signs, every formational parameter (movement, handshape, location, etc.) takes part in the same consistent mappings from linguistic form to a source domain, and from source to target domain.

But recall how for purely iconic signs, the form doesn't have to give a complete picture: a single aspect or parameter of the form might resemble one aspect of the referent, while the rest of the form is non-iconic. Our example of this was iconic time-ordering of clauses in both signed and spoken languages: each clause may or may not resemble the event it refers to, but the temporal sequence of clauses does present an analogue for the temporal sequence of events.

Metaphorical iconic signs are the same way. There are a number of signs in which only one or two formational parameters are metaphorical, and other signs in which some parameters are motivated by one metaphor and others by a different one. In these cases, the conceptual mappings

involved are usually fairly sparse, consisting of only one or two correspondences, and thus can easily be represented by a single parameter such as direction of motion. In fact, some parameters actually take on "metaphorical definitions" and get used in productive combinations to bring in their metaphorical meaning (cf. discussions of THE FUTURE IS AHEAD, IMPROVEMENT IS UPWARD). Moreover, in some signs, some of the parameters are motivated by metaphors, and others are motivated by iconic imagery.

In this chapter, we will look at case studies of single-parameter iconic metaphors, signs that combine several metaphors, and signs that combine both metaphorical iconicity and pure iconicity.

It should be noted that in this chapter, the term "parameters of a sign" is not restricted to the five major parameters described in Chapter 3 (i.e., handshape, location, movement, orientation, and non-manual signals). Instead, it refers to all the aspects of a sign that can be used iconically: all the directions in signing space that could be meaningful (e.g., front/back, up/down, left/right), all the parts of the body that we distinguish (e.g., head, hand, heart, gut), all the potentially meaningful qualities of handshape (grasps, tracing shapes, shape, plurality) -- in short, all the iconic devices listed in Chapter 5 and more besides.

THE FUTURE IS AHEAD

It is extremely common in the languages of the world for *time* to be metaphorically understood in terms of *space*; and in particular, in terms of the space *in front of* and *behind* the language user (see, e.g., Clark 1973; Fleischman 1982a, 1982b; Traugott 1975, 1978; Emanatian 1992). In this mapping, the language user (or thinker) functions as a reference point or "reference person" in space. The future is conceptualized as being *ahead* of the reference person; the past is *behind* the reference person; and the present is *co-located* with the person. Relative distance in space corresponds to relative "remoteness" in time; thus, a time one week in the future is seen as closer to the reference person than a time ten years in the future.⁴⁶ This metaphor can be called THE FUTURE IS AHEAD, and its mapping is laid out in Table 7.1.

⁴⁶ This mapping is consistent with two larger (yet mutually inconsistent) mappings: in one, TIME IS A MOVING OBJECT, time is seen as a continuum of objects that flow past the language user from front to back; in the other, TIME IS A LANDSCAPE, the language user travels forward across a "temporal landscape" from past to future times. See Lakoff (1992) for details.

Table 7.1: Metaphorical Mapping for THE FUTURE IS AHEAD

SOURCE	TARGET
"HERE"; location of reference person	present time
space in front of reference person	future time
space behind reference person	past time
points located with respect to reference person	specific times
location of events with respect to reference person	occurrence of events at specific times
degree of distance from reference person	degree of "remoteness" in time

As we can see, this metaphor uses a single spatial dimension, and is thus a perfect candidate to be a single-parameter metaphor in signed languages.

Researchers have indeed noticed this kind of metaphorical/iconic representation of time in many different signed languages (cf. Engberg-Pedersen 1993 for Danish Sign Language, Cameracanna et. al. 1994 for Italian Sign Language; Frishberg 1979, Wilbur 1987, Wilcox 1993 for ASL); the phenomenon is usually referred to as the *time line*. The line in signing space passing from the signer's front to his or her back, perpendicular to the line of the shoulders, has become metaphorically defined as representing past and future time (see Fig. 7.1). The signer's location on this line (or more specifically, the space between the signer's dominant

shoulder and chin) represents present time; locations ahead of the signer represent progressively later times; and locations behind the signer represent progressively earlier times. The double mapping for the *time line* metaphor is given in Table 7.2 below.

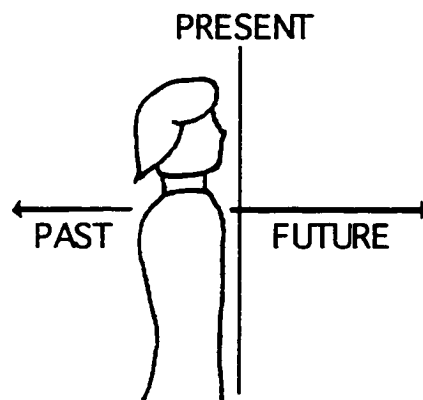


Fig. 7.1: The *time line* in signing space

Table 7.2: Double Mapping for THE FUTURE IS AHEAD

ARTICULATORS	Iconic mapping Metaphorical mapping SOURCE	TARGET
area in front of signer's dominant shoulder ("origin area")	----- "HERE"; location of reference person 	----- present time
line extending forward from origin area	----- space in front of reference person	----- future time
line extending backward from origin area	----- space behind reference person	----- past time
points along this line	----- points located with respect to reference person	----- specific times
location of signed material along this line	----- location of events with respect to reference person	----- occurrence of events at specific times
degree of distance from origin area	----- degree of distance from reference person 	----- degree of "remoteness" in time

Many signs incorporate location or movement along this line into their forms, and by so doing, incorporate a corresponding time or progression in time into their meanings. For example, the sign meaning WEEK (Fig. 7.22; the dominant 1-hand with index finger extended forward, palm down, moves across the non-dominant palm toward the fingers) can incorporate a forward movement and future reference to mean ONE-WEEK-IN-FUTURE (cf. Fig. 7.24); it can also add a

backward movement and take on the meaning ONE-WEEK-IN-PAST. Some other signs participating in this metaphor include those glossed as ONE-YEAR-IN-FUTURE (Fig. 7.2), ONE-YEAR-IN-PAST (Fig. 7.3), TODAY, YESTERDAY, TOMORROW, POSTPONE, "PREPONE", WILL, PAST, UP-TO-NOW, FORESEE, and REMINISCE (Fig. 7.4).

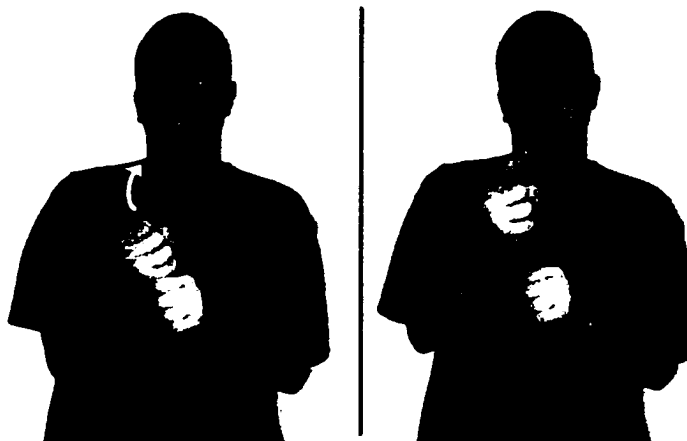


Fig. 7.2: ONE-YEAR-IN-FUTURE

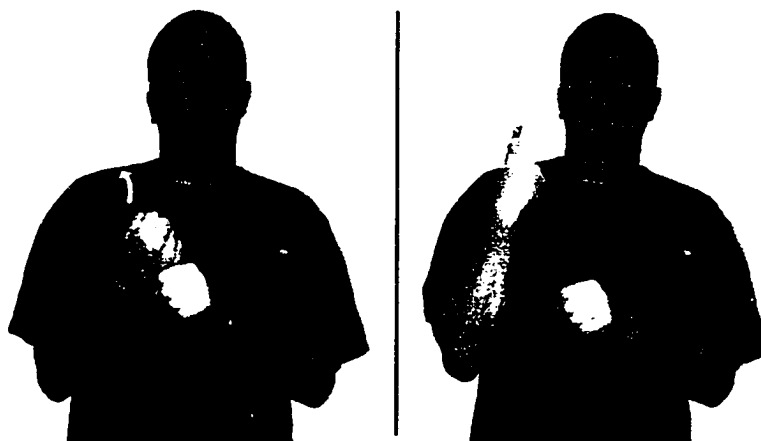


Fig. 7.3: ONE-YEAR-IN-PAST

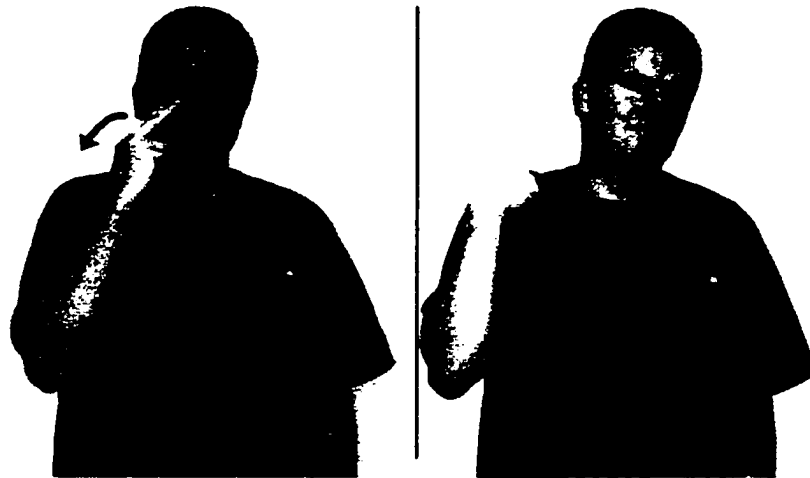


Fig. 7.4: REMINISCE

It should be noted, however, that not all signs that are located or move along this line participate in this metaphor -- that is, the line is not "dedicated" to the metaphor. This is typical for ASL's iconic system as a whole, both metaphorical and non-metaphorical: though handshapes, movements, locations, and so on may participate, even productively, in iconic mappings, they also occur in other signs where they are not used iconically. Also, a single *iconic* system (e.g., an iconic representation of a direction in space) may be used as a source domain for several metaphors (cf. Chapter 7).

INTIMACY IS PROXIMITY

Another one-parameter metaphor is INTIMACY IS PROXIMITY (that is, physical closeness). This metaphor gives significance to the relative locations of articulators in signing space. It partially motivates the physical forms of signs like LOVE, RESIST, FRIEND, CLOSE-FRIEND, MARRY, and DIVORCE.

This mapping is relatively simple; Table 7.3 spells it out.

Table 7.3: Double Mapping for INTIMACY IS PROXIMITY

ARTICULATORS	Iconic mapping SOURCE	Metaphorical mapping TARGET
two articulators (e.g., hands, fingers, body, spatial loci)	two physical entities 	two referents (at least one is animate)
degree of proximity of articulators	degree of proximity of the entities	degree of intimacy between the referents
a) close articulators	close entities 	strong intimacy between referents
b) distant articulators	distant entities 	little intimacy between referents
movement of articulators together or apart	movement of entities together or apart 	intimacy between referents becomes greater or lesser

In brief, the degree of intimacy between two entities is given iconic and metaphorical representation by the degree of proximity between articulators: the closer the articulators, the stronger the intimacy and mutual affection between the entities (cf. Sweetser 1995 for a similar mapping in English).

As evidence for this metaphor, let us consider the forms of the signs that were listed above. First, many signs that refer to intimacy or affection involve closeness of articulators. In FRIEND and CLOSE-FRIEND, the index fingers of both hands touch; for CLOSE-FRIEND (Fig. 7.5), which describes a stronger emotional attachment, the fingers grasp each other more strongly and for a longer time. In MARRY, the two hands clasp each other. For LOVE (Fig. 7.6), both arms are held tightly against the body.



Fig. 7.5: CLOSE-FRIEND



Fig. 7.6: LOVE

Second, the reverse is also true: many signs that refer to dislike or emotional disapproval involve distance between referents. For RESIST (Fig. 7.7), the dominant arm is held rigidly away from the body, and for DIVORCE (Fig. 7.8), which refers to the breakup of a once-intimate relationship, the two D-shaped hands (index finger extended, thumb and middle

finger touching, other fingers curled) start together and move apart.



Fig. 7.7: RESIST

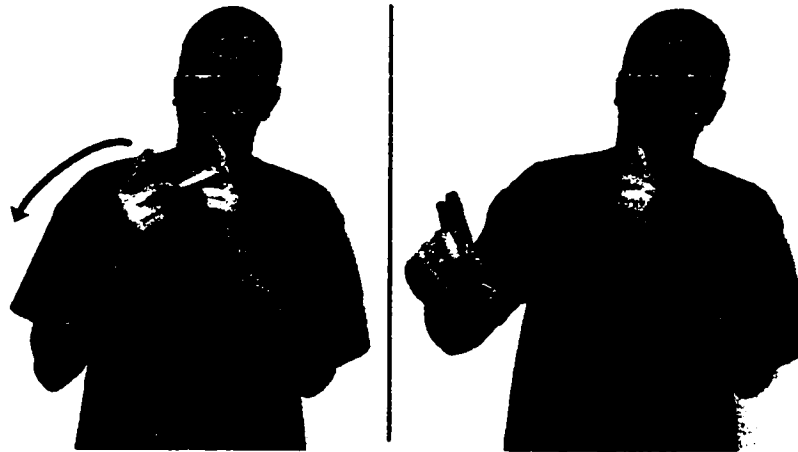


Fig. 7.8: DIVORCE

One other example deserves comment. ASL has a system for manually spelling English words using a succession of handshapes, one for each letter; these fingerspelled words are articulated in a special location, and their internal structure differs sharply from the structure of ASL signs. Sometimes, commonly-used fingerspelled words are borrowed into ASL: their internal structure simplifies to match the normal standards for ASL signs, and their movements, orientation, and place of articulation can change (Battison 1978). Two such fingerspelled "loan signs" are #OFF and #BACK.⁴⁷

#OFF (variant "a," as recorded by Battison) denotes the ending of a romantic relationship, and its movement pattern clearly draws on the INTIMACY IS PROXIMITY mapping: the two hands start together, both holding the O-shape, then move apart, opening to the F-shape. #BACK has become a motion verb meaning *to return*; its path through space indicates the starting and ending points of its referent. In combination with #OFF, it can be used metaphorically to refer to the resumption of a romantic relationship: the two hands, initially separate in signing space, move together while taking on the shapes B, A, and K. Generally, when used together, the two loan signs are repeated in rapid

⁴⁷ The symbol "#" has become standard in the ASL literature to indicate

alternation: #OFF, #BACK, #OFF, #BACK. This sequence denotes an "off-again, on-again" relationship, where the two lovers repeatedly break up and reconcile; the movements of the hands apart and back together iconically and metaphorically represent the changing amounts of affection that the lovers feel for each other.

Finally, INTIMACY IS PROXIMITY affects signers' choices of where in signing space they establish loci to represent various referents. Users of Danish Sign Language put referents in different places depending on how they feel about them (Engberg-Pedersen 1993): in particular, people or institutions that are well-liked will be placed close to the signer, while disliked people or institutions will be placed farther away. Engberg-Pedersen gives the example of a mother who sets up a locus for her daughter close to herself in signing space, while setting up her daughter's kindergarten far away. For a similar ASL example, Engberg-Pedersen cites Padden (1986).

A few words on the evidence for INTIMACY IS PROXIMITY are in order. If we found only that signs referring to affectionate relationships involved closeness of articulators, we would not have full evidence for a consistent mapping between two conceptual domains. But in

that a gloss represented a fingerspelled loan sign.

fact, we find that both ends of the proximity scale are used in consistent ways to refer to affection and dislike. This fact gives strong evidence for the existence in ASL of a consistent, conventional metaphorical mapping between the two domains.

It should be noted as well that a number of the signs described here involve more than just the INTIMACY IS PROXIMITY metaphor. In particular, LOVE, RESIST, and MARRY all incorporate body-for-body iconicity: LOVE presents an image of a hug, RESIST gives the image of keeping something at arm's length, MARRY shows hands clasping each other. One might question whether these signs should be considered metaphorical at all, since they all present vivid images of actions that are strongly associated with their meanings. Instead, these actions might be considered to be metonymic representations of the conceptual category.

But notice how each action in some sense presents an instance of the metaphor: a hug and a hand-clasp necessitate the physical closeness as well as the social intimacy of the two humans involved, while holding someone at arm's length necessitates that the person is not physically close. These images invoke the *experiential basis* of the metaphor (Lakoff & Johnson 1980) -- that is, the metaphor itself is no doubt based on the experience we all have of wanting people we like close to us, and wanting to keep people we don't like far

away. It is no coincidence that the signs involved draw on exactly these images; they are easily recognizable, familiar, and form the motivation for a deeply-entrenched and typologically common conceptual metaphor.

INTENSITY IS QUANTITY

The third single-parameter metaphor that I will treat here can be called INTENSITY IS QUANTITY; it affects the handshapes of ASL signs. There are a number of pairs of signs that differ (pretty much) only in the handshapes they use; in these pairs, one sign uses a 1 handshape, with index finger extended from a fist, and the other uses a 4 or 5 handshape, with all fingers extended. Moreover, the main difference in meaning between the signs is that the sign with all fingers extended denotes more intensity than the the sign with one finger extended.

The sign pairs that participate in this metaphor include COMPLICATED and VERY-COMPLICATED; MAKE-SINGLE-DIGRESSION (Fig. 6.9) and MAKE-COMPLEX-DIGRESSION (Fig. 6.10); and DESIRE (Fig. 7.9) and STRONG-DESIRE (Fig. 7.10). The last two are a typical pair: DESIRE is articulated by stroking the index finger down the front of the neck, while STRONG-DESIRE involves stroking all four fingers down the neck. The first

sign refers to most desires and wants, while the second is reserved for intense desires, such as scoring the tie-breaking goal at the end of a football game.



Fig. 7.9: DESIRE



Fig. 7.10: STRONG-DESIRE

All the sign pairs named so far refer to abstract concepts such as complexity, thinking, and desires. There are also sign pairs like CRY (Fig. 7.11) and WEEP (Fig. 7.12) which differ by handshape in the same way, but refer to a concrete action. For CRY and WEEP, the handshapes iconically depict the amount of water coming from the eyes during painful emotion: the 1 handshape of CRY corresponds to moderate production of fluid and intensity of feeling, and the 4 handshape of WEEP corresponds to heavy fluid production and intensity of feeling. These two signs are frozen examples of element classifiers for the movement of water from the eyes, but they also participate in the INTENSITY IS QUANTITY metaphor: the images represented by these signs are part of the experiential basis for INTENSITY IS QUANTITY. This is analogous to the situation for LOVE, MARRY, and RESIST described above.

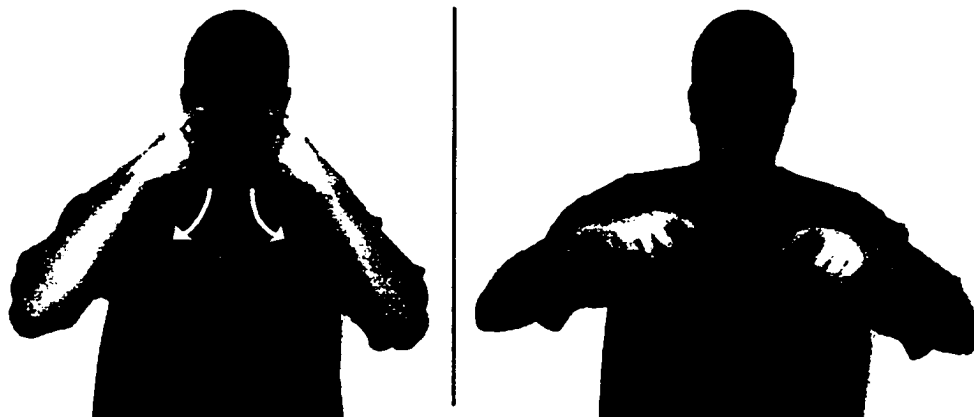


Fig. 7.11: CRY

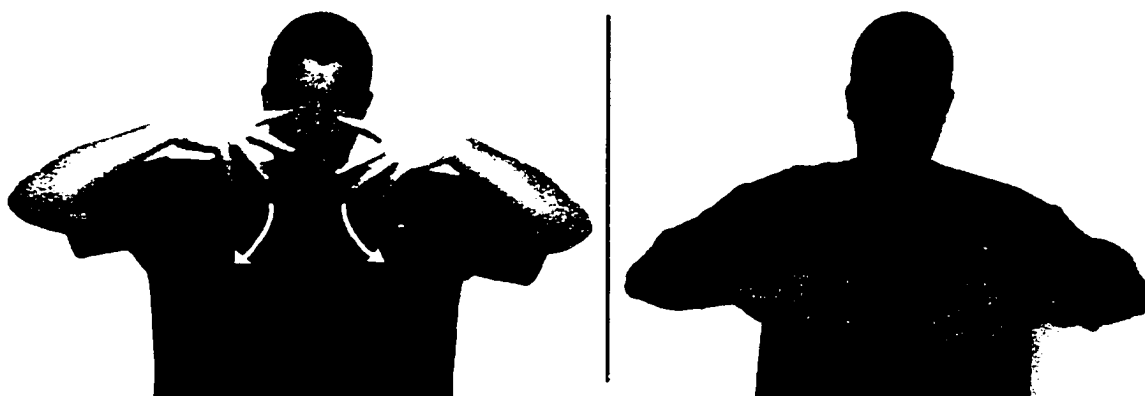


Fig. 7.12: WEEP

The INTENSITY IS QUANTITY mapping is summarized in Table 7.4; it is quite simple (with only two correspondences), but deserves a few comments.

Table 7.4: Double Mapping for INTENSITY IS QUANTITY

ARTICULATORS	Iconic mapping SOURCE	Metaphorical mapping TARGET
one finger	small quantity	low intensity
four fingers	large quantity	high intensity

Notice that the iconic representation of quantity (by number of fingers) is highly schematized: use of one finger represents "small quantity," while use of four fingers represents "large quantity." No signs participating in this mapping make any finer distinctions than this: that is, no signs use two fingers to represent "medium quantity." This differs from the classifier and number-agreement uses of fingers to represent numbers of referents (Chapter 5); as we saw there, for those cases, each number of fingers (up to four or five) corresponded exactly to the number of referents.

Second, it is worth noticing that discrete quantity (*one* vs. *four*) is being used to represent to refer to continuous amount (*some* vs. *a lot*).

Multiple Metaphorical Parameters in a Single Sign

We have seen that entire metaphors (albeit simple ones) can be represented by one parameter of a sign. But signs have many parameters. It should not be surprising, then, to learn that a single sign can incorporate more than one metaphorical/iconic parameter. In fact, there are signs whose handshape, movement, and location are all motivated by different metaphors.

Let us take as a case study a number of signs for emotions: SAD, HAPPY, THRILL, and EXCITED. SAD (Fig. 7.13) consists of a downward motion of both spread-fingered hands, palm in, in front of the face. HAPPY (Fig. 7.14) involves a repeated upward brushing of the dominant flat B-hand, palm in, against the chest. THRILL (Fig. 7.15) has two open-8 hands (fingers spread, middle finger bent inward) whose middle fingers brush upward along the length of the abdomen and off the shoulders. Finally, in EXCITED (Fig. 7.16), the two open-8 hands alternate in short rapid brushes upward at the chest.⁴⁸ These signs form an interesting sequence, in that SAD incorporates one iconic metaphor, HAPPY incorporates

⁴⁸ The downward motions (indicated by dotted lines) do not contact the chest, and are solely for the purpose of allowing the hands to make additional upward motions; they do not "count" in the metaphorical interpretation of the sign.

two, and THRILL and EXCITED incorporate three; moreover, THRILL and EXCITED also bring in an iconic use of time.



Fig. 7.13: SAD



Fig. 7.14: HAPPY

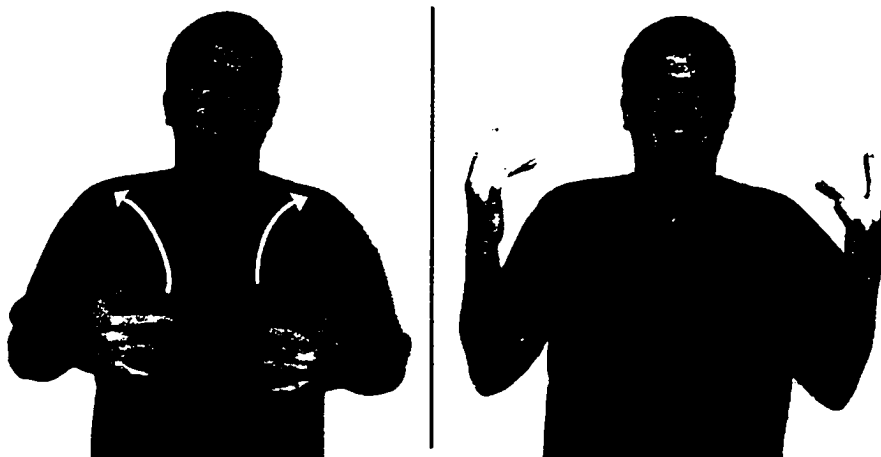


Fig. 7.15: THRILL

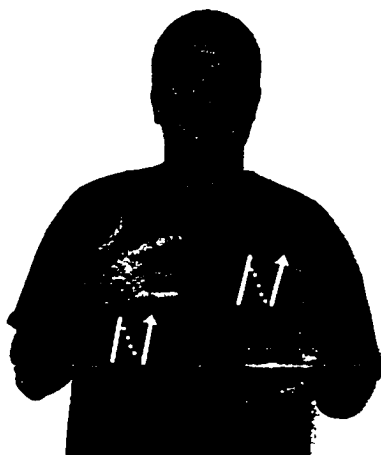


Fig. 7.16: EXCITED

As we go through the metaphors used in these signs, I will provide full mappings for each, along with additional signs that provide strong evidence for the mappings.

The first sign on our list is SAD; this sign builds an iconic metaphor into its *movement* parameter. The metaphor it uses is HAPPY EMOTIONS ARE UP, a simple mapping based on the up/down scale (noted for ASL by Wilbur 1987 and Holtemann 1990). (English has a similar metaphor, apparent from expressions such as *I'm feeling down today*; see Lakoff & Johnson 1980.) Table 7.5 summarizes the mapping.

Table 7.5: Double Mapping for HAPPY EMOTIONS ARE UP

ARTICULATORS	Iconic mapping SOURCE	Metaphorical mapping TARGET
upward movement ---	top of the vertical scale	happy emotions
downward movement -	bottom of the vertical scale	unhappy emotions

Many (though not all) emotion signs in ASL draw on this metaphor. The signs denoting positive feelings that have upward movement include INSPIRE and our other case-study signs HAPPY, THRILL, and EXCITED. Signs denoting negative feelings that have downward movement include SAD, DEPRESSED, and DISAPPOINTED.

Our second example is HAPPY; this sign uses two different metaphors, one motivating its direction of movement, and another motivating its place of articulation.

As just mentioned, HAPPY's upward movement comes from the metaphor HAPPY EMOTIONS ARE UP. The second metaphor can be called THE LOCUS OF EMOTION IS THE CHEST.

Many (but not all) ASL emotion signs are articulated at the chest: HAPPY, THRILL, EXCITED, DISAPPOINTED, DEPRESSED, ANGRY, INSPIRE, and CONCERN, to name a few. Some signs move to or from the chest in motivated ways: BE-TOUCHED, which moves inward and contacts the chest, denotes *being strongly emotionally affected by "external" events*; and EXPRESS-EMOTION (Fig. 7.17), which depicts objects being taken up from the chest and offered forward, denotes *sharing emotional experience with others*.

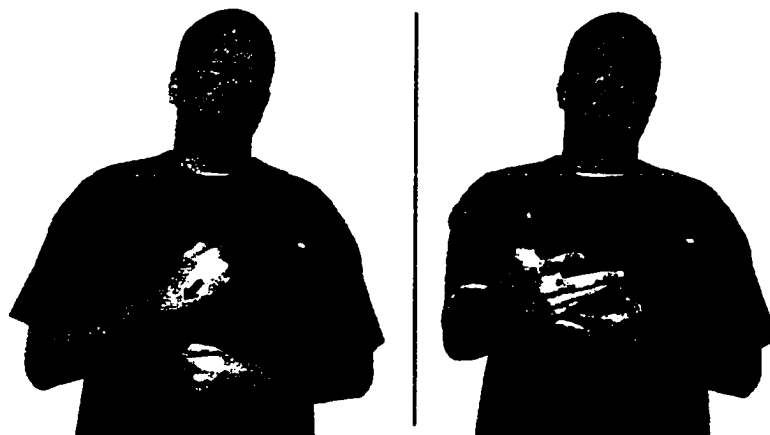


Fig. 7.17: EXPRESS-EMOTION

Moreover, some signs take on an emotional meaning when articulated at the chest; the signs BOIL and BOIL-INSIDE are

a good example of this. BOIL (Fig. 7.18) is articulated in a neutral area of signing space, with the non-dominant flat B-hand held palm down above the dominant spread 5-hand; the fingers of the 5-hand wiggle, as in the element classifier representing *fire*. This is clearly a frozen sign based on shape-for-shape and element classifiers; the meaning is *for liquid to boil*. In BOIL-INSIDE (Fig. 7.19), the same configuration of the hands is articulated at the signer's abdomen area; this sign means *to feel strong unexpressed anger*.



Fig. 7.18: BOIL



Fig. 7.19: BOIL-INSIDE

Table 7.6 gives the mapping for this metaphor.

Table 7.6: Double Mapping for THE LOCUS OF EMOTION IS THE CHEST

ARTICULATORS	Iconic mapping SOURCE	Metaphorical mapping TARGET
chest/abdomen	chest region	locus of emotional experience
location at chest/abdomen	location inside chest	experience of emotion
movement of object to chest/abdomen	movement of object into chest	"external" events causing emotional experience
movement of object away from chest/abdomen	movement of object out of chest	emotional experience being communicated to others

Note that the final correspondence, *movement of object out of chest => emotional experience being communicated to others*,

draws on the first metaphor we discussed, COMMUNICATING IS SENDING. Here the idea or topic being "sent" to others is a private emotional experience; it is metaphorically removed from the chest container and made accessible to other people.⁴⁹

This mapping, THE LOCUS OF EMOTION IS THE CHEST, is part of a mapping of different parts of mental experience onto different parts of the body (cf. Johnson 1987, Sweetser 1990 for English counterparts). It contrasts with THE LOCUS OF THOUGHT IS THE HEAD, a metaphor which spatializes thought onto the head, and in particular, the forehead (Wilcox 1993). Thought-related signs located at the forehead include THINK (Fig. 3.7a), KNOW (Fig. 3.7b), UNDERSTAND, and FORGET; LEARN, which denotes the acquisition of new information, presents an object moving into the forehead, while INFORM (Fig. 6.4), which denotes the sharing of information, presents an object moving out of the forehead.⁵⁰ In fact, the sign EXPRESS-EMOTION is practically a minimal pair for INFORM; both use flat-O instrument classifiers to represent the manipulation of mental experiences, and both show the "experiences" (i.e., thoughts or feelings) coming out of the appropriate body part

⁴⁹ This correspondence brings in other metaphors, namely KNOWING IS SEEING and PRIVATE IS HIDDEN, which we do not have space to discuss here. Sweetser (1995) discussed similar complexes of metaphors in English.

and being sent to other people. Many cultures have similar pairs of metaphors, where the body and emotions are contrasted with the head and thought.

Our third example, THRILL, uses both of the metaphors we saw in SAD and HAPPY, and adds a third: its upward movement comes from HAPPY EMOTIONS ARE UP, its location at the chest comes from THE LOCUS OF EMOTIONS IS THE CHEST, and its open-8 handshape is motivated by the metaphor FEELING IS TOUCHING. In fact, THRILL's meaning is largely predictable from the metaphorical/iconic pairings that motivate its form.

The open-8 handshape has a number of meanings in ASL; the one that concerns us here is *physical touch or contact*. An entire paper could be written on the signs bearing this handshape and their semantic connections; space only allows us to list a few of them, classifying them broadly into a group associated with physical contact, and a group associated with emotions (cf. Frishberg & Gough 1973, Frishberg 1979).

The central sign of the group is TOUCH (Fig. 7.20), where the extended middle finger of the dominant hand contacts the back of the palm-down non-dominant hand. This sign is iconic: one basic way of *touching* is for the fingers

⁵⁰ Wilcox (1993) gives evidence for this metaphor in ASL, and shows that ASL signers spatialize unconscious thought onto the back of the head.

to contact some object, and the sign TOUCH does in fact encode an image of a finger contacting an object. The iconicity is highly conventionalized, however; in ASL, it is crucially important that to represent the concept of *touching*, the middle finger must make the contact and not any other finger. Contact with, say, the index finger would be an excellent example of touching (and probably a more typical example), but in ASL, it would not serve to denote the concept of *touching*.



Fig. 7.20: TOUCH

Other open-8 signs associated with physical contact include CONTACT, CONTACT-LENSES, and various iconic signs for sexual behavior (Woodward 1979).

The open-8 "touch" handshape has several metaphorical uses, but the primary one is to denote emotions or feelings. The mapping for this metaphor is given in Table 7.7.

Table 7.7: Double Mapping for FEELING IS TOUCHING

ARTICULATORS	Iconic mapping Metaphorical mapping SOURCE	TARGET
open-8 handshape	-- physical contact	-- emotional experience

Here, a physical contact is used metaphorically to refer to an experience of an emotion.

Many ASL emotion signs use this metaphor, including THRILL, EXCITED, DISAPPOINTED, FEEL, TOUCHED, and CONCERN, all located at the chest, and PITY (shown as I-PITY-HIM/HER/IT in Fig. 7.21), which is not. In some sense, the open-8 handshape has become a kind of "emotion classifier"; it freely combines with other metaphorical/iconic pairings to designate any kind of emotion. Thus, THRILL and DISAPPOINTED have opposite directions of motion, and basically opposite meanings: the sign with upward motion (THRILL) denotes a vivid, brief joyful experience, while the sign with downward motion (DISAPPOINTED) denotes a vivid, brief sorrowful experience. Klima & Bellugi (1979) in fact give an example of an invented sign that playfully draws on these metaphors:

to represent feeling excited and sad at the same time, a signer simultaneously moved one open-8 upward along the chest, and the other open-8 downward along the chest. The meaning of this novel sign is completely transparent based on its form.



Fig. 7.21: I-PITY-HIM/HER/IT

With this in mind, let us analyze our final example sign, EXCITED, and compare it to THRILL. EXCITED uses the same three metaphors as THRILL: with its motion upward, location at the chest, and open-8 handshape, it is virtually required to denote a positive emotion. Nonetheless, its meaning differs from THRILL's; while THRILL refers to a brief, vivid positive experience, EXCITED denotes a state of positive feeling and anticipation that can last for a long time.

Notice that EXCITED's form differs from THRILL's as well. In THRILL, both hands move upward in a single long, rapid stroke; in EXCITED, however, the two hands alternate making short upward movements at the chest. I claim that this difference of form comes from time-for-time iconicity. The temporal structure of THRILL's form, with its short, sharp movement, fits the temporal structure of THRILL's meaning (i.e., brief, vivid experience); while the temporal structure of EXCITED's form, with its repeated movements, fits the temporal structure of EXCITED's meaning (i.e., an ongoing state). The meanings of these two signs are almost completely predictable from their forms, if one understands ASL's system of iconic and metaphorical mappings.

To summarize: different aspects of ASL signs can be motivated by different iconic metaphors. Tables 7.8 through 7.11 lay out the metaphorical and iconic mappings for our four example signs. As we can see, the forms of some signs, such as SAD, are only partially motivated by metaphors; but the forms of other signs, such as EXCITED, are almost completely motivated by metaphor and iconicity.

Table 7.8: Double Mapping for SAD

	Iconic mapping	Metaphorical mapping
ARTICULATORS	SOURCE	TARGET

handshape:		
spread fingers		
location:		
face		
movement direction:		
downward	----- bottom of	----- unhappy emotions
	vertical scale	

Table 7.9: Double Mappings for HAPPY

	Iconic mappings	Metaphorical mappings
ARTICULATORS	SOURCE	TARGET

handshape:		
flat B-shape		
location:		
chest	----- chest region	----- locus of emotional
		experience
movement direction:		
upward	----- top of vertical	--- happy emotions
	scale	

Table 7.10: Double Mappings for THRILL

Iconic mappings		Metaphorical mappings	
ARTICULATORS	SOURCE	TARGET	

handshape:			
open-8	-----	physical contact	-- emotional experience
location:			
chest	-----	chest region	----- locus of emotional experience
movement direction:			
upward	-----	top of vertical scale	--- happy emotions
movement timing: (iconic only)			
single rapid movement	----	brief experience	

Table 7.11: Double Mappings for EXCITED

Iconic mappings		Metaphorical mappings	
ARTICULATORS	SOURCE	TARGET	

handshape:			
open-8	-----	physical contact	-- emotional experience
location:			
chest	-----	chest region	----- locus of emotional experience
movement direction:			
upward	-----	top of vertical scale	--- happy emotions
movement timing: (iconic only)			
repeated movements	-----	ongoing state	

These signs might well be described as metaphorical compounds. There are analogous cases in spontaneous gesture accompanying speech (Cienki, in press). We can also compare these compounds to metaphorical compounds in spoken languages

(e.g., English *black-hearted*, *cold-hearted*). These English compounds also each use two conceptual metaphors: THE LOCUS OF EMOTION IS THE HEART, along with GOOD IS WHITE and AFFECTION IS WARMTH. (All three of these metaphors can be justified with additional examples and the construction of a mapping; see Lakoff et. al. 1991 for details.) Thus, the words *cold*, *heart*, and the *adjective-verb-participle* construction come together with these metaphors to produce the meaning *having little capability for affection*. This productivity and compositionality is analogous to the situation for ASL emotion signs; but there are two major differences: the ASL signs express their metaphors *iconically* and *simultaneously*, rather than using *arbitrary* words in *sequence*, as spoken languages must do.

Metaphorical Iconicity and Pure Iconicity In a Single Sign

Finally, we will address a case where two different types of iconicity combine with metaphorical iconicity in the structure of one sign. Our example is the sign TWO-WEEKS-IN-PAST, and its relatives TWO-WEEKS-IN-FUTURE, THREE-WEEKS-IN-PAST, and so on.

Let us start with the basic sign, WEEK (Fig. 7.22), from which TWO-WEEKS-IN-PAST is derived. WEEK's form is already

partially motivated by iconicity and metonymy. The non-dominant hand is held palm-up in a flat "B" shape, fingers together and thumb extended. The dominant hand takes on the 1 shape, index finger extended from a fist; it slides, palm-down, across the non-dominant palm from the heel of the hand to the fingertips. The iconic image represented here is of a horizontal row on a calendar: the non-dominant hand, in a typical flat-object form, represents the calendar page, while the sliding motion of the dominant 1 traces out one row on the calendar. As we know, the typical calendar is organized so that each row represents a week; this is a clever way to find a visual image to represent the temporal concept week.



Fig. 7.22: WEEK

WEEK is one of those signs that takes *number agreement* (see Chapter 5); its basic handshape, the 1, can be changed

to any number handshape up to 9, and its meaning then changes to indicate that number of weeks.⁵¹ Fig. 7.23 illustrates the sign TWO-WEEKS; that sign incorporates two distinct kinds of iconicity: number agreement and the representation of the calendar row.



Fig. 2.23: TWO-WEEKS

Finally, WEEK and its number-agreement derivatives can incorporate the metaphor THE FUTURE IS AHEAD. The movement pattern of the sign is altered: instead of simply sweeping across the non-dominant palm, the dominant hand sweeps across the palm and then either forward or backward to the dominant shoulder in an arc. The variant with the forward arc

⁵¹ The numbers 6 through 9 are not strictly iconic; the number of fingers selected cannot directly correspond to the referent number, for

indicates a time in the future, and the variant with the backward arc indicates a time in the past.

Putting it all together, the sign TWO-WEEKS-IN-PAST (Fig. 7.24) is motivated by two different iconic mappings and a metaphorical/iconic mapping. In this sign, the dominant 2 handshape sweeps across the non-dominant palm, then arcs backward to the dominant shoulder. The shape and location of the non-dominant hand, and the first part of the dominant hand's movement are a partial encoding of the calendar-row image. The dominant hand's 2-shape iconically encodes the concept *two*. Finally, the last part of the dominant hand's movement is motivated by the metaphorical/iconic mapping of THE FUTURE IS AHEAD. This situation is summarized in Table 7.12; note that the final two correspondences, which pick out a row on a calendar, refer to the concept *week* not directly but by metonymic association.

obvious reasons.

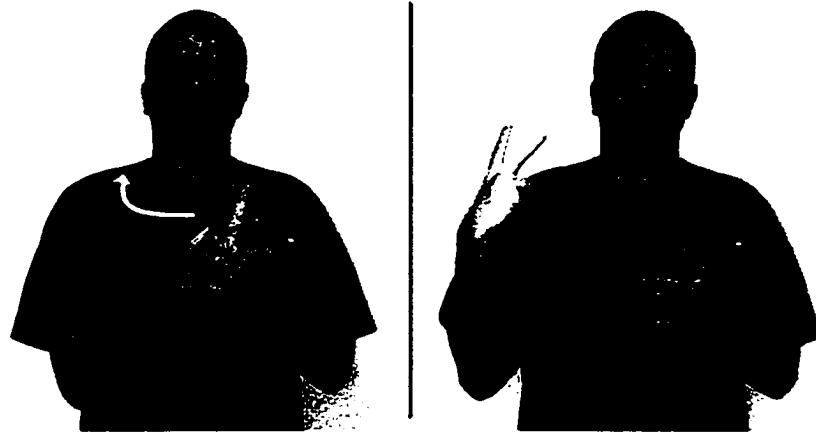


Fig. 7.24: TWO-WEEKS-IN-PAST

Table 7.12: Mappings for TWO-WEEKS-IN-PAST

ARTICULATORS	Iconic mappings SOURCE	Metaphorical mappings TARGET
movement backward	-	area behind the --- earlier in time signer
dominant 2-shape	--	the number two
non-dominant B-shape	-----	calendar page
dominant hand's sweep across B	---	calendar row

The result is a sign meaning *a time two weeks in the past*;
this meaning is predictable from its parts.

Summary

We have seen in this chapter how metaphorical/iconic signs need not have all their aspects motivated by the same metaphor. Some signs (e.g., THINK-PENETRATE) are fully motivated by a single metaphor; other signs are only partially motivated (e.g., SAD); others are fully motivated by several metaphors at once (e.g., THRILL); and still others combine motivations by both metaphorical and pure iconicity (e.g., TWO-WEEKS-AGO). An Analogue-Building model of this phenomenon could be easily developed; it would involve a stage where the different images would be integrated into one encodable whole.

Chapter 8: **The Vertical Scale as Source Domain**

Multiple Uses of a Single Source Domain

Conceptual metaphors are pairings of source and target conceptual domains. When discussing a metaphor, we must always specify both the source and the target domain, for a very good reason: a language may use the same source domain to describe many different target domains, and it may describe a single target domain using many different source domains. Each of these source/target pairings has a distinct mapping, and should be treated as a separate conceptual metaphor. It makes little sense to talk about English's FIRE metaphors, for example, as a coherent group. English uses *fire* as a source domain for concepts such as *life*, *desire*, *destruction* and *anger*; the target domains differ greatly, and each source/target pairing draws on different aspects of the *fire* domain.

In this section, we will go through several ASL metaphors that use the same source domain: the vertical up/down scale (cf. Sweetser 1995 for vertical-scale metaphors in English). As each source/target pairing is analyzed, we will see that they fall into two types: the "positive-end-up" type and the "positive-end-down" type. Moreover, each pairing's use of the vertical scale is different, and is

motivated by a different set of experiences in the world. The positive-end-up mappings are based on two different kinds of experience: the fact that piles of objects become taller when more objects are added, and the fact that height or high ground gives one an advantage in a physical confrontation. The positive-end-down mapping is related to the experience of digging into the ground to reach hidden objects.

We shall see as well that each metaphor gets represented iconically in several different ways, using a number of interesting devices; and that these vertical-scale metaphors sometimes combine with other ASL metaphors, such as STATES ARE LOCATIONS.

MORE IS UP

In our first metaphor, the vertical scale is mapped onto the domain of *quantity*. This metaphor can be called MORE IS UP, since the high end of the vertical scale represents large amounts (cf. Lakoff & Johnson 1980 for English MORE IS UP; Wilbur 1987 for ASL). I will first give the metaphorical mapping by itself, in Table 8.1, since it shows up iconically in several different ways.

Table 8.1: Metaphorical Mapping for MORE IS UP

SOURCE	TARGET
up/down ----- dimension	scale of relative quantity
higher locations --	larger amounts
lower locations ---	smaller amounts
movement upward ---	increasing amount
movement downward -	decreasing amount

We will discuss here two groups of signs that incorporate this metaphor: these can be called the "bent-B" group and the "H" group, after the handshapes they use.

The bent-B group is large and productive, in that new signs of this class can be invented freely to fit the needs of the situation. In this group, both hands take on the bent-B shape: fingers together and bent at the first joint after the palm. The palms face each other, and the fingers are held parallel to the ground, defining a horizontal plane in signing space. For all members of this group, the non-dominant hand's plane forms a *reference level* in signing space; the dominant hand's plane is to be compared to the reference level (we will call this plane the *actual level*). The double mapping for this group is given in Table 8.2.

Table 8.2: Double Mapping for Bent-B Group

ARTICULATORS	Iconic mapping SOURCE	Metaphorical mapping TARGET
vertical axis of signing space	up/down dimension	scale of relative quantity
higher locations in signing space	higher locations	larger amounts
lower locations in signing space	lower locations	smaller amounts
non-dominant bent-B's fingers	reference level	reference amount
dominant bent-B's fingers	actual level	actual amount
dominant and non-dominant fingers on the same plane	actual level equal in height to reference level	actual amount equal to reference amount
dominant fingers above non- dominant fingers	actual level above reference level	actual amount greater than reference amount
dominant fingers below non- dominant fingers	actual level below reference level	actual amount less than reference amount
dominant fingers move upward	actual level rises	actual amount increases
dominant fingers move downward	actual level falls	actual amount decreases

Signs in the bent-B group include EQUAL, MORE-THAN, LESS-THAN, MINIMUM, and MAXIMUM. For EQUAL (Fig. 8.1), the fingers of both hands are on the same horizontal plane; this maps onto the meaning of *equal amount*. MORE-THAN and LESS-THAN (Fig. 8.2) both start in the same configuration as EQUAL, but the dominant hand subsequently moves, to a higher position for MORE-THAN and to a lower position for LESS-

THAN.⁵² As one might expect, MORE-THAN is a predicate denoting *greater amount than the reference value*, and LESS-THAN denotes *smaller amount than the reference value*.



Fig. 8.1: EQUAL

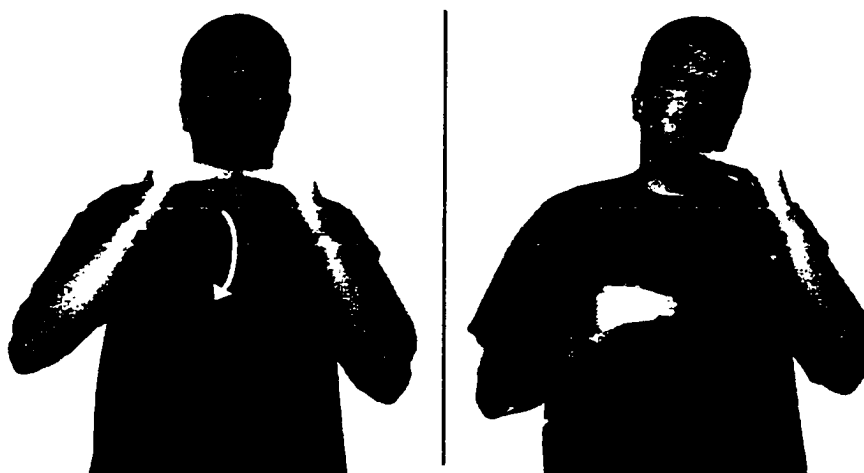


Fig. 8.2: LESS-THAN

⁵² As we shall see, there are many pairs of signs like MORE-THAN and LESS-THAN which differ only in the direction of movement along the vertical scale. There is not enough space for me to illustrate both members of the pairs, but it is relatively easy to reconstruct the second member from the illustrated one.

For EQUAL, MORE-THAN, and LESS-THAN, the reference level is approximately in the middle of signing space; but for MINIMUM and MAXIMUM, the reference level is set at one endpoint of the vertical scale. In MINIMUM, the non-dominant fingers are fairly low in signing space; the dominant fingers touch the top of the non-dominant fingers and move upward. Here, the non-dominant fingers' reference level is set equal to the bottom of the vertical scale, which metaphorically corresponds to the minimum acceptable value. The dominant fingers sweep through a range of acceptable actual levels, which are all above the bottom of the scale, and thus represent values greater than the minimum value. Similarly, in MAXIMUM (Fig. 8.3), the non-dominant fingers are relatively high in signing space; the dominant fingers sweep upward and hit the bottom of the non-dominant fingers. This time, the non-dominant fingers represent the top of the vertical scale, and thus the maximum allowable amount. The dominant fingers move upward through a range of acceptable levels, but cannot go higher than the top of the scale; this shows that the actual amount is limited to be no more than the maximum amount.

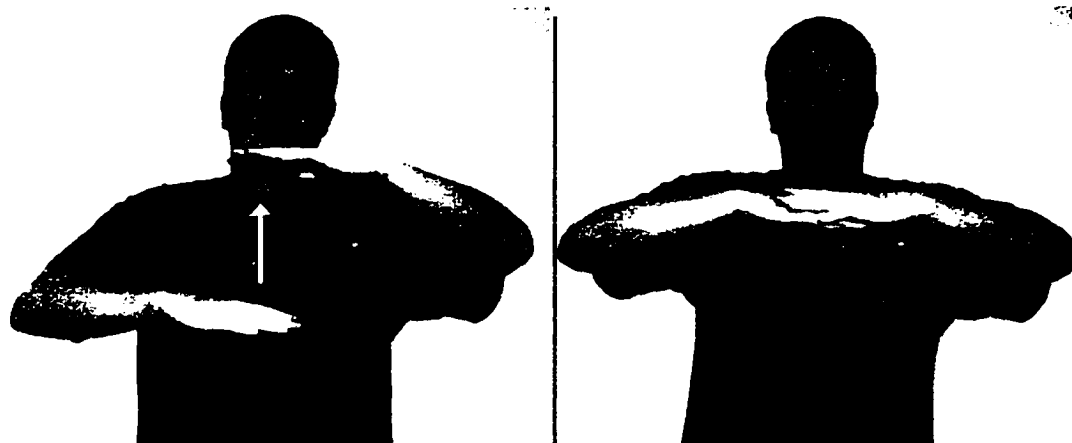


Fig. 8.3: MAXIMUM

The metaphorical/iconic pairing for the bent-B group is alive and well in ASL; signers are free to invent new signs of this type to fit the needs of the moment. Basically, what happens is that the signer shapes the hands into bent-B's and sets both fingers' planes on the same level in signing space; this has the effect of invoking the bent-B double mapping, and establishing the reference level in space. Once this is done, the signer can move the dominant fingers to any level or series of levels that correspond to the amounts which he or she wishes to describe; this method provides a simple way to describe gradual or rapid increases or decreases in amounts.

The second group of signs connected with MORE IS UP is the H group, in which both hands take on the H shape (index and middle fingers extended from a fist and touching each

other). There are only two signs in this group: INCREASE-AMOUNT and DECREASE-AMOUNT.

The version of MORE IS UP that the H group uses is more detailed than the version used by the bent-B group; a better name for this version might be AMOUNT IS THE HEIGHT OF A PILE. We have all had experience in the world with objects stacked into a pile; we know that taller piles, on the whole, have more stuff in them, and shorter piles have less stuff; and we know that when we add stuff to the pile, the pile will get taller. This experience is probably the reason why metaphors like MORE IS UP exist, which map the vertical scale onto a scale of quantity; these metaphors use an abstract version of the source domain, where only the vertical scale and not the pile itself is retained. The H group, however, still retains the vivid, detailed source domain; we can see in these signs the iconic representation of the top of a pile, and of stuff being added to the top or taken away from it.

The metaphorical mapping for AMOUNT IS THE HEIGHT OF A PILE is given in Table 8.3.

Table 8.3: Metaphorical Mapping for AMOUNT IS
THE HEIGHT OF A PILE

SOURCE	TARGET
-----	-----
pile of stuff -----	quantity to be measured
top of pile -----	total amount
stuff to be added - or taken away	amount to be added or taken away
stuff being added - to the pile	amount being increased
stuff being ----- removed from the pile	amount being decreased
top of pile ----- rising	amount increasing
top of pile ----- falling	amount decreasing
new top of pile ---	new total amount

Notice how the MORE IS UP metaphor preserves the structure of this mapping, while using a more schematic source domain: in both metaphors, the vertical scale represents quantity, higher locations represent larger amounts, and lower locations represent smaller amounts.

The H group signs use H handshapes to show the top of the metaphorical pile and the stuff being added to or removed from the pile. In INCREASE-AMOUNT, the non-dominant H starts relatively low in signing space, fingers facing down and pointing forward and toward the dominant side. The dominant H's fingers begin face-up, and are turned over and placed on top of the non-dominant H's fingers; simultaneously, both hands rise in signing space. This sign means *for a quantity*

to increase. In DECREASE-AMOUNT (Fig. 8.4), the reverse happens: the dominant H's fingers start face-down on top of the non-dominant H's fingers, and the entire configuration is relatively high in signing space. Next, the dominant H's fingers are removed from that position and turned face-up, and both hands move downward in space. As might be expected, this sign means *for a quantity to decrease*. The movements of both signs can be repeated. These signs are used to describe increases and decreases in quantities such as prices that do not typically form piles; thus, their iconic depictions of piles' heights are metaphorical rather than purely iconic.

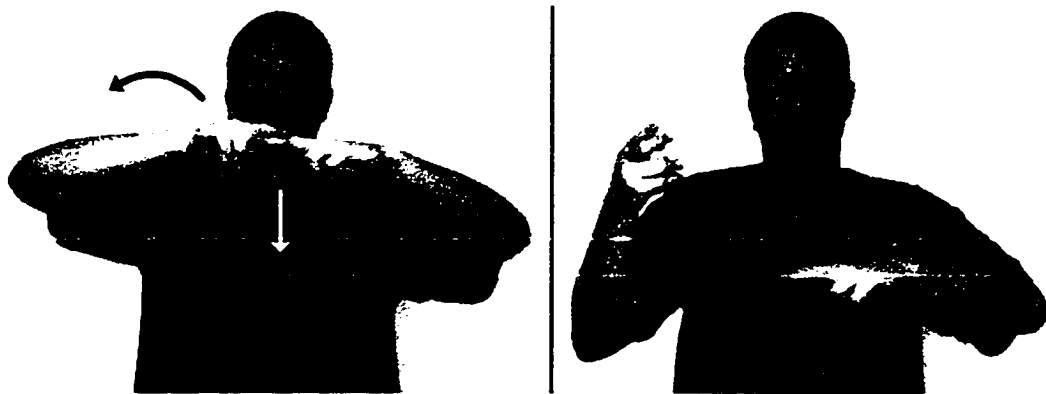


Fig. 8.4: DECREASE-AMOUNT

The double mapping for the H group signs is described in Table 8.4.

Table 8.4: Double Mapping for H Group

ARTICULATORS	Iconic mapping SOURCE	Metaphorical mapping TARGET
[null]	pile of stuff	quantity to be measured
non-dominant H's fingers	top of pile	total amount
dominant H's fingers	stuff to be added or taken away	amount to be added or taken away
dominant H's fingers placed on top of non-dominant H's fingers	stuff being added to the pile	amount being increased
dominant H's fingers removed from top of non-dominant H's fingers	stuff being removed from the pile	amount being decreased
non-dominant H's fingers rising	top of pile rising	total amount increasing
non-dominant H's fingers falling	top of pile falling	total amount decreasing
new level of non-dominant H's fingers	new top of pile	new total amount

The non-dominant H's fingers define the level of the top of the pile, and the dominant H's fingers represent the stuff that is being placed onto or removed from the pile. At the same time, the height of the non-dominant H's fingers in space represents the total amount of stuff in the pile; as the amount decreases, the pile becomes shorter and the non-dominant H sinks lower (and vice versa for increases in

amount). We can see that the meanings of the H group signs are strongly motivated by the iconic and metaphorical double mappings.

IMPROVEMENT IS UPWARD

Our second metaphor once again uses the schematic vertical scale, just as the bent-B group does. This time, the vertical scale represents the domain of progress and improvement; higher locations on the scale correspond to being better, and movement upward corresponds to improvement (cf. Wilbur 1987). It is interesting to note that in this metaphor, the ends of the vertical scale are given different social values: the high end has the most positive value, and the low end has the least value. With MORE IS UP, on the other hand, neither the low end of the scale (representing small amount) nor the high end (representing large amount) is considered to be more valuable in and of itself.

The metaphorical mapping for IMPROVEMENT IS UPWARD is given in Table 8.5.

Table 8.5: Metaphorical Mapping for IMPROVEMENT IS UPWARD

SOURCE	TARGET
up/down ----- dimension	scale of relative goodness
higher locations --	better quality
lower locations ---	worse quality
movement upward ---	improvement
movement downward -	deterioration

This metaphor is given iconic representation in ASL in several different ways. We will discuss first a group of signs that use the non-dominant palm as a landmark that iconically represents the vertical scale; I will refer to these signs as the "palm group." For this group, the non-dominant hand articulates a B-shape (fingers straight and together), with fingers upward and palm facing the non-dominant side. The dominant hand also takes on the B-shape, with the thumb folded in and the edge of the index finger touching the non-dominant palm. Once this configuration has been established, invoking the IMPROVEMENT IS UPWARD double mapping, the dominant hand's motion upward and downward represents improvement and deterioration in some condition. This double mapping has produced several frozen signs, including IMPROVE(1), WORSEN(1), and UP-AND-DOWN;⁵³ it can

⁵³ The index (1) in these signs' glosses simply means that there are other signs which I want to gloss with the same English word. The index allows them to be distinguished: IMPROVE(1) vs. IMPROVE(2).

also be used to create new signs productively that fit the situation.⁵⁴

The double mapping for the palm group is given in Table 8.6.

Table 8.6: Double Mapping for Palm Group

ARTICULATORS	Iconic mapping SOURCE	Metaphorical mapping TARGET
vertical axis of non-dominant palm and fingers	up/down dimension	scale of relative goodness
higher locations on non-dominant palm and fingers	higher locations	better quality
lower locations on non-dominant palm and fingers	lower locations	worse quality
movement upward along non-dominant palm and fingers	movement upward	improvement
movement downward along non-dominant palm and fingers	movement downward	deterioration

The first sign of this group, IMPROVE(1), starts with the dominant hand touching low on the non-dominant palm, fingers pointing upward; the dominant hand then slides upward a few inches along the non-dominant palm. This sign can refer to one's state of mind, abilities, progress on a project, and

⁵⁴ Regrettably, I do not have an illustration for the palm group at

many other areas that are subject to evaluation; in all areas, it means that the area being evaluated is *improving*. The second sign, WORSEN(1), begins just as IMPROVE(1) does, with a brief upward movement and orientation of the dominant fingers; but the fingers soon dip to point downward, and slide down to the lowest part of the non-dominant palm. Predictably, WORSEN(1) means that the area of evaluation is *deteriorating*. Finally, UP-AND-DOWN(1) starts in the same way as IMPROVE(1) and WORSEN(1); the dominant hand slides up and down several times along the non-dominant palm, and the dominant fingers orient themselves to point in the direction of motion. The meaning of this sign is that an area *repeatedly alternates getting better and getting worse*.

The next group of signs, which I will call the "space" group, is much like the palm group, except that there is no explicit landmark representing the vertical scale. That is, the dominant hand indicates relative quality by moving up and down in signing space, not by moving against a landmark such as the non-dominant palm. I believe that this group is derived from the palm group, because the iconic mapping is very similar: again, the dominant hand takes on the B-shape with the index finger's edge at the non-dominant side, the hand moves up and down to show improvement and worsening, and

this time.

the fingers change their orientation to point in the direction of the hand's motion. The only difference is that the non-dominant palm landmark does not appear, and signers judge relative height based on the vertical dimension of signing space itself.

Table 8.7 gives the iconic and metaphorical double mapping for the space group.

Table 8.7: Double Mapping for Space Group

ARTICULATORS	Iconic mapping SOURCE	Metaphorical mapping TARGET
vertical axis of signing space	up/down dimension	scale of relative goodness
higher locations in signing space	higher locations	better quality
lower locations in signing space	lower locations	worse quality
movement upward in signing space	movement upward	improvement
movement downward in signing space	movement downward	deterioration

It is my impression that there are no frozen signs in the space group; instead, the movement of the dominant hand freely represents the "ups and downs" of the situation the signer wishes to describe. Thus, a person's fluctuating emotional state can be described by moving the hand up and down in signing space, with the fingers oriented in the

direction of motion; this construction is demonstrated in Fig. 8.5.



Fig. 8.5: Metaphorical/iconic description of a situation that goes from better to worse and back again

The third set of signs that use IMPROVEMENT IS UPWARD can be called the "arm group": they use the non-dominant arm as their landmark for judging relative height. The double mapping for the arm group is given in Table 8.8.

Table 8.8: Double Mapping for Arm Group

Iconic mapping		Metaphorical mapping	
ARTICULATORS	SOURCE	TARGET	
non-dominant arm	up/down dimension	scale of relative goodness	
non-dominant shoulder	top of up/down scale	best possible value	
non-dominant wrist	bottom of up/down scale	worst possible value	
closer to shoulder on arm	higher location	better quality	
closer to wrist on arm	lower location	worse quality	
movement toward shoulder along arm	movement upward	improvement	
movement toward wrist along arm	movement downward	deterioration	

The signs IMPROVE(2) and WORSEN(2) use this double mapping. IMPROVE(2), illustrated in Fig. 8.6, begins with the dominant B-shape contacting the non-dominant wrist; the contact is made on the outside edge of the B's little finger. Next, the B-shape makes an arc upward and contacts the non-dominant biceps. The sign means *to improve*. WORSEN(2) uses the same hand and arm configurations and contact points, but with opposite movements: the dominant B-shape touches the non-dominant arm first at the biceps, and then at the wrist. Predictably, the sign means *to become worse*. The movements and contact points of these signs can be changed, and the changes in meaning that result are predictable from Table 8.8; for example, it is common to start the dominant B at the

non-dominant wrist and move slowly in several small arcs along the non-dominant forearm, to indicate *slow, step-by-step improvement*.

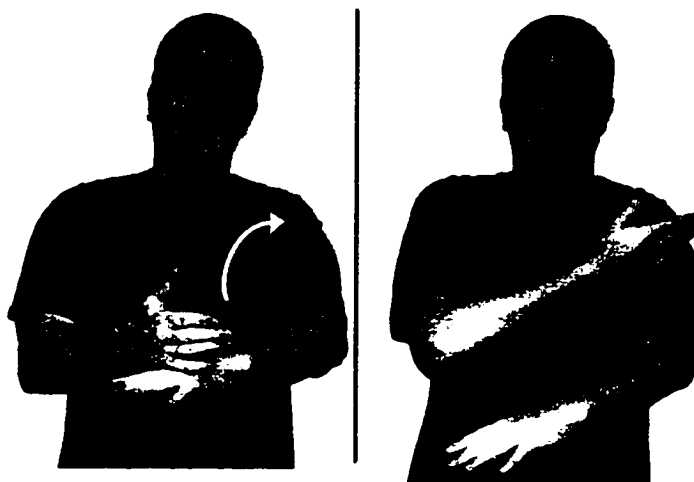


Fig. 8.6: IMPROVE(2)

This group is particularly interesting for the following reason: the arm is mobile, and changes its position with respect to true up and down. Imagine the arm hanging beside the body. The wrist is the lowest point on the arm, and the shoulder is the highest point. This is the configuration that the arm group uses to determine its forms: when the arm hangs in this way, movement toward the shoulder is the same as movement upward. But what happens when the arm takes on different positions?

It turns out that for this group of signs, "away from the wrist" always counts as "upward," no matter how the arm

is positioned in space. It is in fact quite common for the non-dominant forearm to be horizontal in signing space, since this configuration brings the hand and arm into the area where most signs are articulated. The movement pattern described above as meaning *slow, step-by-step improvement* is articulated on the forearm; more often than not, the dominant hand will actually be moving *sideways* or perhaps even *downward* in space when it performs that movement. Nevertheless, the movement is toward the shoulder, in the direction defined as *upward* along the arm; and so the movement still denotes improvement rather than worsening. (Cf. Clark 1973 for a discussion of "canonical" body positions.)

POWERFUL IS UP

The third metaphor we will discuss can be named POWERFUL IS UP (cf. Sweetser 1995 for English, Holtemann 1990 for ASL). In this mapping, the vertical axis represents relative importance and social significance; higher locations are assigned to more important people, roles, institutions, and so on. This metaphor is partially based on the experience of physical confrontations: the person on the high ground has an advantage; and the taller person also in general has the

advantage of weight and reach. Just as in IMPROVEMENT IS UPWARD, the top end of the vertical scale is given a positive value judgement: we feel that it is better to be powerful than to be without power. The metaphorical mapping is given in Table 8.9 below.

Table 8.9: Metaphorical Mapping for POWERFUL IS UP

SOURCE	TARGET
-----	-----
up/down ----- dimension	scale of relative power/importance
higher locations --	more important ranks
lower locations ---	less important ranks
movement upward ---	increasing power
movement downward -	decreasing power

This metaphor gets represented iconically in ASL in at least two ways. The most straightforward way is for the vertical up/down axis of signing space to represent iconically the up/down dimension; this is the case for the signs ADVANCE(1) and BE-DEMOTED(1). Table 8.10 gives the double mapping shared by these two signs.

Table 8.10: Double Mapping for ADVANCE(1), BE-DEMOTED(1)

ARTICULATORS	Iconic mapping Metaphorical mapping	SOURCE	TARGET
vertical axis of signing space	--	up/down dimension	----- scale of relative importance
higher locations in signing space	--	higher locations	-- more important ranks
lower locations in signing space	---	lower locations	--- less important ranks
movement upward in signing space	---	movement upward	--- increasing power
movement downward in signing space	-	movement downward	- decreasing power

In both of these signs, the hands articulate a bent-B shape, with fingers together and bent only at the first joint beyond the palm. The palms face each other, and the plane of the fingers defines a horizontal "level" in signing space. For ADVANCE(1), shown in Fig. 8.7, the fingers start at a low level, then rise to a higher level; the sign means *to be promoted or to have high status*. For BE-DEMOTED(1), the movement and meanings are reversed: the fingers start at a high level and descend to a lower level, denoting *to be demoted or to have low status*.

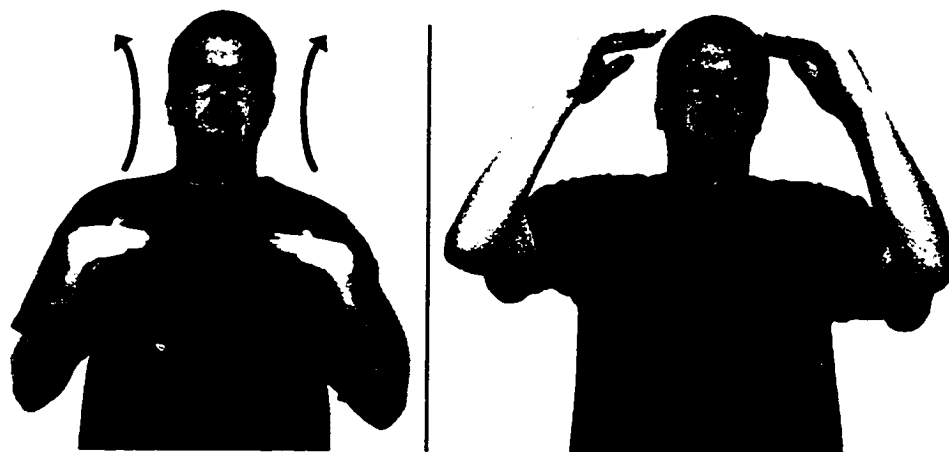


Fig. 8.7: ADVANCE(1)

The second iconic representation of POWERFUL IS UP is used by ADVANCE(2), BE-DEMOTED(2), and the signs for levels in school (FRESHMAN, SOPHOMORE, JUNIOR, SENIOR); these signs draw on the device of using the non-dominant hand as an "ranking" landmark (cf. Liddell 1990). In this use, the non-dominant hand is held palm inward; the thumb points up, and the fingers are spread, so that the little finger angles toward the dominant side and downward. Each finger (or fingertip) represents a "rank"; rank increases in order from

the little finger (lowest rank) to the thumb (highest rank).⁵⁵ When the non-dominant hand is held in this way, the relative heights of the fingers basically correspond to their ranks as predicted by POWERFUL IS UP; there is a slight deformation, as the thumb is not exactly above the other fingers. The metaphorical/iconic double mapping for this ordering device is given in Table 8.11.

Table 8.11: Double Mapping for Ranking Device

ARTICULATORS	Iconic mapping SOURCE	Metaphorical mapping TARGET
"vertical" axis of non-dominant spread hand's fingers	up/down dimension	scale of relative importance
higher fingers on hand (starting with thumb)	higher locations	more important ranks
lower fingers on hand (starting with little finger)	lower locations	less important ranks

The signs for FRESHMAN, SOPHOMORE, JUNIOR, and SENIOR years in school are based on this metaphorical/iconic ranking device: for FRESHMAN (Fig. 8.8a), the dominant palm contacts the non-dominant ring finger; for SOPHOMORE (Fig. 8.8b), it

⁵⁵ There are ordinal uses of the non-dominant hand where the counting begins with the thumb; cf. Liddell (1990).

contacts the middle finger, and so on. It is clear from the use of the ranking device that FRESHMAN refers to a level that is fourth from the top, SOPHOMORE is third from the top, etc.

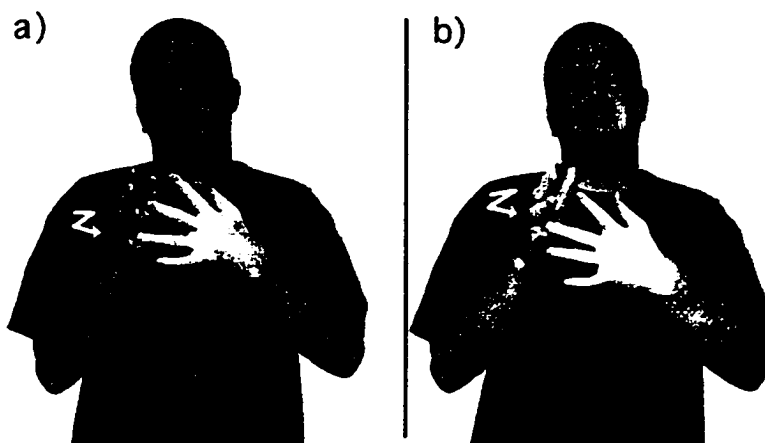


Fig. 8.8: a) FRESHMAN, b) SOPHOMORE

Along with the ranking device, ADVANCE(2) and BE-DEMOTED(2) also incorporate a metaphorical use of the bent-V "legs" classifier, which has the handshape of index and middle fingers extended and slightly bent at all joints. This handshape, in its normal iconic classifier use, describes the movement of a two-legged creature (that is, a human) from one place to another. Here, the movement of this handshape is used metaphorically to represent a person

changing from one rank to another.⁵⁶ Table 8.12 gives the complete iconic and metaphorical mappings for these two signs.

Table 8.12: Double Mapping for ADVANCE(2) and BE-DEMOTED(2)

ARTICULATORS	Iconic mapping SOURCE	Metaphorical mapping TARGET
vertical axis of non-dominant spread hand's fingers	up/down dimension	scale of relative importance
higher fingers on hand (starting with thumb)	higher locations	more important ranks
lower fingers on hand (starting with little finger)	lower locations	less important ranks
bent-V handshape	referent person	referent person
bent-V moves to higher finger	person moves to higher location	person changes to more powerful rank
bent-V moves to lower finger	person moves to lower location	person changes to less powerful rank

For ADVANCE(2) (Fig. 8.9), the bent-V handshape begins at the little finger of the non-dominant hand, then moves upward and to the side until it reaches the non-dominant thumb.

Conversely, for BE-DEMOTED(2), the bent-V begins at the thumb and moves sideways and downward along the "ranks" until it

⁵⁶ This metaphor, STATES ARE LOCATIONS, exists in all the languages that metaphor analysts have looked at. Lakoff (1992) presents a detailed analysis of its structure in English. STATES ARE LOCATIONS has

reaches the little finger. The meanings of these signs are completely predictable from the double mapping of Table 8.12: ADVANCE(2) means *for a person to change to a more powerful rank*, and BE-DEMOTED(2) means *for a person to change to a less powerful rank*.

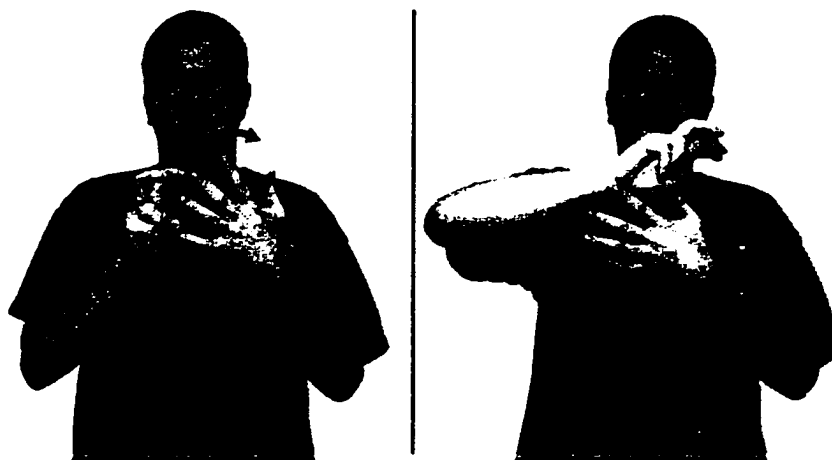


Fig. 8.9: ADVANCE(2)

SPECIFIC IS DOWN

The final metaphor we will discuss in this chapter can be given the name SPECIFIC IS DOWN; it uses the vertical

a long, detailed mapping in ASL as well as in English; space does not

scale to describe the domain of information and knowledge (cf. Lakoff & Johnson 1980, Sweetser 1995 for an English version). Some of the signs that participate in this metaphor are SURFACE, DEEP, and ANALYZE. As we shall see, this mapping is different from the others we have looked at: the vertical scale is seen as a measure of *depth*, not *height*. That is, for this metaphor, the vertical scale begins in the middle of signing space and proceeds downward.

The metaphorical mapping for these signs is not based on the experience of stacking up objects to make a tall pile; instead, it is based on the experience of digging downward into the earth to find buried objects. (Another name for the metaphor could have been FINDING OUT IS DIGGING.) Table 8.13 lists the source/target correspondences for this metaphor.

permit its presentation here.

Table 8.13: Metaphorical Mapping for SPECIFIC IS DOWN

SOURCE	TARGET
surface -----	simplest, most summarized information
area below surface -----	information that requires effort to figure out
digging or descending below surface -----	figuring out more details
scale of depth below surface ----	scale of degree of detail
closer to surface (=higher) -	less detail
deeper below surface (=lower) -----	more detail

As we can see, in this mapping, people work hard to get to *lower* levels, not to *higher* levels; there is a positive value to being lower on the depth scale. Also, though *descending* corresponds to *figuring out more details*, *rising* does not correspond to the opposite, *forgetting more details*. This comes from our knowledge about digging for hidden objects: once we have excavated deeply enough to find the object, the object is *found*; we still know where and what it is when we return to the surface. In the source domain, *rising* does not function as the opposite of *descending*; therefore, *rising* cannot be mapped as the opposite of *figuring out details* in the target domain.

The signs SURFACE and DEEP have essentially opposite meanings; the first denotes a brief, summarized, even superficial analysis, while the second denotes a long, involved, detailed analysis. These signs partially share a metaphorical/iconic mapping: both use the non-dominant B hand, palm down, as a landmark representing the metaphorical "surface." This surface acts as a "reference level"; the dominant hand's vertical location, which represents the actual level of detail being described, is compared to the vertical location of the reference level. This double mapping is given in Table 8.14.

Table 8.14: Double Mapping for SURFACE and DEEP

ARTICULATORS	Iconic mapping Metaphorical mapping SOURCE	TARGET
non-dominant B-hand	surface as reference level 	simplest, most summarized information
locations below non-dominant B-hand	area below surface 	detailed information requiring effort to figure out
level of dominant hand	actual depth level being described	amount of detail in the current information
dominant B-hand co-located with non-dominant B-hand	actual depth level located at the surface 	current information has minimal detail
dominant 1-CL descends below surface	actual depth level descends below surface 	current information contains more and more detail

For SURFACE (Fig. 8.10), the dominant B-hand, palm down, rubs the top of the non-dominant B-hand, which is also palm down. Here, the dominant and non-dominant hands are co-located at the level which iconically represents the "surface" of the depth scale; this level metaphorically corresponds to the least possible amount of detail. For DEEP (Fig. 8.11), the dominant 1-CL, index finger extended downward from a fist, starts at the non-dominant B-hand and moves downward with a slight wiggle. (The wiggle is part of the iconic resources of ASL, and represents *movement over a long distance*.) Thus, in DEEP, the dominant hand's depth level, and therefore the amount of detail in the information, is portrayed as very

large.

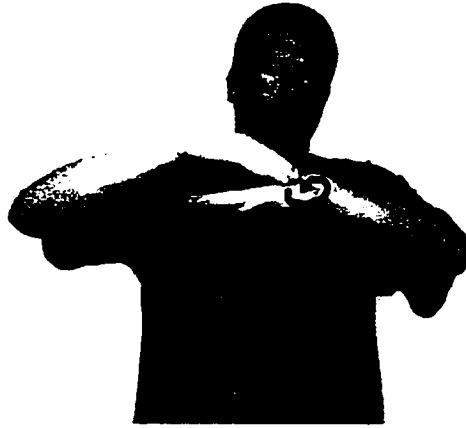


Fig. 8.10: SURFACE

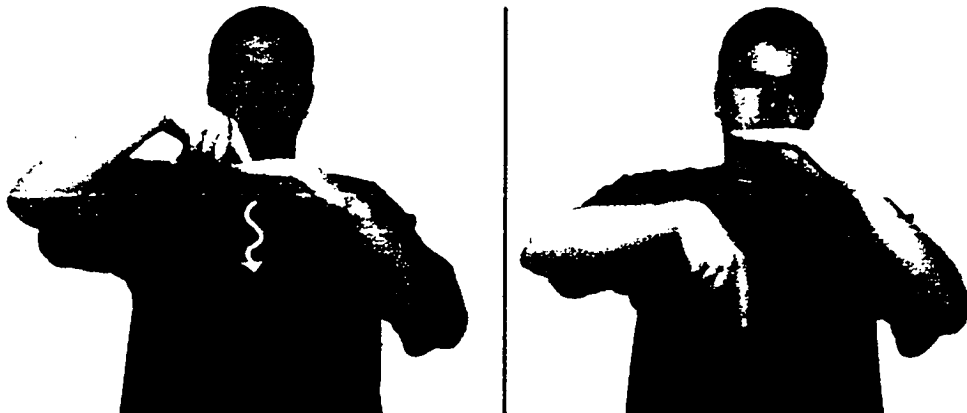


Fig. 8.11: DEEP

The third example of SPECIFIC IS DOWN, ANALYZE (Fig. 8.12), uses a different iconic mapping. Here, the

metaphorical surface is not given an explicit representation with a flat-object classifier; instead, the hands portray the "digging" movement necessary for penetrating downward beneath the surface. The double mapping is given in Table 8.15.



Fig. 8.12: ANALYZE

Table 8.15: Double Mapping for ANALYZE

ARTICULATORS	Iconic mapping SOURCE	Metaphorical mapping TARGET
bent V-hands' initial position in signing space	surface	simplest, most summarized information
regions in signing space below hands' initial position	area below surface	information that requires effort to figure out
bent V-hands contract and descend in space	person digs and descends below surface	person figures out more details

To articulate the sign ANALYZE, both hands take on the bent-V shape: index and middle finger extended from the fist and bent slightly at every joint. The bent-V's are held, palm down and forward, at a high level in signing space; this level represents the metaphorical "surface." Next, the fingers of the bent-V's contract at every joint as the hands descend slightly in signing space; this movement is repeated twice. The effect of this movement is to iconically represent the digging process, where successive layers of dirt are stripped away. Metaphorically, this represents the process of figuring out more and more details of information; as we might predict, this process is exactly what the sign ANALYZE denotes.

Different Motivations for Different Uses

We have now seen four different iconic metaphors in ASL that all use the vertical scale as a part of their source domain. It is clear, however, that the four mappings use the vertical scale in different ways. Some discussion of the "positive-end-up" type and the "positive-end-down" type is in order (and see also Sweetser 1995 for more details).

The positive-end-up type derives (at least in part) from

the basic metaphor MORE IS UP. This mapping is widespread and deeply entrenched in the languages of the world. MORE IS UP is based on the universal experience of adding objects to a pile and noticing that the top of the pile gets higher; this experience naturally associates greater quantity with higher levels on the vertical scale.

Metaphors like POWERFUL IS UP are partially based on MORE IS UP, in that *more* power or status is mapped as being *higher* on the vertical scale. Other experiences contribute to this metaphor as well, including (as noted above) the benefit of height and high ground in a physical fight.

Since we value power and status, in POWERFUL IS UP we view the higher end of the vertical scale as being better than the lower end of the vertical scale. This kind of metaphor, which puts together the notion of MORE IS UP with some desired quality like POWER, is also extremely common in the languages of the world. Since these metaphors value the high end of the scale over the low end of the scale, they naturally lead to the next metaphor, IMPROVEMENT IS UPWARD.

IMPROVEMENT IS UPWARD, another common metaphor, is indirectly based on MORE IS UP, and more directly based on groups of metaphors that define *more* of some *good quality* as *up*. When enough of these metaphors exist, the high end of the vertical scale itself become strongly associated with good qualities. Thus, *good* in general comes to be seen as

up, and *improvement as movement upward*.

The positive-end-up metaphors derive, directly or indirectly, from MORE IS UP. SPECIFIC IS DOWN, a positive-end-down metaphor, comes from another lineage altogether. It is not in any way based on the experience of piling up objects; instead, it is based on the experience of digging down below some surface to find hidden objects. Though the vertical up/down dimension is crucial to this metaphor, it is used in a very different way: the valued end of the continuum is at the bottom, and *movement upward* does not even participate in the mapping.

The moral of this story is that it is not enough to simply talk about "vertical scale" metaphors. Metaphors that use what seems to be the "same" source domain can be very different from each other. They may be based on different kinds of experiences, and produce different valuing and interpretations of the elements of the source domain. It is crucial to treat each metaphor on its own terms, carefully gathering examples and constructing individual, self-consistent mappings; one cannot lump metaphors together and assume that their details will be the same.

Chapter 9: Verb Agreement Paths in ASL

ASL Verb Agreement

Now that we understand how iconicity and conceptual metaphor function, and how they work together in signed languages, we are ready to tackle one of the unsolved issues of ASL's grammar: *verb agreement*. This topic concerns how some ASL verbs move in space from an area representing one referent to an area representing another referent.⁵⁷ Most linguists talk about this phenomenon as if the two end-points of the movement were all that mattered; they refer to it as "incorporation" of the referents' loci into the verbs' movement patterns. I prefer to discuss it in terms of the verb's entire movement: in my analysis, the verb traces a path from one referent to the other that is specified by the verb's semantics.⁵⁸

In this discussion we will be limiting ourselves to frozen or lexicalized ASL verbs, and not discussing

⁵⁷ We are concerned only with person/number agreement here, not movements that result from aspectual inflections or "distributional" inflections (cf. Padden 1988).

⁵⁸ Some verbs which are considered to be of this type do not actually move from one referent to the other. Instead, they orient their handshapes so that the palm and fingers face one referent and the back of the hand faces the other referent. Most treatments of verb agreement class these verbs together with verbs that move without further comment; for lack of space, I will do the same here. They are equally difficult for treatments based on locus incorporation as for my path-based

classifier forms (which have their own iconic principles for incorporating movement). There are several different "systems" within ASL for determining how verbs move; all are highly iconic, and some are metaphorical as well. Some are based on the verb's semantics in a clear and obvious way, and others have taken on layers of conventionalized structure on top of the direct semantic motivation. Earlier linguists (e.g., Friedman 1975, Gee & Kegl 1982) have tried to put forward semantically-based theories of verb agreement; but the complexities of the system were too difficult to handle at that time (cf. Padden's 1988 rebuttal to Friedman). Yet ASL verb movement is deeply rooted in semantics. With our new understanding of iconicity and metaphor, and with the tools of cognitive linguistics (especially frame semantics and prototype theory) we are ready to begin unraveling this tangled area.

The Semantics of Verbs

Let us start with a bit of background on the semantics of verbs. As many cognitive scientists have noted (e.g., Fillmore 1982, Schank & Abelson 1977, Lakoff 1987), our

treatment. We can think of them as indicating the direction of their

information about the world comes in bundles or "frames" that are basically self-contained (see also Chapter 2). The meanings of words can be set out most clearly by referring to one of these frames. For example, to understand the English phrase *third base*, one needs to know about the game of baseball, its rules and equipment; without that frame, the concept cannot be easily defined. Frames can be extremely complex, including long scenarios with many characters (e.g., *baseball, dining at a restaurant, the U.S. government*); or they can be quite simple, involving only a scale or other simple relation (e.g., *size, color, distance*).

Verbs (for the most part) refer to frames where there is a relationship that is either ongoing or changes over time; in the frame's scenario, some entity does something or exists in some state, affecting either only itself, or one or more other entities. The verb refers to the scenario, and picks out one or more of the entities which it pays special attention to. These entities are called the "arguments" of the verb. For example, in the frame of *hitting*, one entity forcefully contacts another entity; the English verb *hit* takes both entities as arguments, as in the sentence *John hit the wall*. In the frame of *restaurants*, which contains waiters, customers, menus, tables, food, and so on, the verb

paths by which way they "point" their fingers and palms.

order takes "customers" and "food" as arguments, as in *Lucy ordered a sandwich*.

As we can see from the restaurant example, the verb need not involve as arguments all the entities in the frame. Verbs pick out certain aspects of the frame to focus on (Langacker 1987 would say they *profile* those aspects); only the profiled entities are chosen as arguments. Thus, the verb *order* (in the restaurant scenario) profiles the customers and the food, while treating the cooks and tables as "backgrounded" information, important for comprehension yet not specifically mentioned.

Different verbs can highlight variations on a scenario. For example, there is a frame of *transferring objects*, where an object begins with one person and ends up with another person. Many English verbs refer to that frame, and many of them refer to particular variations of the basic scenario. The verb *give* treats the original owner as the active party in the transfer, while the new owner is a passive recipient; conversely, the verb *take* treats the new owner as active and the original owner as passive.

Though semantic frames describe many different kinds of actions and states, there are some types of structure that many frames share. For example, many frames have one entity which acts so as to affect another entity. In the frame of *hitting*, the "hitter" is that actor; in the frame of *digging*,

it is the "digger"; and so on. Linguists have found it useful to give a name to that kind of actor; they call it an *agent* (abbreviated AGT) and refer to it as a *semantic role* or *role archetype* that appears in many frames (cf. Fillmore 1968, Langacker 1991).

There are a number of semantic roles that frames share. The ones that concern us here are *agent* (AGT), the effector of some change; *patient* (PAT), an entity that undergoes a change of state; *theme*, an entity that moves, is located, or is the subject of perception; *experiencer* (EXP), a person who perceives or feels some stimulus; *source*, the location from which some literal or metaphorical object moves; and *goal*,

the location to which some literal or metaphorical object moves.⁵⁹

Let me briefly give prototypical examples of these roles, using English sentences. In *Alice hit Betsy*, *Alice* is an AGT and *Betsy* is a PAT. In *The ball rolled from the table to the door*, the *ball* is a THEME, the *table* is a SOURCE, and the *door* is a GOAL. In *Lucy hates ice cream*, *Lucy* is an EXP and *ice cream* is a THEME.

My use of semantic roles follows Langacker 1991b (and cf. Fried 1995). Many linguists (e.g., Fillmore 1968) assign one role to each argument of a verb; this is useful for certain kinds of linguistic theories. Thus, for the English verb *give*, the "giver" would be considered to be an AGT but not a SOURCE, even though the "giver" fits the definition of this other role as well. For me, however, the AGT/PAT, SOURCE/GOAL, and EXP/THEME pairs of roles draw on different cognitive structures (or *schemas*); there is no reason why a verb's meaning should not incorporate more than one of these structures. AGT and PAT have to do with the schema of *willful action and its effects*, SOURCE and GOAL have to do with *movement from place to place*; and EXP and THEME have to do with *mental experience due to some stimulus*. The English verb *give*, in its prototypical sense of object-transfer, uses

⁵⁹ I will follow the convention of putting the names of the roles in

at least two of these structures; the "giver" is thus AGT and SOURCE at once. The two schemas for these roles are not correlated in any necessary way, and can recombine in other patterns; thus, *take* has an AGT/GOAL argument.⁶⁰

In this chapter, we will find it useful sometimes to talk in terms of the generic semantic roles (AGT, PAT, etc.) and sometimes in terms of the roles that are specific to each frame (*giver*, *mover*, etc.). We will see that ASL's verb agreement structures draw on patterns from both levels. As we discuss each verb, its frame and scenario will be briefly described, along with its arguments, roles, and the point of view it imposes.

Three Types of Verbs in ASL

There are two main strategies that structure the movement of ASL's verbs. Many linguists (starting with Padden 1988) have noticed how verbs pattern and made this distinction; some have attributed it to syntactic factors, but I will give here my own semantics-based summary. The first strategy is strongly iconic, and the second is

capital letters.

⁶⁰ I also follow Langacker (1991b) in treating the "receiver" in the giving frame as an EXP: this captures the change in the receiver's

metaphorical and iconic. They have been discussed as if they spring from different principles; but as we will see, they are both based on partial iconic representations of the verbs' frames.

Under the first strategy, verbs iconically trace out the path of some "mover" object, or THEME, from one place to another. This strategy motivates the movement patterns of what have been called "spatial" verbs (Padden 1988) such as RUN or TRAVEL: the verb starts at a locus in signing space that represents the THEME initial location in some mental space, and moves to another locus representing the THEME's stopping place in the mental space.

Verbs that use this strategy map the mental space onto every point along the verb's path: small differences in the path taken by the verb correspond to small differences in the path in the mental space, and thus to changes in the verb's meaning (Padden 1988). We could say that their mapping of the mental space onto the signing space is *complete*: it faithfully represents relative distances and locations.

For example, consider the verb RUN (Fig. 9.1). If the signer has already established loci in signing space for his or her home and a store, RUN can move from the first locus to the second, with the meaning "run from home to the store."

internal mental state as she or he gains a new possession. The receiver

But the verb can also move part-way along this path, with meanings such as "run from home half-way to the store," or "run from home almost all the way to the store"; the distance along the path in signing space corresponds directly to the distance of running that the verb asserts.

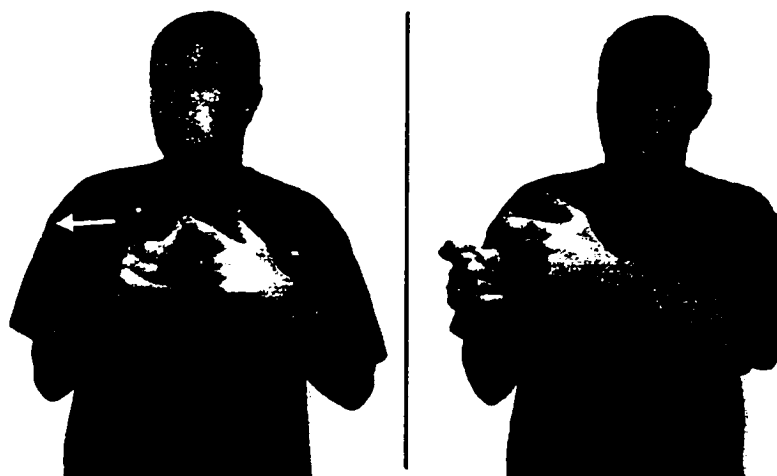


Fig. 9.1: RUN

The second strategy, as it is usually described, is based not on the literal movement of some object from place to place, but instead on the notion of agency -- that is, of how one entity affects another entity.⁶¹ In ASL verbs describing situations where one entity affects another (e.g., *flattering, bothering, defeating*) the verb moves from the

is thus SOURCE/EXP. (Cf. the section on EXP/THEME verbs below.)

locus of the affecter or AGT to the locus of the affected one or PAT. This type of verb has been called an *agreement verb* (R. Johnson & Liddell, 1987; Padden 1990), and its movement pattern has been sharply distinguished from the pattern of spatial verbs. Verbs like DEFEAT (Fig. 9.2 below) and BOTHER are in this category; these verbs have AGT and PAT as arguments, not THEME, SOURCE, and GOAL.

The mapping of signing space is less iconically complete for agreement verbs than for spatial verbs: only the loci representing the verb's arguments are mapped, not the surrounding space; thus, small changes in the verb's path in signing space do not make any changes to the verb's meaning (Padden 1988). The path is not given a complete mapping onto signing space; relative locations and distances are not preserved.

For example, consider the agreement verb GIVE (Fig. 9.3 below). If the signer has set up loci for two people (let us call them Alice and Betsy), movement of the verb from Alice's locus to Betsy's locus would mean "Alice gives (something) to Betsy." Yet movement of the verb *part-way* along this path does not change the verb's meaning (conceivably to something like "Alice gives (something) partially to Betsy"); instead,

⁶¹ This pattern is often described in terms of the grammatical relations *subject* and *object*, rather than the semantic roles AGT and PAT. I prefer the semantic analysis, for reasons described in note 4.

the verb still means "Alice gives (something) to Betsy" no matter what percentage of the distance along the path has been covered.

The basis for agreement verbs' movement pattern has not previously been understood, and most accounts simply assert it to be "natural" that the verb would move from AGT to PAT. In fact, this pattern is also based on the movement of objects from one locus to another, but the movement and the objects are metaphorical rather than literal.

Let me say a few words about how this works; we will go into more detail in the section on DEFEAT. In many languages, *affecting someone* is metaphorically described as *giving that person an object* (cf. Lakoff 1992); for example, English *The noise gave me a headache* means that *the noise affected me, causing my head to hurt*. In this mapping, the effect is seen as a metaphorical object which moves from the actor or AGT to the affected one or PAT; PATs are treated as if they were recipients of objects. This metaphor underlies the movement pattern of ASL's agreement verbs: the verbs iconically trace out the path of the metaphorical object from AGT to PAT.

Thus, ASL verbs are typically divided into three classes: plain, spatial, and agreement verbs. The distinction is often simply asserted, without any semantic justification. If one were given, it would look like this:

plain verbs do not incorporate referents' loci at all; spatial verbs trace an iconic, completely-mapped path between two loci for locations; and agreement verbs trace a metaphorical/iconic, incompletely-mapped path from AGT's locus to PAT's locus. The reason that the semantic justification is not given is simple: as stated, it doesn't work. The semantic grounding for the "agreement" class, in particular, is problematic: many agreement verbs do not have AGT and PAT arguments, or travel in the "wrong" direction. Also, there is no explanation of why some verbs do not move at all.

These difficulties have caused many theorists to abandon a semantic explanation. But it is now possible to make this explanation work. The crucial thing to notice is that all these verbs trace a path in the verbs' semantics: the spatial verbs are the simplest and have only one highly literal, vivid path; the agreement verbs are more messy and often have several conflicting paths. With this understanding, we can indeed predict verb type and path direction from the verb's semantics.

Semantic Basis for the Three Types: Janis (1995)

Janis 1995 figured out the first part of the puzzle: how do we know whether a verb will move at all? And if it moves, will it map space completely (as a spatial verb) or incompletely (as an agreement verb)?⁶²

To answer these questions, we must look at the verb's arguments. It is simplest to figure out when a verb will be a spatial verb: according to Janis, verbs will follow the spatial agreement pattern "...whenever the location of [an argument] influences how the action (or state) expressed by the verb is characterized." (p.216) In other words, let us say that a verb refers to exact locations in some mental space; in ASL, that verb will map those locations *and their relationship to each other* onto signing space. This produces the pattern noted above: small variations in the paths of spatial verbs, or verbs concerned with exact locations, create small variations in the verbs' meanings. We can look at this as a principle of iconic primacy: the verbs with the

⁶² Janis makes her explanation in terms of theoretical constructs such as *locative case* and *direct case*; I am reframing her work without these constructs, drawing instead on our understanding of iconicity, metaphor, and conceptual mappings. In her terms, *nominals with locative case impose locative agreement*; in my terms, *arguments concerned with location impose a full iconic mapping onto signing space*. In her terms, *nominals with direct case can impose direct-case agreement*; in my terms,

most concrete, specific envisioning of space are exactly those verbs which map space most completely.

It is important to notice, as Janis did, that location can be important to verbs at some times but not at other times; this explains why we see ASL verbs that sometimes act as spatial verbs, and at other times like one of the other categories. We can divide verbs into three types. Verbs like RUN, which always consider exact location to be important, will always be spatial verbs, imposing a fully metric mapping of signing space. Verbs like HATE, which never consider exact location to be important, will never be spatial verbs. But verbs like SIT and STEAL can take on two distinct patterns.

Signers can use SIT to focus on the exact location where a person sits down; at those times, SIT acts like a spatial verb, moving to the locus representing the specific seat. But signers can also use SIT *without* focusing on the exact location, simply using it to report a change in posture; at those times, SIT acts like a plain verb, articulated in the "neutral space" in front of the signer. Similarly, STEAL can incorporate the locus where the stolen object was located (e.g., a place in a house that has been set up in signing space); in this use, it functions as a spatial verb. But it

arguments that are not concerned with location can impose a partial

can also incorporate the locus of the person from whom the object was taken; at these times it functions as an agreement verb.

To summarize: ASL has conventionalized some verbs as always indicating exact location; these verbs always impose a metric mapping onto signing space. Other verbs are conventionalized as never indicating exact locations. And some verbs, as we see with SIT and STEAL, are allowed to indicate exact location or not, depending on the specific meaning the signer wishes to convey.

It is relatively simple to tell whether a verb will take "spatial" agreement. The more difficult task is figuring out whether a non-spatial verb will be an "agreement" or a "plain" verb. A number of different factors influence this choice, mostly from the verbs' semantics but in one case from the verb's form.

Spatial verbs, as we have seen, have THEME and locational arguments. If a verb has AGT, PAT, GOAL/EXP (i.e., "recipient"), or EXP arguments, according to Janis, it will be an agreement verb, moving in space to or from its arguments' loci -- with two major exceptions. First, if the PAT argument is not animate, or not able to be understood as a "person" metaphorically, the verb will not take agreement.

iconic mapping onto signing space.

Second, if one of the verb's arguments is an EXP, and the verb is "body-anchored" (i.e., must be articulated at, or move to or from, a specific part of the signer's body), the verb will not take agreement. It is possible to give motivated explanations for these exceptions (and Janis offers some), but space does not allow us to go into them here.

The main point is that criteria do exist for predicting the agreement behavior of ASL verbs. It is not necessary to simply declare that verbs arbitrarily belong to one of three classes; instead we can predict their behavior on (mostly) semantic grounds. The complete iconic mapping used by spatial verbs is thoroughly motivated; these are exactly the verbs whose semantics involves precise specification of locations. Similarly, the less-complete mapping used by agreement verbs is also motivated; these verbs care less about precise locations and more about interactions between entities. Moreover, the fact that verbs can switch classes is motivated: the verbs map space in the way that fits the semantics they are expressing.

Direction of Movement: Paths in Signing Space

Now we know how and when a verb will impose a mapping of a mental space onto signing space. Our next task -- and the

main advance of this chapter -- is to look at certain oddities about the direction of the verb's movement.

Spatial verbs are simple: they always trace the iconic path of their THEME argument, moving from the locus of the THEME's starting point to the locus of the THEME's ending point. Agreement verbs, on the other hand, can be odd. According to the standard semantic analysis (given above), agreement verbs should move from AGT to PAT arguments. But a small but significant number of them (e.g., BORROW, STEAL, COPY) move toward their AGT argument. Padden (1988) named this type of verb "backwards," because the movement is opposite to what is expected.⁶³ Linguists have tried a number of strategies for dealing with the movement patterns of these "backwards" verbs, from Friedman's (1975) early semantic approach, to Padden's (1988) purely formal (and non-explanatory) approach. At this point, we are ready to undertake a complete semantics-based explanation for their behavior.

The reason why "backwards" verbs move as they do is easy to see intuitively: they are iconic, and they trace the path

⁶³ The "forwards/backwards" distinction has usually been made in terms of the grammatical relations *subject*, *object*, and *indirect object*: forward verbs move from subject's locus to object or indirect object's locus, and backward verbs move in the reverse direction. I am avoiding these syntactic terms and framing my analysis in terms of semantic roles such as AGT and PAT, for two reasons. First, the semantic analysis works and is arguably less complicated; and second, like Engberg-

of some object in a mental space. For example, STEAL traces the path of the stolen object from EXP/SOURCE (the victim) to AGT (the thief).⁶⁴ But we need some sophistication to make this approach work, particularly with "backwards" verbs such as COPY and TAKE-ADVANTAGE-OF, which do not involve the movement of any concrete object in physical space. We need to know the conditions for when an "objectless" verb will move from AGT to PAT, as with DEFEAT, and when it will move from PAT to AGT, as in TAKE-ADVANTAGE-OF.

The following discussion will show that there is a delicate balance for agreement-type verbs that determines the direction of their movement. I claim that *all* agreement verbs trace out a literal or metaphorical path from their semantic frame. A number of verbs, including the "backwards" ones, have two or more paths in their frames; I provide a semantic hierarchy that can predict which path the verb will follow. Taken together with Janis (1995), this discussion will give a complete account of metaphorical/iconic paths in ASL verbs: we will be able to predict on semantic grounds

Pederson (1993), I have doubts that the grammatical terms have been shown to be appropriate for ASL.

⁶⁴ As noted above, STEAL has two different agreement patterns: moving from "victim" to "thief," and from "stolen object's initial location" to "thief." Verbs like TAKE and BORROW show the same two patterns, sometimes originating at the EXP/SOURCE's location and sometimes at the THEME's initial location. In the rest of this chapter, I will only treat the first pattern; but the second pattern is equally if not more strongly motivated by the verb's semantics, and poses no problems for my analysis.

whether a verb will incorporate an iconic path movement, whether it will be of the "spatial" or "agreement" types (i.e., how much of an iconic mapping it will impose on signing space), and which direction the verb will move (i.e., which path it will take if two possibilities are in conflict).

DEFEAT: the action-chain path

We will structure our discussion of movement direction by going through a series of verbs whose frames are more and more complex. The entire discussion is summarized in Table 9.14, which lists all the verbs and their path directions, and Table 9.15, which gives the principles for determining path direction in case of a conflict. But let us start slowly by considering the simplest cases first.

The verb DEFEAT is shown in Fig. 9.2, in the inflected form I-DEFEAT-HIM/HER/IT. The verb has an AGT and a PAT argument, and means *for one person (the AGT) to defeat another person (the PAT) in some contest or battle*.⁶⁵ As Janis would predict, DEFEAT is an agreement verb; it moves from AGT's locus toward PAT's locus.

⁶⁵ In describing the verbs' meanings in this chapter, I will formulate them in terms of a prototypical case where all the participants (except the literal or metaphorical mover) are "people" or animate beings. The



Fig. 9.2: I-DEFEAT-HIM/HER/IT

If we are to claim that all agreement verbs move along the path of some object in the verb's semantics, we are immediately faced with a challenge: where is the path in the semantics of DEFEAT? No object literally changes hands in the frame of *defeating*, and we would be hard-pressed even to find a metaphorical object (e.g., an *idea*, as in IDEAS ARE OBJECTS, Chapter 6; *respect*; *status*) moving from victor to loser. Yet we are rescued by one fact: for DEFEAT, an AGT acts in a way that strongly affects a PAT. Recall the widespread metaphor, mentioned earlier, that treats *effects* as *objects that move from agent to affected one*. Though the frame of *defeating* doesn't supply its own literal or

participants can of course be non-humans as well: institutions, organizations, etc.

metaphorical object, it shares with all other AGT/PAT frames the metaphorical "effects" object, which "moves" from AGT to PAT. Thus, DEFEAT does have a path available in its semantics, and it traces that path, moving from its AGT's locus to its PAT's locus. This situation is summarized in Table 9.1.

Table 9.1: DEFEAT's paths

	<u>victor</u>	<u>loser</u>
action-chain:	AGT	-->PAT
	("head")	("tail")

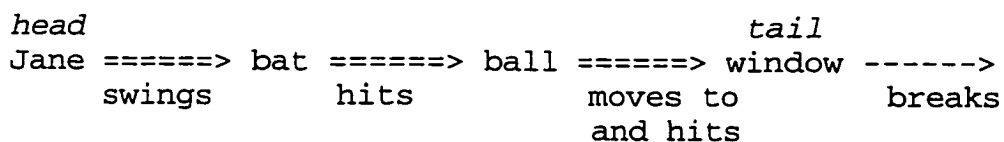
result:		----->

I will refer to the victor-to-loser path as the *action-chain* path, in reference to a cognitive model of causation that bears that name. For DEFEAT, this path leads from AGT to PAT, but that is not the only possibility.

Cognitive linguists (notably Croft 1991, Langacker 1991b) have found it useful to develop a model of how we conceptualize events. Typically, when we perceive a network of interrelated changes, movements, and other occurrences, we figure out some story about why those events took place; in general, we trace events back to some original cause effected by some particular entity.

For example, the breaking of a window pane can be seen as caused by the impact of a baseball, which was caused by the movement of the ball in a particular trajectory, which was caused by the impact of a bat against the ball, which was caused by the actions of a girl named Jane. In this scenario, *Jane* is conceived of as the original cause of the window's breaking. She is the "head" (to use Langacker's terms) of a chain of caused events which ends with the window's breaking; since the window does not affect any other entity, it is the "tail" of the chain. This chain is diagrammed in Fig. 9.3.

Fig. 9.3: Action Chain for a Complex Event



Each of the double arrows indicates that one entity is affecting the next; the single arrow at the end indicates that the window's breaking is not conceived of as affecting any other entity.

In general, any event (particularly physical, concrete events) can be broken down into an *action chain* of one or more entities each affecting the next, the first entity being

the *head*, and the last entity being the *tail*. Since, metaphorically, effects are conceived of as objects, we can speak of "effects objects" moving from entity to entity along the chain from head to tail. Thus, a metaphorical path exists from head to tail along the action chain, and it is always accessible to motivate the meaning of a verb.

Our current example, DEFEAT, has a very short action chain (shown in Fig. 9.4).

Fig. 9.4: Action Chain for DEFEAT

```

head                tail
victor =====> loser ----->
                defeats          loses (status, property, etc.)

```

The victor is the head, the loser is the tail, and there are no intermediate entities. The same is true for many verbs with AGT/PAT arguments (though often there is an intermediate entity on the chain, an *instrument* by which the AGT affects the PAT); for this type of verb, the AGT is always the head and the PAT is the tail of the action chain. We shall see in the next section that the situation is more complex for verbs like GIVE and TAKE, but the head and the tail are still readily identified.

To summarize: for verbs like DEFEAT, with an AGT argument and a PAT argument, the verb traces the action-chain path from AGT/head to PAT/tail.

GIVE: literal and action-chain paths aligned

If every verb only had one path in its semantics, ASL verb agreement would be simple and regular. But that is not the case; many verbs have two paths or even more, and these paths often run in conflicting directions.

Our next case hardly poses a problem, however. The verb GIVE, shown in Fig. 9.5 as I-GIVE(TO)-HIM/HER/IT, has two paths, but they lead in the same direction. The verb means *for someone to give an item to another person*; it has as arguments a *giver*, who is both an active AGT and a SOURCE of the object; a *receiver*, who is GOAL and EXP; and a *gift object* or THEME that passes from the giver to the receiver. In the prototypical case, the gift is a concrete object that is literally passed from giver to receiver; it is this case that determines the verb's agreement pattern.



Fig. 9.5: I-GIVE (TO) -HIM/HER/IT

The first path in GIVE's semantics is the literal path of the gift from the giver to the receiver. The second path is the metaphorical action-chain path. This requires a bit of discussion. Fig. 9.6 summarizes the action chain for GIVE.

Fig. 9.6: Action Chain for GIVE

<i>head</i>				<i>tail</i>
giver	=====>	gift	=====>	receiver
	causes		moves	changes
	motion		to	mental state

The head of this chain is the giver, who causes the object to move to the receiver. When the object arrives, it causes the receiver to experience a change in mental state: she or he is

now the owner of a new object. Following Langacker (1991b), I capture this change in state by giving the receiver the role of EXP, not PAT; but regardless of role, the receiver is still the tail of the action chain. The metaphorical action-chain path leads from head (giver/AGT) to tail (receiver/EXP).

For GIVE, then, the action-chain path and the literal path (giver to recipient) lead in the same direction. This situation is summarized in Table 9.2.

Table 9.2: GIVE's paths

	<u>giver</u>	<u>receiver</u>
action-chain:	head	-->tail
literal:	SOURCE	-->GOAL

result:		----->

There is no conflict, and predictably, the verb form moves from giver's locus to receiver's locus.

We should note here that the gift object and its path are not necessarily physical; GIVE can denote the transfer of some non-physical object like an idea or a story, or even some physical object that is too large to be literally passed from hand to hand. In these cases, we can understand the path as metaphorical. Wilcox (1993) has a lengthy discussion

of GIVE's meanings, based on extensions from the prototypical case of physical transfer by hand.

INFORM: metaphorical and action-chain paths aligned

The situation for INFORM (illustrated in Fig. 9.7 as I-INFORM-HIM/HER/IT) is much like that of GIVE: the verb's semantic frame has two paths which do not conflict. In INFORM's scenario, one person (the informer) tells another person (the learner) some information. As we have seen (Chapter 6), in ASL information can be metaphorically and iconically represented as an object that moves from informer to learner. The path of this metaphorical object is the first path in INFORM's semantics. The second path is once again the action-chain path of "effects," summarized in Fig. 9.8.



Fig. 9.7: I-INFORM-HIM/HER/IT

Fig. 9.8: Action Chain for INFORM

<i>head</i>				<i>tail</i>
informer	=====>	information	=====>	learner
	expresses		impinges	changes
			on	mental state

The informer's direct action is to express the information; the learner's perception of that information is conceptualized as an effect the information has on the learner. Thus, the AGT/informer is the chain's head, and the EXP/learner is the tail.

Both paths lead from informer to learner, and naturally enough, this is the direction in which INFORM moves. The situation is summarized in Table 9.3.

Table 9.3: INFORM's paths

	<u>informer</u>	<u>learner</u>
action-chain:	head	-->tail
metaphorical:	SOURCE	-->GOAL

result:		----->

We should notice that *both* of INFORM's paths are metaphorical -- based on COMMUNICATING IS SENDING, for the SOURCE/GOAL path and CAUSING IS GIVING, for the action-chain path -- but the first path is more specific to the frame of communication. This fact will become important when we start dealing with path conflicts. (In the rest of this chapter, we will abbreviate "specific metaphorical path" to "metaphorical path," and "action-chain metaphorical path" to "action-chain path"; this is for ease of reading and writing, and is not intended to imply that the action-chain path is not metaphorical.)

TAKE: literal and action-chain paths in conflict

At last we begin to look at those verbs which have been called "backwards." We shall see that the movement of these verbs is by no means anomalous, but is the result of a sensible resolution of path conflicts.

The verb TAKE, illustrated in Fig. 9.9 as I-TAKE(FROM)-HIM/HER/IT, means *for someone* (the "taker) *to take an item from another person* (the "previous owner"). Here the AGT/taker is a GOAL, not a SOURCE; and the previous owner is a SOURCE, not a GOAL. This is because the taken object moves from previous owner to taker, while the taker is seen as the active cause of the movement.

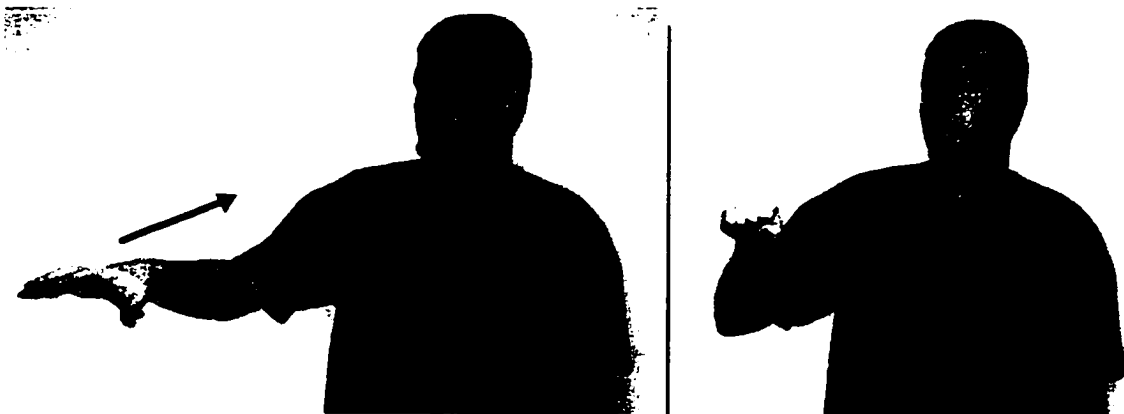
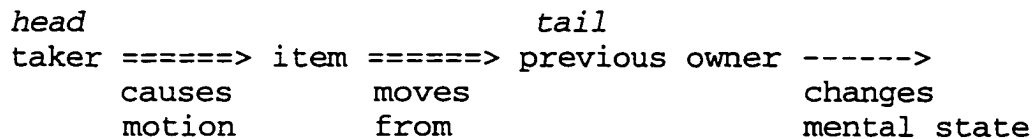


Fig. 9.9: I-TAKE(FROM)-HIM/HER/IT

The action chain for TAKE is diagrammed in Fig. 9.10.

Fig. 9.10: Action Chain for TAKE



Just as for GIVE, the head of the path is an AGT causing the movement of the item; and once again, the movement causes a mental experience for the previous owner or SOURCE/EXP; the only difference is that this time the experience is the loss rather than the acquisition of a possession.

The two paths in TAKE's semantics are aligned in opposite directions. The literal path of the taken object leads from previous owner (SOURCE) to taker (GOAL), but the action-chain path leads from taker (head) to previous owner (tail). This situation is summarized in Table 9.4.

Table 9.4: TAKE's paths

	<u>taker</u>		<u>previous owner</u>
action-chain:	head	-->	tail
literal:	GOAL	<--	SOURCE

result:		<-----	

How does ASL resolve this conflict? We could imagine several possibilities: for example, ASL could have a rule that both paths are represented, or that the action-chain path always "wins." Neither of these is the case: as we can see from Fig. 9.9 and Table 9.4, TAKE follows the path of the literal object from affected party to agent. This is our first data point in figuring out the hierarchy for resolving path conflict: when a literal path and the action-chain path conflict, the literal path "wins." Other verbs of this type, with a literal path and the action-chain in conflict, include STEAL and QUIT-FROM; both of these verbs move from tail to head in terms of the action chain.

QUOTE: metaphorical and action-chain paths in conflict

The verb QUOTE is illustrated in Fig. 9.11 as the inflected form I-QUOTE-HIM/HER/IT. This verb means *for one person to say/sign/write what another person said/signed/wrote*, and it emphasizes the fact that the first person (or "quoter") knows that the other person made the comment first. QUOTE's arguments include the quoter (AGT/GOAL), the quoted material (THEME), and the originator of the material (SOURCE). In some sense, the quoter is

"taking control" of the quoted material, by using it for his or her purposes; before the event of quoting, the originator was the only "controller" of the material.

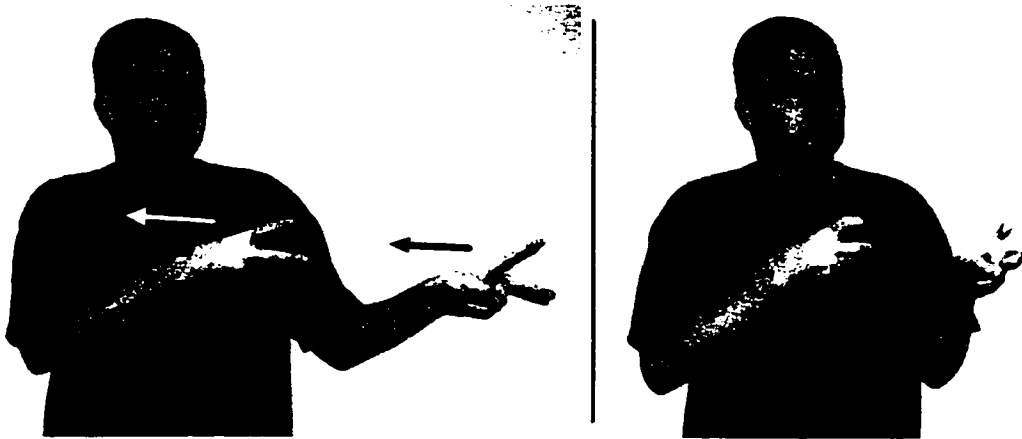
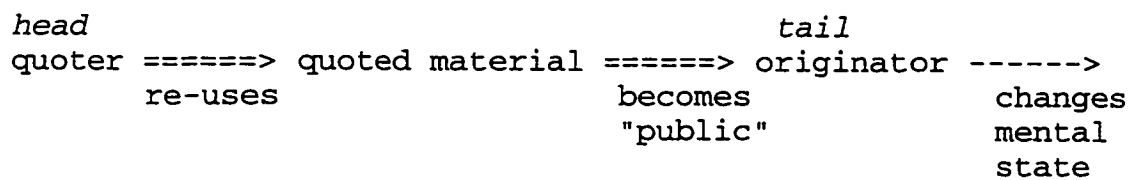


Fig. 9.11: I-QUOTE-HIM/HER/IT

The action-chain path runs from the quoter to the originator, as shown in Fig. 9.12.

Fig. 9.12: Action Chain for QUOTE



The quoter's primary effect is on the material which she or he re-uses; the effect of the re-use on the originator is admittedly indirect or subtle, but it still can be conceptualized as causing a mental experience for the originator (i.e., the experience of being quoted).

There is a second path here as well: the quoted material is understood as a metaphorical THEME object which "moves" from the originator to the quoter. (The COMMUNICATING IS SENDING data in Chapter 6 provide independent evidence for this claim.) A new metaphor is used here as well: *being located near an entity* is used to represent *being controlled by an entity*. As the quoted material "moves" from originator to quoter, it comes under the control of the quoter.

Both the path of the "effects" object and the path of the "quoted material" object are metaphorical; they differ, however, in their degree of specificity. The action-chain path is part of the semantics of causation and the structure of events; this conceptual structure is highly generic and has few vivid details; the quoted material's metaphorical path, on the other hand, is much more specific to this particular verb's frame. Table 9.5 summarizes these paths.

Table 9.5: QUOTE's paths

	<u>quoter</u>	<u>originator</u>
action-chain:	head	-->tail
metaphorical:	GOAL	<-- SOURCE

result:		<-----

As we can see from Fig. 9.11 and Table 9.5, the verb QUOTE follows the vivid, specific metaphorical path and moves from originator to quoter, rather than from head to tail along the action chain. We can hypothesized from this example that *specific* metaphorical paths "beat" the generic action-chain path. And indeed, we find that other two-path verbs with conflicting action-chain and metaphorical paths do follow the metaphorical path: the verbs COPY and TAKE-ADVANTAGE-OF both move toward their AGT/head arguments, as the result of specific metaphorical paths in their semantics.

So far, our situation is still fairly simple: for two-path verbs, when the action-chain path conflicts with a frame-specific path, either literal or metaphorical, the action-chain path loses. But two-path verbs are not the limit of complexity. We will now move on to cases with *three* paths in the verb's semantics: the action-chain path and two others (the *frame-specific* paths).

There are a number of logical possibilities of path types, based on what we have already seen. The two frame-

specific paths can be both literal, as in BORROW, where an object goes from owner to borrower and is expected to return back again; both metaphorical, as in ASK, where asker metaphorically "sends" words to answerer, and answerer is requested to "send" other words back; or one of each, as in INVITE, where an invitation metaphorically "travels" from host to guest in the hope that the guest will literally travel in the reverse direction. We will find as well that one of these paths is often treated as the *profiled* path (i.e., the one to which the verb directs our attention) and the other is "backgrounded" (i.e., presupposed, suggested but unrealized, or in some other way a backdrop for the profiled path). With these three factors -- metaphorical vs. literal, profiled vs. backgrounded, and frame-specific vs. action-chain -- we will be able to predict in all cases the direction of the verb's path motion.

BORROW: two literal paths

I will begin by noting that there are at least sixteen different possible combinations of profiled, backgrounded, and action-chain paths, if both specific paths can be either literal or metaphorical, and can move either with or against the action-chain path. I have not found examples of all these possibilities in ASL; indeed, some of these

possibilities (e.g., two literal paths that move in the same direction) are likely to manifest as reduplicated or compounded forms of simpler verbs rather than as verbs in their own right. (For example, a situation where a person gives a gift to the same person twice would be represented by two occurrences of the verb GIVE, not by some other verb meaning *give twice*.) Others of the missing possibilities may be accidental gaps in the lexicon of ASL, or in my ASL data collection. Luckily, however, it is not necessary to examine every possible combination of parameters to figure out the principles behind the choice of in ASL verbs; and the examples we do have are the right ones for that task.

We will first consider a verb with two literal paths plus the action-chain path. This verb is BORROW, illustrated in Fig. 9.13 as the inflected form I-BORROW(FROM)-HIM/HER/IT. The frame of BORROW is complex: in this frame, an item is owned by one person; another person temporarily takes that item with the expectation that it will be returned to the owner. For BORROW, the second person (or *borrower*) is viewed as active and the owner (or *lender*) is viewed as a passive affected party. (English *borrow* is the same way, but for *lend* the owner is viewed as active.)

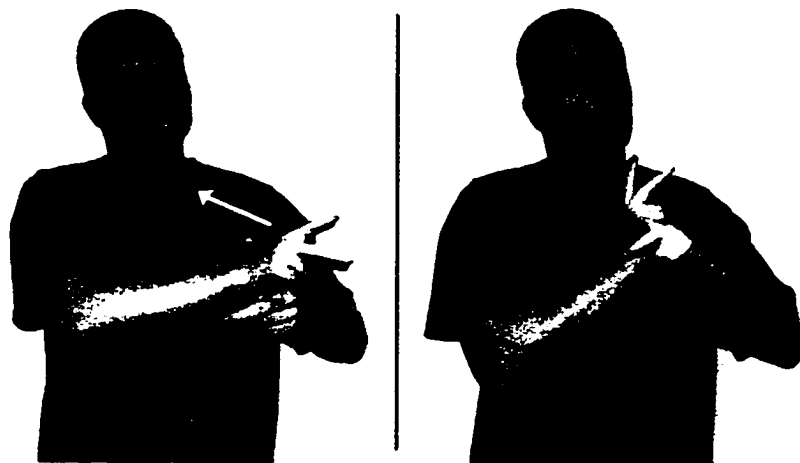


Fig. 9.13: I-BORROW(FROM)-HIM/HER/IT

The verb asserts that the item does move into the borrower's control, but it does not assert that the item actually is returned to the lender; the expectation of return is part of BORROW's background information. Therefore, BORROW profiles the path from lender to borrower, and backgrounds the reverse path.

Fig. 9.14 shows the action chain for BORROW; since this verb only asserts one path, I will assume that the action chain should only deal with that path.

Fig. 9.14: Action Chain for BORROW

<i>head</i>		<i>tail</i>
borrower	=====> item	=====> lender
	causes	changes
	motion	mental state
	from	

As we can see, the borrower is the head of the chain, and the lender is the tail.

The three paths line up as follows: the action-chain path leads from borrower to lender; the profiled path (or actual path of the item) leads from lender to borrower; and the backgrounded path leads from borrower to lender. This situation is summarized in Table 9.6.

Table 9.6: BORROW's paths

	<u> </u>	<u>borrower</u>	<u> </u>	<u>lender</u>	
action-chain:	head		-->	tail	
literal:	GOAL	<--	SOURCE		(loan)
[literal:	SOURCE	-->	GOAL]	(return)

result:			<-----		

The brackets around the second literal path indicate that it is a backgrounded path.

As we can see from Fig. 9.13 and Table 9.6, BORROW moves in the direction of the literal profiled path, not in the

direction of the literal backgrounded path or the action-chain path.⁶⁷

ASK: two metaphorical paths

The profiled path "beats" the backgrounded path when both paths are literal; now we must ask whether the same is true when both paths are metaphorical. Signs like ASK provide us with the answer to that question.

Fig. 9.15 shows the sign I-ASK-HIM/HER/IT. The semantic frame of ASK involves two participants (the "asker" and the "answerer") and a piece of information that the answerer is likely to know. The asker makes a request of the answerer, that the answerer would tell him or her that information. The verb ASK treats the asker as AGT and the answerer as affected party; it asserts that the asker is making the request, but it does not assert that the answerer provides the information.

⁶⁷ If we had an example of two literal paths where the profiled path aligned with the action-chain path, it would be discussed here. The expectation is that the profiled path would still "win" (since it "won" when both the background and the action-chain paths aligned against it), and the verb would move from lender to borrower. Some dialects of ASL do have a sign LEND, similar in hand configuration to BORROW, which moves in exactly the manner predicted.

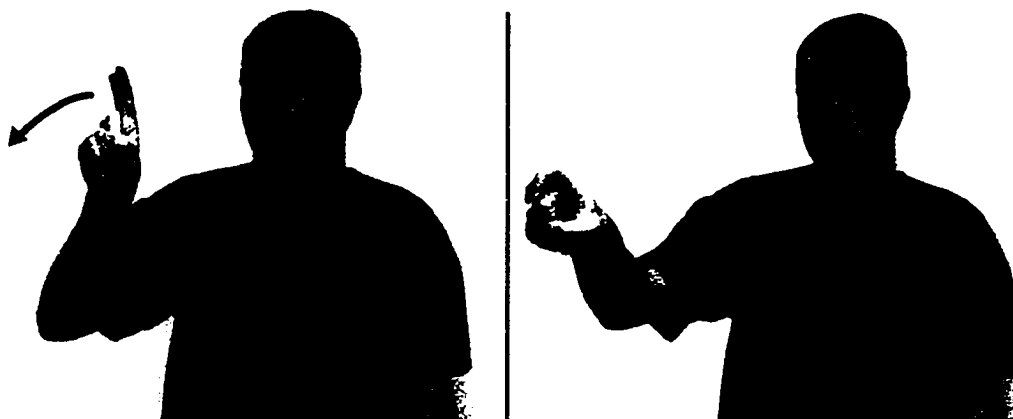


Fig. 9.15: I-ASK-HIM/HER/IT

The action chain for ASK is shown in Fig. 9.16; again, I have selected only the asserted portion of ASK's frame.

Fig. 9.16: Action Chain for ASK

```

head
asker  =====>  question  =====>  tail
           expresses                impinges  answerer  ----->
                                   on          changes
                                           mental state

```

As we can see, the action-chain path runs from asker to answerer.

The other two paths involve metaphorical movement of linguistic material (i.e., questions and answers). Since the question is asserted, its path (also from asker to answerer) is profiled. The path of the answer, which leads in the

opposite direction, is not asserted, and is thus backgrounded. This situation is summarized in Table 9.7.

Table 9.7: ASK's paths

	<u>asker</u>		<u>answerer</u>	
action-chain:	head	-->	tail	
metaphorical:	SOURCE	-->	GOAL	(question)
[metaphorical:	GOAL	<--	SOURCE]	(answer)

result:		----->		

As we can see, when both frame-specific paths are metaphorical, once again the profiled path "wins."

Other verbs of this type include ANSWER and DRILL-ANSWER-OUT; they also follow an profiled metaphorical path from agent to patient, not a backgrounded metaphorical path from patient to agent.

INVITE: profiled metaphorical path, backgrounded literal path

When the frame-specific paths are both literal or both metaphorical, the verb follows the profiled path. This suggests that profiled paths should be ranked above backgrounded paths in some "verb path hierarchy." Does this hypothesis hold true when one frame-specific path is literal and one is metaphorical? There are two verbs that give the

data we need for an answer: INVITE and SUMMON both have profiled metaphorical paths and backgrounded literal paths.

Fig. 9.17 illustrates the verb I-INVITE-HIM/HER/IT. The frame of INVITE has two participants: an "inviter" and a "guest." Prototypically, the two are at different locations. The inviter tells the guest that his or her presence with the inviter (usually at some event) would be welcome; the guest is then free to decide whether to join the inviter or not.



Fig. 9.17: I-INVITE-HIM/HER/IT

The inviter is regarded as the agent, and the guest as the affected one; the invitation that the inviter extends to the guest is, like all linguistic material, a metaphorical object moving from inviter to guest; and the potential movement of the guest to the inviter's location is of course

a literal movement through space. INVITE asserts that the invitation has been made, but it says nothing about whether the guest accepts the invitation; thus, the guest's path is backgrounded, and the invitation's path is profiled.

Fig. 9.18 gives the action chain for INVITE's asserted path.

Fig. 9.18: Action Chain for INVITE

<i>head</i>			<i>tail</i>
inviter	=====>	invitation	=====> guest
	expresses	impinges	----->
		on	changes
			mental state

For INVITE, then, the action-chain path leads from inviter to guest, as does the metaphorical profiled path. The backgrounded path is literal, and runs from guest to inviter. Table 9.8 summarizes this situation.

Table 9.8: INVITE's paths

	<u>inviter</u>	<u>guest</u>	
action-chain:	head	-->	tail
metaphorical:	SOURCE	-->	GOAL (invitation)
[literal:	GOAL	<--	SOURCE] (guest's movement)

result:		<-----	

As we can see, contrary to what we might have expected, the profiled path does not "win" here. Instead, the verb follows the backgrounded path.

We can explain this data by hypothesizing that verbs will follow literal rather than metaphorical paths; and that although profiled paths are preferred to backgrounded paths, it is important enough for the path to be literal if possible that the "profiled" preference can be overridden.⁶⁸

PAY and SELL: two equally-asserted literal paths

We are almost done figuring out the principles for path direction in agreement verbs; there are just a few more cases that we must consider. The first of these involves a

⁶⁸ Padden 1988 argues against a semantic path-based analysis of verbs like INVITE because of the following fact: if the event to which the guest is being invited is set up in space at a locus different from the inviter's locus, the verb INVITE still moves from guest's locus to inviter's locus, not guest's locus to event's locus.

It is not clear that for these cases, the inviter and the guest will not become co-located at the event: that is, the inviter will likely meet the guest at the event. The situation where the inviter asks the guest to an event that he or she will not actually attend him- or herself is so unusual that language users see it as a strange use of the verb INVITE.

Thus, the inviter and the guest will likely both move to the event's location. Why then does the verb move to the inviter's current locus and not to the event's locus? This is not a major problem for path-based analyses. The *prototypical* type of invitation is a situation where the inviter asks the guest to join him or her. Thus, the guest's *prototypical* path is to the inviter, regardless of where the event takes place. The direction of the verb's movement is not computed based on the actual situation at hand, but on the *prototypical* situation; the

situation with two paths that are equally asserted by the verb.

The verbs PAY and SELL (Fig. 9.19, I-PAY(TO)-HIM/HER/IT; Fig. 9.20, I-SELL(TO)-HIM/HER/IT) both draw on the same semantic frame. In this frame, one person (the buyer) has money, and another person (the seller) has an item that the buyer wants. The buyer gives money to the seller, and the seller gives the item to the buyer; these transfers are understood as happening simultaneously, so one is not more asserted than the other. Also, both buyer and seller have active roles.

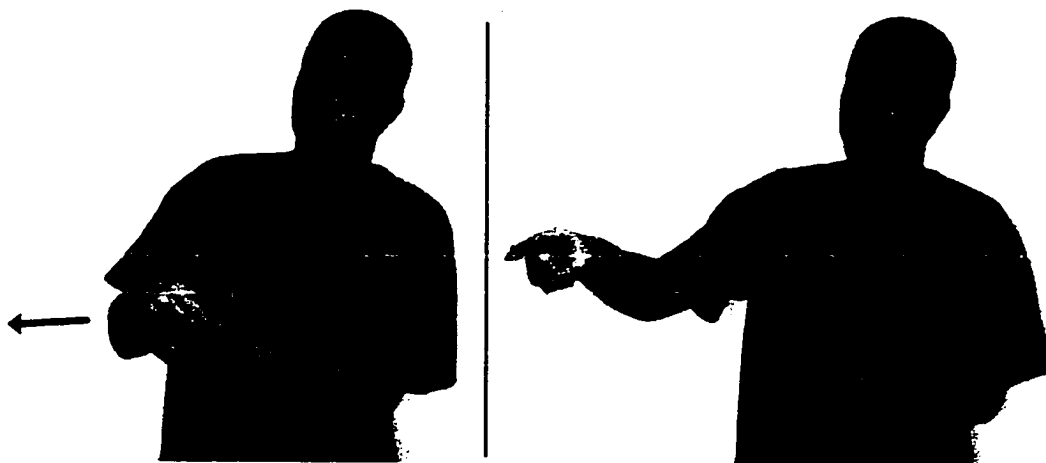


Fig. 9.19: I-PAY(TO)-HIM/HER/IT

movement direction then becomes a conventional yet motivated property of the verb.

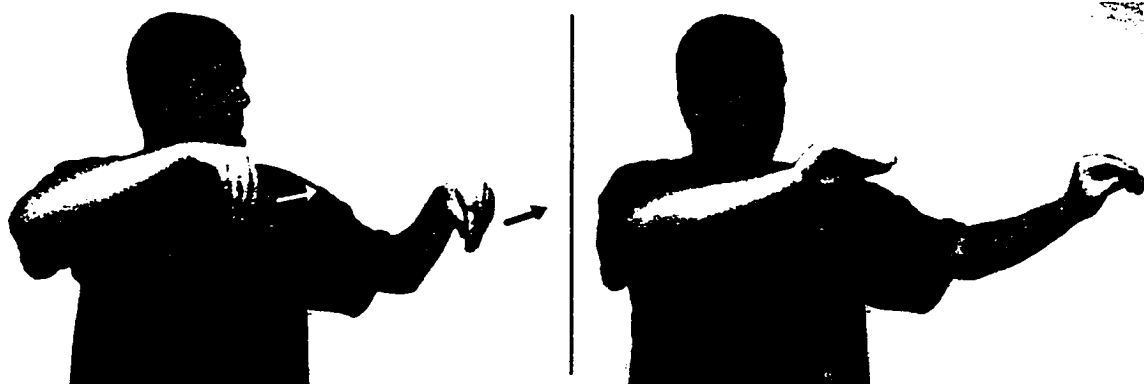


Fig. 9.20: I-SELL(TO)-HIM/HER/IT

PAY and SELL both refer to this frame, and they both assert that the two transfers have taken place. They differ, however, as to which participant they profile: PAY draws our attention to the buyer and his or her action, while SELL draws attention to the seller and his or her action. Though both the buyer and the seller affect each other, each verb only profiles one set of effects.

A note about the action chain for these verbs is necessary. As verbs' scenarios become more and more complex, with actions by different participants, agreements between participants about what actions to take, and so on, the action chain becomes less prototypical and harder to work out. For BORROW, ASK, and INVITE, which only assert one (literal or metaphorical) transfer, I adopted the solution of choosing the action chain for that asserted transfer; it

seemed reasonable to only compute the chain for the events that are assumed to take place.

This solution will not work for our next examples, PAY and SELL, since they assert *two* paths. What is the "head" or original cause of a transaction where a goat is exchanged for thirty dollars? What is the "tail"? Are the participants both heads and tails to each other? Does it depend on the specifics of the situation? We could adopt the solution of computing the action chain for only the *profiled* path; but that seems unsatisfactory.

Luckily, we do not need to answer these questions. As we shall see, in these cases we can always pick the correct path direction on other grounds (i.e., by making a principled choice between the two frame-specific paths). Thus, I will resort to marking the action-chain path of verbs like PAY, SELL, EARN, and BRIBE (to name a few other examples) as "indeterminate."

Thus, the paths for these verbs lead in the following directions: both PAY and SELL have literal asserted paths running from buyer to seller (with the money) and from seller to buyer (with the item), but each verb only profiles one of these paths. For PAY, the profiled path runs from buyer to seller, and for SELL, it runs in the opposite direction. This situation is summarized in Tables 9.9 and 9.10.

Table 9.9: PAY's paths

	<u>buyer</u>	<u>seller</u>	
action-chain:	indeterminate		
literal:	SOURCE	-->GOAL	(money)
[literal:	GOAL	<-- SOURCE]	(item)

result:	----->		

Table 9.10: SELL's paths

	<u>seller</u>	<u>buyer</u>	
action-chain:	indeterminate		
[literal:	GOAL	<-- SOURCE]	(money)
literal:	SOURCE	-->GOAL	(item)

result:	----->		

We can see from this diagram and from the illustrations that although the two frame-specific paths are completely balanced in how literal and asserted they are, the profiled path once more wins the day. As we might expect, the verb moves in the direction of the profiled object-transfer.

DISCUSS: completely balanced paths

Let us now consider a group of verbs whose scenarios are basically reciprocal in nature: they involve two (or more)

participants, each essentially performing the same action and affecting the other person(s) in the same way. Verbs of this type include DISCUSS, EXCHANGE, and COMMUNICATE.⁶⁹

We will use DISCUSS as our main example; it is illustrated in Fig. 9.21 as I-DISCUSS(WITH)-HIM/HER/IT. In this verb's frame, two (or more) participants (the "discussants") take turns telling each other their thoughts and opinions on some topic. Via the COMMUNICATING IS SENDING metaphor, each act of telling is understood as the movement of an object from teller to addressee. Since the verb asserts that the two participants alternate roles, there are metaphorical paths leading in both directions, and neither direction is more "asserted" than the other. Moreover, this verb does not profile one path over the other; it draws attention to both paths equally.

⁶⁹ These verbs are not prototypical agreement verbs. They can be "plain" (i.e., not incorporating spatial loci into their forms) or their paths can be modified for at least the loci of first person and one more locus. Their lack of prototypicality in form can be ascribed to their unusual semantics and their completely balanced paths; more typical agreement verbs will choose one path over the others (in form as well as in meaning).



Fig. 9.21: I-DISCUSS (WITH) -HIM/HER/IT

This situation is summarized in Table 9.11. Once again I have considered the direction of the action-chain path, in this complex situation, to be "indeterminate."

Table 9.11: DISCUSS's paths

	<u>discussant</u>	<u>discussant</u>
action-chain:	indeterminate	
metaphorical:	SOURCE	-->GOAL
metaphorical:	GOAL	<--SOURCE

result:	<----->	

So what does ASL do when all the paths in the verb are fully balanced with identical paths taking the opposite direction? It turns out that since there are no grounds for

a decision, ASL essentially "refuses" to decide: in verbs of this type, ASL represents *both* paths. Thus, for DISCUSS, the two hands move back and forth together between the discussants' loci.

Verbs of this type are somewhat idiosyncratic about how they represent the two paths: EXCHANGE uses a vertical circling motion in which the hands switch places twice, and COMMUNICATE has the hands moving back and forth in an alternating manner along parallel paths. But in all cases, both paths are represented.

LOOK and PERCEIVE-BY-EYES: EXP and THEME arguments

There is one final puzzle which we need to address: the agreement patterns of verbs like HATE, PITY, LOOK, PERCEIVE-BY-EYES, and PERCEIVE-BY-EARS. These verbs each have two participants in their semantic frames; one participant is a sentient being who has a mental experience (a thought, perception, emotion, etc.), and the other participant is the subject, content, or trigger of that mental experience. The participants have the semantic roles of EXP and THEME respectively.

The puzzle is that the EXP/THEME verbs do not display a consistent agreement pattern: HATE, PITY, and LOOK move from EXP's locus to THEME's locus, while PERCEIVE-BY-EYES and

PERCEIVE-BY-EARS move in the reverse direction. In this section, I will show that the EXP/THEME relationship intrinsically has two metaphorical paths. The individual verbs each profile one of those paths; as usual, it is the profiled path that the verb traces.

Let us begin with a discussion of the structure of mental experiences. The action-chain model of causation, which works well for physical events, is less appropriate for experiences. Though we can usually tell the direction of causation in physical interactions (e.g., the ball breaks the window, not vice versa), mental events of perception and emotion are less clear-cut (Sweetser 1980, Langacker 1991b, Croft 1991). Neither EXP nor THEME is a prototypical head or tail of an action chain.

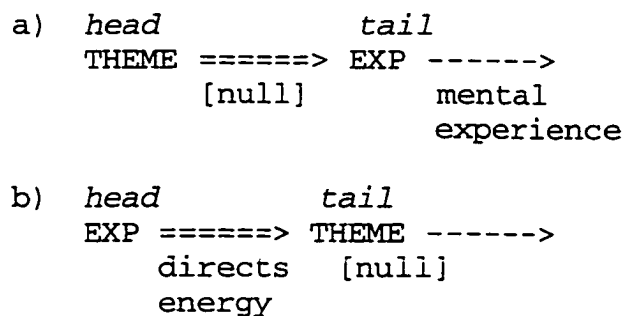
An example will clarify this point. If we perceive a rose blossom and experience it as beautiful, in some sense that rose has affected us. Since we are affected, we are the receiver of a metaphorical "effects" object, and should come later on the action chain than the rose. Yet the rose certainly did not *do* anything to cause our perception and experience; it was in no way active, and thus makes an odd head or "causer" for an action chain.

On the other hand, if we perceive the rose and delight in its beauty, in some sense we are directing our energy -- our senses, our thoughts, our emotions -- toward the rose.

By directing energy toward the rose, we are behaving much like the prototypical head of an action chain; the direction of this energy forms another metaphorical path leading from us to the rose. But of course, the rose is not itself affected by this mental energy; thus it is not a prototypical tail for the action chain.

Thus, we can apply the action chain model to EXP/THEME verbs in two different ways -- but neither is a particularly good fit. Fig. 9.22 diagrams the possibilities.

Fig. 9.22: Two Action Chains for EXP/THEME Verbs



In 9.22a, the head does nothing to cause the tail's experience; and in 9.22b, the head has no effect on the tail.

As we can see from the preceding discussion, there are good reasons to look at either EXP or THEME as the head of the chain; in other words, there are generic-level metaphorical paths that lead in both directions. Once again

we have a situation of path conflict -- and once again, it is resolved in a principled way.

We will take the verbs LOOK and PERCEIVE-BY-EYES for examples, as their meanings are extremely similar; they are illustrated in Fig. 9.23, I-LOOK(AT)-HIM/HER/IT, and Fig. 9.24, I-PERCEIVE-BY-EYES-HIM/HER/IT. Both verbs draw on the frame of *vision*; this frame has as participants a being with eyes (the EXP or "viewer") and a physical object (the THEME or "picture"). If the picture is positioned in front of the viewer's eyes, the viewer will have a visual experience of the picture.



Fig. 9.23: I-LOOK(AT)-HIM/HER/IT

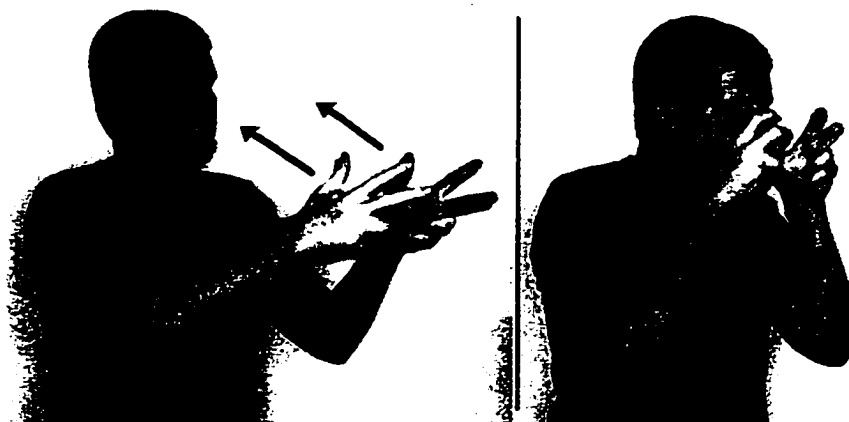


Fig. 9.24: I-PERCEIVE-BY-EYES-HIM/HER/IT

The verbs profile slightly different parts of the frame, however. LOOK profiles the energy that the viewer directs at the picture; it means, roughly, *for a viewer to direct the eyes toward (and thus perceive) a picture*. PERCEIVE-BY-EYES, on the other hand, profiles the experience that the viewer "gets from" the picture; it means *for a viewer to visually perceive a picture (by directing the eyes toward it)*.

Clearly, these verbs each profile a different action chain in the two EXP/THEME possibilities. In metaphorical terms, for LOOK the EXP sends a metaphorical object toward the THEME, while for PERCEIVE-BY-EYES, the EXP receives a metaphorical object from the THEME. Once again, we have a situation with two metaphorical paths, one of which is profiled and the other of which is backgrounded. Tables 9.12 and 9.13 show the paths for LOOK and PERCEIVE-BY-EYES.

Table 9.12: LOOK's paths

	<u>viewer/EXP</u>		<u>picture/THEME</u>	
[action-chain (1):	tail	<--	head]	(information)
action-chain (2):	head	-->	tail	(attention)

result:		----->		

Table 9.13: PERCEIVE-BY-EYES's paths

	<u>viewer/EXP</u>		<u>picture/THEME</u>	
action-chain (1):	tail	<--	head	(information)
[action-chain (2):	head	-->	tail]	(attention)

result:		<-----		

As we can see from the tables and the photographs, LOOK's path is directed from viewer to picture, while PERCEIVE-BY-EYES moves from picture to viewer.⁷⁰ Both verbs trace out the profiled path in their semantics. Other EXP/THEME verbs in ASL such as HATE, PITY, and PERCEIVE-BY-EARS work in the same

⁷⁰ In the form shown here, LOOK does not actually move along its path; the path's direction is indicated by the palm and fingers' orientation toward the picture and away from the viewer (cf. the second note in this chapter). In forms inflected for repetitive and continuative aspect, this verb does in fact move repeatedly a short distance along its path in the direction indicated.

way; they too profile one of the two EXP/THEME action-chain paths, and they move in the direction of their profiled path.

There are other ways to think about mental experiences than by applying the action chain model; but the action chain is a strong prototype model, and language users attempt to apply it, even when it is not quite appropriate. The result is that across languages, EXP/THEME verbs display mixed patterns: they sometimes treat the EXP like an AGT or action-chain head, and sometimes like a PAT, or action-chain tail. Linguists have found (as with ASL) that these choices are made in principled ways, based on the verbs' semantics (e.g., Sweetser 1980, Croft 1991, Langacker 1991b).

A Model of Verb Agreement Paths

Our survey of the ASL verb agreement path data is now complete; Table 9.14 gives a summary of the verbs and their directions.

Table 9.14: Agreement Verbs and their Path Directions

gloss	paths	"winner"
DEFEAT	--> action-chain	--> action-chain
GIVE	--> action-chain --> literal	--> action-chain and literal
INFORM	--> action-chain --> metaphorical	--> action-chain and metaphorical
TAKE	--> action-chain <-- literal	<-- literal
QUOTE	--> action-chain <-- metaphorical	<-- metaphorical
BORROW	--> action-chain <-- literal profiled --> literal backgrounded	<-- literal profiled
ASK	--> action-chain --> metaphorical profiled <-- metaphorical backgrounded	--> action-chain and metaphorical profiled
INVITE	--> action-chain --> metaphorical profiled <-- literal backgrounded	<-- literal backgrounded
PAY	xxx action-chain --> literal profiled <-- literal backgrounded	--> literal profiled
DISCUSS	xxx action-chain --> metaphorical profiled <-- metaphorical profiled	<--> both directions
LOOK	--> action-chain profiled <-- action-chain backgrounded	--> action-chain profiled

Happily, we can represent all this complex data with a simple model, summarized in Table 9.15. The model uses three

criteria to rank paths. The first is *literalness*, or whether a path is literal or metaphorical; this distinguishes a literal path from both the metaphorical and the action-chain paths. The second is *specificity*, or whether a path is frame-specific or generic; this distinguishes metaphorical and literal paths from the action-chain path. Finally, the third is *profiling*, which distinguishes profiled paths from backgrounded paths.

Table 9.15: Selection of Verb Agreement Path

RANKINGS

Specificity: [literal, metaphorical] > action-chain

Literalness: literal > [metaphorical, action-chain]

Profiling: profiled > backgrounded

RULES (in order)

1. Choose a path in the verb's semantic frame.
2. If there is a tie, choose the most specific path.
3. If there is a tie, choose the most literal path.
4. If there is a tie, choose the most profiled path.
5. If there is a tie, represent both paths.

This model selects the correct path direction for all the verbs in Table 9.14. For the one-path verb DEFEAT, there is no path conflict, so Rule 1 selects the action-chain path. Our two-path verbs are also straightforward. GIVE, TAKE, INFORM, and QUOTE all select their frame-specific paths over the action-chain path, by Rule 2.

BORROW and ASK are slightly more complex. Their two

frame-specific paths are tied for specificity (Rule 2) and literalness (Rule 3), but Rule 4 correctly selects the profiled path in both cases. Other sets of rules could have handled BORROW and ASK, but INVITE's path shows us that literalness must override specificity. For INVITE, the two frame-specific paths are tied at Rule 2, but Rule 3 correctly chooses the literal background path over the metaphorical profiled path.

For PAY, once again Rules 2 and 3 produce a tie between the two literal frame-specific paths, and Rule 4 correctly selects the profiled path. DISCUSS's two balanced metaphorical profiled paths are tied all the way down to Rule 5, which correctly predicts that both path directions will be represented. And finally, LOOK'S two action-chain paths are tied until Rule 4 chooses the profiled path.

The set of rankings and rules in Table 9.15, as we can see, successfully predicts the choice of path direction in the ASL verbs we have discussed. But, we must note, this model does not *explain* the path direction; it simply provides an accurate description.

Like Langacker (1987), I feel that a good grammar of a language should not include rules; elements of the grammar should either be actual forms of the language or "schemas" that generalize over forms of the language. The model in Table 9.15 does not fit my standards of a good grammatical

model. We can regard it, however, as a sort of shorthand for a full cognitive model which has not yet been worked out. The rule systems and hierarchies are useful in that they do accurately describe the facts of the language; but it is unlikely that they actually "exist" within an ASL user's grammar. I do not believe, for example, that language users go through a series of ordered rules to derive correct linguistic structures.

It is heartening to see, however, as we look at the model in Table 9.15, that the rankings and rules are well motivated on semantic grounds. They are not unreasonable or arbitrary, and clearly will lend themselves well to a cognitive-grammar-style analysis. In general, the paths which are more cognitively basic and the paths which have more attention drawn to them are the paths which are selected.

Let us first discuss the rankings. The *literalness* ranking tells us that a literal path is to be chosen over a metaphorical path. Literal paths (i.e., movements of objects through space) are far more conceptually basic than metaphorical paths; we can directly perceive literal paths with our senses, while metaphorical paths only "exist" when we map a literal, concrete path onto an abstract conceptual domain. Thus, for this dimension, ASL chooses a basic path over a conceptually "manufactured" path.

The *specificity* ranking tells us that a frame-specific path is to be chosen over the generic action-chain path. Although there are reasonable conceptual motivations in either direction, it is not surprising that the specific path is chosen. The specific paths (e.g., the path of the borrowed item for BORROW, the path of the quotation for QUOTE) are based on vivid details of the verbs' frames; portraying them gives a more direct representation of the verbs' meanings. Though the action-chain path also contains useful information about the verbs' semantic roles, it is unlikely (though possible) that a signed language would prefer this path; I find it hard to imagine, for example, a sign meaning *take* that would move from the taker to the previous owner.

Finally, the *profiling* ranking tells us that an profiled path is to be chosen over a backgrounded path. The profiled path is the one upon which the verb focuses our attention; it is the most salient path in the verb's semantics. If this is the path to which our attention should be drawn, what better way than to have the verb trace it out for us?

All three of these rankings are highly motivated; the more basic, vivid, or focused paths are chosen over the alternatives. But what happens when the rankings are pitted against each other? Is a literal path "more basic" than a frame-specific path? Is profiling "more important" than

literalness?

We have seen that for ASL verbs like INVITE, when a literal backgrounded path meets a metaphorical profiled path, the literal backgrounded path "wins." That is, in ASL, literalness is a more powerful criterion than profiling. The other rankings do not collide with each other in our data set. We cannot pit literalness and specificity against each other, for example, because that would require a verb with a literal action-chain path, which is a contradiction in terms.

To pit specificity against profiling, we would need a verb with an asserted action-chain path and a literal or metaphorical backgrounded path that lead in opposite directions. A verb of that type might have a meaning like English *extort*, or *threaten so as to get money* (though *threatening* arguably involves a metaphorical communication path from AGT to PAT/EXP); other possibilities would be something like *defeat in order to get money*, or *defeat in order to get praise*. I have not found ASL verbs with these meanings. If such verbs exist, my model predicts that the frame-specific path would be selected over the asserted path, via either Rule 2. Thus verbs with meanings like *extort* or *defeat in order to get something* would move from PAT to the "extorter" or "defeater," which seems reasonable.

How motivated is it for literalness and specificity to be more powerful than profiling? This is an area where

languages could differ from each other. The individual rankings seem fairly universal; but it is possible to imagine a signed language where profiling "wins" over literalness, and the verb meaning *invite* moves from host to guest. This is not a problem for motivation-based linguistic theories; when two opposite choices have equal (and different) motivations, this is an area where we predict cross-linguistic variation. (See Croft 1990 for a discussion of how linguistic theory can handle cross-linguistic variation in terms of competing motivations.)

Verb Agreement is Predictable

The data and discussion in this chapter have shown that verb agreement in ASL is thoroughly iconic in nature, and that the movement patterns of individual verbs can be predicted from their semantics.

We can see now why verbs like TAKE, QUOTE, and INVITE have been regarded as "backward": our prototypical model of causation, the *action chain*, would predict that they should move away from their AGT argument; but instead, they move *toward* that argument. But of course, this movement direction is not "backward" or odd at all; it is a result of a highly-motivated system of principles.

It should also now be clear that iconicity and metaphor are not limited to the lexicons of languages, or in any way superficial or easily dismissed. The verb agreement data show that metaphor and iconicity are deeply intertwined in the core grammar of ASL.

Chapter 10: **The Future of Signed-Language Research**

Our Past

At a recent sign linguistics conference,⁷¹ Elissa Newport gave a stirring speech entitled "Sign Language Research in the Third Millennium." Since Stokoe's (1960) first bold article proclaiming that signing had linguistic structure, the field has grown immensely and gone through a number of stages. Newport summarized our progression and challenged us to face some key issues that we as a group have not been addressing. Though the research in this book was begun long before the 1996 conference, it might as well have been conceived and developed as an answer to Newport's challenges. Truly addressing the issues that Newport raises will transform sign linguistics, and the field of linguistics as a whole, by requiring us to handle linguistic motivation, iconicity, and metaphor.

My own brief summary of sign linguistics is in order here. The earliest signed-language research focused on proving that ASL (and soon thereafter, other signed languages) was a true language, with the same types of

⁷¹ The Fifth International Conference on Theoretical Issues in Sign Language Research, University of Quebec at Montreal & McGill University, Sept. 19-22, 1996.

structure to be found in spoken languages. Researchers sought to counter the myths that signing is a single, universally-understood system, or that it is "just pictures" on the hands; that it is "broken English," or not capable of describing abstractions.

Some linguists, particularly the earliest ones, marvelled at the differences between ASL and spoken languages. For example, Stokoe's first description of ASL's form component was called "cherology," after the Greek word *cheir*, or "hand." It emphasized the simultaneous nature of signs, where the formational components of handshape, location, and movement occurred in a simultaneous package; by contrast, spoken-language components -- vowels, consonants, glides, and so on -- occurred in a sequence.

Later sign linguists sought to minimize those differences. The term "cherology" was quickly abandoned in favor of the term "phonology" (from the Greek *phone*, meaning "sound"), which is used for spoken languages' form component. The point of this change was to emphasize the similarities between signed and spoken languages. A number of other terms have been imported from spoken language research: *syllable*, *classifier*, and even *subject* and *object*; debates are still raging as to whether these terms are appropriate for signed languages. The "hold/movement" model of sign structure (Liddell & Johnson 1989) was widely acclaimed by many not

just for its merits, but also because it was a *sequential* model rather than Stokoe's simultaneous model; it made signs appear more like spoken-language words with their sequences of consonants and vowels. And of course, as we have seen, ASL's iconicity was treated as minor or unimportant.

One reason for emphasizing similarities between signed and spoken languages was political, aimed at convincing skeptics that ASL was a true language "like any other language." But another, deeper reason came from the desire to understand what is universal about language itself, about the human capacity to develop productive and flexible communication systems. Tantalized by the new awareness of language in more than one modality, researchers began to look for universals of *language*, rather than universals of *spoken language*.

In the last ten or fifteen years, linguistic analyses of more and more signed languages have been carried out. As that information comes in, little by little we can begin to get a picture of what *signed language* looks like, and to compare language in the signed and spoken modalities. As expected, there are many similarities between the two -- but we are also finding differences.

Our Challenge

It is now time, according to Newport, to turn our attention to the places where signed languages are *different* from spoken languages. It is time to acknowledge that there may in fact be some large differences.

One area where the differences become particularly obvious is the "mutual intelligibility" of languages. For spoken languages, it is a truism that speakers of different languages will not be able to understand each other. A person who speaks only English and a person who speaks only Thai, or Swahili, or French will not be able to carry on any kind of conversation with each other. By pictures and gesturing, some communication may be established, but it will be sharply limited and laborious. Only if the two languages are closely related will their speakers be able to communicate well; language pairs of this sort, such as Spanish and Portuguese (to some extent), or Low German and High German, share a common ancestor language and are sometimes considered to be dialects of a single language rather than separate languages in their own right. The fact that spoken languages are not, on the whole, mutually intelligible, is used as evidence for their lack of iconicity: if sounds and meanings were connected in a

motivated way, people would do better at figuring out each others' languages.

The situation is different for signed languages. We know that many signed languages are not historically related to each other; for example, the signed languages of France and Britain do not share a common ancestor, and the brand-new signed language of Nicaragua appears to have no linguistic ancestors at all (Kegl et. al. 1995, Senghas 1995). These languages' vocabularies are very different from each other. Yet, when Deaf people from different language groups get together, they are able to establish easy communication conversation in a startlingly brief period of time (Rutherford, pers. comm.).⁷²

As linguists, we must ask: what causes this difference? Some part of it must be attributed to the remarkable communication skills of Deaf people, who have had to function their entire lives in a community of hearing people who do not sign; Deaf people have had to become expert in communicating across a language barrier. Yet we must also ask, is there more? Is there a structural difference between signed and spoken languages that makes signed languages mutually intelligible? The answer to that question, as

⁷² During her twenty years of fieldwork on Deaf culture, many Deaf people have reported this experience to Dr. Susan Rutherford; the Deaf people in question came from many countries, including the United

Newport pointed out, is yes.

Spoken languages, considered as a group, are quite diverse in their structural types. There is hardly space to summarize the diversity here, but a few examples will help. Word order within a normal declarative clause, for example, is extremely variable: some languages put the subject first, then the verb, then the object ("SVO" ordering); others have the orders "SOV" or "VSO" (Greenberg 1966a). Grammatical inflections are also quite variable: some languages inflect their nouns, some inflect their verbs, some inflect adjectives and even prepositions (e.g., Irish), while other languages do not use inflections at all (e.g., Mandarin). The field of *linguistic typology* (e.g., Comrie 1985; Talmy 1985a, 1985b, 1987; Croft 1990) is devoted to cataloguing the differences and noting the similarities among languages; the related field of *language universals* (e.g., Greenberg 1966a, 1966b) looks at what all spoken languages seem to share, and postulates that those shared properties result from the shared language "machinery" of the human brain.

Signed languages, on the other hand, are remarkably *similar* in their structural types. Linguists have not liked to emphasize this fact, because it appears to reinforce the common myth that "sign language" is a single universal system

States, Canada (in particular, Quebec), Sweden, Austria, Spain, the

understood all over the world. There is no such universal system; different signed languages differ considerably in their vocabulary and parts of their grammatical structure. But, as more and more sign linguists begin to study languages other than ASL, as the data begin to pour in from Asia, Africa, Europe, and Latin America, we cannot help but notice that all signed languages seem to share certain grammatical structures.

To the best of our knowledge, all signed languages have *classifiers*: systems of iconically-motivated forms for representing shapes, locations, and movements. All signed languages establish *referential loci* in space -- special locations in signing space that represent people, places, and so on -- and have pronouns and verbs that change their movement patterns to "agree" with those loci. Finally, all signed languages inflect their verbs for *temporal aspect*.

Newport also noted that these structures are not unique to established signed languages. Any time that humans are required to communicate using gestures of the hands, face, and body, structures of this type emerge. We see them in *homesign* (e.g., Singleton et. al. 1995): deaf children who are raised without exposure to signing of any kind typically create their own personal gestural communication systems.

Netherlands, England, France, Finland, Brazil, and Taiwan.

These systems are rudimentary, lacking much vocabulary and structure; in families where there are several deaf children the systems become far more complex and language-like, which shows how the flow of communication encourages the invention of language. But we find that even the systems used by only a single child have the basic structures: classifier-like forms, referential loci, and agreement with the loci.

When a critical mass of homesigning deaf children is brought together, the children together meld their individual systems into a new language. This phenomenon is still occurring today; in Nicaragua, the first school for deaf children was established in 1980, and a new signed language has been developing there ever since (Kegl et. al. 1995, Senghas 1995). This new language, like its homesign forbears and like other signed languages, uses iconic classifiers and spatial agreement morphology.

Deaf children with hearing parents are often brought up to use a manual code for English, instead of ASL. There are several such codes (SEE I, SEE II, LOVE, and so on); the codes are created by a radical restructuring of ASL vocabulary. For each English word and common inflection (e.g., *-tion*, *-ness*, *-s* for plural), a sign equivalent is invented, borrowed from ASL, or created by changing an ASL sign. These sign equivalents are then strung together in English word order, without any of ASL's grammatical

structure or spatial mappings. The result is not a natural language, but a "code" or representation of English on the hands. Recent research by S. Supalla (1991) has shown that Deaf children, when given this unnatural system, tend to "re-invent" some of the characteristics of ASL; in particular, they introduce referential loci, and pronoun/verb agreement with those loci.

The children who create these innovations are using visual/gestural communication systems every day; they have plenty of time to develop changes. But even on a much shorter time-scale, people adopt classifier-like and loci-like structures. In recent experiments, researchers have brought hearing, non-signing adults into the laboratory and asked them to communicate without talking. One study (Morford et. al. 1995) asked people to describe some animated video clips of objects moving across landscapes; the subjects all used their hands, movements, and space in classifier-like ways to convey the images they saw. Another, more anecdotal study (Bloom 1979, cited in McNeill 1992) asked a college student to tell the story of *Sleeping Beauty* without speaking; over the next twenty minutes, the student developed a system of spatial loci, "pronouns" and "verbs" referring to them, and a set of iconic classifier-like forms for describing shapes and movements.

Even the gestures that accompany hearing people's

speech, though they do not encode all the information in the speech, are influenced by spatial mapping (McNeill 1992).

The gestures of the hands and head are often aimed toward specific spots when referring to specific people or things; and they can also show the shape or movement of objects in space, or the repetition or continuity of events over time.

All this evidence, from signed languages, homesign systems, modifications of manual codes for English, hearing people's gestures without speech, and gestures accompanying speech, points in the same direction: communication systems in the visual/gestural modality will naturally develop classifiers, referential loci, and aspectual marking.

Why does this happen? Newport suggested we look toward the neural structures for language in the brain, and that is a useful and fruitful direction to take. But I think that even before we collect new brain data, we can give an answer. That answer is *motivation*, and in particular, motivation by *iconicity* and *conceptual metaphor*.

The Importance of Iconicity and Metaphor

We have seen how ASL's referential loci are fundamentally iconic, and how ASL's verb agreement system is deeply iconic and metaphorical. The classifier system as

well is iconic, and we have also seen how signs for abstract concepts can develop from that iconic system. There has also been an example of how ASL's aspectual system uses time in an iconic way (i.e., the repetitive inflection), and the remaining aspectual inflections are equally iconic. All of these parts of ASL are strongly motivated by universal properties of human cognition: the ability to establish concepts, associate them with visual and kinesthetic images (some of which are universal), simplify the images, and choose body parts and movements to encode these images.

These motivations are part of being human, of having the kinds of brains, bodies, and experiences that we do. Thus, humans all over the world are capable of making the same kinds of iconic representations -- first as mime, and later, through repetition, memorization, and re-analysis, as a linguistic system.⁷³ These representations are so powerful, and so well-motivated, that whenever meaning must be communicated in the gestural modality, humans re-invent them. We re-invent shape- and interaction-based classifiers, we re-invent referential loci, we re-invent time-based aspectual inflections, re-deriving all three types from our basic human understanding of space, time, experience, and similarity.

⁷³ Research with connectionist computing networks (e.g., Elman & McClelland 1984, Rumelhart et. al. 1986, Regier 1996) gives some clues

All over the world, in isolated homes, laboratories, and Deaf schools, children are re-making the underpinnings of gestural languages using their natural human abilities.

This is the reason why signed languages share so much structure; why signed languages with separate origins are mutually intelligible; why Deaf children and hearing adults create the same kinds of gestural communication systems. The universal motivations of iconicity and conceptual metaphor, combined with the special resources of the visual/gestural modality, naturally lead to languages of this sort.

A Note on "Loss of Iconicity"

There has been much research showing how signed languages "lose their iconicity" over time (e.g., Frishberg 1979); this deserves some comment.

Signed languages are young languages. Since most Deaf children are born to hearing parents, it is through the Deaf schools and the Deaf community that the language develops and is passed on. In many countries, Deaf schools were established only a few centuries or even a few decades ago; because of the recent establishment of these institutions,

as to how this process might happen. The topic is too large to address

signed languages are mostly less than a few centuries old. The discussion in this book of iconicity and metaphor has focused on the creation of iconic signs, not what happens to them after they are created.

There is some evidence that change in ASL over time "reduces" iconicity (cf. discussion in Chapter 4). For example, Frishberg (1979) noted that signs tend to move from their original locations toward the center of signing space. This process may make the sign easier to perceive, by moving closer to where the eyes fixate; but it would reduce a sign's iconicity by moving it from the iconically appropriate location. This is, as claimed, a true loss of iconicity.

Inflection of signs, another process that has been claimed to reduce iconicity, really increases it. The common example is the sign SLOW, made with the dominant flat hand slowly stroking toward the wrist along the non-dominant hand's back, combined with the inflection for intensity, which is a rapid, tense movement. When these two combine, the resulting sign VERY-SLOW is actually articulated with a rapid movement. The claim (Klima & Bellugi 1979) is that VERY-SLOW is less iconic than its component parts, and so their combination has less iconicity. In fact, the combination is *more* iconic; the two iconic mappings simply do

here, but will be taken up in some future work.

not combine into a consistent picture. VERY-SLOW resembles the highly iconic and metaphorical emotion signs in Chapter 7; these signs combine several metaphorical and iconic mappings in their structures, though they do not present a single iconically-represented image.

We do not yet know what an older signed language will look like; the signed languages of today have not had much time to diverge from their highly-motivated origins, if indeed they will diverge.⁷⁴ Perhaps in older signed languages, many of the fully imagistic frozen signs will be modified, their origins covered over in layers and layers of conventionalized changes. But on the other hand, there are some core iconic/metaphorical areas which will probably never lose their profound iconicity.

We have evidence that iconicity can overwhelm systematic change in highly-motivated cases: as described in Chapter 4, English *peep* (for high-pitched bird sounds) should have changed to *pipe*, as the Great Vowel Shift took place, but the older, iconic form survived as well. *Peep* is a highly-motivated iconic word; yet I doubt it is more motivated than

⁷⁴ We might gain insight by looking at parallels between signed languages and creoles: the youngest spoken languages are quite transparent semantically (though not nearly as iconic as signed languages). One form is reliably associated with a single unified meaning. In contrast, in an old language like English, a single form (e.g., *over*, *back*, or *just*) can have dozens of historically-related meanings, some acquired by principle and some by chance. For an overview of this issue, see McWhorter (1997).

the core iconic structures that appear in signed language after signed language, in homesign and in hearing people's gestures.

I do not believe that signed languages will ever lose their iconic classifier systems. The classifiers may change slightly in nature; Morford et. al. (1995) suggest that as homesign systems develop, classifier-like gestures start as strict representations of an object's shape, but later represent an entire semantic category regardless of each member's shape (e.g., all vehicles would eventually get the same classifier, as in today's ASL).⁷⁵ Yet this would not change the essential iconicity of the system; classifiers would still be chosen based on the shape of the category prototype. Similarly, Senghas (1995) notes that in Nicaraguan Sign Language, some classifier constructions based on the movements of handling objects are replaced by constructions that represent the shape and size of the object; this may be a move away from "mimetic enactment," as she claims, but it is certainly not a loss of iconicity itself.

Moreover, the system of referential loci will never lose its iconicity, nor will the inflections for verb agreement and temporal aspect -- they are already highly abstract and

⁷⁵ This change could also be based on the child's development of

fully motivated. The changes in frozen signs may remove some small portion of signed languages' iconicity, but the core iconic grammatical structures that appear in language after language will never disappear.

Our Future

The challenge for the future of signed-language research is thus to investigate and describe linguistic iconicity, and to incorporate it into linguistic theories. I have demonstrated how this can be done in the cognitive linguistics framework, using the tools of *conceptual mappings*, *frame semantics*, *prototype theory*, and *conceptual metaphor theory*. The cognitive linguistics approach treats form and meaning as integrated on every level of linguistic structure; thus, it is well-suited for treating issues of linguistic motivation. In particular, the intimate form/meaning connections in iconicity demand this kind of approach. Conceptual metaphor, with its complex connections between conceptual domains, is best treated in this framework.

In this book we have seen major differences between

semantic categories, rather than a change in the iconic system itself.

signed and spoken languages in how iconic they can be, and how easily they can connect metaphor and iconicity. Signed languages are easily, beautifully, naturally iconic -- they describe space and movement iconically, use iconicity and metaphor in their grammar, and connect metaphor to iconicity to describe abstract concepts. The iconicity and metaphor are so pervasive and so motivated that signers familiar with one language's system can quickly master the basics of another language's system. Spoken languages have much less iconicity, and rarely (if at all) connect it to their own rich and beautiful metaphorical systems.

Yet we must remember that these differences, though seemingly deep, are a direct consequence of the languages' modalities. We have seen that the process of creating iconic forms is identical in both signed and spoken languages, and that metaphorical mappings between conceptual domains work the same way in both modalities. Having the body and space as articulators, however, lets us represent far more types of imagery iconically; and many more concepts have visual, spatial, or kinesthetic images associated with them than auditory images. The processes of iconicity and metaphor are modality-independent; yet their interactions with the two modalities of human language produce two distinct language types: the highly-iconic signed varieties and the less-iconic (yet still highly-motivated) signed varieties.

Language, in any modality, is motivated -- it draws on structures and associations in the language user's conceptual system. Iconicity, a feature of all languages, is based on our ability to associate sensory images with concepts, simplify those images, and create analogues of them using the resources of the language, all while preserving the essential structure of the original image. Conceptual metaphor, another feature of all languages, creates associations between abstract and concrete conceptual domains. While all languages have metaphor and iconicity, only signed languages put the two together, creating a vast range of iconic and metaphorical/iconic words, inflections, and syntactic structures. To give a real description and explanation of these phenomena, we must adopt a theory of linguistics that can also draw on the complexities of conceptual structure; we must not separate off semantics from syntax and phonology, but must integrate them together in one linguistic representation. In short, we must adopt the cognitive linguistics point of view.

The field of linguistics owes a great debt to the world's Deaf communities for creating and sharing language in the signed modality. Signed languages are vital to our progress in figuring out the human language capacity, because their iconicity is too strong and pervasive and multi-faceted to ignore. Truly taking signed languages seriously will

cause a revolution in spoken-language linguistics: a new direction for all of us language scholars as we enter the Third Millennium.

References

- Alpher, Barry. 1994. Yir-Yoront ideophones. In Leanne Hinton, Johanna Nichols, & John J. Ohala, eds., *Sound Symbolism*. Cambridge: Cambridge University Press.
- Baker, Charlotte, & Dennis Cokely. 1980. *American Sign Language: a Teacher's Resource Text on Grammar and Culture*. Silver Spring, MD: T.J. Publishers, Inc.
- Battison, Robin. 1978. *Lexical Borrowing in American Sign Language*. Silver Spring, MD: Linstok Press.
- Berlin, Brent & Paul Kay. 1969. *Basic Color Terms: Their Universality and Evolution*. Berkeley: University of California Press.
- Bickerton, Derek. 1981. *Roots of Language*. Ann Arbor: Karoma Publishers.
- Bickerton, Derek. 1984. The language bioprogram hypothesis. *Behavioral and Brain Sciences*, 7: 173-88.
- Bloom, Ralph. 1979. *Language Creation in the Manual Modality: A Preliminary Investigation*. Unpublished bachelors thesis, Dept. of Behavioral Sciences, University of Chicago.
- Boyes-Braem, Penny. 1981. *Features of the Handshape in American Sign Language*. Unpublished doctoral dissertation, U.C. Berkeley.
- Brennan, Mary. 1990. *Word Formation in British Sign Language*. Stockholm, Sweden: University of Stockholm.
- Brennan, Mary. 1994. Pragmatics and productivity. In Inger Ahlgren, Brita Bergman, & Mary Brennan, eds., *Perspectives on Sign Language Usage: Papers from the Fifth International Symposium on Sign Language Research, Vol. 2*. Durham, England: International Sign Linguistics Association. 371-390.
- Brentari, Diane. 1996. Trilled movement: Phonetic realization and formal representation. *Lingua* 98, 43-71.
- Cameracanna, Emanuela, Serena Corazza, Elena Pizzuto, & Virginia Volterra. 1994. How visual spatial-temporal metaphors of speech become visible in sign. In Inger Ahlgren, Brita Bergman, & Mary Brennan, eds., *Perspectives on Sign Language Structure: Papers from the Fifth International Symposium on Sign Language Research, Vol. 1*. Durham, England: International Sign Linguistics Association. 55-68.
- Choi, Soonja, & Melissa Bowerman. 1991. Learning to express motion events in English and Korean: The influence of language-specific lexicalization patterns. *Cognition*, 41.

- Chomsky, Noam. 1957. *Syntactic Structures*. The Hague: Mouton.
- Chomsky, Noam. 1965. *Aspects of the Theory of Syntax*. Cambridge, MA: MIT Press.
- Chomsky, Noam. 1981. *Lectures on Government and Binding*. Dordrecht: Foris.
- Cienki, Alan. In press. Metaphoric gestures and their relations to verbal metaphorical expressions. In J.P. Koenig, ed., *Conceptual Structure, Discourse, and Language 2*. Stanford: CSLI.
- Clark, Herbert. 1973. Space, time, semantics and the child. In T. Moore, ed., *Cognitive Development and the Acquisition of Language*. New York: Academic Press. 27-63.
- Comrie, Bernard. 1985. *Tense*. Cambridge: Cambridge University Press.
- Croft, William. 1990. *Typology and Universals*. Cambridge: Cambridge University Press.
- Croft, William. 1991. *Syntactic Categories and Grammatical Relations: The Cognitive Organization of Information*. Chicago: University of Chicago Press.
- DeMatteo, Asa. 1977. Visual imagery and visual analogues in American Sign Language. In Lynn A. Friedman, ed., *On The Other Hand*. London: Academic Press.
- DeLancey, Scott. 1981. An interpretation of split ergativity and related phenomena. *Language* 57: 626-57.
- Elman, Jeffrey L., & James L. McClelland. 1984. Speech perception as a cognitive process: the interactive activation model. In Norman Lass, ed., *Speech and Language*. Vol. 10. New York: Academic Press.
- Engberg-Pedersen, Elisabeth. 1993. *Space in Danish Sign Language: The Semantics and Morphosyntax of the Use of Space in a Visual Language*. Hamburg: SIGNUM-Verlag.
- Emanatian, Michele. 1992. Chagga 'come' and 'go': metaphor and the development of tense-aspect. *Studies in Language* 16-1:1-33.
- Fauconnier, Gilles. 1985. *Mental Spaces: Aspects of Meaning Construction in Natural Languages*. Cambridge: Cambridge University Press.
- Fillmore, Charles. 1968. The case for case. In Emmon Bach & Robert T. Harms, eds., *Universals in Linguistic Theory*. New York: Holt.
- Fillmore, Charles. 1982. Frame semantics. In The Linguistic Society of Korea, ed., *Linguistics in the Morning Calm*. Seoul: Hanshin Publishing Co.
- Fleischman, Suzanne. 1982a. The past and the future: are they coming or going? In *Proceedings of the Eighth Annual Meeting of the Berkeley Linguistics Society*.

- Fleischman, Suzanne. 1982b. *The Future in Thought and Language*. Cambridge: Cambridge University Press.
- Fried, Mirjam. 1995. *Grammatical Subject and its Role in the Grammar of Case Languages*. Unpublished doctoral dissertation, U.C. Berkeley.
- Friedman, Lynn A. 1975. Space, time, and person reference in American Sign Language. *Language*, 51:940-961
- Frishberg, Nancy, & B. Gough. 1973. Morphology in American Sign Language. Ms.
- Frishberg, Nancy. 1979. Historical change: from iconic to arbitrary. In Klima & Bellugi, *The Signs of Language*. Cambridge, MA: Harvard University Press. Ch. 3.
- Gee, James P., & Judy A. Kegl. 1982. Semantic perspicuity and the locative hypothesis: implications for acquisition. *Journal of Education (Boston University)* 164, 185-209.
- Gentner, Dedre, & Arthur Markman. 1996. Structure-mapping in analogy and similarity: the importance of being connected. Ms.
- Givon, Talmy. 1979. *On Understanding Grammar*. New York: Academic Press.
- Givon, Talmy. 1984. *Syntax: A Functional-Typological Introduction*. Vol. 1. Amsterdam: John Benjamins.
- Grady, Joseph, & Christopher Johnson. forthcoming. Converging evidence for the notions of "subscene" and "primary scene". In *Proceedings of the Twenty-Third Annual Meeting of the Berkeley Linguistics Society*.
- Grady, Joseph, Sarah Taub, & Pamela Morgan. 1996. Primitive and compound metaphors. In Adele Goldberg, ed., *Conceptual Structure, Discourse, and Language*. Stanford: CSLI.
- Greenberg, Joseph H. 1966a. Some universals of grammar with particular reference to the order of meaningful elements. In Joseph H. Greenberg, ed., *Universals of Grammar* (2nd edition). Cambridge, MA: MIT Press.
- Greenberg, Joseph H. 1966b. *Language Universals, with Special Reference to Feature Hierarchies*. The Hague: Mouton.
- Haiman, John, ed. 1985a. *Iconicity in Syntax: Proceedings of a Symposium on Iconicity in Syntax, Stanford, June 24-6, 1983*. Amsterdam: John Benjamins.
- Haiman, John. 1985b. Symmetry. In John Haiman, ed., *Iconicity in Syntax: Proceedings of a Symposium on Iconicity in Syntax, Stanford, June 24-6, 1983*. Amsterdam: John Benjamins.
- Hinton, Leanne, Johanna Nichols, & John J. Ohala, eds. 1994. *Sound Symbolism*. Cambridge: Cambridge University Press.
- Hock, Hans Heinrich. 1986. *Principles of Historical Linguistics*. Berlin: Mouton de Gruyter.

- van Hoek, Karen. 1996. Conceptual locations for reference in American Sign Language. In Gilles Fauconnier & Eve Sweetser, eds., *Spaces, Worlds, and Grammar*. Chicago: University of Chicago Press.
- Hoemann, H. 1975. The transparency of meaning of sign language gestures. *Sign Language Studies*, 7:151-161.
- Holtemann, Derek. 1990. Unpublished bachelors thesis. Dept. of Linguistics, U.C. Berkeley.
- Hopper, Paul J., & Sandra A. Thompson. 1980. Transitivity in grammar and discourse. *Language* 56: 251-99.
- Hopper, Paul J., & Sandra A. Thompson. 1985. The iconicity of the universal categories "noun" and "verb". In John Haiman, ed., *Iconicity in Syntax: Proceedings of a Symposium on Iconicity in Syntax, Stanford, June 24-6, 1983*. Amsterdam: John Benjamins.
- Janis, Wynne D. 1995. A crosslinguistic perspective on ASL verb agreement. In Karen Emmorey & Judy Reilly, eds., *Language, Gesture, and Space*. Hillsdale, NJ: Lawrence Erlbaum.
- Johnson, Mark. 1987. *The Body in the Mind*. Chicago: University of Chicago Press.
- Johnson, Robert E. & Scott K. Liddell. 1987. A morphological analysis of subject-object agreement in American Sign Language. Paper presented at the Fourth International Conference on Sign Language Linguistics, 15-19 July, Lapeenranta, Finland.
- Kay, Paul, & Chad McDaniel. 1978. The linguistic significance of the meanings of basic color terms. *Language* 54(3), 610-46.
- Kegl, Judy. 1985. Causative marking and the construal of agency in ASL. In W. Eilfort, P. Kroeber, and K. Peterson, eds., *CLS Part 2: Papers From the Parasession on Causatives and Agentivity at the Twenty-First Annual Meeting*.
- Kegl, Judy, Ann Senghas, & Marie E.V. Coppola. 1995. Creation through contact: sign language emergence and sign language change in Nicaragua. In M. DeGraf, ed., *Comparative Grammatical Change: The Intersection of Language Acquisition, Creole Genesis, and Diachronic Syntax*. Cambridge, MA: MIT Press.
- Kingston, John, & Mary E. Beckman. 1990. *Papers in Laboratory Phonology I: Between the Grammar and Physics of Speech*. Cambridge: Cambridge University Press.
- Klima, Edward, & Ursula Bellugi. 1979. *The Signs of Language*. Cambridge, MA: Harvard University Press.
- Lakoff, George. 1987. *Women, Fire, and Dangerous Things: What Categories Reveal about the Mind*. Chicago: University of Chicago Press.

- Lakoff, George. 1992. The contemporary theory of metaphor. In Andrew Ortony, ed., *Metaphor and Thought*, 2nd ed. Cambridge: Cambridge University Press.
- Lakoff, George, Jane Espenson, and Alan Schwartz. 1991. *Master Metaphor List*, 2nd ed. Ms., U.C. Berkeley.
- Lakoff, George, and Mark Johnson. 1980. *Metaphors We Live By*. Chicago: University of Chicago Press.
- Lakoff, George, and Mark Turner. 1989. *More than Cool Reason: a Field Guide to Poetic Metaphor*. Chicago: University of Chicago Press.
- Lane, Harlan, Robert Hoffmeister, & Ben Bahan. 1996. *A Journey into the DEAF-WORLD*. San Diego, CA: DawnSignPress.
- Langacker, Ronald. 1987. *Foundations of Cognitive Grammar: Volume I: Theoretical Prerequisites*. Stanford: Stanford University Press.
- Langacker, Ronald. 1991a. *Foundations of Cognitive Grammar: Volume II: Descriptive Application*. Stanford: Stanford University Press.
- Langacker, Ronald. 1991b. *Concept, Image, and Symbol: the Cognitive Basis of Grammar*. Berlin: Mouton de Gruyter.
- Leite, Naomi. 1994. Master metonymy list. Ms., U.C. Berkeley.
- Liddell, Scott. 1990. Four functions of a locus: reexamining the structure of space in ASL. In Ceil Lucas, ed., *Sign Language Research: Theoretical Issues*, 176-198. Washington, DC: Gallaudet University Press.
- Liddell, Scott. 1992. *Paths to Lexical Imagery*. Ms., Gallaudet University.
- Liddell, Scott. 1994. Conceptual and linguistic issues in spatial mapping: comparing spoken and signed language. Ms. Gallaudet University.
- Liddell, Scott. 1995. Real, surrogate, and token space: grammatical consequences in ASL. In Karen Emmorey & Judy S. Reilly, eds., *Language, Gesture, and Space*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Liddell, Scott. 1996. Numeral incorporation and bound roots: an analysis of simple and complex numeral incorporating forms. Poster presented at the Fifth International Conference on Theoretical Issues in Sign Language Research; Montreal, Quebec.
- Liddell, Scott K., & Robert E. Johnson. 1989. American Sign Language: the phonological base. *Sign Language Studies* 64: 195-277.
- Mandel, Mark. 1977. Iconic devices in American Sign Language. In Lynn A. Friedman, ed., *On The Other Hand*. London: Academic Press.

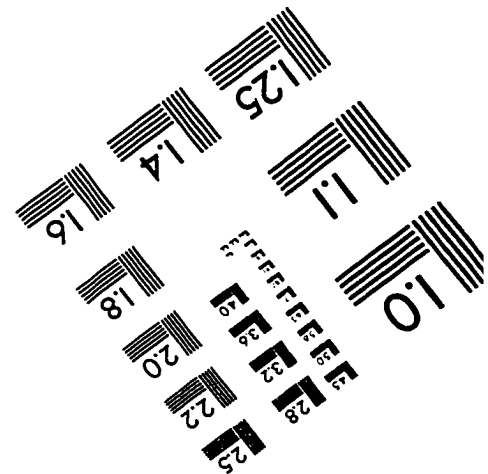
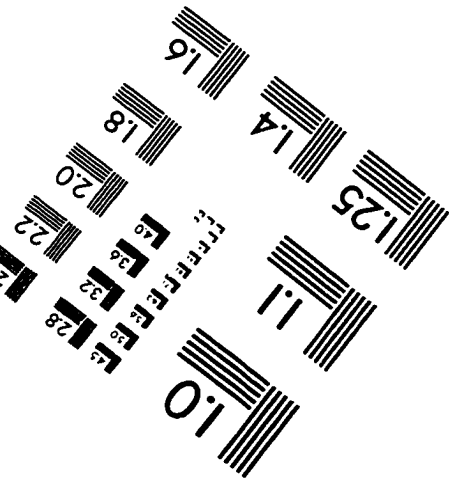
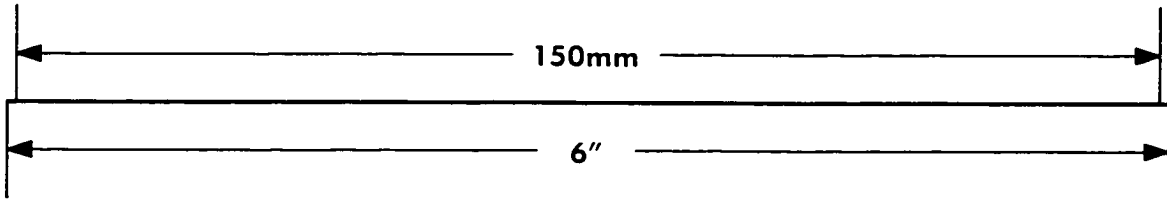
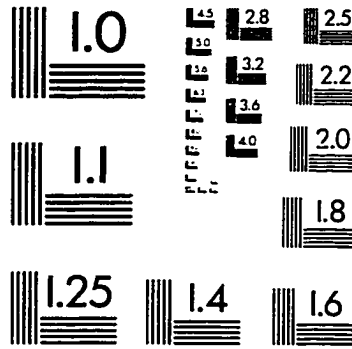
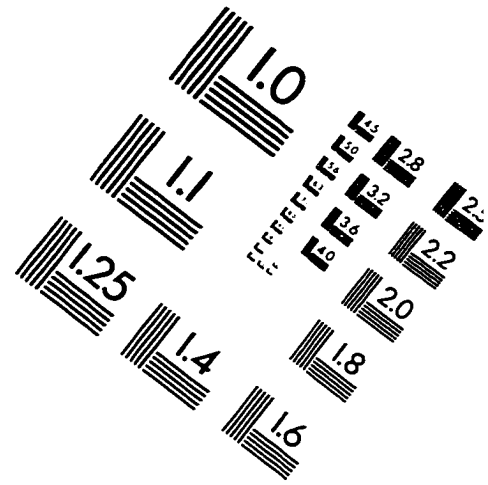
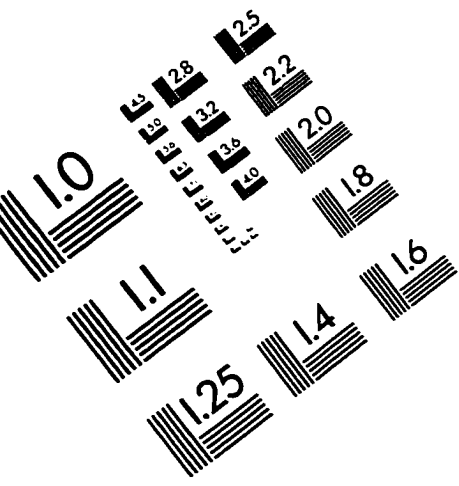
- Marr, David. 1982. *Vision: a Computational Investigation into the Human Representation and Processing of Visual Information*. San Francisco: W.H. Freeman.
- McDonald, Betsy H. 1982. *Aspects of the American Sign Language Predicate System*. Unpublished doctoral dissertation, University of Buffalo.
- McNeill, David. 1992. *Hand and Mind: What Gestures Reveal About Thought*. Chicago: University of Chicago Press.
- McWhorter, John. 1997. Identifying the creole prototype: vindicating a typological class. Ms., U.C. Berkeley.
- Morford, Jill P., Jenny L. Singleton, & Susan Goldin-Meadow. 1995. The genesis of language: how much time is needed to generate arbitrary symbols in a sign system? In Karen Emmorey & Judy Reilly, eds., *Language, Gesture, and Space*. Hillsdale, NJ: Lawrence Erlbaum.
- Morgan, Pamela. 1996. Metaphorical "families". Ms., U.C. Berkeley.
- Newport, Elissa. 1996. Sign language research in the third millenium. Paper presented at the Fifth International Conference on Theoretical Issues in Sign Language Research, 19-22 September, Montreal, Quebec, Canada.
- Ohala, John J. 1983. The phonological end justifies any means. In Shiro Hattori & Kazuko Inoue, eds., *Proceedings of the XIIIth International Congress of Linguists, Tokyo, 29 Aug. - 4 Sept. 1982*. Tokyo: Sanseido Shoten.
- Ohala, John J. 1990. There is no interface between phonology and phonetics: a personal view. *Journal of Phonetics* 18: 153-171.
- Ohala, John J., & Jeri J. Jaeger, eds. 1986. *Experimental Phonology*. Orlando, FL: Academic Press.
- Oswalt, Robert L. 1994. Inanimate imitatives in English. In Leanne Hinton, Johanna Nichols, & John J. Ohala, eds., *Sound Symbolism*. Cambridge: Cambridge University Press.
- Padden, Carol. 1986. Verbs and role-shifting in ASL. In Carol A. Padden, ed., *Proceedings of the Fourth National Symposium on Sign Language Research and Teaching*. Silver Spring, MD: National Association of the Deaf.
- Padden, Carol. 1988. *Interaction of Morphology and Syntax in American Sign Language*. New York: Garland Publishing Company.
- Padden, Carol. 1990. The relation between space and grammar in ASL verb morphology. In Ceil Lucas, ed., *Sign Language Research: Theoretical Issues*. Washington, DC: Gallaudet University Press.
- Poizner, Howard, Edward S. Klima, & Ursula Bellugi. 1987. *What the Hands Reveal About the Brain*. Cambridge, MA: MIT Press.

- Reddy, Michael. 1979. The conduit metaphor -- a case of frame conflict in our language about language. In A. Ortony, ed., *Metaphor and Thought*. Cambridge: Cambridge University Press.
- Regier, Terry. 1996. *The Human Semantic Potential: Spatial Language and Constrained Connectionism*. Boston: MIT Press.
- Rhodes, Richard. 1994. Aural images. In Leanne Hinton, Johanna Nichols, & John J. Ohala, eds., *Sound Symbolism*. Cambridge: Cambridge University Press.
- Rosch, Eleanor. 1977. Human categorization. In N. Warren, ed., *Studies in Cross-Cultural Psychology*. London: Academic Press.
- Rosch, Eleanor. 1981. Prototype classification and logical classification: the two systems. In E. Scholnick, ed., *New Trends in Cognitive Representation: Challenges to Piaget's Theory*. Hillsdale, NJ: Lawrence Erlbaum.
- Rosch, Eleanor, & Carolyn Mervis. 1975. Family resemblances: studies in the internal structure of categories. *Cognitive Psychology* 7:573-605.
- Rumelhart, D.E., J.L. McClelland, & the PDP Research Group. 1986. *Parallel Distributed Processing: Explorations in the Microstructure of Cognition, Vol. I: Foundations*. Cambridge, MA: Bradford Books, MIT Press.
- de Saussure, Ferdinand. 1983 (1915). *Course in General Linguistics*. Roy Harris, trans. Charles Bally, Albert Sechehaye, and Albert Reidlinger, eds. London: G. Duckworth.
- Schank, R.C., & R.P. Abelson. 1977. *Scripts, Plans, Goals, and Understanding*. Hillsdale, NJ: Lawrence Erlbaum.
- Senghas, Ann. 1995. *Children's Contribution to the Birth of Nicaraguan Sign Language*. Unpublished doctoral dissertation, MIT.
- Shibatani, Masayoshi. 1990. Japanese. In Bernard Comrie, ed., *The World's Major Languages*. Oxford: Oxford University Press.
- Singleton, Jenny L., Susan Goldin-Meadow, & David McNeill. 1995. The cataclysmic break between gesticulation and sign: evidence against a unified continuum of gestural communication. In Karen Emmorey & Judy Reilly, eds., *Language, Gesture, and Space*. Hillsdale, NJ: Lawrence Erlbaum.
- Slobin, Dan I. 1996. From 'thought and language' to 'thinking for speaking.' In J.J. Gumperz & S.C. Levinson, eds., *Rethinking Linguistic Relativity*. Cambridge: Cambridge University Press.
- Stokoe, William C. 1960. *Sign Language Structure*. Studies in Linguistics Occasional Papers 8. Buffalo: University of Buffalo Press.

- Supalla, S. J. 1991. Manually coded English: the modality question in signed language development. In Patricia Siple & Susan D. Fischer, eds., *Theoretical Issues in Sign Language Research*. Vol. 2, *Psychology*. Chicago: University of Chicago Press.
- Supalla, Ted. 1978. Morphology of verbs of motion and location in American Sign Language. In Frank Caccamise and Doin Hicks, eds., *American Sign Language in a Bilingual, Bicultural Context: Proceedings of the Second National Symposium on Sign Language Research and Teaching*. Publisher not given.
- Supalla, Ted. 1986. The classifier system in American Sign Language. In Colette Craig, ed., *Noun Classes and Categorization*. Amsterdam: John Benjamins Publishing Company.
- Supalla, Ted. 1990. Serial verbs of motion in ASL. In Susan D. Fischer and Patricia Siple, eds., *Theoretical Issues in Sign Language Research, Vol. 1: Linguistics*. Chicago: University of Chicago Press.
- Sweetser, Eve. 1980. Tagalog subjecthood revisited. In J. Kreiman & A. Ojeda, eds., *Papers from the Sixteenth Regional Meeting of the Chicago Linguistic Society*.
- Sweetser, Eve. 1987. Metaphorical models of thought and speech: a comparison of historical directions and metaphorical mappings in the two domains. In Jon Aske, Natasha Beery, Laura Michaelis, and Hana Filip, eds., *Proceedings of the Thirteenth Annual Meeting of the Berkeley Linguistics Society*.
- Sweetser, Eve. 1990. *From Etymology to Pragmatics: Metaphorical and Cultural Aspects of Semantic Structure*. Cambridge: Cambridge University Press.
- Sweetser, Eve. 1995. Coalignment in metaphorical systems. Paper presented at the International Cognitive Linguistics Association Conference, 16-21 July, Albuquerque, NM.
- Talmy, Leonard. 1985a. Lexicalization patterns: semantic structure in lexical forms. In T. Shopen, ed., *Language Typology and Syntactic Description, Vol.3: Grammatical Categories and the Lexicon*. Cambridge: Cambridge University Press.
- Talmy, Leonard. 1985b. Force dynamics in language and thought. In *Parasession on Causatives and Agentivity*. Chicago Linguistic Society, 21st Regional Meeting.
- Talmy, Leonard. 1987. The relation of grammar to cognition. In Brygida Rudzka-Ostyn, ed., *Topics in Cognitive Linguistics*. Amsterdam: John Benjamins.
- Traugott, Elizabeth. 1975. Spatial expressions of tense and temporal sequencing: a contribution to the study of semantic fields. *Semiotica* 15,3:207-230.

- Traugott, Elizabeth. 1978. On the expression of spatio-temporal relation in language. In J. Greenberg, C.A. Ferguson, & E.A. Moravcik, *Universals of Human Language*, Vol. 3. Stanford: Stanford University Press.
- Washabaugh, William, James C. Woodward, & Susan DeSantis. 1978. Providence Island Sign Language: a context-dependent language. *Anthropological Linguistics*.
- Wilbur, Ronnie Bring. 1987. *American Sign Language: Linguistic and Applied Dimensions*. Boston: Little, Brown and Co.
- Wilbur, Ronnie B., Mark E. Bernstein, & Rebecca Kantor. 1985. The semantic domain of classifiers in American Sign Language. *Sign Language Studies* 46, 1-38.
- Wilcox, Phyllis. 1993. *Metaphorical Mapping in American Sign Language*. Unpublished doctoral dissertation, University of New Mexico.
- Wilcox, Phyllis. 1995. Metaphor, metonym and synecdoche in American Sign Language: a cognitive intertropic relationship. Paper presented at the International Cognitive Linguistics Association Conference, 16-21 July, Albuquerque, NM.
- Wilcox, Phyllis. Forthcoming. GIVE: acts of giving in American Sign Language. In John Newman, ed., *The Linguistics of Giving*. Amsterdam: John Benjamins.
- Winitz, H., M.E. Scheib, & J.A. Reed. 1972. Identification of stops and vowels for the burst portion of /p, t, k/ isolated from conversational speech. *J. Acoust. Soc. Am.* 51: 1309-1317.
- Woodward, James. 1979. *Signs of Sexual Behavior: an Introduction to some Sex-Related Vocabulary in American Sign Language*. Silver Spring, MD: T.J. Publishers.

IMAGE EVALUATION TEST TARGET (QA-3)



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