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# Mechanisms of Language Acquisition

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## 1

### The Principle of Contrast: A Constraint on Language Acquisition

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Different words mean different things. That is, wherever there is a difference in *form* in a language, there is a difference in *meaning*. This is what, in 1980, I called the *Principle of Contrast*.<sup>1</sup> It is by virtue of this property that language maintains its usefulness as a medium of communication. As Bolinger put it, "any word which a language permits to survive must make its semantic contribution" (1977, p. ix). This applies as much to constructions as to words: "the same holds for any construction that is physically distinct from any other construction" (1977, p. ix-x).

In the present paper I focus on the acquisition of meaning in light of the Principle of Contrast. This principle makes specific predictions about acquisition that are supported by data from many different domains. It shapes the lexicon for immature and mature speakers alike. It also plays a role in establishing which forms are conventional and thus contributes a solution to why children give up over-regularizations in morphology and syntax. Finally, it helps account for individual variation during acquisition.

I begin in the first section with a statement of the Principle of Contrast together with its corollary, the Principle of Conventionality, and review its predictions about language use in general. In the next section I review the evidence for the Principle of Contrast in acquisition and show that children observe it in both expected and unexpected ways from the earliest stages in the acquisition of language. In the third section I look at the consequences of the Principle of Contrast for the acquisition of morphology and of syntax, and the

<sup>1</sup>See also Clark (1983a, 1983b), Clark and Berman (1984), Clark and Clark (1979), and Clark and Hecht (1982).

role it plays in children's getting rid of over-regularizations. I then show how this principle helps account for variations in the courses children follow during acquisition. In the last section I argue that this principle subsumes several other proposals to constrain language development in that they each constitute special cases of the Principle of Contrast.

## THE PRINCIPLE OF CONTRAST

The Principle of Contrast states that any difference in form in a language marks a difference in meaning. The term *dog*, for instance, which differs in form from *horse* also differs from it in meaning. This principle can be stated as:

*The Principle of Contrast:* Every two forms contrast in meaning.

This principle is a general one for speakers of a language. It is one that has been stated or assumed by virtually every linguist over the years.

The Principle of Contrast must be carefully distinguished from its converse, which I will call the Homonymy Assumption. This assumption is that every two meanings contrast in form. Under this view, one should never find two different meanings being carried by the same form, as in *bank* of a river versus a financial institution, or *bat*, a small flying mammal versus an instrument used in playing cricket or baseball. This assumption clearly doesn't hold in general for speakers of a language. But, within one level of a semantic field, where the words for two different meanings over time come to have the same form, the resultant homonymy may cause genuine confusion. Speakers then typically introduce another form to carry one of the meanings (see Orr, 1962). Aside from this special case, the Homonymy Assumption should be kept distinct from the Principle of Contrast because it may play little or no role in either adult language use or acquisition.

The Principle of Contrast is essential, though, because it helps maintain conventionality in language:

*The Principle of Conventionality:* For certain meanings, there is a conventional form that speakers expect to be used in the language community.

If one wishes to talk about an instance of the category 'dog', one had better use the conventional word *dog* (and not *horse*), or no one will understand. Conventional terms used conventionally work best to convey speakers' intentions within the speech community. Conventional terms work in large part because speakers are consistent with the conventional meanings they assign to forms from one occasion to the next, and therefore maintain the same contrasts in meaning over

time. Speakers of English use the word *dog* to denote dogs, not dogs one day, horses the next, and some other animal the day after. These two principles jointly constrain the choices speakers make in language use (e.g., Bolinger, 1977; Clark & Clark, 1979). Without them, languages simply wouldn't work.

If the Principle of Contrast (from now on, Contrast for short) is truly general in language, then a number of predictions follow:

1. Words contrast in meaning, so there are no true synonyms.
2. Established words have priority in the expression of meaning.
3. Innovative words fill lexical gaps and so may not be used in place of established words with the identical meanings.

The evidence for these predictions is extensive, so I will simply summarize some of the major findings before turning to the predictions Contrast makes about acquisition.

### Contrast in Meaning

Evidence for the first prediction comes from the lexicon and from syntax. In both, differences in form make for contrasts in meaning. Meanings may overlap, of course, but they nonetheless contrast in at least some contexts. In the lexicon, many apparent synonyms are in fact not synonymous; they mark contrasts in dialect, in register, or in connotation. In syntax, differences in form mark differences in meaning, but some of these reflect subtle shifts in perspective or topicalization.

**Lexical contrasts.** Meaning differences, large and small, are characteristic of the lexicon. The study of such differences has traditionally been carried out within semantic fields where linguists have analyzed and characterized patterns of contrasts (e.g., Bierwisch, 1967; Lehrer, 1974; Lyons, 1963). While different lexical domains may be organized in a variety of ways, the property they all display is that each term within a domain or semantic field contrasts in meaning with all the others. The precise pattern of lexical contrasts will vary with the internal organization of a semantic field (for discussion, see Fillmore, 1978; Kay, 1971; Lehrer, 1974; Lyons, 1977).

Possible relations in lexical domains include those among *co-hyponyms* (terms contrasting at the same level). For example, *horse*, *dog*, *cat*, and *sheep* are all co-hyponyms of terms above them, hierarchically, like *mammal* or *animal*. This relation of hyponymy may hold across two or more levels. Thus *spaniel*, a co-hyponym of *boxer*, *Alsatian*, and *Labrador*, is a hyponym of and contrasts with *dog*, and *dog* in turn is a hyponym of and contrasts with *animal*.

Contrasts in meaning, then, may hold at the same level (among co-hyponyms) or across different levels.<sup>2</sup> Contrasts may also be orthogonal, between terms that potentially belong in more than one domain. *Dog*, for instance, is a hyponym of *animal* and also of *pet* (see further Fillmore, 1978; Lyons, 1977).

Analyses of specific lexical domains, then, have focussed on the contrasts inherent in the meaning relations within each domain. Many contrasts are obvious but others are more subtle. All languages contain numerous expressions whose meanings overlap. In many contexts these may be exchanged for each other, and it is this degree of overlap or partial synonymy that is exploited in dictionaries or thesauri, e.g., for the adjective *mature*, one finds *adult*, *ripe*, *perfect*, *due*; for the verb *govern*: *direct*, *control*, *determine*, *require*; or for the adjective *loose*: *inexact*, *free*, *relaxed*, *vague*, *lax*, *unbound*, *inattentive*, or *slack*. When the entry for each of these is inspected, one moves further and further away from the original word being "defined." What this shows, clearly, is that overlaps are not equivalent to synonymy. While two terms may be interchangeable in many contexts, they are not so in all, and it is the contexts where they are not equivalent that reveal their often subtle contrasts in meaning.

**Dialect, register, and connotation.** English, like most other languages, contains many apparent synonyms, but these typically contrast in meaning according to dialect or register choices, or according to emotive coloring, connotation. Terms that differ only in one of these dimensions have the same extensions: their intensions are different. It is this that may mislead. Such pairs are then perceived as synonyms and their meaning differences ignored.

Choice of a term from one dialect over another in many settings identifies the speaker's membership in a particular societal group. Dialect differences account for pairs such as *autumn* (UK) versus *fall* (Western UK and US), as well as for differences between pairs like *truck/lorry*, *pail/bucket*, *sack/bag*, and *cup/tassie* (Palmer, 1981). They also account for multiple terms with the same denotation such as *cowshed*, *cowhouse*, and *byre*; *haystack*, *hayrick*, and *haymow*; *tap*, *pigot*, and *faucet*, and so on. The contrasts between dialects are really no different from translation equivalents across languages like French and Hungarian or English and Hebrew. In many communities speakers may be unfamiliar with the original dialects while being familiar with some of these pairs from written sources. This, though, simply makes the pairs similar to equivalent terms from two distinct languages, e.g., *house* and *maison*.

Other apparent synonyms mark different registers (speech styles). Registers may differ in formality, e.g., the contrasts among *smell*, *effluvium*, *stink*

(straightforward, pretentious, colloquial) or, on a similar continuum, *die*, *pass away*, *pop off*. Speakers often opt for Latinate vocabulary in English to mark a more formal register: compare *numerous* and *many*, *facilitate* and *ease*, *attempt* and *try*, *sufficient* and *enough* (Joos, 1961). Choices of lexical items may signal solidarity or identification with a particular social group, formality or informality, or politeness. The dimensions along which lexical choices can mark register are not clearcut, and the same choices may have different consequences on different occasions (Lakoff, 1973; Nunberg, 1978).

Yet other apparent synonyms differ in the emotive coloring or connotation each carries. That is, the speaker's choice of term can convey his attitude towards the person or event being described. Compare the choice of *politician* versus *statesman*, where the latter is laudatory and the former not (see also Orwell, 1950). Much the same contrast appears to underlie choices of *skinny* versus *slim*, *obstinate* versus *firm*, and *spendthrift* versus *generous*. The first term typically carries a negative connotation, while the second carries a positive one. Many apparent synonyms contrast in connotation.

**Syntactic contrasts.** Differences in form at the syntactic level also mark contrasts in meaning (e.g., Bolinger, 1977; Chafe, 1971). Consider the following pairs of sentences:

- (1a) They pulled the ropes in.
- (1b) They pulled in the ropes.
- (2a) Jan taught Rob French.
- (2b) Jan taught French to Rob.
- (3a) Jo lit the fire.
- (3b) The fire was lit by Jo.
- (4a) Bees swarmed in the garden.
- (4b) The garden swarmed with bees.

In (1), as Bolinger (1977) pointed out, the contrast is one of completion or achievement marked by the first form (the ropes were in) compared to non-completion in the second. Much the same contrast appears in (2): in the first, one infers that Rob learned some French; in the second, the outcome remains unspecified. In (3) and in (4), the first form in each pair focuses on the actor, while the second focuses on the object affected and the location respectively (see Salkoff, 1983).

Other constructional contrasts appear in lexicalized versus periphrastic causatives as in (5) and in descriptions of sequence as in (6):

- (5a) Bill killed John.
- (5b) Bill caused John to die.

<sup>2</sup>The terms superordinate and subordinate are often used in place of hyponymy to talk about the relations among terms at different levels. However, they tend to suggest there is a fixed number of levels, typically three—superordinate, basic, subordinate—when in fact there are sometimes more and sometimes fewer.

- (6a) He opened the door and he came in.
- (6b) He opened the door and came in.

In (5), the contrast is one between direct (5a) versus indirect (5b) causation (McCawley, 1978; Shibatani, 1976), while in (6) there is a subtle contrast in meaning between (6a) where there are two distinct activities, and (6b) where there is only one (Bolinger, 1977).

Finally, in (7), adjectival modification offers further contrasts at the constructional level:

- (7a) the blue cushion, the pale blue cushion
- (7b) the green cushion, the pale green cushion
- (7c) the red cushion, the pink cushion (\*pale red)

Here the modification of adjectives by *pale* is blocked in the case of *red* because of the existence of the term *pink*, an adjective that picks out just the domain that would otherwise be designated by the construction *pale red* (see Gruber, 1976; Hofmann, 1982, 1983).

Contrasts in meaning, then, show up not only in the lexicon but also in the combinatorial options possible at the syntactic level.

In summary, differences in form mark differences in meaning at both the lexical and the syntactic levels. Furthermore, where languages contain a variety of apparent synonyms, these typically mark contrasts in dialect, in register or speech style, or in connotation. True synonyms probably do not exist: "... there are no real synonyms . . . no two words have exactly the same meaning" (Palmer, 1981, p. 89).

### Priority of Established Forms

Evidence that established forms take priority comes from existence of suppletive forms in many otherwise regular paradigms in the lexicon as well as elsewhere in the language. The lexicon as a whole can be roughly organized into paradigms or groups of terms that share some element of form that marks an element of meaning shared by all the members of a paradigm. For example, many adjectives in English end in the suffix *-y*, an element of form marking any terms that carry it as adjectives with the meaning, roughly, 'having X' or 'being connected with X', e.g., *stony*, *dirty*, *watery*. Similarly, many agentive nouns end in *-er*, an element of form indicating agentivity, e.g., *builder*, *farmer*, *runner*; and many nouns for states end in *-ness*, a suffix indicating statehood, e.g., *closeness*, *ordinariness*, *roughness*. Such paradigms reflect the many regularities to be found in the lexicon.

But irregularities abound too. The lexicon as a whole combines regular and irregular forms in a complex patchwork. Irregular forms are often the remains of

paradigms no longer in use, as when a suffix like nominal *-th* ceased to be productive several hundred years ago. Yet traces of *-th* remain in the lexicon in words like *warmth*, *width*, and *depth*. Other irregularities result from changes in the sound system that obscure the connections between forms that were originally related (e.g., *create* and *creature*), or from the borrowing of isolated forms to express special meanings (e.g., *hors d'oeuvres*, *sabotage*).

Irregular forms in the lexicon often fill slots in otherwise regular paradigms. These forms are *suppletive*. They pre-empt or block the use of the expected, regular form that would otherwise fill that slot. In morphology, for instance, the regular past tense *\*goed* (\*unacceptability indicates) is pre-empted by suppletive *went*, the regular comparative adjective *\*gooder* is pre-empted by *better*, and the regular plural *\*foots* is pre-empted by *feet*. In the lexicon, the regular noun *\*gloriosity* (from *glorious*) is pre-empted by *glory*, the regular *\*longness* (from *long*) is pre-empted by *length*, the regular agentive *\*cooker* (from the verb *cook*) is pre-empted by the noun *cook*, and the regular denominal verb *\*to car* is pre-empted by *to drive*. In syntax, the regular causative construction *\*to disappear X* is pre-empted by *to make X disappear*, just as the regular phrase *\*to kick with his foot* (alongside *to bruise with his foot*, *to knock with his foot*, etc.) is pre-empted by *to kick*, and the regular phrase *on this day* (alongside *on the next day*, *on the second day*, *on that day*) is pre-empted by *today* on just those occasions when the speaker is referring to the actual time of utterance. In each instance, an established but irregular suppletive form with just the meaning required pre-empts or blocks use of the regular form one would expect there (see Aronoff, 1976; Clark & Clark, 1979; Gruber, 1976; Hofmann, 1982, 1983; Kiparsky 1983). Provided there is no contrast in meaning, established suppletive forms in the language take priority over regular ones that would convey the *same* meaning. This can be stated as a principle covering pre-emption by synonymy in general (Clark & Clark, 1979, p. 798):

*Pre-emption by synonymy:* If a potential innovative word-form would be precisely synonymous with a well-established word, the innovative word is pre-empted by the well-established word, and is therefore considered unacceptable.

Such pre-emption is illustrated further for some verb and noun paradigms in English in Table 1 and Table 2 respectively. In Table 1 the paradigm is that of verbs formed from nouns, a highly productive option in English. Virtually all terms for vehicles, for instance, provide the source for the corresponding verbs, e.g., *to sled*, *to ski*, *to skateboard*, *to helicopter*, *to jet*, *to truck*, *to Chevy*, and *to bicycle*. Two possible verbs in this paradigm, *\*to car* and *\*to airplane*, though, are normally pre-empted by *to drive* and *to fly*. This is because these two terms are already established in the lexicon with just the meanings intended. In contexts where *to car* and *to airplane* contrasted in meaning with *to drive* or *to fly*, they would be perfectly acceptable verbs (Clark & Clark, 1979). The pre-empt-

TABLE 1  
Pre-emption within the Lexicon: Verbs

Source	Paradigm	Pre-empted	Pre-empter
bicycle	to bicycle		
jet	to jet		
car		*to car	
airplane		*to airplane	
knee	to knee		
shoulder	to shoulder		
foot		*to foot	
palm		*to palm	
stable	to stable		
jail	to jail		
hospital		*to hospital	
prison		*to prison	
salt	to salt		
pollen		*to pollen	
butcher	to butcher meat		
chauffeur	to chauffeur		
baker		*to baker bread	
banker		*to banker money	
		to bake	
		to bank	

ing terms pre-empt, then, because they already have just the meaning that the regular forms would carry within the pertinent paradigm. The same point applies to the nouns formed from adjectives and verbs listed in Table 2. Such pre-emption is a logical consequence of the Principles of Contrast and Conventionality. If different forms carry contrasting meanings, the starred forms in Tables 1 and 2 should differ in meaning from the established, suppletive terms.

### Contrast in Innovative Forms

Evidence for the third prediction comes from the fact that speakers coin words freely and frequently, typically to fill gaps. These may be momentary gaps, as when one forgets the exact word for something, or long-term gaps, where there is no established word for that particular meaning. In either case, speakers make use of the word-formational resources available to construct a form appropriate for the meanings they wish to convey.<sup>3</sup> Speakers freely coin new verbs for specific actions. They construct these verbs, for instance, around terms for instruments: *to BART to Berkeley*, *to Concorde*, *to siren up to an accident* (said of the police), *to postcard someone*, *to Ajax the bath*, *to Windex the panes*, to

*bottle the police* (meaning 'to throw bottles at'), *to toothpick the clam*, *to jaw the swimmer* (following the film *Jaws*), *to microwave the chicken*, *to crayon the walls*, *to x-and-m out a word*, or *to 86 a customer* (meaning 'to throw out for drunkenness according to Ordinance 86'). These represent only a minute sample of the range English-speakers use (see further Clark & Clark, 1979; Karius, 1985).

Speakers are equally free in coining new nouns for talking about new categories or subcategories of objects. One of the easiest ways is to create innovative noun + noun compounds, such as *apple-juice-chair* for the chair with the apple-juice nearest it, *earthquake-schools* for schools that would be unsafe in the event of an earthquake, *hedge-axe* for an axe for cutting down hedges, *banana-fork* for a fork for eating bananas, *giraffe-fence* for a fence for confining giraffes, *elf-shoes* for shoes to fit elves, or *bike-horn* for a horn on a bicycle (Downing, 1977). There are other ways too. People can construct a term to designate virtually any category they wish. What is crucial, as Bolinger (1975, p. 109) observed, is that:

Words are not coined in order to extract the meanings of their elements and compile a new meaning from them. The new meaning is there FIRST, and the coiner is looking for the best way to express it without going to too much trouble.

In summary, evidence for the Principle of Contrast is widespread. The first prediction was that differences in form mark differences in meaning. The evidence for this comes from analysis of lexical contrasts, including contrasts between terms that differ in dialect, in register, and in connotation, as well as from

TABLE 2  
Pre-emption within the Lexicon: Nouns

Source	Paradigm	Pre-empted	Pre-empter
curious	curiosity		
tenacious	tenacity		
glorious		*gloriosity	glory
furious		*furiosity	fury
polishy	polisher		
sweepy	sweeper		
drilly		*driller	drill <sub>N</sub>
bore <sub>V</sub>		*borer	bore <sub>N</sub>
ride <sub>V</sub>	rider		
drive <sub>V</sub>	driver		
cook <sub>V</sub>		*cooker	cook <sub>N</sub>
spy <sub>V</sub>		*spyer	spy <sub>N</sub>
apply		*applier	applicant
inhabit		*inhabiter	inhabitant

<sup>3</sup>In using an innovation speakers rely on their addressees to work out the intended meaning, given their mutual knowledge, the prior linguistic context, and any other pertinent information (see Clark & Clark, 1979; H. Clark, 1983).

syntactic contrasts, where differences in form again mark contrasts in meaning. The second prediction was that established terms take priority (by virtue of their meaning) over regular terms designed to carry the *same* meaning. The evidence here was drawn from the presence of suppletive forms in otherwise regular paradigms in morphology, in the lexicon, and in syntax. The suppletive forms pre-empt or block the formation of regular forms to carry the requisite meanings. The third prediction was that lexical gaps—points where there are no established terms to convey particular meanings—are filled by lexical innovations. Here pre-emption no longer applies since the novel meanings have no conventional expressions already established. Speakers must therefore call on some other resource, and they do.

### CONTRAST IN ACQUISITION

The general predictions of Contrast for children acquiring language parallel those for adult users of a language. If the notion of Contrast is inherent to the nature of language, then children should assume this principle from a very early point in acquisition (Clark, 1983a, 1983b). The major predictions for children, then, are similar to those for adults:

1. Children assume words contrast in meaning.
2. Children give priority to known words.
3. Children assign novel words that they hear to gaps in their lexicon, and, to fill such gaps, they coin new words themselves

But the kinds of evidence I shall draw on appear very different.

#### Different Forms Contrast in Meaning

For children, too, different forms contrast in meaning so they reject any apparent synonyms. Evidence for this first prediction comes from several sources: children narrow down over-extensions as they acquire new, contrasting vocabulary items; they build up each lexical field by adding new contrasts as they add new items; and they assign contrasting meanings to contrasting forms at the level of words, word-formational patterns, and multi-word constructions.

**Narrowing down over-extensions.** Some of the earliest evidence that children assume that words contrast in meaning comes from their narrowing down of lexical over-extensions. Suppose, in an over-extension, child A applies *dog* not only to dogs, but also to cats, sheep, and other four-legged mammals (Clark, 1973, 1978). When this child acquires *cat*, a word for part of this domain, he stops over-extending *dog* to cats. And when A acquires *sheep*, he

stops over-extending *dog* to sheep. At this point, A relies on *cat* for designating *cats*, *sheep* for sheep, and *dog* for dogs and (possibly still over-extending it) for other small mammals excluding any for which he already has terms available. Each new term contrasts with the terms already known, rather than being treated as synonymous with one or more of them. Such patterns of narrowing are clearly illustrated in the detailed diaries kept by Leopold (1939, 1949), and Pavlovitch (1920) and in studies such as Mervis and Canada (1981).

**Building up lexical fields.** In narrowing down over-extensions, children simultaneously build up *lexical fields*: terms for animals, for birds, for vehicles, for people, for toys, and for furniture as well as for relations and dimensions (Clark, 1978). Each new term acquired contrasts in meaning with those already known.<sup>4</sup> Early uses of *big* and *small*, for example, become restricted with the addition of further contrasting adjectives like *tall/short* for objects with vertical extent, or *long/short* for ones with horizontal extent (e.g., Clark, 1972; Donaldson & Wales, 1970). Children follow a similar progression with orientational terms like *top* as they add *front*, *back*, and *side* (Clark, 1980; Kuczaj & Maratsos, 1975) and possession verbs like *give* as they add *take*, *buy*, *sell*, and *trade* (Gentner, 1975). Each term added contrasts with its neighbors.

**Contrasting meanings for contrasting forms.** Children assign contrasting meanings to distinct forms, but they don't always hit on the conventional adult contrasts. For example, in building up terms for birds, some children establish a three-way contrast quite early among *duck*, *bird*, and *chicken*, to group birds into those that go in the water, those that fly, and those that don't fly (Clark, 1978). Similarly, many children make use of the deictics *here* and *there* among their first 50 to 100 words, but they don't contrast these terms deictically. Instead, they typically use one term to mark transfers of possession, e.g., *Here* said as a child hands a rattle to his parent, and the other to mark completion of some activity, e.g., *There!* said as the child places the last block on a tower (Clark & Sengul, 1978). Such contrasts must often be revised as they learn more about the adult meanings.

Children may also assign idiosyncratic contrasts at the syntactic level. For example, in a study of early possessive constructions by Deutsch and Budwig (1983), children contrasted utterances containing their own name plus the term for some object, e.g., *Timmy book* with utterances containing a first person pronoun (*I, me, mine*) plus some object, e.g., *Me cookie*. The first type of utterance was used to describe current states—the object named was in the child's possession—while the second was used in situations where the child was

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<sup>4</sup>Children do not necessarily identify the appropriate adult contrast, but they do impose *some* contrast. This may be modified later or even changed altogether as they learn more about the conventional meanings of all the terms in a particular domain.

laying claim to something not yet his (see also Budwig, 1985). Analogously, children acquiring Hungarian may contrast two different inflected forms of nouns to mark two different meanings. For instance, they may use the nominative or citation form in naming things and the accusative of the same nouns when talking about things they want to have (MacWhinney, 1985; Slobin, 1985b). In other words, even though they may not hit at first on the conventional contrasts adults use, children consistently assume that differences in form mark contrasts in meaning.

Finally, in assigning meanings to contrasting forms, children may tidy up the language by aligning one form with one meaning in a manner orthogonal to the match of meanings and forms in the adult language. In a study of Icelandic word-formation by Mulford (1983), some children used the suffix *-ari* (equivalent to English *-er*) only for agentive terms analogous to English forms like *worker*, and opted for a compound noun pattern (X + N) for instrument terms analogous to English *work-machine*. Icelandic-speaking adults, however, make use of both the suffix and the compound pattern for both agentive and instrumental nouns. Also a French child observed by his father (Vinson, 1915–16) took contracted *de* + article forms to be partitive in meaning, as in *du pain* for '[some] bread', and uncontracted forms to be possessive in meaning, as in *de la fille* 'of the girl, the girl's'. Contraction in fact occurs only when *de* is combined with masculine singular or with plural definite articles and appears in both partitive and possessive constructions. Vinson's son created a meaning contrast for contracted versus uncontracted forms that was orthogonal to the adult one. He then filled in the paradigm by constructing a contracted feminine form with partitive meaning, e.g., \**da neige* '[some] snow', and using uncontracted masculine forms with possessive meaning, e.g., \**de le garçon* for *du garçon* 'of the boy, the boy's.'

Children consistently act as if they assume different forms must have contrasting meanings. That is, they assume any new expressions contrast with those they already know.

### Priority Goes to Known Words

In giving priority to words or expressions already familiar to them, children again reject apparent synonyms. The evidence for the second prediction comes from two main sources: early in language acquisition, children don't appear to realize that contrast operates both within and between levels for the lexicon and the grammar. Two- and three-year-olds consistently reject what appear to them to be multiple labels for the same thing. For instance, if an adult says of a dog, *There's an animal*, children object by saying, *No, it's a dog*. They act as if one cannot use *animal* because *dog* already carries the requisite meaning. They haven't yet recognized that there are contrasts between levels in the lexicon as well as within any one level. Young bilinguals also reject multiple labels across languages. Both within and across languages, children's reliance on form-meaning combinations already familiar to them leads them to reject further forms

perceived as synonymous. Even in word-learning tasks, children reject synonyms.

**Rejecting multiple labels within a language.** Children aged two and three have long been known to reject multiple labels for things. Having learned one label for something, they are unwilling to accept a second even though it is superordinate or subordinate to the first (e.g., François, 1977; Macnamara, 1982; Mervis & Canada, 1981). These utterances from two-year-olds are typical:

- (8) Not a plate, it a bowl. (upon being asked to take his plate off the table)
- (9) That not a plane, that a jet-plane. (looking at a picture book)
- (10) It's not a animal, it's a dog. (said of a toy)

What these children have not yet realized is that meanings may contrast in the levels of categorization being picked out. They act as if terms for the same domain all contrast at the same level. If the terms in these examples were at the same level, the pairs would have to be synonymous. Since the children already know one term for the object being referred to and don't accept synonymy, they reject the multiple labeling. Once they recognize that there is more than one level for labeling, such rejections vanish.

**Rejecting multiple labels across languages.** Young bilingual children face a similar problem. In the earliest stages of acquisition, they often accept only one label for a category despite exposure to a label from each language (e.g., Ervin-Tripp, 1974; Fantini, 1974; Taeschner, 1983). Knowing a term in one language appears to preclude use of the equivalent term from the second language, as in the following typical examples:

- (11) English/Spanish: *leche* precludes *milk*  
English/Spanish: *lupo* precludes *wolf*  
English/French: *bird* precludes *oiseau*  
German/Italian: *acqua* (water) precludes *Wassar*  
German/Italian: *Beine* (legs) precludes *gambe*

The result, from the young child's point of view, is a single lexicon in which all the terms should contrast. This leads them to accept only one term (from whichever language they happen to pick up on first) for each category. The other is rejected. This typically lasts only a few months, until these children have a vocabulary of about 150 words (Taeschner, 1983). At that point, bilingual children begin to admit 'doublets', equivalent terms from both languages, e.g., *leche* and *milk*, into their vocabulary. This point may well coincide with the one at which young bilinguals also begin to distinguish their two languages on phonological grounds. Early on, they typically make use of a single phonological

system as well as a single lexicon (e.g., Vogel, 1975). If young bilingual children at first believe they are dealing with a single language, their rejection of apparent synonyms follows directly from their assumption of contrast: different forms should carry different meanings. Bilingual children, however, start to accept equivalent terms in their two languages at a stage when monolingual children still reject as synonymous terms from a single level within their language. The only reason for young bilinguals to begin accepting equivalent terms across languages—essentially two labels for many of their categories—is their recognition that they are dealing with two distinct systems with the Principle of Contrast applying *within* each system, but not *across* systems. From that point on, they should only reject apparent synonyms within each language.

Children not only give priority to words already known and reject apparent synonyms within a language. They also do so across languages, but they reject apparent synonyms only until they realize they are dealing not with one but with two languages. Terms learned first, then, take priority over apparent synonyms, whether from within the same language or from another language. Where there is no synonymy, children simply add new terms and expressions to their growing repertoire.

**Rejecting synonyms in word-learning tasks.** Priority for known terms sometimes causes unanticipated problems. In 1950, Werner and Kaplan examined the difficulties children had in inferring the meanings of nonsense words used in a set of sentential contexts. Children found this a very difficult task. Most five-year-olds failed, and only some nine-year-olds did well. This occurred even though children add actual new words to their vocabulary at an average rate of nine a day from age two onwards (e.g., Carey, 1978; Templin, 1957). If children acquire real words so rapidly, why did they have such difficulty with Werner and Kaplan's task?

The task itself dealt in synonyms. To construct the sets of context sentences, Werner and Kaplan took English words like the noun *stick*, made up several sentences using the word *stick* (e.g., including the facts that sticks are used to walk with and burn easily), and then substituted a nonsense word like *corplum* for *stick* in each sentence. The children's task was to discover the meanings of the nonsense words—exact synonyms for English words they already knew.

This is indeed a major source of difficulty for children. In a replication of the Werner and Kaplan study by Braun-Lamesch (1962), French-speaking children were given sets of four sentences with a nonsense word substituted for a familiar French noun, verb, or adjective. (They were told the sentences had been produced by a second-language speaker who made some mistakes.) One hundred children (aged from five to nine) heard the sentences read one at a time and were asked to correct what was wrong in each set. As in Werner and Kaplan's original study, few of the younger children (under age seven) succeeded in supplying the target word across all four sentences in each set.

In Braun-Lamesch's second study (with five-, six-, and eight-year-olds), children heard similar sets of sentences, but with a pause in place of the target word. Under these conditions, six- and eight-year-olds found the task much easier than when they had to identify and correct the nonsense words. The youngest children also produced the appropriate target words more often. So if children aren't being asked to discover synonyms, they can make use of linguistic context to identify any words omitted. Gaps are easier to fill than places that are already taken.

In summary, when children are faced with apparent synonyms, they reject them. They do this within a language prior to discovering that terms at higher or lower levels of categorization are simply labels given at some other still contrasting level. They also do this across languages prior to discovering that they are working on two languages simultaneously. And, again for the same reason, they have difficulty in tasks where they have to discover exact synonyms for terms they already know.

### Unfamiliar Words and Innovations Fill Gaps

Evidence for the third prediction comes from two sources. First, when children hear words new to them, they consistently assume these words designate kinds of things for which they lack terms themselves. They assign new terms to gaps in their lexicon. Second, when children themselves wish to talk about things for which they have no words, they often construct innovative terms on the spot.

**Unfamiliar words fill gaps.** When children hear an unfamiliar word, they appear to make some immediate inferences about what it might mean. This "rapid mapping," which appears to be the first step children take in figuring out what a word means, was first looked at experimentally by Carey and Bartlett (1978). In their study, nursery school children were exposed to one instance of an unfamiliar word in a color context (e.g., "Give me the chromium tray, not the red tray" in the presence of a red and an olive-green tray). A number of the children took *chromium* to be a color term, as Carey and Bartlett had intended, and remembered it as such a couple of weeks later, even if they got the target color wrong.

Do children hearing unfamiliar words consistently associate them with unfamiliar objects? In a follow-up study by Dockrell (1981), three- and four-year-olds were presented with a set of animals, three familiar (a cow, a pig, and a sheep) and one unfamiliar (a tapir), and then heard a novel word (*gombe*) in contrast to the familiar words for the known animals. All the children assumed the novel word picked out the novel animal.

The setting influences the inferences children make about unfamiliar words. For instance, children were given a set of solids of different colors, in two different linguistic contexts. In the shape context, children were asked for "the

gombe one, not the square one or the round one." In the color context, they were asked for "the gombe one, not the green one or the red one." When the contrast was with known shapes, children consistently handed Dockrell the only solid unfamiliar to them. When the contrast was with color, they were more likely to select solids of an unusual color or with some pattern although some children still preferred shape.<sup>5</sup>

It has long been known that one- to two-year-olds attach new words they hear to unfamiliar objects (Vincent-Smith, Bricker, & Bricker, 1974). In a study by Golinkoff, Hirsh-Pasek, Lavallee, and Baduini (1985), two-year-olds were presented with a series of novel objects mixed in with familiar ones, and heard both familiar and unfamiliar labels. The children overwhelmingly selected a novel object as a referent for a novel word and an appropriate referent for a known word. Since all the objects in a set were equally familiar from prior handling and play, the children's assignments of labels could not be attributed just to the salience of a new object.

In the same study, two-year-olds also readily extended the novel word to a new exemplar from the same category. And, when given a choice (through the introduction of a second novel word with further novel objects from another category), these children preferred *not* to pair a second novel name with a novel object that had already been labeled. Instead, they assumed that the second novel name must refer to an as-yet-unnamed novel object. That is, these children assumed contrast rather than synonymy. Overall, these studies offer strong support for the hypothesis that children rely on contrast in their acquisition of the lexicon.

**Gaps can be filled by innovative words.** Young children typically have vocabularies much smaller than they need for talking about objects and activities. Yet this rarely limits what they talk about. To make do with the resources at their disposal, they stretch them. For example, they over-extend their words, they rely heavily on deictic terms like *that*, and they use general purpose verbs like *do* or *go*. They also construct innovative words (Clark, 1978, 1982a, 1983b).

Children's coinages appear from the earliest stages of acquisition on. Typical examples of innovative nouns, adjectives, and verbs, together with glosses of their intended meanings, are shown in Table 3. Children coin new verbs but only to talk about actions that contrast with those they already have words for. These

<sup>5</sup>The preference for shape in mapping the meanings of unfamiliar words may be a further reflection of the importance of shape in identifying instances of categories. In the overextensions used by one- and two-year-olds, the vast majority are based on similarities in shape (Clark, 1973; Thomson & Chapman, 1977).

TABLE 3  
Some Spontaneous Coinages

Nouns:

- a plate-egg vs. a cup-egg (2;0) = 'fried/boiled egg'
- the car-smoke (2;6) = 'the car exhaust'
- a tell-wind (2;6) = 'weather-vane'
- plant-man (3;0) = 'gardener'
- fix-man (3;0) = 'mechanic'
- a driver (3;0) = 'ignition key'
- a lessoner (4;0) = 'teacher'

Adjectives:

- hay-y (3;3) = 'covered in hay'
- salter (3;6) = 'saltier'
- a windy parasol (4;0) = 'a parasol blown by the wind'
- flyable (4;0) = 'able to fly' (of cocoons)

Verbs:

- You have to scale it (2;4) = 'to weigh'
- I'm darking the sky (2;6) = 'making dark/darkening'
- How do you sharp this? (3;0) = 'sharpen'
- String me up, mommy (3;2) = 'do up the string' (of a hat)
- I'm crackering my soup (3;11) = 'putting crackers into'
- We already decorationed our tree (4;11) = 'decorated'
- I'm sticking it (5;7) = 'hitting with a stick'

actions are often very specific in that they involve particular instruments, places, or goals.<sup>6</sup>

They also coin nouns to talk about objects, and they again contrast these with terms they already know. English-speaking two-year-olds produce many innovative noun + noun compounds, e.g., *plate-egg* ('a fried egg') or *fire-dog* ('a dog like that found at the site of a local fire'). In a corpus of over 300 such compounds produced between age 2;2 and 3;2 (Clark, Gelman, & Lane, 1985), over two-thirds were used to mark explicit contrasts between subcategories, e.g., *tea-sieve* versus *water-sieve* (2;2) for a small and large strainer respectively, *snow-car* versus *race-car* (2;4) for pictures of a car with snow on it and a racing car respectively, and *car-truck* versus *cow-truck* (2;4) for pictures of a car-transporter and a cattle-truck respectively. In a follow-up elicitation task, two- and three-year-olds, like adults, relied on compounds far more often when they were labeling contrasting subcategories than when they were not (Clark, Gelman, & Lane, 1985). Finally, when presented with agentive and instrumental

<sup>6</sup>As in Dockrell's studies, when children are presented with verbs that contrast in form e.g., *walk* versus *make X walk*, or *kick* versus *foot*, they consistently interpret them as having contrasting meanings (Ammon, 1980; Clark, unpubl[shed] data).

TABLE 4  
Examples of Illegitimate Innovations

<i>Child Innovation</i>	<i>Adult Pre-empter</i>
to broom	to sweep
to fire	to burn
to scale	to weigh
to babysitter	to babysit
to decoration	to decorate
a fix-man	a mechanic
a tooth-guy	a dentist
a lessoner	a teacher
a oarer	a rower
a locker	a lock

meanings for which there are no conventional terms available, young children freely coin innovative nouns upon demand (e.g., Clark & Berman, 1984; Clark & Hecht, 1982; Mulford, 1983).

The innovative terms children construct fill gaps in their lexicon. But since children have such a small vocabulary, many of their innovations express meanings for which there is already a conventional, established term in the language. What are gaps for children are often not gaps for adults. Children's innovations, then, can be divided into *legitimate* innovations that fill long-term gaps (innovations that could just as well have been produced by adults) and *illegitimate* ones that are actually pre-empted by established forms not yet acquired (see further Clark, 1981). Some examples of illegitimate innovations together with their pre-emptors are given in Table 4. In each instance, children eventually have to give up their innovative form in favor of the conventional established one.

How do established forms take over from such innovations? Contrast again plays a crucial role. It is children's discovery that two forms do *not* contrast in meaning that leads to take-over by the established term. Imagine that children have expressed some meaning with term *a*, and this meaning is identical with the meaning expressed by *b*, the term consistently used by adults for that meaning. Since there is no contrast in meaning between *a* and *b*, children are faced with two different forms with a single meaning.<sup>7</sup> And this is a violation of Contrast. But since adults are consistent in using one form, *b*, in just the meaning slot children have assigned *a* to, the adult form takes priority over the child one. And children then give up their own form in favor of the established, conventional form for that meaning.

<sup>7</sup>Moreover, there are no phonological conditioning factors they can appeal to account for the difference in form, as there may be for case endings, say, where these can differ in form with the class of noun, for example, as well as with the number or gender of the stem (see further Slobin, 1985b).

In summary, children rely heavily on Contrast in filling gaps in their lexicon: unfamiliar words are assumed to denote categories for which they as yet have no words. At the same time, when they need to talk about categories for which they lack established words, they freely construct innovative terms for that purpose. In both cases, they are engaged in filling lexical gaps in accordance with Contrast.

### THE ROLE OF CONTRAST IN MORPHOLOGY AND SYNTAX

Children replace their own coinages with established terms when they find no meaning contrast between the form they are using and the one adults use. The absence of a contrast in meaning leads them to choose one and eliminate the other. Since the form used by adults is already established in the lexicon, it takes priority. The same procedure applies with equal force in the acquisition of inflectional morphology and syntax.

#### Morphological Over-regularizations

Children are pattern-makers. And when they begin to acquire the inflections that mark tense, for instance, they typically take irregular verbs such as *break*, *bring*, and *go*, and treat them as if they belonged to the regular paradigm of *walk*, *open*, and *jump*. So the past tense of *break* is produced as *breaked*, *bring* as *bringed*, and *go* as *goed* (e.g., Berko, 1958; Cazden, 1968; Kuczaj, 1977). The initial basis for adding particular inflections and then for over-regularization appears to be semantic: verbs for change of state like *break* or *drop* are inflected for past tense before verbs for activity or state like *run* or *sleep* (Bloom, Lifter, & Hafitz, 1980). Moreover, the phonetic shape of the verb stem also affects the course of over-regularization. As Bybee and Slobin (1982) found, children first over-regularize verb stems that do not end in an alveolar stop (e.g., *break/breaked*, *bring/bringed*, *go/goed*). Verbs like *hit*, *ride*, or *eat* are left unchanged, because, argued Bybee and Slobin, they already conform to the past tense schema by ending with an alveolar stop (/t/ or /d/). It is only later, often after forms like *broke* and *went* have been mastered, that *hit* is over-regularized to *hitted* and *ride* to *rided*.

Once children have constructed over-regularized past tense forms, how do they get rid of them? Just as for the lexicon, the Principle of Contrast offers children crucial evidence for replacing regularized forms by irregular past tense forms. Suppose a child uses *breaked* as the past tense of *break* instead of *broke*. But that child hears only the irregular form *broke* from adults. He then notices that wherever he would use *breaked*, adults use *broke*, so his anticipations about the the form for a particular meaning are wrong. He realizes that the meaning

conveyed by *broke* must be identical to the meaning of his own *breaked*. By the Principle of Contrast, different forms necessarily have different meanings. So if the meanings of two forms are the same, one form must be eliminated. The child therefore gives up his over-regularized form in favor of the established adult one (see also Platt & MacWhinney, 1983). Pre-emption works in morphology just as it does in the lexicon.

Children appear to extend rules to different verbs, for instance, on a rather gradual basis (Bloom et al., 1980). They presumably get rid of over-regularized forms in the same way. They should eliminate them one by one as they discover the absence of any difference in meaning between their own over-regularized forms and the forms adults use.<sup>8</sup> The evidence suggests that this is just what they do (e.g., Bybee & Slobin, 1982).

### Syntactic Over-regularizations

Over-regularizations appear in syntax just as they do in morphology, though they are less well documented. The best examples, perhaps, come from Bowerman (1983). Bowerman classified the syntactic errors she observed in her two daughters' speech into several categories. One type consists of incorrect *Dative movement* with verbs like *say*, as in (12) and (13):

- (12) (3;6) Don't say me that or you'll make me cry.
- (13) (3;9) I do what my horsie says me to do.

or with verbs like *button*, as in (14):

- (14) (3;4, asking to have the remaining snaps on her pajamas fastened)  
Button me the rest.

Further instances are documented by Mazurkewicz and White (1984). A second type of syntactic over-regularization involves *Passivization* with verbs like *fall*.<sup>9</sup>

- (15) (4+) I don't like being falled down on!

<sup>8</sup>At the same time, children clearly set up routines for producing particular forms that may endure beyond the point where they distinguish the conventional form from their own, and will acknowledge, when pressed, that the conventional form is "right" or is the one grown-ups use (see Platt & MacWhinney, 1983; Slobin, 1978) even though they themselves do not yet produce the latter with consistency. Instances of over-regularization may well linger on after children have begun to produce the appropriate irregular past tense forms just because the children have become used to saying the past-tense form of a verb that way. After all, they have been doing so for three or four years.

<sup>9</sup>Part of the problem here may be with the prepositions allowed with passive verbs. Verbs with particles and prepositions tend to be less favored for passivization. My thanks to Dwight Bolinger for this observation.

A third involves *Causativization*, with such verbs as *disappear* or *ache* appearing incorrectly as causatives as well as correctly as intransitives:

- (16) (6+) Do you want to see us disappear our heads?
- (17) (5;3, as she climbs a long flight of stairs)  
This is aching my legs.

A fourth type involves *Figure-ground reversals*. These are exemplified by the two patterns in "The garden swarmed with bees" and "Bees swarmed in the garden." They were used with verbs like *cover* or *spill* that normally appear in only one of the two patterns:

- (18) (4;5) I'm going to cover a screen over me.  
(for 'cover myself with')
- (19) (5;0, of a salt shaker) Can I fill some salt into the bear?  
(for 'fill the bear with salt')
- (20) (4;11, after being asked if she was going to finish her toast)  
I don't want to because I spilled it of orange juice.  
(for 'spilled orange juice on it')

In all these over-regularizations, the children have extended a syntactic pattern to further instances that do not belong.<sup>10</sup>

Syntactic over-regularizations have also been documented by Mazurkewicz and White (1984) for verbs that do and don't allow dative alternation. Verbs that do allow it appear with their indirect object either adjacent to the verb (NP NP) or marked by the preposition *to* (NP PP) as in *Rob gave Jan the book/Rob gave the book to Jan*, while verbs with NP PP forms only do not allow alternation as in *Rob donated the picture to the museum/\*Rob donated the museum the picture*. It has commonly been assumed that children learn which verbs do and don't take both constructions on an item-by-item basis through positive evidence alone (e.g., Baker, 1979).<sup>11</sup> However, as Mazurkewicz and White found, nine-, twelve-, and sixteen-year-olds<sup>12</sup> judged as grammatical many instances of NP

<sup>10</sup>One issue is whether these errors are lexical or syntactic. The decision appears to depend on one's grammatical frame of reference with some approaches including them in the syntax and others excluding them.

<sup>11</sup>The evidence that children receive no negative feedback tends to rest on a single study carried out by Brown and Hanlon in 1970. While parents may not directly approve or disapprove the syntactic forms their children produce, recent work shows that adults are more likely to repeat ungrammatical utterances from two-year-olds, with corrections, than they are grammatical utterances (Hirsh-Pasek, Treiman, & Schneiderman, 1984). The range of indirect, corrective (negative) feedback available to children at different ages and stages is badly in need of further documentation.

<sup>12</sup>Children younger than this are typically unfamiliar with many Latinate verbs of the type that appear to be over-regularized, e.g., *suggest*, *create*, or *capture* in *for-dative* constructions. The

NP constructions where only NP PP forms appear for adults. That is, these children over-regularized the syntactic paradigm of verbs like *give* to verbs like *donate*. Syntactic over-regularizations of *to*-dative verbs, according to Mazurkewicz and White, are eliminated by age 12;0, and those of *for*-datives verbs are virtually gone by age 16;0.

How do children arrive at the established, conventional forms? Part of the answer lies in their identification of semantic contrasts between pairs of successive configurations and their detection of the absence of pertinent contrasts. Let's take the intransitive verb *to disappear*: it is frequently over-regularized (from as young as age three) to a transitive structure, as in *I disappeared the box*. The transitive meaning, though, is conventionally expressed by a periphrastic construction, *to make X disappear*. Once children realize that there is no difference in meaning between their form and the adult one, they give up their form.<sup>13</sup> Absence of a contrast in such instances is as critical as presence of a contrast elsewhere. Take the case of *give* (NP NP and NP PP) and *donate* (only NP PP). One difference between them is that the indirect object of *give* verbs is both a goal and eventual animate possessor. It contrasts in meaning with *donate* which occurs with inanimate, indirect object goals or beneficiaries. In the case of *give*, children hear the verb with both configurations, NP NP and NP PP. In the case of *donate*, they hear it only with NP PP. But absence of a form on its own in the input is not enough to eliminate NP NP for *donate*. Children also discover, from their erroneous anticipations of NP NP that *donate* with NP PP is the only configuration adults use with *donate*. From this, they infer that there is no meaning contrast marked by dative-alternation for *donate*, and they therefore give up their over-regularization of *donate* with NP NP.

So far investigators have only just begun to explore over-regularizations in syntax.<sup>14</sup> Sometimes over-regularized constructions are pre-empted by other constructions conventionally used to express just the meaning children attempt to convey through regularization. At other times, they may result from missing a subtle contrast in meaning between two otherwise related construction types.

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reason for this unfamiliarity is probably that the Latinate verbs differ in register from their non-Latinate counterparts. Latinate connotes a higher or more formal register of speech. In addition, a Latinate verb like *donate* is typically more specific in meaning than its non-Latinate counterpart *give*. As a result, the class of things one may donate is much more restricted than the class of things one may give. The greater specificity of Latinate verbs also shows up in the fact that idiomatic or metaphorical extensions typically stem from non-Latinate rather than Latinate forms. My thanks to Dan I. Slobin for discussion on these points.

<sup>13</sup>The exact nature of the mechanism at work has yet to be specified in detail, but to achieve this, children have to be able to monitor their own production as well as compare it continually against comprehension (see further Clark, 1982b; MacWhinney, 1978).

<sup>14</sup>Few researchers have observed or tested children over the age of 5;0 or 6;0, so there are few data available on syntactic over-regularizations. Two things are needed: longitudinal observations to a much later age to explore the range of spontaneous over-regularizations in syntax, and systematic elicitation of the pertinent forms.

Discovering these subtleties may take children a long time. In either case, contrast is a crucial ingredient in discovering which syntactic forms convey which meanings.

## CONTRAST AND THE COURSE OF ACQUISITION

The Principle of Contrast also helps account for the different courses children follow in acquisition. Although there are many consistencies in the routes children follow, there is also much variation from child to child. Children necessarily build, as they learn more, on what they already know. But they vary in the particular expressions they are exposed to and hence in the stage at which they acquire such expressions. Equally, differences in exposure may lead children to different initial hypotheses about word meanings. These in turn may point children along different paths en route to the adult analysis.

Children with similar input, for example, may differ in the course they follow in organizing their lexicon. Consider their acquisition of terms for animals. Child A acquires the term *dog* as his first term at a point when his vocabulary totals 20 words. Child B acquires the same term, *dog*, as her fifth term for an animal (following *cat*, *horse*, *cow*, and *rabbit*), at a point where her vocabulary totals 150 words. The set of contrasts within the domain of animals for these two children is very different. Child A contrasts *dog* as the sole animal term with his other 20 words drawn from several domains. Child B contrasts *dog* with each of four other animal terms, and with the rest of her vocabulary, some five times larger than A's. In the lexicon, different points of acquisition for the same expression may lead to different lexical organizations from child to child. The general point in acquisition is this: What's already been acquired affects what gets acquired next.

When children are exposed to markedly different types of input, it seems less surprising that they might follow different courses. Such differences in input may stem from several sources—from adults, from older siblings, and from peers—and may vary in amount and in influence from culture to culture and even within cultures (e.g., Heath, 1983; Ochs, 1985; Schieffelin, 1985; Snow & Ferguson, 1977). Such differences should affect the initial "fast mapping" children make following their first encounter with a new word (Carey, 1978; Dockrell, 1981). For example, in the acquisition of the dimensional adjectives *tall* and *long*, children's initial meanings appear to depend directly on the kinds of objects they first hear the terms applied to—trees, fences, buildings, shelves, or pencils (Keil & Carroll, 1980; Gelman, Ravn, & Maloney, 1985). This in turn affects the pattern of contrasts they construct as they build up this lexical domain.

The routes children follow in getting to the adult meaning may also depend on the initial hypothesis they form about the meaning of a word. For example, once children begin to work out the deictic meanings of terms like *here* and *there*,

some children opt for the hypothesis that *here* designates the place where the child is (ego-centered), while others identify *here* with where the speaker is (speaker-centered). These two starting points lead children to follow different routes as they work out the meaning relations conveyed by *here* and *there* (Clark & Sengul, 1978). These routes converge when children arrive at the adult meanings. But the hypotheses children start with, I suggest, depend on the contrasts they have already worked out for locative and deictic terms; it is what they already know that points them in one direction rather than another.

Whatever the variations in the courses children follow, the Principle of Contrast operates in the same way. What children already know at each step affects how they deal with each new form—in the lexicon, in morphology, and in syntax.

### SPECIAL CASES OF CONTRAST

The Principle of Contrast appears in several more specific proposals designed to account for constraints children seem to observe during acquisition. The first of these is Slobin's (1973, 1985a) *Unifunctionality*, which assumes one-to-one mapping of forms and meanings. The second is Markman's (1984) *Mutual Exclusivity*: it assumes contrast among category labels at a single level. Another proposal is the *M-constraint* examined by Keil (1979), and the last proposal is *Uniqueness*, put forward in a learnability framework by Wexler and Culicover in 1980 and since then extended by others. Each of these proposals, I will argue, represents a special case of the Principle of Contrast.

**Unifunctionality.** In 1973, Slobin discussed several instances where children appeared to have adopted a one-to-one mapping of forms and meanings in language. He appealed to one-to-one mapping to account for children's over-uses of a single inflectional form to mark a particular meaning, e.g., instrumental *-om* in Russian added to all nouns regardless of gender, past tense *-ed* in English added to regular and irregular verbs alike. Under this view, children hold onto such unifunctional mappings until forced to give them up in light of many meanings with one form or many forms with one meaning.<sup>15</sup>

This Unifunctionality, Slobin (1985a) argued, is what leads children to maximize one-to-one mappings of forms and meanings. Slobin called on two kinds of evidence: first, the morphological over-regularizations children use where a single form marks a particular modulation in meaning; and second, the construction

of additional forms to distinguish two closely allied meanings carried, for adults, by a single form.<sup>16</sup> For instance, French-speaking five- to seven-year olds sometimes construct additional forms to distinguish, for example, the numeral 'one' from the indefinite 'a' meaning of the indefinite article, e.g., *une voiture* 'a car' versus \**une de voiture* 'one car' (Karmiloff-Smith, 1977, 1979).

Unifunctionality is actually a complex principle. It has two parts: 1. Each form carries a different meaning, and 2. Each meaning is carried by a different form. In other words, it combines the Principle of Contrast (no synonymy) with the Homonymy Assumption (no homonymy). This combination is necessarily more restricted in scope than Contrast alone because it requires not only Contrast but also the Homonymy Assumption. But as we saw earlier, this assumption doesn't hold in general. In fact, children violate the Homonymy Assumption from early on. In English, for instance, two-year-olds have no difficulty treating the inflection *-s* as marking plural on nouns (e.g., *dogs*), possessive on nouns (*the girl's*), and third person singular present on verbs (*goes*). From two or three on, children have no difficulty with *-er* appearing both as a nominal suffix on agent and instrument nouns (e.g., *rainer* 'someone who stops it raining' or *locker* 'a lock') and as a comparative suffix on adjectives (e.g., *goorder*). Nor do they appear to have any difficulty with such homonyms in the lexicon as *bank*, *bat*, *bee/be*, *pair/pear*, *sea/see*, or *two/too*. Yet children who tolerate homonyms do not tolerate synonyms.

Unifunctionality as a constraint on language acquisition, then, is only half correct: children do observe Contrast but they don't observe the Homonymy Assumption. So once we discard the second half of Unifunctionality, we are left with Contrast pure and simple. Unifunctionality, then, should be replaced by the Principle of Contrast.

**Mutual Exclusivity.** The second proposal is Markman's (1984) Mutual Exclusivity. As she put it (1984, p. 403), "Category terms will tend to be mutually exclusive." The labels children apply to categories are treated as mutually exclusive because this makes them more useful in picking out instances of different categories: "For example, an object cannot be a cat *and* a dog or a bird or a horse" (1984, pp. 403–404). Mutual Exclusivity, she argued, is needed to account for the discreteness of children's labels for object categories and for the fact that children assume unfamiliar words label instances of categories, e.g., kinds of dogs, rather than thematic groupings of related objects, e.g., a dog and a bone (Markman & Hutchinson, 1984). Since many of the labels children learn early are labels for basic-level categories, Mutual Exclusivity offers a useful way of characterizing how children use such labels. Once they realize that labels

<sup>15</sup>The latter is actually hard, if not impossible, to find. In case systems, the forms of inflections for a particular case can vary with gender, number, and person. Verb inflections to mark aspect or tense also vary with person and number, as well as mood or even negativity (Bybee, 1985). That is, different forms are not used to express the same meaning.

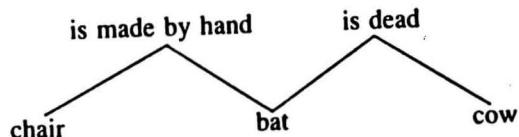
<sup>16</sup>Slobin (1985a) puts this in the form of the following Operating Principle: "If you discover that a linguistic form expresses two closely related but distinguishable notions, use available means in your language to distinctly mark the two notions."

apply at different levels in a taxonomy, though, they must give up Mutual Exclusivity. So this constraint, Markman argued, applies for only a relatively brief period during acquisition.

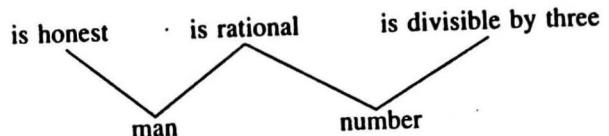
Mutual Exclusivity, like Unifunctionality, is a complex principle. It consists of three distinct parts. The first is equivalent to the Principle of Contrast: different forms have different meanings. The second I will call the Principle of No Overlap: terms at one level in a semantic field (*dog*, *horse*) denote non-overlapping categories. This is a general assumption about terms in semantic fields, and it holds just as much for adults as for children. The third part is what I will call the Single Level Assumption: all terms are at only one level of the lexicon. So all contrasts are like *dog* versus *horse*. None are like *dog* versus *animal*. So what Markman argued, in effect, is that children have a Single Level Assumption, which they give up as they learn terms at different levels. Children do not give up either the Principle of Contrast or the Principle of No Overlap. So by recasting Markman's hypothesis in this form, we can see what assumption it is that children actually give up and what it is they retain.

While Mutual Exclusivity superficially appears to be equivalent to the Principle of Contrast, it actually embodies two other principles besides. And even when children leave off using that part of Mutual Exclusivity captured in the Single Level Assumption, they continue to rely on Contrast.

**The M-Constraint.** The so-called M-Constraint studied by Keil (1979) is a constraint on the predicates that apply to ontological categories. These categories, it is assumed, form a rigid hierarchy or tree structure. An M structure is one where two predicates apply to a single category, as follows:



The assumption is that M structures are disallowed, so the term *bat* must be a homonym. It picks out both the instrument used in games and the small nocturnal mammal, two distinct categories. W structures like this one are also disallowed:



As a result, the predicate *is rational* must be a homonym with two distinct meanings, the first 'having reason' and the second 'is expressible as a fraction'.

M and W structures without ambiguous terms do not occur, according to the M-Constraint.<sup>17</sup> That is, the M-Constraint requires rejection of the Homonymy Assumption.

In language, according to Keil (1979, p. 168f.), the M-Constraint offers a source of information about the properties of referents for new words, and hence clues to word meaning. Suppose a child hears *The boojum is hungry*, he can then infer of boojums that they have mass and are animals (Keil, 1979, p. 168f.). That is, the new term *boojum* inherits all the predicates above it in the tree the child has constructed to date as well as *is hungry*. There is nothing in the M-Constraint itself that requires terms appearing with the same predicates to contrast, yet Contrast is needed for the scheme to work. For instance, when a child hears *The boojum is hungry*, nothing in the M-Constraint per se prevents the child from assuming that *boojum* is synonymous with *dog* or anything else that can be hungry. So although the M-Constraint correctly disallows the Homonymy Assumption, it doesn't require Contrast. Yet it cannot work without it. Not until children hear predicates applied that force a meaning difference, do they need assume any contrast between *boojum* and *dog*, and they might never hear pertinent evidence for this conclusion.

The M-Constraint (whether or not it holds on other grounds) requires that the Homonymy Assumption be rejected, and it requires *tacit* observance of Contrast, namely that any difference in form is taken to mark a difference in meaning.<sup>18</sup> Without the Principle of Contrast, the M-constraint does not work.

**Uniqueness.** The final proposal is the Uniqueness Principle, put forward by Wexler and Culicover (1980) and assumed necessary in learnability for the acquisition of syntax. Wexler and Culicover (1980) argued that children take each surface form in the input as the expression of a single 'deep structure', which corresponds to a single meaning, unless they hear evidence that the same form is used for more than one meaning. This constrains the surface structures a given deep structure can map onto. That is, the same meaning can't be expressed by two different forms. Without this, Wexler and Culicover argued, there is no way for children to work back from surface sentence structures to the underlying meanings.

Wexler and Culicover applied Uniqueness only to syntax, but it has been extended since by Grimshaw (1981), Pinker (1984), and Roeper (1981) to morphology. Like Platt and MacWhinney (1983), Pinker (1986) argued that Uniqueness is at work when children remove regularized forms from their own speech, as when they replace *breaked* with *broke*:

<sup>17</sup>This is equivalent to Bever and Rosenbaum's (1970) argument that daughter nodes in a tree structure cannot converge.

<sup>18</sup>Besides relying on the Principle of Contrast, it also appears to rely on the Principle of No Overlap.

There may be at most a single realization of a given form [e.g., the past tense of *break*] in a language, unless there is direct positive evidence in the input for more than one form, in which case both forms may be retained (p. 71).

For *breaked* and *broke*, of course, the elimination of *breaked* by Uniqueness is equivalent to pre-emption by synonymy. However, for Uniqueness to be fully equivalent to Contrast, one would have to motivate such pre-emptions on semantic grounds. In Pinker's account, the constraint is simply stipulated.<sup>19</sup> Notice that Pinker allowed for more than one form if "there is direct positive evidence in the input for more than one form". But unless such forms have different meanings, this violates the Principle of Contrast. If the meanings are different, then this must be specified by Uniqueness. Otherwise, there is no way for children to tell that *came* and *went*, for example, aren't both realizations of the past tense of *come*. That is, the semantic motivation assumed by Wexler and Culicover is essential for Uniqueness to work. Without it, children would be unable to analyze forms in the input. And once Uniqueness is motivated semantically, it becomes equivalent to the Principle of Contrast. In other words, adherents of Wexler and Culicover's Uniqueness have in fact espoused the Principle of Contrast.

## CONCLUSION

The Principle of Contrast is inherent in language. It is a principle essential both to skilled users of a language and to children who are just acquiring their first words. Yet, because Contrast is so basic, it is often taken for granted, and its power ignored. The Principle of Contrast offers a powerful tool to children acquiring language. It constrains the inferences they can make about possible meanings for new forms by distinguishing them from already familiar forms. The general predictions made by this principle fall under three headings: that differences in form make for differences in meaning, that established words take priority over innovations, and that gaps in the child's lexicon are filled by unfamiliar words on the one hand or can be filled by innovative ones on the other. Each of these predictions is strongly supported by the evidence. Moreover, the evidence suggests that the Principle of Contrast operates, for children, from very early in the process of acquisition.

The Principle of Contrast is important for another reason too: it helps account for differences in the course of acquisition across children. Children necessarily build in language on what they already know. But since they vary in when and how they are exposed to specific expressions, they differ in their points of

<sup>19</sup>In discussing the need for motivation, Pinker did suggest avoidance of synonymy might be a candidate (1986, p. 74).

acquisition. And, depending on their initial hypotheses about the meanings of new forms, children may follow quite different routes in arriving at the adult analysis.

Every theory of acquisition tacitly assumes that when children hear new forms—whether in phonology, morphology, syntax, or the lexicon—they infer that these forms carry new meanings. Every theory, then, subscribes to the Principle of Contrast. But Contrast also motivates children in acquisition itself. It motivates them to acquire new forms at every level in language. And it motivates them to get rid of unconventional, over-regularized forms, again at every level. As a tool for acquisition, the Principle of Contrast is invaluable.

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