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1 author:

Eve V Clark
Stanford University
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On the logic of contrast*

EVE V. CLARK
Stanford University

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ABSTRACT

The Principle of Contrast, that different words have different meanings, holds for adult language use. But at what age do children assume Contrast? Do they rely on it from the start, or do they assume that new words may have the same meaning (the Null Hypothesis) until they discover otherwise? Both the Null Hypothesis and Contrast have certain consequences. The Null Hypothesis places a heavy burden on language-learners, whereas children could discover Contrast as part of their experience of rational behaviour. Examples that have been claimed to go counter to Contrast fall into two groups. Those in the first do not in fact violate Contrast at all. Those in the second rely on sameness of extension instead of sameness of meaning, and so are indeterminate as counter evidence. Usage consistent with Contrast, on the other hand, is pervasive in children's speech from an early age.

INTRODUCTION

Different words mean different things. This is the Principle of Contrast, hereafter called Contrast, and it plays an essential role in a language's maintaining its usefulness as a medium of communication. Linguistic studies of the adult lexicon presuppose Contrast, and hence that no true synonyms exist. Indeed, one goal of lexical research has always been to uncover the subtle distinctions our language allows us to make (e.g. Bolinger 1972, 1976, 1977, Borkin 1973, 1984, Lehrer 1974, McCawley 1978, Haiman 1980, Riddle 1984, 1985). Contrast is taken for granted in adult usage by linguists and psycholinguists alike, even those who contest its role in acquisition.

But when does Contrast begin to hold for children? Do they too assume there are no synonyms? The goal of this paper is to consider when – at what

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age – they do. I shall begin with the role Contrast plays for adult speakers, the kinds of contrast commonly exemplified, and possible tests for sameness or difference of meaning. I shall then turn to the role of Contrast during acquisition, show that potential counterexamples either do not violate Contrast or are indeterminate, and spell out what Contrast does and does not predict about children's usage. I shall conclude with some discussion of other principles that Contrast appears to combine with, in order to account for the routes children follow in their acquisition of language.

THE PRINCIPLE OF CONTRAST

The Principle of Contrast, more precisely, is this: 'Every two forms contrast in meaning.' That is, any difference in FORM in a language indicates that there is a difference in MEANING. The reverse does not hold since the same form may be used to express several meanings – the different senses that may accrue to a particular word and result in extensive polysemy. While languages readily tolerate polysemy, they do not allow true synonymy.

Kinds of Contrast

Contrasts in meaning come in many guises. In taxonomies, terms at one level contrast by including those at the next level down. In the domain of animals, one finds *animal* at one level; *dog*, *horse*, and *cow* at a level below that, and *collie*, *pekinese*, and *spaniel*, kinds of dogs, on the level below that again. Below that, there are specific subkinds of spaniel, such as *springer spaniel* and *water spaniel* (Berlin, Breedlove & Raven 1973). In such taxonomies, terms also contrast with co-hyponyms at the same level. So *dog* contrasts with *horse*, *cow*, and *deer* among its co-hyponyms. In other domains, terms contrast between classes and collections, as in *trees* (the class) and *forest* (the collection); and wholes that include parts contrast with parts alone, as in *arm* (includes the hand) vs. *hand* (see further Fillmore 1978, Miller 1978). Terms may also contrast in perspective, as in the choices between *here* and *there*, or *come* and *go*; or in attitude, as in the choices among *strong-minded*, *obstinate*, and *pig-headed*; *skinny*, *thin*, and *slim*, or *statesman* vs. *politician* (e.g. Waldron 1979). Contrasts may be based on register, for example, formal versus familiar, as in *policeman* vs. *cop*, or *attempt* vs. *try*; on social class, as in *lavatory* vs. *toilet*, or *napkin* vs. *serviette*; or on dialect, as in *lorry* vs. *truck*, or *tassie* vs. *cup*. Finally, of course, terms from different languages contrast in the language chosen (e.g. English vs. French for *window* and *fenêtre*, English vs. Dutch for *bicycle* and *fiets*).

Differences in form, then, signal differences in meaning. These may be very subtle, such that two words may overlap in all but just one or two critical contexts. Or the differences may be blatant, as for words drawn from distinct

domains, words whose distributions rarely or never overlap at all. These are the two extremes, and languages typically contain the whole gamut of possibilities in between. Contrasts in meaning, then, are not all of one type, and they are not all equally discernible at first glance.

Conventionality

Contrast does not work on its own. One pragmatic principle it works with is the Principle of Conventionality: 'For certain meanings, there is a conventional form that speakers expect to be used in the language community,' i.e. if one does not use the conventional form that might have been expected, it is because one has some OTHER, contrasting meaning in mind. Contrast and Conventionality depend on each other for their success. Together, they promote stability of usage within a speech community over time (see Lewis 1969, de Saussure 1974).

One way they do this is through pre-emption. Terms already IN the lexicon, terms that have become the conventional forms for particular meanings, have priority for the expression of those meanings. As a result, any new terms coined must carry other meanings, meanings that contrast with those that are already established. What is conventional, in other words, PRE-EMPTS what is not conventional for a specific meaning.[1] This can be stated as a general condition covering all types of pre-emption by synonymy (Clark & Clark 1979:798):

> 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.

By way of illustration, consider how the following nouns are regularly formed from adjectives and verbs: *curiosity* comes from *curious*, *tenacity* from *tenacious*, *rider* from *ride*, *polisher* from *polish*. Yet there is no **gloriosity* or **furiosity* from *glorious* and *furious* respectively, nor is there **spyer* or **cooker* from the verbs *spy* and *cook*. Why not? Because the starred forms (*) are pre-empted by the existing conventional forms for just those meanings, namely *glory*, *fury*, *spy*, and *cook* (see further Bolinger 1975, Aronoff 1976, Clark & Clark 1979, Hoffmann 1982, 1983, Kiparsky 1983, Horn 1984).

[1] One category of coinages may appear to be an exception, namely coinages to fill temporary gaps, where the speaker has forgotten the 'right word' (the conventional term). Where this occurs, speakers typically go back and correct the novel formation as soon as they remember the conventional term (even several minutes later), and they often make clear that such formations are a stop-gap measure, and so intended to fill in temporarily for the right word rather than replace it (see Clark 1981).

At the same time, new forms readily enter the language, provided they contrast in meaning with any conventional forms from the same base. Although *longness* is pre-empted by *length* (for the meaning conventionally carried by *length*), it can be used provided it contrasts in meaning with *length*. Similarly, *to farmer* ('play the farmer') is quite acceptable since it contrasts with *to farm*, as is *to winterize* ('make winter-proof') vs. *to winter* ('spend the winter'), or *tipper* ('someone who leaves a tip') vs *tipster* ('someone who offers advice on betting at a race-course') (Clark & Clark 1979). Contrast is also at work in the subtle meaning differences between suffixes like *-ness* and *-ity*. These two suffixes have often been treated as Germanic and Romance counterparts, with *-ness* added primarily to Germanic roots, and *-ity* to Romance ones. However, contrasting pairs like *ethnicity* and *ethnicness* suggest that the meanings of the two suffixes themselves differ (Riddle 1985). On occasion, a new form may even replace the conventional form, as in the replacement of the nominal suffix *-th* by *-ness* (Broselow 1977, Ullmann 1962). Pre-emption, as a consequence of Conventionality and Contrast, shows up under the same circumstances in other languages. Existing, conventional forms for the expression of specific meanings take priority and pre-empt use of other, novel forms for the SAME meaning (e.g. Corbin 1976, Booij 1977, Zwanenburg 1981, 1984, Scalise, Ceresa, Drigo, Gottardo & Zannier 1983, Scalise 1984 for discussions of Dutch, French, and Italian).

Other terms that contrast in meaning with conventional words are those borrowed from another language or dialect for political or social reasons. Terms for animals from French were borrowed by English speakers originally perhaps to mark a specific register, but swiftly came to be used only for the meat of the animals – *mutton*, *beef*, *veal*, *venison* – since English already contained terms for all these animals on the hoof, namely *sheep*, *cow*, *calf*, *deer*. Terms from neighbouring dialects, e.g. *fox* and *vixen*, both meaning 'fox', were assigned to different genders (a distinction not otherwise found for non-domestic animals in English). Speakers consistently assign contrasting meanings to potential synonyms under these circumstances, or else get rid of the earlier conventional term in favour of the new borrowing (see further Bréal 1897, Ullmann 1962, Stern 1964, Gruber 1976). Both options, and the consistency with which they are applied over time, are natural outcomes of Contrast.

Is it possible to test for Contrast?

How does one test, logically, for the presence of a contrast in meaning between two terms? Imagine an adult – Paul – a learner of English, overhearing people in an art gallery talking about a painting with a large square in its centre. Some call it *a square*, others *a box*. From this, can Paul accept

the Null Hypothesis that *box* and *square* do not differ in meaning? Or imagine that he comes upon the terms *little* and *small* in the same contexts (*a little/small girl, a little/small house*). Can he opt for the Null Hypothesis here too? How could he establish for sure the absence of a difference between *little* and *small*? He might assume two words had the same meaning if they were used to refer to the same entity or the same kind of entity, or if they had a similar distribution for a single speaker. If Paul did opt for the Null Hypothesis, he would have used one of these criteria.

But do these two criteria, sameness of reference and similarity of distribution, really offer evidence for sameness of meaning? Sameness of reference *per se* is insufficient to establish sameness of meaning. I might refer to a person simply as a *neighbour, grouch, ex-navy man*, or *next mayor*. But no one would be tempted to assume that, because each expression has the same referent (on some occasions), they are therefore synonyms. For the same reason, Paul cannot accept the Null Hypothesis for the meanings of *box* and *square*. The fact that some people used *a box* and others *a square* for talking about the same figure is not in itself evidence for synonymy or sameness of meaning.

So let's take a harder case, the pair *cop* and *policeman*. These terms have the same extension, but they are not generally used in the same contexts: one would expect to hear *policeman* in polite or formal speech, but *cop* in colloquial, familiar, and informal speech. But even if the two terms are both used in the same context, with the same extension, in a courtroom for example, a speaker would mean something very different in choosing *cop* vs. *policeman* (see Cruse 1986). Sameness of reference or, more broadly, of extension, is not a sufficient criterion from which to conclude that two (or more) expressions carry exactly the same meaning. Paul needs a stronger criterion.

What about similarity of distribution? Let's go back to *little* and *small*. These two adjectives do indeed occur in many of the same contexts – *a little girl, a small girl*; *a little knife, a small knife*; *a little house, a small house*, and so on. But for sameness of meaning, the distributions would have to be identical, and they aren't. Upon looking at someone's ornamental pond or lake, one might say *I see you've got a little water near the house*, but not **I see you've got a small water by the house*. Or, in another domain, one can talk of *a small probability*, but not of **a little probability*. One may have to look far to discover a context in which only one of the two terms, *little* and *small*, can occur, and so establish a contrast between them. But just one difference, however subtle, forces one to reject the Null Hypothesis. Mere similarity of distribution does not make for sameness of meaning. Take *a little girl* vs. *a small girl*. The former typically means a young female child (generally below the age of eight or ten); the latter designates a female small in size, but not necessarily a child, as in *Although she could lift hay bales, Jan was a small girl.*

As a result, one could say of a tall eight-year-old, *That little girl isn't very small*. With knives, *little* carries the connotation of miniature and hence not functional, while *small* simply designates relative size. The same difference appears to apply for houses.

Suppose one extended the second criterion to consider not just a single speaker but two or more speakers. This, of course, would require more tallying to keep track of candidate expressions that might conceivably have the same meaning. The closest candidates that appear to meet this version of the criterion typically differ still on the dimension of dialect, or even of language. For example, one person might say *haystack* on just those occasions and in all those contexts where another says *haymow*. *Haystack* and *haymow* are from different dialects, so one speaker would never use them interchangeably. A speaker who uses one of them might on some occasions use the other by way of accommodating to a speaker of the other dialect (Giles 1984, Giles, Mulac, Bradac & Johnson 1987), but this could not be used to argue for synonyms within a single dialect. In fact, a speaker who uses *haymow*, in lieu of his usual *haystack*, is thereby deferring to his addressee, so *haymow* does not have precisely the same meaning for him as *haystack*.

To show SAMENESS OF MEANING all down the line, one has to eliminate any possibility of difference. This in turn requires constant checking, to make sure the terms in question have the same extensions AND the same distribution across contexts. Since differences in meaning may be subtle, it may take speakers a long time to discover that *little* and *small*, *marsh* and *slough*, or *often* and *frequently* do differ in meaning. To reject Contrast, that is, to accept the Null Hypothesis, imposes an immense burden on speakers, to establish the ABSENCE of differences in meaning. Accepting the Null Hypothesis here is as difficult as it is in statistical contexts.

ARRIVAL AT THE PRINCIPLE OF CONTRAST

Adults adhere to the Principle of Contrast. It is taken for granted in linguistics, and indeed no-one has argued against it. At some age, then, children must come to adhere to the Principle of Contrast too. Where might it come from? The full answer to this question may well have to remain open, but one can say something about how it could NOT be acquired.

First, one might propose that Contrast is acquired through the Word-by-Word Approach. Children would have to establish the basis for some contrast in meaning separately for every word that entered their lexicon. To do this, they would compare the possible uses of the new word to every other word already known. When children only know five or six words, this may be feasible. This problem is also complicated by polysemy: each form may actually carry a number of meanings, and each of those must enter into all the comparisons. The number of comparisons rapidly becomes enormous, increasing with every new word.

One way to make such comparisons more manageable would be to do them wholesale. For example, if a new word is seen to have the privileges of occurrence of an adjective, children could eliminate from consideration all words from any other part of speech. (This, of course, assumes that children distinguish different parts of speech.) Then children have only to make Word-by-Word comparisons with those adjectives already known. Or if a new word within a specific word class is seen as being subcategorized in a specific way, children could eliminate other groups of words with different subcategorizations, and so again make their Word-by-Word comparisons only with near neighbours. Equally, if a new word is seen as belonging to a specific semantic domain (animals, say), children can eliminate all other semantic domains from consideration. The only comparisons they need be concerned with are those between the new word and its semantic neighbours. But it is at this point that Word-by-Word comparisons become hard. Consider the terms *dog* and *collie*. When children who know *dog* begin to acquire *collie*, they have to look for differences in the distribution of the two words before they can decide that the meanings are different, and they may have to look for a long time. They will need to make similar comparisons with EVERY new word added to their vocabularies.

In principle, children might never have enough information to reject the Null Hypothesis for a specific pair of words because they have to discover just the context that differentiates the meanings. The process of adding a new word to one's vocabulary would become an impossible feat long before one reached anywhere near the average six-year-old's estimated vocabulary of 14,000 words (Templin 1957).

One might argue instead that children only take the Word-by-Word Approach for the first 20, the first 50, or even the first 200 words acquired. Then, at that point, children make the generalisation that, in light of the evidence so far, they should assume the Principle of Contrast for every subsequent word they encounter. But WHEN might children arrive at this generalisation? Notice that they would still have too little information available for discovering all the contrasts they would need to establish, on a word-by-word basis, even for their first 50 words. To assume that children DISCOVER, from the Word-by-Word Approach, the generalisation captured by the Principle of Contrast seems as improbable, logically, as the Word-by-Word Approach alone. The problem for all the variants of the Word-by-Word Approach is that children may never receive enough evidence to work out all the possible contrasts, pair by pair, for their current vocabularies. Unless one assumes Contrast, a new word could always mean just the same as some other word already in one's lexicon. In some respects, then, the problem children face here is analogous to the 'no negative evidence' problem in the acquisition of syntax (Baker 1979; see also Bowerman 1983).

Where, then, might Contrast come from? One possibility is that it

develops with the recognition of intentions as part of rational behaviour. To discover Contrast as a pragmatic principle, children would have first to see the underpinnings of rational behaviour – that people do things intentionally, and they always have a reason for choosing one word, *x*, on a particular occasion, rather than another, *y*. From this it would follow that *x* could not be equivalent to *y*, and so must contrast with it in some way (see Clark & Clark 1979).

Intentions are recognised early on by children. From 0;7–0;8, infants will repeatedly attempt actions (crawling to a particular goal, manipulating a specific toy), and will both initiate and elicit exchanges as in peek-a-boo. By 0;9 or 0;10, infants recognise more elaborate intentions, and successfully get adults to do things for them – open doors, boxes, or purses; pick up fallen toys; or repeat games like pat-a-cake or peek-a-boo (e.g. Piaget 1951, Bates 1976). Such acts assume that adults have intentions, just as they must have intentions in uttering words, choosing now one form, *x*, and now another, *y*. The very notion of SPEAKER'S MEANING is predicated directly on its being an attempt to get someone else to recognise the speaker's INTENTION in producing a specific utterance on a particular occasion (see Grice 1957, Clark 1985).

How well children relate their knowledge of intentions to language use, and exactly when they do so, in detail and with proficiency, remains an open question. Children give many signs of having recognised Contrast as early as 1;6 or 2;0 (see Dockrell 1981, Clark 1983*a*, 1983*b*, 1987, Golinkoff, Hirsh-Pasek, Baduini & Lavallee 1985, Markman & Wachtel 1988, Taylor & Gelman 1987). This of course reflects their recognition of the SYSTEMIC consequences of Contrast, presumably derived from their primitive understanding of rational behaviour combined with the language they hear.

Notice that children nonetheless CAN (and do) make errors in precisely which meaning is assigned to an unfamiliar word. For example, *dog* may be taken to mean 'animal', *team* to designate the event of sitting on a blanket at one end of the room, or *hi* the act of covering up one's fingers (Clark & Clark 1977). Adherence to the Principle of Contrast, even at an early age, does not guarantee that children will arrive at the conventional adult meaning with no errors en route.

Clearly, there is an ECONOMY in assuming Contrast compared to assuming the Null Hypothesis. In working out the meaning of a new term, reliance on Contrast automatically eliminates consideration of all the meanings already known. If one STARTS with Contrast, one can start straight away on working out how, not whether, the new word is different from each of all the words already known. From an economical point of view, Contrast makes the task of acquiring meanings simpler.

EVIDENCE FOR AND AGAINST CONTRAST

Let me first consider the most direct evidence FOR Contrast. It comes from two main sources. The first has to do with PRE-EMPTION. As children learn the conventional forms of their language, Contrast predicts that these should pre-empt earlier regularizations and innovations. They do. For example, where *buyed*, *breaked*, and *sitted* are produced by 3- to 5-year-olds, these forms are pre-empted by *bought*, *broke*, and *sat* in older children. The same holds for other inflexional paradigms. Regularised plurals are pre-empted by the conventional forms. Pre-emption also applies in word-formation. Where forms like *bicycler*, *cooker*, and *oarer* appear in younger children's speech, the conventional *bicyclist*, *cook*, and *rower* pre-empt these formations in older children. That is, because children observe Contrast, they cannot maintain two terms for the same meaning, so they give up their innovations in favour of the conventional, pre-empting terms (see Clark 1987). The evidence for this is inescapable: children REPLACE their earlier regularizations with conventional forms.

The second kind of direct evidence comes from children's meanings for unfamiliar words. Experimental studies have shown that children assign new words to objects for which they lack labels from as young as 1;6 or 2;0 (e.g. Dockrell 1981, Golinkoff *et al.* 1985, Merriman 1986, Heibeck & Markman 1987, Taylor & Gelman 1987, Au & Markman 1988). The majority of these studies were designed to see what assumptions young children (from 1;6 to around 5;0) make about new names. When they have no name for a category, children typically assign the new label to the hitherto unnamed category; when they already have a name for a category, they may reject a second label, treat it as a subordinate of the label already known (e.g. Markman & Wachtel 1988, Taylor & Gelman 1987), assign it some other relation such as superordinate (e.g. Waxman & Gelman 1986), or assign it to other as-yet-unnamed objects (e.g. Golinkoff *et al.* 1985). Overall, these studies have offered strong support for Contrast in young children's assumptions about the relations between familiar and unfamiliar words (Clark 1987).

Evidence that has been claimed to go AGAINST the Principle of Contrast has come primarily from data on pairs of words that appear to exhibit no differences in reference and hence in meaning (Merriman 1986, 1987, Gathercole 1987). The specific evidence can be grouped under several headings: words for objects, superordinates, and relational words. The data addressed here are those pertinent to what Gathercole gave as 'Version B' of her Contrastive Hypothesis, the version closest to the Principle of Contrast.

Words for objects. One sort of evidence offered against Contrast is that young children sometimes produce two different words with the same reference (Gathercole 1987, Merriman 1987). Typically, this seems to

happen with under-twos right as they are acquiring new, often more appropriate words (see Leopold 1939–1949, Lewis 1951). For instance, a child who previously used only *wau-wau* might use both *wau-wau* and *dog*, say, for dogs. The problem with such instances is that the data available are not adequate to determine sameness of reference or extension. The diaries contain too little information on the precise range of such pairs, and hence on the true degree to which they overlapped. Presumably in recognition of the difficulty of establishing that two terms are in fact truly synonymous, the original diarists hedged many of their observations about potential synonymy with such terms as 'apparently', 'maybe', 'in some contexts'.

Many of the overlaps observed may reflect other semantic relations such as superordinate to subordinate (*animal* and *dog* will necessarily have the same reference on some occasions), or a mismapping of adult words, as in *Mummy* used to mean 'I want' rather than the conventional 'mother' (Barrett 1986, Mervis 1987). A few might be attributed to perseveration of earlier habits in production, as when a child occasionally reverts to his old term the day after first producing the new one (e.g. Lewis 1951). The problem with these examples, where the child uses two terms with the same reference in some contexts, sometimes on only one or two occasions, is that sameness of reference is, as I have argued, an inadequate criterion for establishing the Null Hypothesis – the absence of Contrast.

Overlap *per se* is not a violation of Contrast, although it is a violation of Mutual Exclusivity (Markman 1984). Mutual Exclusivity is the TENDENCY of children to apply labels for categories at the same level in a mutually exclusive fashion. It appears to apply at an early stage in acquisition. A cat is a *cat* and not a *dog*; a robin is a *bird* and not a *duck*. (Notice that children do not necessarily assign terms at the same level as the adult, and so child category labels may differ from adult ones (see Clark 1978, Mervis 1987).) In some studies of new label assignment, overlap resulting in sameness of reference within the task has been taken as evidence against Contrast, but there are several problems with this interpretation. In one study (Merriman 1986), when the experimenter introduced novel objects as *pilsons*, for instance, and later called them *tukeys*, some children picked out the same referents for both terms. It was as if someone called a specific kind of dog *a spaniel* at first, and then later *a terrier*. One reaction, under these circumstances, would be to assume that a terrier is a kind of spaniel, or that a spaniel is a kind of terrier. So children could pick the same referent for both terms if they thought one term included the other. Another reaction would be to assume that *pilsons* and *tukeys* were independent categories, like *dog* and *pet*. This would also allow them to accept two terms for the same category. A third possible reaction would be to assume the speaker had made a mistake, so the second label must be a correction. Children could again pick the same referent for the second word as for the first. All three interpretations just

given allow for sameness of reference without sameness of meaning. Overlap in meaning, moreover, is not a violation of Contrast. It is an inherent property of taxonomies, where the same category is labelled at several different levels, e.g. *water-spaniel*, *spaniel*, *dog*, *mammal*, and *animal*, and of many independent categories, such as *dog* and *pet*.

Another piece of evidence that has been adduced against Contrast is that some children cease to produce a word for a particular category without having acquired a more appropriate term for it (Gathercole 1987). For example, one child initially over-extended *ticktock* to a barometer (once) and to circular road signs (repeatedly), but a month later stopped using *ticktock* for these categories, even though he had not acquired other words for either one (Barrett 1986). But absence of production hardly constitutes evidence against Contrast. What appears to have happened in this instance is that the child had arrived at a mapping of *ticktock* (for clocks) that suggested it was inappropriate for barometers and road-signs. Many categories go unlabelled by young children, but this isn't relevant to Contrast.

Another kind of evidence offered against Contrast has been taken from young children's uses of colour terms (Gathercole 1987). Young children may appear to use colour terms interchangeably, as when a cushion is called *green* one day and *red* the next. Even so, adjacent colours are labelled with different colour terms, and choices of colour terms elsewhere may contrast in brightness though not yet in hue (Cruse 1977). The data on colour usage are subject to the same problems as the other production data from diaries. There is not enough information available to be sure that children really use different terms interchangeably. Again, proving that children assume the Null Hypothesis would take more information than is available.

The evidence against Contrast here, then, is indeterminate: the diary data do not allow one to decide for sure that the extensions and uses of two words are identical. If two terms simply overlap in reference in some, but not all, contexts (e.g. *pet* and *dog*), this does not violate the Principle of Contrast.

Superordinates. Sometimes young children reject terms superordinate to words they already know. For instance, if they know *dog*, they may reject *animal* when it is applied to dogs. At other times, even as young as age two, children accept superordinates. When they accept them, it has been argued, they are violating Contrast (Gathercole 1987). Rejection and acceptance, though, both provide evidence FOR Contrast.

When children REJECT superordinate terms (e.g. of a toy, *It's not a animal, it's a dog*), they might be assuming that *animal* is being offered as another term for dogs. But since they have already assigned *animal* as a co-hyponym of *dog*, then it cannot apply to dogs, but only to some other kind. This has been observed, for example, when *duck* is produced for ducks and *bird* (the superordinate) for robins and pigeons. Alternatively, children may treat the superordinate term as a collection term like *forest* (trees) or *pack* (dogs,

wolves) (Markman & Seibert 1976, Macnamara 1982): here *animal* might have been construed as meaning a group of (different) animals, so it could not be applied to a single instance. So the rejection of a superordinate term is evidence for Contrast.

When children ACCEPT superordinate terms, they have learnt that it is possible to categorise an object at more than one level. Children learn this fairly early. They make extensive use of hyponyms, like *chow-dog* and *dalmation-dog* as well as *dog*, and also assign terms as superordinate to others, as when they use *car*, say, as a superordinate for both *car* and *truck* (see Clark, Gelman & Lane 1985, Waxman & Gelman 1986, Mervis 1987, Taylor & Gelman 1987). In fact, such relations are common in adult-to-child speech where objects are often categorised at two levels, as in *A collie is a kind of dog* (Mervis & Mervis 1982, Callanan 1985, Mervis 1987; see also Chapman, Leonard & Mervis 1986). So this is also evidence for Contrast.

This kind of evidence could only be used to argue against Contrast if Contrast was misidentified as Mutual Exclusivity. Mutual Exclusivity, of course, does not allow for categories being labelled at different levels in a taxonomy, and so predicts the rejection of terms superordinate or subordinate to known words.[2] But Contrast is not the same as Mutual Exclusivity and does not make that prediction. With the acceptance of superordinate terms, children have clearly realised that some words can contrast in level.

Relational words. Relational terms represent a further domain in which it has been claimed that children treat words as synonyms (Gathercole 1987). The principle example is that *big* means the same as *tall*. Maratsos (1973, 1974) showed that children's meaning for *big* was affected by their acquisition of 'vertical' terms. When four-year-olds acquired *tall* and *high*, they began to attend more to the topmost points of objects, and typically chose the higher of two referents when they were asked for *the big one* or for *the tall one*. However, what Maratsos did not show or claim was that the terms *big*, *tall*, and *high* had the same meaning. He never tested more than one of these terms at a time, and, as he pointed out, uses of the terms varied with context. Children do not equate the meaning of *big*, say, with that of *tall*. Rather, in some settings, they will choose the object with greater vertical extension as being *big*, and even ignore non-vertical extension in doing so (see further Ravn & Gelman 1984). In another domain, *less* for many years was taken to be equivalent in meaning to *more*. Children appeared to treat the two terms in the same way, albeit in separate tasks (Donaldson & Balfour 1968). Yet when *more* and *less* both appear in the same task, these two words are

[2] In earlier discussions, I have not always distinguished clearly enough between predictions based on Contrast alone, and those based on Contrast combined with other acquisitional principles such as the Single Level Assumption and the No Overlap Assumption (see Clark 1987: 26). This may have led to some confusion about the status of Contrast within taxonomic domains (see Clark 1978, 1983*b*).

consistently treated as if they differ in meaning (Wannemacher & Ryan 1978, Clark in press). In essence, sameness of reference within a specific task provides only indeterminate evidence that the Null Hypothesis might hold. And where investigators have looked further, or presented children with more than one dimensional term in the same task, children consistently contrast them.

Sameness of meaning has also been claimed for causative verbs, which again would be a violation of Contrast. Bowerman (1974), for example, proposed that lexical causatives and periphrastic causatives (e.g. *open* and *make...open* in *He opened the door*, *He made the door open*) had the same meaning for children learning how to produce causatives. The evidence again was sameness of reference, and the fact that children sometimes used a lexical and then a periphrastic form in succession in the same utterance. It is possible that the children were repairing what they had just said (Clark 1982), switching from lexical to periphrastic, or vice versa, for the meaning intended. Bowerman argued against this on contextual grounds: it was difficult to discern any distribution appropriate to the adult mapping of direct and indirect causation in her children's uses, but, as she also pointed out, her children may not have started from the realization that lexical causatives were usually used for direct causation, so that consistency with the adult distinctions might be hard to discern. By age three, though, children do evidently realise that direct causation is generally lexical in expression, and that indirect causation is periphrastic (Ammon 1980). Such data again point to the difficulty of proving children begin with the Null Hypothesis, whether with observational or experimental data.

Analyses of distribution rather than of reference have tended to reveal differences in many domains where reliance on sameness of reference obscures subtle contrasts. For example, many children around age three to four make use of two comparative constructions, *more X* and *X-er*, yet the two are not used in identical contexts (Gathercole 1979) and so contrast. Similarly, despite the apparent interchangeability for 2-year-olds of the pronoun *me* and the child's own name both in self-reference, analysis of the contexts of use reveal subtle but consistent differences in meaning (Deutsch & Budwig 1983, Budwig 1985, 1986). Such studies remind us that similarity of distribution is not the same as identity of distribution. In short, it is virtually impossible to prove that children start with the Null Hypothesis: there is simply not enough evidence.

Nearly all the potential counterevidence to Contrast, then, either relies on the criterion of sameness of reference or does not in fact violate Contrast at all. Sameness of reference cannot be equated with sameness of meaning, so that evidence must remain indeterminate. At the same time, the logic of using Contrast, the economy of effort achieved through assumption of that principle, and the evidence from how young children replace earlier regu-

larizations as well as from how they assign meanings to unfamiliar words, all suggest that children rely on Contrast from a very young age.

SOME CONSEQUENCES OF CONTRAST IN ACQUISITION

Contrast has a number of consequences in acquisition. First, established words take priority over new ones. Because such terms have already 'taken' specific meanings, they pre-empt other terms that might otherwise express the same meanings and so fail to contrast. In addition, existing irregular forms within paradigms may 'block' the formation of the regular forms that one might otherwise expect to find in the pertinent slot. These are a special case of pre-emption – where existing inflectional or derivational forms have priority over potential (regular) paradigm members. For example, despite the existence of the regular paradigm with present/past pairs like *open/opened, jump/jumped*, and so on, *broke* pre-empts *breaked* as the past of *break*, and *flew* pre-empts *flied* as the past of *fly*. (Notice that regular formations are quite acceptable if they carry a meaning that contrasts with an existing term. For instance, the verb *to fly out* in baseball has as its past the regular form, *flied out*. Similarly, one finds the past form *standed* for the compound verb *to grand-stand* but not for the simple verb *stand* where *stood* pre-empts the regular form.) Second, Contrast constrains the formation of new words in that their meanings must contrast with conventional meanings already established (e.g. Clark & Clark 1979, Clark 1987).

The theoretical question is not WHETHER Contrast holds, but rather HOW it combines with other principles to account for young children's uses of language. For example, children appear to rely on a number of basic principles as they work on the mapping from conceptual category to word form. One of these is the Whole Object principle – that words pick out whole objects (e.g. Markman & Hutchinson 1984, Huttenlocher & Smiley 1987, Mervis 1987, Mervis & Long 1987). When children hear a new word in the context of an object for which they lack a name, they treat it as if it was the label for that object and for other members of the same category (e.g. *cat* applied to a specific cat, and extended to other cats). They do not pick out parts of objects (e.g. just the cat's ears or its tail), or thematic groupings of objects (the cat plus its bowl of milk nearby), or even actions of an unnamed object. But when children already have a word for the whole object, they look for some other relation. They may assign a 'part-of' or attribute meaning (e.g. Markman & Wachtel 1988) or assign a sub-type interpretation (e.g. Taylor & Gelman 1987). Another early principle is the principle of No Overlap – that terms at a single level in a semantic field denote non-overlapping categories. The categories denoted by *dog* and *cat* do not have members in common. Another is the Single Level assumption – that known words all apply at a single level of organisation in the lexicon. This

assumption has to be given up as children learn words at levels superordinate to or subordinate to words already known. (In fact, when Contrast is combined with No Overlap and Single Level, the result is Markman's Mutual Exclusivity principle (see Clark 1987).) Yet another is the Inclusion principle – that terms at the next level down in a taxonomy are included in the term at the level above. So *animal* must include *dog*, *cat*, and *horse*; and *dog* must include *poodle*, *boxer*, and *labrador*. (Different levels in a taxonomy, though, need not map on to each other.) These principles, and others, combine with Contrast and Conventionality in different ways at different stages, depending on what each child already knows about the conventional lexicon. But, as yet, relatively little is known about either these principles or their combinations.

Contrast, it is important to note, simply predicts that words must contrast in meaning IN SOME WAY. No two terms can be exactly synonymous. Contrast does NOT predict which contrasts will be acquired first, not does it predict order of acquisition in particular domains, or order of acquisition across children. Rather it allows specifically for individual variation depending on each child's input and lexical 'history' (Clark 1987). Predictions about all of these can follow only from a full theory about the principles and assumptions children rely on in conjunction with Conventionality and Contrast.

The application of Contrast is complicated by the asymmetry between comprehension and production. There are asymmetries between the two for adults and children alike (e.g. Clark & Hecht 1983). Both adults and children typically make fewer distinctions in production than in comprehension. Contrast should apply for comprehension and production separately. For instance, adults may produce only *parrot*, yet understand *macaw*, *cockatoo*, and *budgerigar* as well as *parrot*. Or they may produce only *horse* and *pony* yet understand *roan* and *palomino* as well. Certain contrasts may hold for comprehension that do not hold for production. So conclusions based on production alone are likely to be more limited than those based on production AND comprehension.

CONCLUSION

Contrast clearly holds for adults, but at what point does it come in for children? There is strong evidence that it comes in early. Arguments against this view have sought evidence for sameness of meaning in early word use, but the criteria used to demonstrate it are inadequate. It appears untenable, on grounds of economy as well, for children to rely on the Null Hypothesis. Contrast, I have also argued, constrains the process of acquisition, both by itself and in combination with other acquisitional principles. The theoretical task now is to identify those other principles and their origins, and show how, in interaction with Conventionality and Contrast, they help account for the course of acquistion.

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