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TESTING THE LANGUAGE BIOPROGRAM HYPOTHESIS: A REVIEW OF CHILDREN'S ACQUISITION OF ARTICLES

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One component of D. Bickerton's Language Bioprogram Hypothesis is here empirically tested by reviewing studies of children's comprehension and production of articles. Seven studies reporting relevant data in English and French were reviewed. Two of them provide clear empirical support for the hypothesis that children are universally sensitive to the specific/non-specific distinction of referential meaning. Moreover, findings of all reviewed studies were generally consistent with a four-stage hypothesis of the acquisition of English and French articles, characterized by (a) the use of the indefinite and/or definite article(s) for specific referents, and zero article for both non-specific referents and naming; (b) the use of the indefinite article for non-specific referents, and the definite article for specific referents whether or not they are presupposed; (c) an increase in the correct use of the indefinite article for specific, non-presupposed referents, with a concomitant decrease in the correct use of the definite article for specific, presupposed referents; and (d) the correct use of the definite and indefinite articles.

Bickerton 1981, 1984 has made an intriguing case for a view of language acquisition which places prime importance on children's innate predisposition to learn language. While a nativist view of acquisition is by no means original, what is novel in Bickerton's Language Bioprogram Hypothesis (LBH) is his use of linguistic analysis of the structure of diverse creole languages to discover similarities which, according to the LBH, can be explained only by positing a universal and species-specific biological program for language acquisition.

The LBH has attracted considerable attention both from linguists (particularly creolists) and from child language specialists. Among the authors of the 25 commentaries published with Bickerton's 1984 article, many of the linguists (e.g. R. Posner, P. Roberts, W. Samarin, G. Sampson, P. Seuren, and E. Woolford) disagreed with aspects of his linguistic and historical account of creoles, and were therefore reluctant to embrace his hypothesis. However, there appeared to be general agreement among the child language specialists (e.g. E. Bates, L. Bloom, A. Marantz, P. Maratsos, and D. Slobin), that the LBH is well worthy of serious consideration. Most of the objection to the LBH among non-linguists seems to be centered on the claims that the language acquisition faculty is innate and that it is specific to language acquisition (the so-called 'modularity' view of the acquisition facility) rather than a consequence of more general aspects of cognitive development.

Although the general framework of the LBH seems largely compatible with what many language acquisition specialists know, there is nevertheless relatively little direct empirical support for the specific predictions which the LBH makes for child language. Bickerton 1981, in his first detailed formulation of the LBH, cites a mere handful of acquisition studies which, by his interpretation, support the LBH; and his 1984 paper makes only quick and rather superficial reference to Slobin 1982, to McNeill 1966, and to a few examples of utterances from Robert Wilson's on-going study of language acquisition by

a blind child. Bickerton himself notes: 'the LBH has presently the status of a hypothesis rather than a theory; a great deal of evidence from a great many fields will have to be gathered, sifted, and interpreted in order to test it thoroughly' (1984:188).

The purpose of this paper is to examine evidence from studies of child language acquisition which are relevant to one of the four major components of the LBH, i.e. the specific/non-specific (SNS) distinction. Bickerton (1981:146–54) argues that this distinction is marked in all creole languages by the use of articles, and that children must therefore be biologically programmed to make it in acquiring language. I evaluate this hypothesis here by undertaking a secondary analysis of four studies cited by Bickerton 1981, as well as three other studies of the acquisition of articles. It should be mentioned that the issues of whether SNS is innate, and whether it reflects a cognitive ability which is specific only to language (i.e. its modularity), are outside the scope of my investigation. Instead, a more modest goal is set: to discover whether SNS is acquired by children at a universally early age. Such universality, while by no means a sufficient condition for Bickerton's nativist LBH of language acquisition, is clearly a NECESSARY condition for one component of the hypothesis. Thus I examine here what is called the SNS Hypothesis—i.e. that children, from very early in the language acquisition process, universally demonstrate a tendency to interpret SNS in the language they hear, and to mark it in the language they produce, whether or not this distinction is clearly made (or made at all) in the language to which they are exposed.

1. Before beginning this survey, it is important to consider the type of data that would constitute evidence for the universality of SNS. Obviously, completely (or nearly) errorless acquisition of the linguistic means to express this distinction would constitute supporting evidence. However, it is possible that no language for which we have acquisition data uses a simple, straightforward means for expressing it. As explained by Bickerton (1981:146–8) and Brown (1973:340–50), the presence of the English articles *a* and *the* with singular referents does not depend solely on the specificity ($\pm S$) of the referent, but also on whether it can be presupposed ($\pm P$) by the speaker that the listener will know which specific referent the speaker has in mind. In general, the definite article *the* is used only when the referent is both specific and presupposed ($+S + P$); the indefinite article *a(n)* is typically used for all other referents, whether or not they are specific. Examples are: *The sun is hot* ($+S + P$); *A dog bit me yesterday* ($+S - P$); and *I want a cookie* ($-S - P$). As explained by Brown (345–7), a number of circumstances determine whether a referent can be presupposed—including whether it is (a) unique for all (e.g. *the sun*, *the moon*); (b) unique in a given setting (*the desk*, *the ceiling*), (c) uniquely salient for a given social group (*the boss*, *the Constitution*); (d) made salient by pointing, nodding, or spotlighting; (e) made salient by stimulus characteristics (*the explosion*); (f) specific by entailment (*the motor of a car*, *the tail of an animal*); (g) specific by definition (*the last sentence*); or (h) specific by prior utterance. This contrasts with the relatively straightforward article system used

in creole languages, as described by Bickerton (1981:56–8, 247–8): here all –S referents take zero article, whether or not they are +P, while +S referents take the definite article if +P, but the indefinite article if –P. Thus the creole-speaking child acquires what appears to be more straightforward rules of article use, with zero for all –S referents, and the definite and indefinite articles for +S referents which are +P and –P, respectively.

However, one common use of articles does not fit neatly into this classification based on specificity and presupposedness, viz. NAMING (also referred to with the terms ‘identification’ or the ‘nominative function of articles’). Even when a referent is clearly +S+P (e.g. when there is only one table in a room), one would say *That’s a table*, but use *the* for all other references to the object (*Look at the table!*) Brown (347) puts named referents into the +S–P category; but Maratsos (1976:7) argues that named referents may sometimes also be +S+P, and therefore are problematic for the specificity/presupposedness classification of articles. For the present purposes, it probably suffices to note that, for singular referents, both English and French use the indefinite article for naming. It is unclear at present, however, how creoles use articles for naming: Bickerton (p.c., January 14, 1985) believes that they use zero articles in naming contexts, but A. Valdman (p.c., January 4, 1985) believes that indefinite articles are used for naming in Haitian Creole French. Clearly, more research needs to be done to investigate this use.

2. Contrasting the English and creole systems provides a basis for hypothesizing patterns of early article use in English which would be consistent with the SNS Hypothesis. One pattern is described by Bickerton himself (1981:154): he predicts that, ‘when a substantial body of early child language is properly examined, there will be found to be a significant skewing in article placement, such that a significantly higher percentage of articles will be assigned to specific-reference NP, while zero forms will persist in non-specific environments longer than elsewhere.’ However, even if this were found to be true, we would not expect English-speaking children to persist long in this use (and non-use) of articles, if they are at all sensitive to the structure and meaning of language which they hear spoken by others.

First, an article (*a, the, some*) or other determiner (e.g. the demonstratives *this, that, these, or those*) is almost always used in English with a NP, the only common exceptions being proper names and generic nouns (*Milk is good for Hugo*). Second, it would seem that children would very early want to attach some significance to the *a/the* distinction so often heard. If they do have a universal tendency to mark SNS, it would hardly be surprising to find *the* used for +S and *a* for –S: though we have seen that *a* is used for both +S and –S referents, *the* is commonly used only for +S referents. (The only exception is its relatively rare use in formal styles of speech for –S+P generics such as *The whale is a mammal*.) However, the child must then eventually come to the knowledge that the SNS relationship of the definite and indefinite articles is not one-to-one, since *a* is also used with +S–P referents. If this knowledge develops before sensitivity to presupposedness (as should be the case, given

the egocentricity of young children), there should be some increase in the use of *a* for +S referents, whether or not they are presupposed. Then, as sensitivity to presupposedness develops, the child's use of articles should resemble that of the adult. With respect to naming, it will be recalled that both English and French use the indefinite article for naming singular referents, while creoles are thought to use either zero or the indefinite article. Therefore, one might expect that children acquiring English or French (a) would first use zero incorrectly, and then the indefinite article (correctly); or (b) would first use the indefinite article (correctly) for naming singular referents.

Thus a comparison of the creole and English article systems—taken along with Bickerton's hypothesis concerning the universality of SNS, and knowledge of child development with respect to egocentricity—permits us to hypothesize four distinct stages in the acquisition of English articles; see Table 1.

PRESUPPOSEDNESS	SPECIFICITY	
	+	-
	Stage 1	
+	* <i>a</i> , <i>the</i>	*∅
-	<i>a</i> , * <i>the</i>	*∅
	Stage 2	
+	<i>the</i>	<i>a</i>
-	* <i>the</i>	<i>a</i>
	Stage 3	
+	* <i>a</i> , <i>the</i>	<i>a</i>
-	<i>a</i> , * <i>the</i>	<i>a</i>
	Stage 4	
+	<i>the</i>	∅, <i>a</i> , <i>the</i>
-	<i>a</i>	<i>a</i>

TABLE 1. (Asterisks indicate predicted errors in article use.)

2.1. In Stage 1, the child should, as Bickerton has predicted, use the basic pattern found in creole languages—with *a* or *the* used for +S referents, and the zero article for -S referents. The use of either article for +S referents should show up as errors of *a* for +S + P, and of *the* for +S - P; but this should be mixed with correct use as well. In addition, we would expect the zero article to be used primarily for -S referents, for naming, and for generic NP's—this last being the only instance (except for proper names) where the zero article will not be an error. Either zero or *a* should be used for naming singulars.

2.2. In Stage 2, the child should replace zero with *a* for -S, and retain *the* only with +S referents. Thus an error type characteristic of this stage would be the use of *the* for +S - P referents. If the zero article had initially been used for naming, *a* should replace it at this stage.

2.3. In Stage 3, the child should begin to learn that *a* is also used for +S referents, but may not yet know that this is the case only when the referent is also -P. If the child were to acquire this partial knowledge of the correct use of *a*, it should be shown in the rather interesting pattern of an increase in the correct use of *a* for +S - P referents, along with with a decrease in the correct use of *the* for +S + P referents—since *a* would be used incorrectly for at least

some of these referents. However, this hypothesized stage may last for only a short time (or be absent) if the child instead quickly learns that *the*, not *a*, must be used for +S+P referents. Thus the child may appear to pass directly from Stage 2 to the correct use of articles characteristic of Stage 4 below.

2.4. In Stage 4, the child should be able to base the choice of articles on both the specificity and presupposedness of the referent, and thus attain the correct adult pattern of article use.

This Four-stage Hypothesis for the acquisition of English articles, based on Bickerton's SNS, provides a useful framework for reviewing the results of relevant child language acquisition studies. It should be kept in mind, however, that the hypothesis goes beyond Bickerton's own prediction; thus a failure to find evidence consistent with all aspects of its four stages should not necessarily lead us to reject the core SNS Hypothesis. In this survey, then, relevant studies will be examined to determine to what extent they support both (a) the core hypothesis that children are universally sensitive to SNS in their comprehension and production of language; and (b) the Four-stage Hypothesis concerning the acquisition of articles with respect to both specificity and presupposedness, as outlined in Table 1.

3. When considering evidence for the Four-stage Hypothesis, it should be kept in mind that, while the order of the hypothesized stages should be expected to be relatively invariant as to their sequence, it does not seem reasonable to expect each stage to be found only at a narrow age-range. This is because of the possible influence of both individual and study-related differences. Individual differences include those in the children's development of cognitive and linguistic abilities, as well as in the type and quantity of language to which they are exposed. In fact, although the LBH postulates innate universals of acquisition, it should be emphasized that—except in the acquisition of creole languages—these universals will, in many (if not most) cases, need eventually to be revised or abandoned completely by the child in order successfully to acquire the target language. The only way children can do this is by using the information provided in the language they hear. Thus we might reasonably expect large differences in the ages at which a particular hypothesized stage appears, depending on whether primary linguistic input is provided by other children of similar or younger age (e.g. siblings or playmates), or by adults (e.g. in single-child families). Study-related differences include those (a) in the language investigated, in this survey, English and French; (b) in whether language data were naturalistically or experimentally collected; and (c) in both experimental tasks and data collection procedures. Also, it must be realized that it is always possible for a researcher to miss a stage in child development, in either cross-sectional or longitudinal research designs, because development can take place outside time periods when data are collected.

There is also a statistically-related problem in attempting to discern sequential stages of development based on age-group means, frequencies, or proportions—whether the groups are cross-sectional or longitudinal. Suppose that ten children were, as a group, 60% correct in using *a* for +S–P objects. This could

indicate (a) that each child was correct six out of ten times; or (b) that six children were 100% correct, with the remaining four always incorrect; or (c) that the pattern of responses was somewhere between these two extremes. Thus differences in the degree of individual variability in a measured behavior across age groups can hide developmental patterns if—as is usually true—only group statistics are reported, with no information provided on individual variation. An example would be the finding that a group of four-year-olds and another group of five-year-olds both performed at 60% success on a given task. At first glance, it might appear that no age-related development is apparent; but it is possible that a significantly higher proportion of the older children were consistently correct in the behavior under study.

Thus it seems highly unlikely that any one study could provide clear evidence for each of the four stages of article acquisition hypothesized here. However, it was hoped that, when all relevant and available child language studies were considered collectively, they would permit an empirically based evaluation of the SNS Hypothesis, as well as provide information relevant to the Four-stage Hypothesis which follows directly from the SNS Hypothesis.

3.1. BROWN 1973 was the first to study, systematically and longitudinally, the acquisition of English morphemes, among them the articles *a* and *the*. Bickerton does not review Brown's findings, other than to mention (1981:147) that they provide naturalistically collected evidence that the English article system is acquired at a very early age. However, a more detailed examination of Brown's data—collected from Adam, Eve, and Sarah, three American children at ages from 18 to 44 months—is quite revealing with respect to the acquisition of articles, and their use to mark SNS. Of particular interest is the table presented by Brown, p. 354, which provides a full list of all observed article errors made by the three children.

Two aspects of this table are particularly striking. First, the total frequency of errors is very low; only nine are reported for Adam, ten for Eve, and eight for Sarah. Second, and of particular interest from the perspective of SNS, all 27 reported errors occurred with +S referents. These errors were of two types: (a) 14 uses of *a* for +P referents ('specific to the listener', as described by Brown); and (b) 13 instances of *the* used for +S–P referents. No errors at all were reported for –S referents, and Brown makes clear his puzzlement, commenting: 'I do not know why this should be so' (355).

Let us examine these data with respect to both the SNS and the Four-stage Hypotheses. The fact that these children were never observed to use *the* with –S referents, and yet were apparently quite successful in using *the* for +S+P, is strong evidence for the SNS Hypothesis. In addition, the article errors that were made with +S referents are consistent both with Stage 1 (which predicts the use of *a* for +P referents) and with Stages 2–3 (which predict the use of *the* for +S–P). It is unfortunate that Brown does not report errors with the zero article; thus we are unable to verify the Stage 1 prediction that these should occur primarily with –S referents. However, his findings do provide evidence for the SNS Hypothesis, and are consistent with the predictions made by the

first three stages of the Four-stage Hypothesis. It is particularly noteworthy that the SNS Hypothesis clearly predicts the very finding which Brown was at a loss to explain, i.e. complete absence of the use of *the* for $-S$ referents.

3.2. BRESSON 1974 reports the findings of a single experiment which examined the elicited production of French articles by four groups of French children at four, four-and-one-half, five, and five-and-one-half years of age (see §3.5 below for a brief description of the French article system). Since the experimental objects used by Bresson were all $+S$, this experiment does not provide information directly relevant to the SNS Hypothesis. However, Bresson did manipulate the presupposedness of the objects in his experiment by having the children refer to (a) an entire group of identical objects ($+S+P$, *les* expected); (b) a part of a group ($+S-P$, *des* expected); (c) a single object of a group of identical objects ($+S-P$, *un* or *une* expected); and (d) a singleton, i.e. one unique object ($+S+P$, *le/la* expected). The results obtained from these manipulations (see Bresson's Table 1, p. 70) are of considerable interest with respect to the Four-stage Hypothesis.

First, it was found that all four groups were more successful in correctly using the definite articles *le/la* and *les* for the $+S+P$ objects than they were in using the indefinite articles *un/une* and *des* for the $+S-P$ objects; over-all mean percentages of correct article use were 69.9% vs. 33.9%, respectively. This suggests considerable incorrect use of definite articles for $+S-P$ referents, as predicted by both Stages 2 and 3 of the Four-stage Hypothesis.

Also of considerable interest is a finding, not discussed by Bresson, which shows that the children at age four-and-one-half were the least successful in their use of the definite article *le* for the $+S+P$ objects; they were correct less than half the time (48%), compared to 60% for the younger group, and 72% and 80% for the two older groups. This peculiar dip in the correct use of the definite article for $+S+P$ referents is consistent with the prediction made regarding Stage 3: an increase in the incorrect use of the indefinite article for $+S+P$ referents results from the child's realizing that the indefinite article can be used for $+S$ referents, without realizing that this use is limited to $-P$ referents. Thus, while Bresson's work is not directly relevant to the SNS Hypothesis, it does provide data which are consistent with Stage 2 of the Four-stage Hypothesis, and also shows a pattern of results which appears unexplainable without recourse to Stage 3.

3.3. MARATSOS 1976 conducted a series of cleverly designed experiments with American children, from 32 to 59 months of age, to examine their use and comprehension of what he referred to in his title as 'definite and indefinite reference'. He included four experimental tasks: (a) story comprehension, (b) story completion, (c) 'imitation with expansion' (given only to the three-year-olds), and (d) an asking ('games') task. Although the primary purpose of these experiments was to assess the child's use and comprehension of the English definite and indefinite articles with respect to the presupposedness of their referents, some of Maratsos' results are nonetheless relevant to the SNS Hypothesis; virtually all his findings are relevant to some aspect of the Four-stage Hypothesis.

3.31. Bickerton (1981:148) mentions one of Maratsos's findings—viz. that the children's success rate was approximately 90% on the story completion task—as support for the SNS Hypothesis. However, closer examination of the stories used in this task (Maratsos 1976:48–54) reveals that only one out of the eight 'systematic' stories used ('Like', p. 53) involved reference to a –S phrase (which was also a generic), and this was true for only one of the two versions of the story. (It could also be argued that the –S version of this story might have been confusing to the children, since it attempted to elicit a –S response with the question *Which does he like more?* instead of the more appropriate *Which would he like more?*) Thus the children's high success rates on this task—which, incidentally, Maratsos gives on p. 59 as 79% over-all, not 90% as stated by Bickerton—is in itself irrelevant to the SNS Hypothesis, particularly since Maratsos mentions that 'only full noun phrases of the form Article + Noun were tabulated' (58). If the children had used a large number of NP's without articles, this would have constituted evidence inconsistent with the SNS Hypothesis—since, as already mentioned, virtually all elicited NP's in the stories were +S.

However, the pattern of responses for each group of children shown in Maratsos' Table 6.1 (p. 63) does have implications for the Four-stage Hypothesis. First, the three-year-olds performed quite well (83% accuracy) in using *a* with the +S–P referents, but markedly less well (55%) in using *the* for the +S+P referents; Maratsos interprets this as an indication that these children were not successful in establishing the specificity of the +S+P referents in this task (p. 67). However, another explanation is provided by Stage 1 of the Four-stage Hypothesis, which predicts (a) use of *a* and/or *the*, and (b) little if any use of zero article for +S referents. Unfortunately, the latter prediction of Stage 1 cannot be verified, since zero articles were not reported for this experiment. Second, the eight four-year-olds who were less capable (as determined by an elicited imitation task, designed to assess general language ability) were, as a group, close to perfect (94%) in their use of *the* for the +S+P referents; but, as predicted by Stage 2, they often failed to use *a* correctly for the +S–P referents, being correct less than half the time (42%). Finally, the four-year-olds who were more capable demonstrated virtually perfect performance with both +S–P referents (98% *a*) and +S+P referents (97% *the*), as is characteristic of Stage 4. The drop in correct use of *a* for +S–P referents by the less capable four-year-olds (42%), as compared to the three-year-olds (83%), can also be explained by Stages 1 and 2—since Stage 1 predicts the use of both correct *a* and incorrect *the* for +S–P referents, while Stage 2 predicts only the use of incorrect *the*. Thus, while the results of this experiment have no direct bearing on the SNS Hypothesis, it does provide results which are consistent with Stages 1–2 of the Four-stage Hypothesis.

3.32. In Maratsos' story comprehension task, children acted out the completion of a story as a test of their understanding of *a* as referring to a +S–P object (in this task, one which had not previously been referred to), and *the* as referring to a +S+P object (previously referred to). As in the task described above, the children's high average accuracy of 85% on this task says little about the SNS Hypothesis as such, since again all objects were +S. However, this

high success rate for sensitivity to articles as indicators of presupposedness (also found for the more capable four-year-olds in the task described above) poses something of a dilemma for the Four-stage Hypothesis, since it is only at Stage 4 that children should be sensitive to this function of articles. It would not seem that three- or four-year-olds should have attained this stage of development.

3.33. The results of the 'imitation with expansion' task, which was administered only to the three-year-olds, are once again not directly relevant to the SNS Hypothesis, since all referents were +S. Nevertheless, the errors made are largely consistent with parts of the Four-stage Hypothesis. As predicted for Stages 1–2, the only observed error type—not including errors of article omission—was the use of *the* for +S–P referents (see Maratsos' Appendix VIII, p. 128); but even this error type was not common, constituting only 15% of the article responses given in the +S–P condition. As for errors of article omission (zero articles), eight instances were found, constituting 22% of all obtained responses (p. 70). Since the referents in this task were all +S, such a finding might appear to run counter to Stage 1—which predicts that zero articles should be restricted to –S referents, and perhaps to naming. However, since this task involved the repetition of stimulus sentences from which articles had been removed (e.g. *So he took pencil*), zero articles were probably the result of accurate imitations, rather than an indication of the children's productive rules.

3.34. Finally, the asking task (referred to as 'games' by Maratsos), provides data which bear directly on the SNS Hypothesis. Here the children were asked to choose a toy under four experimental conditions. The two factors distinguishing these conditions were (a) the number of toys present (singular, i.e. one each of two types of toys, vs. plural, i.e. more than one of each); and (b) whether the toys were visible to the child at the time the child asked for one. Here, for the only time in Maratsos's study, the plural/invisible condition clearly involved –S referents: the children knew that more than one of each type of toy was available, but they could not attend perceptually to particular toys, since they were hidden from view. It is also clear that the singular/visible condition involved +S referents, since only one toy of each type was available and visible. However, the intended non-specificity of the referents in the plural/visible and singular/invisible conditions is questionable. The plural/visible condition would probably be perceived by an adult as consisting of –S objects, and this would also be the case for a child who was indeed asking for ANY one of the similar toys. However, if the child was instead attending to one particular toy (even if there was no way for the experimenter to know which one it was), then the referent would be +S from the point of view of the child. In this condition, the likelihood of the child's asking for a +S object was probably increased by the use of toys in the plural conditions—which, though similar within a given set (e.g. all boys), were always easily distinguishable from each other (e.g. by differing hair color). The intended specificity of the objects in the singular/invisible condition is also questionable. While the child was in-

formed that only one of each toy type was available out of view (so that each object should have been specific), their invisibility may have elicited a $-S$ perception, and a correspondingly $-S$ request. The probability of this $-S$ perception was probably increased by the use of distinguishable toys within each set, since Maratsos as experimenter would say, for this singular/invisible condition, ‘‘There’s another boy and girl back here’’, or whatever was appropriate’ (p. 82), without telling the child which specific boy and girl (or whatever toy) was hidden. Thus these four conditions presented (a) clearly $+S+P$ objects (singular/visible); (b) clearly $+S-P$ objects (plural/invisible); (c) objects intended to be $-S-P$, but likely to be perceived by children as $+S-P$ (plural/visible); and (d) objects intended to be $+S+P$, but possibly perceived as $-S+P$ (singular/invisible).

Having described this task in some detail, let me now attempt to interpret the results of this experiment with respect to the SNS and the Four-stage Hypothesis. With respect to the former, Maratsos’ Appendix X (pp. 131–2) shows that the children as a group were very accurate (91%) in their use of *a* for the $-S$ objects in the plural/invisible condition. Also, since Maratsos provides each individual child’s accuracy, it can be seen that 29 of the 40 children (72.5%) were 100% accurate in their use of *a* for the $-S$ referents, with the remaining 11 ‘non-perfect’ children still showing a high preference for *a* at a mean rate of 70.6%. That these children were not simply using *a* for all referents is shown by the finding (again provided by Appendix X) that, as a group, they were 85% accurate in using *the* for the $+S+P$ objects in the singular/visible condition. If we consider only the three-year-olds, we find that, as a group, they also had close to perfect accuracy (91%) in using *a* for the $-S$ objects in the plural/invisible condition, and 78% accuracy in using *the* for the $+S$ objects in the singular/visible condition. These findings are clearly consistent with the SNS Hypothesis that very young children distinguish $\pm S$ referents.

The results of this experiment also have implications for the Four-stage Hypothesis. The four-year-old girls’ performance was nearly without error; they used *a* for both plural conditions, and *the* for both singular conditions, with over-all accuracy of 92% (p. 85). However, the four-year-old boys were, as a group, less accurate. Visibility did not affect these boys’ rate of correct use of *the* in the singular condition (75% and 77% for visible and invisible, respectively), but it did have a statistically reliable effect on the correct use of *a* for the plural conditions; they were 89% accurate for the invisible/plural objects, but only 54% correct for the visible/plural ones (p. 86). This pattern of results is consistent with Stage 3, which predicts consistent use of *a* for $-S$ referents (achieved here at 89%), and primarily *the* but sometimes *a* for $+S$ referents (found here at approximately 76% *the* and 24% *a* for the two singular and hence $+S$ conditions). The error of using *the* for $+S-P$ referents, as predicted by Stages 1–3, is also found in the quite frequent incorrect use (46%) of *the* in the plural/visible condition.

Other results of this same experiment showed no significant sex differences in the three-year-olds’ performance (p. 87); their results for one of the two games were almost indistinguishable from those of the four-year-old boys’ per-

formance on both games. However, in contrast to this more common pattern—in which visibility had no discernible effect on the use of articles for the singular conditions—the correct use of the definite article dropped from 76% in the singular/visible condition to a conspicuously low 37% in the singular/invisible condition of one of the two games comprising this task. Maratsos shows his puzzlement at these results by stating: ‘I do not know of any convincing explanation for why indefinite responses should have increased in both singular and plural conditions after the toys were hidden in playing Feeding the Dragon’ (89). Yet if this ‘invisible’ experimental condition was indeed perceived as involving –S objects, for reasons described above, then the use of *a* is quite understandable: it is predicted in Stages 2–4, and is also consistent with the SNS Hypothesis. That this difference did not occur for the other game (‘Down the Hill’) might be explained by Maratsos’ observation that, in that game, the requested toy was an agent, whereas objects in the former game were patients (food for the dragon); the latter game for some reason held the children’s attention better than the former (87).

Taken as a whole, Maratsos’ research provides evidence for both the SNS and the Four-stage Hypotheses. High sensitivity to the distinction predicted by the SNS Hypothesis was indicated by almost perfect use of *a* for the –S objects in the ‘games’ experiment, and high accuracy in the use of *the* for the +S objects in that same experiment. In addition, the pattern of errors found across the four experiments are almost all consistent with the predictions made by the Four-stage Hypothesis: (a) the story completion task is consistent with Stages 1, 2, and 4; (b) the ‘imitation with expansion’ task is consistent with Stages 1–2; and (c) the ‘games’ task is consistent with all four stages. The only real difficulty posed by these results for the Four-stage Hypothesis appears to be the apparently precocious Stage 4 sensitivity to the presupposedness distinction shown by (a) the more capable four-year-olds on the story completion task; (b) the three- and four-year-old children in the story comprehension task; and (c) the four-year-old girls in the ‘games’ experiment. This suggests a modification of the Four-stage Hypothesis, which would allow sensitivity to presupposedness in the use of articles to develop before Stage 4. We shall see, however, that most other researchers have not found this same sensitivity to the use of articles as indicators of presupposedness in similar-aged or even older children.

3.4. WARDEN 1976 reports findings from a series of three experiments designed to test English-speaking children’s use of the definite and indefinite articles. His subjects included children at three, five, seven, and nine years of age, plus a group of 20-year-old adults for comparison. However, since Warden used only +S referents, his results cannot be used to evaluate the SNS Hypothesis. Nevertheless, his findings have some bearing on the Four-stage Hypothesis, and will be reviewed here.

Warden’s third experiment is of the most interest, since it was designed to eliminate confounding variables found in his first two experiments; it will be the only one considered here in detail. However, it should be noted that, in the naming task of his first experiment, Warden found that all children exclu-

sively used the indefinite article; this is consistent with Stages 2–4 of the Four-stage Hypothesis, as well as with adult use of articles for naming.

In Warden's third experiment, children told a story elicited by a series of cartoon drawings which contained four specific referents, of which at least two appeared twice. In telling the story, the correct use of articles would have involved using *a* the first time a referent was mentioned (+S–P), and *the* for any subsequent reference (+S+P). It was found that all ten adults (as expected) used indefinite and definite articles exclusively for first and second mentions, respectively; but the children often inappropriately used *the* for the first mention of a referent (+S–P). The frequency of the error decreased with age, from 54% for the three-year-olds to 18% for the nine-year-olds. Of course, this is the error predicted in Stage 2, and it is also consistent with Stages 1 and 3. Also, since the Four-stage Hypothesis predicts the possible use of *a* for +S+P referents only at Stage 1, it is noteworthy that this error was made only by the two youngest groups of children.

These findings contrast with those of Maratsos 1976 (who, it will be recalled, found that children by four years of age were able to use the appropriate article consistently to mark presupposedness), since Warden's subjects continued to use the definite article inappropriately for +S–P referents through age nine. Warden offers an explanation for this discrepancy, stating that Maratsos' tasks were limited to providing single-phrase answers to WH-questions. Thus, 'by asking his subjects for a name in response to a question, Maratsos may have biased their responses in favor of the nominative indefinite article' (p. 111). In any case, Warden's results appear more consistent with the Four-stage Hypothesis in this respect, since consistently correct use of the indefinite article for +S–P referents should appear only at Stage 4, and thus should be demonstrated only by older children.

3.5. KARMILOFF-SMITH 1979 conducted a series of 16 experiments designed to investigate the ability of French-speaking children, from three to eleven years of age, to use and comprehend determiners. While she did not manipulate specificity in any of her experiments (and thus they provide little information of direct relevance to the SNS Hypothesis), a considerable amount of data obtained from her Experiments 1, 2, 4, 5, 6, and 12 have implications for aspects of the Four-stage Hypothesis. However, before we review these six experiments, it should be noted that, while there are some differences between English and French in the use of determiners (in particular, the obligatory use of French definite articles for generic nouns as in *J'aime le vin* 'I love wine'), the correct or expected adult use of the French definite *le/la* and indefinite *un/une* in these experiments appears to mirror the corresponding adult English usage almost exactly with respect to specificity and presupposedness.

3.51. In her first experiment (pp. 65–72), K-S had 47 children, between the ages of 3;0 and 9;11, ask for three types of objects: (a) a unique object (singleton); (b) an object from a set of similar objects differing from each other only in color; and (c) an object from a set of identical objects. Her results (pp. 68–9) appear to be, for the most part, explainable by the Four-stage Hypothesis.

First, as predicted in Stage 2, the seven youngest children (3;0 to 3;11) did not discriminate across the three conditions; they used either a definite article, a definite article plus a modifier, or a demonstrative on 47 of 51 trials (96%)—with only two uses (4%) of the indefinite article. The performance of the four-year-olds, however, was not entirely consistent with the Four-stage Hypothesis. These children, like the three-year-olds, persisted in favoring the definite articles for all three conditions; however, they used noticeably more indefinite articles, though only in the two plural (and $-P$) conditions: 19% for plural/similar, and 14% for plural/identical. This seems to show at least the beginning of sensitivity to presupposedness—which, according to the Four-stage Hypothesis, should not appear until the transition from Stage 3 to Stage 4.

The results obtained from the four groups aged 5;0 to 8;11 show an intriguing pattern that is not discussed by K-S. Beginning with the five-year-olds, some incorrect use of the indefinite article occurred in referring to singleton objects; but this error was never made by any child either in the two groups of younger children or in the oldest group, the nine-year-olds. Although this incorrect use of the indefinite article for $+S+P$ referents never became very frequent (8%, 8%, 19%, and 12% for the five-, six-, seven- and eight-year olds, respectively), its appearance at these intermediate ages, and its TOTAL absence among children of the two youngest groups and the oldest group, suggests the hypothesized article use of Stage 3—resulting from knowledge that the indefinite article can be used for $+S$ referents, but lack of knowledge that this can be done only when the referent is $-P$. Also of interest is the finding that, among all groups from 5;0 to 9;11, the seven-year-olds have not only the highest frequency (19%) of this inappropriate use of the indefinite article for singleton ($+S+P$) referents, but also the LOWEST frequency (also 19%) of correct use of the indefinite article for the identical ($+S-P$) referents. In addition—and in contrast with Maratsos' study—the only group here to show results highly consistent with Stage 4 (i.e. appropriate adult article use) was the oldest group of nine-year-olds. Thus this single experiment provides the results as predicted in Stages 2–4 of the Four-stage Hypothesis for children three to four, five to eight, and nine years old, respectively.

3.52. The purpose of K-S's second experiment was essentially the same as the first; but in this task the experimenter did not touch the objects, and some of the trials were preceded by a preliminary naming task in which the child was asked to name an object in a bag, in answer to the question *What's in the bag?* It is interesting to note that, as predicted by the SNS Hypothesis, the definite article was practically never used at any age in the naming task (0% for all age groups, except for 1% and 3% for the four- and nine-year olds, respectively; see K-S's Table 3, p. 75). Also, as is consistent both with the SNS Hypothesis and with Stage 1 of the Four-stage Hypothesis, the youngest three groups—ranging from 3;4 to 5;11—did use zero articles for up to 20% of their responses in the naming task; but the zero article was almost entirely absent (a group maximum of 2%) from the older children, aged 6;0 to 11;7.

The results of the principal task of this experiment (which, like the first, elicited reference to singleton, similar, and identical objects) were quite similar

to those of the first experiment—except that the four-year-olds did discriminate in article use across the three conditions, whereas they had not done so in Experiment 1 (see K-S's Table 4, p. 76). Nevertheless, the three-year-olds showed no such discrimination in their persistent use of the definite article: it was the most common response for all conditions, as predicted by Stage 2. We again find a peak, albeit a relatively small one, in the total use of indefinite articles for singletons by the seven- and eight-year-old children (36% and 38%, respectively, compared to 22% and 6% for the six- and nine-year olds, respectively) with a corresponding low in their total use of definite articles for singletons (49% for both groups, compared to 70% and 77% for the six- and nine-year olds, respectively), as predicted in Stage 3.

3.53. In K-S's fourth experiment (114–22), she performed actions with small objects, and then asked the child *What did I do?*, taking note of the modifier which the child used in referring to the object. The four experimental conditions varied as to (a) whether the object was named prior to the action, and (b) whether the child saw the object prior to the action. From the viewpoint of the SNS and Four-stage Hypotheses, what is of most importance is that the action was always performed with single specific objects; each object was taken from a bag which the child could see, though the contents were not visible. Given that actions were performed with only one object at a time—and that the definite article would constitute the expected adult usage in two conditions, and would also be appropriate for the two other conditions—it is surprising that the youngest children (from 3;4) used a large number of indefinite articles (see K-S's Table 15, pp. 118–19). This finding is consistent with the hypothesized Stage 1, which predicts the use of either the definite or indefinite article for +S referents; but it is inconsistent with the performance of the youngest children in the previous experiments, who tended to use the definite article for all +S referents. At least two possible explanations exist for these findings. First, since the particular objects selected on each trial were not controlled, those chosen for the youngest children may have been ones which normally appear in groups, and for which indefinite articles are most often used. K-S noted that over-all, objects which usually appear in groups—such as a match, a marble, a sheep, or a flower—tended to be given the indefinite article; but objects most likely to be seen as singletons—a watch, a ball, or a church—tended to be given definite articles (121). Thus the youngest children may have been presented with more of the former objects than the latter. Second, and perhaps of more importance, K-S notes that the youngest children appeared to interpret the task as a naming game. As was seen in Experiment 2, even quite young children appear to use the indefinite article consistently when naming +S objects. This experiment also provides additional data consistent with the hypothesized Stage 3, in that the seven-year-olds consistently used a higher percentage of indefinite articles for +S+P referents, across all four experimental conditions, than did the six-year-olds and the eight-year-olds.

3.54. The results of Experiment 5 provide further support for the Four-stage Hypothesis. Although this experiment was conducted for quite another purpose (to investigate the child's use of anaphoric reference), it was found that, as

predicted in Stage 2, the definite article was almost always used by all groups to refer to the singleton +S+P objects included in the experiment (82% to 100%), while the indefinite article was seldom used (0% to 14%) for these objects (see K-S's Tables 16–17, pp. 128–9). However, it is noteworthy that the two age groups which used the indefinite article most often for the singleton objects were the youngest children (aged four, 14%)—and, once again, the seven-year-olds (12%). The use of *a* for +S+P referents by the youngest children is consistent with the hypothesized Stage 1, while the re-appearance of the use of the indefinite article for +S+P referents by some children at age seven is predicted in Stage 3.

The results of this fifth experiment with respect to children's use of definite articles for anaphora also have some bearing on Bickerton's argument (1981:148) that the use of definite and indefinite articles to signal SNS cannot be easily learned from language input, since the only way which English (and presumably French) unambiguously indicates the distinction is by the use of constructions with at least two articles. If a referent is +S, it will be used with *a* on the first mention, and *the* on subsequent mentions; but a –S referent will continue to be used with *a*. The results of K-S's experiment indicate that, when children under seven years of age produce the *a–the* sequence, it does not result from any knowledge of this rule of anaphora, but rather from their use of *a* for naming, and *the* for deixis, as in *That's a doll; the doll is pretty* (139–41). To be sure, a demonstration that young children do not produce the *a–the* sequence anaphorically does not necessarily mean that they do not comprehend the meaning of the sequence; but finding that young children do produce it anaphorically would be inconsistent with Bickerton's claims that young children can not take advantage of anaphoric article sequences to learn the relationship between articles and specificity and that early sensitivity to specificity must thus be innate.

3.55. K-S's sixth experiment essentially replicated the story completion task of Maratsos 1976, but used children of a broader range of ages. Children from 3;3 to 11;1 were told 'a series of stories involving either one X and one Y, or several X's and several Y's. At the end of the story, the child had to answer a question concerning either X or Y' (141). Children were expected to use the definite article to complete the single-X/Y story (involving +S+P referents), but the indefinite article to complete the several-X/Y story (+S–P referents). K-S's results (144) are different from those of Maratsos (1976:63), in that her three- and four-year-olds were somewhat less successful over-all in producing the correct article; however, her findings are quite consistent with the predictions of the Four-stage Hypothesis. First, as is consistent with both the SNS and the Four-stage Hypotheses, the definite article was used for the +S+P referents by the five- through eleven-year-olds with high accuracy, ranging from 83% to 100% (Table 27, p. 144). Second, the higher use of indefinite articles plus 'other' responses (presumably including zero articles) for the three- and four-year olds (60% and 37%, respectively, compared to a maximum of 17% for any of the older groups) is consistent with Stage 1. Third, a number of Stage 3 errors were again found among the eight- and nine-year olds, who occasionally

(9% and 10%, respectively) used the indefinite article for +S+P referents; such use was totally absent from both the eight-year-olds and the ten- and eleven-year-olds. Fourth, the incorrect use of the definite article for +S-P referents declined very gradually from age three through nine (from 62% to 14%), and disappeared entirely at age ten. This is predicted by the Four-stage Hypothesis—in that Stage 2 predicts definite article use with +S referents; Stage 3 predicts some use of indefinite articles for +S-P (correct) as well as +S+P (incorrect) referents; and Stage 4 correctly restricts definite articles to +S+P referents.

3.56. K-S's Experiments 7–11 dealt with the gender-indicating function of determiners, and thus are outside the scope of the present survey. However, noteworthy evidence is provided for the Four-stage Hypothesis by her Experiment 12, which involved a comprehension task with single sentences and concrete extralinguistic referents. As she shows on p. 175—and as predicted in Stages 1, 2 and 4—all children were very successful in understanding the definite article as referring to a specific, singleton object (the lowest success rate was 85% for the three-year olds). However, we again find that the children in the middle of the age range (in this case, the eight-year-olds) did make a few errors (6%); but both the younger (six- and seven-year-old) and the older (nine- and ten-year-old) children made absolutely none in a task testing the comprehension of the indefinite article as a marker of non-specificity (see the last two columns of Table 35, p. 175). K-S offers the explanation that this results from these children's awareness of the numerical function of the indefinite French article *un(e)* 'one'; the results are once again consistent with the hypothesized Stage 3.

In summary, K-S's extensive series of experiments designed to examine the acquisition of French definite and indefinite articles, using a wide range of children's ages, provides impressive support for the Four-stage Hypothesis: all frequent errors in article use were consistent with the four stages. The only results which are not clearly consistent with these stages are those provided by Experiment 1, which suggested a too-early beginning of sensitivity to the presupposedness distinction among four-year-olds. As has already been mentioned in discussing Maratsos' study, this finding may indicate a modification of the hypothesis to allow for a gradual development of sensitivity to presupposedness, throughout all four stages, instead of being restricted to the transition from Stage 3 to 4. Particularly impressive among K-S's findings is the consistently similar pattern of errors found in Experiments 1, 2, 4, 5, 6, and 12—which, though she does not discuss it, provides a U-shaped pattern of article use and comprehension over age, as predicted in Stage 3. Although K-S offers few data of direct relevance to the SNS Hypothesis, the naming task in her Experiment 2 does provide some data which are consistent with the hypothesis.

3.6. EMSLIE & STEVENSON 1981 conducted three experiments, very similar to Warden's third experiment: 30 English-speaking children aged two to four years, as well as a group of adults, were told stories elicited by a series of pictures. All referents were +S; and presupposedness varied according to

whether the subject was making a first mention ($-P$) or a second mention ($+P$) of the referent. Since all referents were $+S$, E&S's results have no direct implications for the SNS Hypothesis. Nonetheless, their findings have important implications for aspects of the Four-stage Hypothesis.

The most consistent and surprising finding across all three experiments—and this contrasts markedly with the findings of Maratsos, Warden, and Karmiloff-Smith reviewed above—was that children as young as three years old (and even some two-year-olds) correctly used the indefinite article quite frequently for the $+S - P$ referents on first mention (e.g. 84%, 68%, and 78% by the three-year-olds in Experiments I, II, and III, respectively). All groups did show some incorrect use of *the* for the first-mentioned $+S - P$ referents, as predicted in Stage 2; but the highest rate for this error type was a quite low 14% for the four-year-olds in Experiment III. This is much lower than what the SNS Hypothesis would appear to predict, and much lower than the rates found for this error in all the studies reviewed above. However, more in keeping with the predictions made by the Four-stage Hypothesis was the finding that, as predicted in Stage 1, only the two-year-olds made any appreciable use of *a* for first-mentioned $+S + P$ referents—17% and 20% in Experiments I and II, respectively. This contrasts with 4% as the highest rate for this error type in any of the other groups of children (the three-year-olds in Experiment I).

It remains puzzling why E&S found results so different from those of the other researchers. This inconsistency is particularly bothersome in light of the fact that Stage 2 errors appear to be the most consistently found type in all other studies of article acquisition, and since it is an error essential to the validity of the Four-stage Hypothesis. E&S discuss a number of possible reasons for this discrepancy, among them the fact that, in their tasks, the children were required to talk to each other—rather than to the experimenter, as was apparently done in Warden's and Karmiloff-Smith's experiments (325–7). E&S speculate that, when tasks involved talking to the experimenter, the children may have assumed that the listener as experimenter was already familiar with the referents; this could lead the children to use egocentrically motivated definite articles for referents that were experimentally designed to be $-P$. Thus, if E&S did succeed in obtaining a 'purer' measure of young children's knowledge of article use with respect to presupposedness, then the Four-stage Hypothesis would seem to be incorrect in specifying that the relationship between presupposedness and article usage is not acquired before the last stage. However, E&S's finding that children as young as two years of age can consider the listener's point of view with respect to presupposedness is quite remarkable, and clearly needs replication. In any event, it should be kept in mind that nothing in E&S's findings disconfirms (or confirms, for that matter) the SNS Hypothesis.

3.7. GARTON 1983 had three-year-old children answer questions concerning specific concrete referents (toy animals), under two conditions: (a) a seeing condition, in which the experimenter could see the toy; and (b) a blindfolded condition, in which she could not. Each set of animals consisted of a singleton, two similar ones (e.g. one black and one brown cow), and two identical ones.

The blindfolded condition was apparently used to make all objects –P; however, it is not stated whether the experimenter knew, before the blindfold was put in place—or, more important, whether the child perceived that the experimenter knew—which particular animals made up the set to be used in the task. Thus it is not clear whether the singleton animals should actually be considered +P in the blindfolded condition.

The most striking finding of Garton's study was that article omission (zero articles) was quite frequent for all object types, at 48% and 22% for the seeing and blindfolded conditions respectively. Since all referents were +S, this error may at first appear inconsistent with all stages of the Four-stage Hypothesis. However, if the children viewed the experiment as a naming task (as Garton states, 522), then the use of zero article is consistent with Stage 1—which predicts the zero article both for –S referents and for naming. Support for this interpretation of the task comes from two additional findings. First, it would not be expected that the same object should be named twice by a child in the same task; accordingly, zero article was almost never used (2%) for the second mention of an object in the blindfolded condition. (No information is provided by Garton for second mentions in the seeing condition; see her Table III, p. 521.) Second, the children did not differentiate in article use among the singleton, similar, and identical objects (p. 518). Although this finding contrasts with those of similar experiments by Karmiloff-Smith, it is consistent with the naming interpretation: we would expect the same article to be used in naming objects, regardless of specificity or presupposedness. Thus, if Garton's experiment is interpreted as a naming task, the results are consistent both with the SNS Hypothesis and with Stage 1.

4. CONCLUSIONS. The primary purpose of this paper was to review studies of the acquisition of articles, to evaluate the SNS Hypothesis. In fact, it was found that most studies of article acquisition did not directly investigate SNS; rather, they focused on children's sensitivity to presupposedness. Nonetheless, strong evidence for the core SNS Hypothesis is provided by Brown, whose subjects were never observed to use *the* for –S referents, and yet used *the* with high accuracy for +S+P referents; and by Maratsos' (1976) 'games' experiment, in which all three- and four-year-old children were very accurate in the use both of *a* for –S and of *the* for +S referents. Also consistent with the SNS Hypothesis are other results: Karmiloff-Smith's second experiment found that three-, four-, and five-year-old children used zero article for naming, while zero article was practically never used by the older children aged six though eleven; while Garton found that zero article was frequently used by three-year-old children in what, it seems, was perceived by them as a naming task. In addition, no studies indicated that children failed to attend to SNS, either in production or comprehension. Rather, virtually all article errors could be understood as involving the failure to take account of presupposedness, and of its interaction with specificity.

With respect to the proposed Four-stage Hypothesis of article acquisition, the studies reviewed here collectively offer quite impressive support. All consistent patterns of article errors found in these studies were predictable by one

of the first three stages of this hypothesis—with the sole exception of the error found by Garton, in which children frequently used zero article to refer to +S referents. Even this finding, however, is consistent with both the core hypothesis and the Four-stage Hypothesis if, as Garton herself suspects, the task was perceived by the children as one of naming. The finding that all other observed error patterns were consistent with the Four-stage Hypothesis provides strong empirical support. Particularly striking in this respect is the finding of Bresson, and the similar repeated findings of Karmiloff-Smith's Experiments 1, 2, 4, 5, 6, and 12, of an increase at middle childhood of the incorrect use of *a* for +S+P referents, as predicted in Stage 3 of the hypothesis.

However, four of the experiments reviewed did not produce the pattern of errors predicted by Stage 2. Karmiloff-Smith's fourth experiment—as well as those of Emslie & Stevenson and of Garton, and Maratsos' story comprehension and 'games' experiments—showed that children as young as two to four years of age correctly used the indefinite article for +S–P referents—whereas Stage 2 predicts the use of the definite article for all +S referents, presupposed or not. This turns out to be the major inconsistency across all the studies reviewed, since the most common error of article use in all others was the 'egocentric' use of the definite article for –P referents. An explanation that would be consistent with the Four-stage Hypothesis is that the experiments which did not find this 'egocentric' article error simply did not include children at Stage 2—since all other stages, including Stage 1, do account for the use of the indefinite article for +S–P referents. Alternatively, if it is the case that such young children can be sensitive to presupposedness in their article use, then a revision of the Four-stage Hypothesis is called for, to include the beginning of this sensitivity before the end of Stage 3.

This survey, and the Four-stage Hypothesis of article acquisition which it supports, also have implications for the interpretation of the often reported error of using the definite article for +S–P referents. This error has been interpreted as egocentric behavior by several researchers, including Brown (355), Maratsos (1976:96), and Warden (111); however, such an interpretation may be misleading, since it assumes that children somehow know that the choice between the definite and indefinite article for specific NP's depends upon what they can expect their listener to know. In other words, the egocentricity argument may be taken to imply that children's over-use of the definite article results from their inability to take the listener's viewpoint into account; but instead, as the Four-stage Hypothesis would explain, children may be simply using the definite article for +S referents and the indefinite article for –S referents, without the slightest suspicion (until they are older) that the listener's perspective has anything to do with the choice of articles. Thus the Four-stage Hypothesis may more parsimoniously explain children's over-use of the definite article for +S–P referents, at least during the early stages of language acquisition.

This survey has found empirical support for the universality of SNS in early language acquisition—as well as for a four-stage hypothesis of the acquisition of English and French articles, springing from the interaction of SNS with the

child's developing sensitivity to presupposedness. However, more child language research is clearly needed to evaluate this and other aspects of the LBH. As is clear from this survey, relatively few studies have focused on the acquisition of SNS; instead, presupposedness has been the major variable of interest. Additional studies focusing on the acquisition of SNS, using both naturalistic and experimental methodologies, are clearly needed. But such studies should be carefully designed to avoid the shortcomings of a number of those reviewed here. Researchers undertaking naturalistic studies should be careful to include all instances of zero article use, and to provide sufficient contextual information so that the specificity of the child's referents can be determined. Experimental researchers need to be particularly concerned about the child's perceptions both of the purpose of the task, and of the role and knowledge of the person with whom the child is communicating. As the contrast between Warden's findings and those of Emslie & Stevenson suggest, children may well assume that, in spite of the designs of the researcher, no unique experimental object should be considered –P when communicating with the experimenter, since the experimenter is assumed to be familiar with the object. It also appears that the artificiality of an otherwise quite cleverly designed experimental task may lead to the perception of the task as a simple (and perhaps quite meaningless) one of naming, in spite of the best intentions of the researcher.

It would also be of particular interest to study the acquisition of languages like Japanese, which do not make the SNS distinction. If it were found that children tend to mark SNS in the early stages of acquisition of these languages, although the distinction is NOT usually made in the language they hear, this would be particularly impressive evidence for the SNS Hypothesis. Similarly, other aspects of the LBH (e.g. the punctual/non-punctual, stative/non-stative, and causative/non-causative distinctions of verbs) need to be evaluated in the light of language acquisition data, in order to better our understanding of these potentially universal characteristics of language acquisition.

There is no doubt a great deal more to child language acquisition than that which is potentially explainable by the LBH. Nonetheless, this hypothesis has been found to be of considerable value in interpreting the findings of the studies of child article acquisition reviewed here; and it promises to be useful as well in discovering other universal features of child language acquisition.

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