

## Pragmatic keywords and the first combining verbs in children's speech\*

ANAT NINIO, *The Hebrew University, Jerusalem*

### ABSTRACT

The first two transitive verbs and the first two intransitive verbs which begin word-combinations in the speech of children acquiring Hebrew were examined for their use as expressions of communicative intents in an independent speech sample of mothers and of children. It was found that the first-combining verbs tend to be used as constants or keywords of communicative intents. Syntagmatic relations apparently emerge from pragmatic relations between two single-word expressions of communicative intents, one a constant and the other its detailed elaboration. The results suggest that developmentally, syntax emerges from pragmatics, through a transitional period using highly frequent,

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partly grammaticalized markers of communicative intents, which are also highly transparent markers of syntactic valency. Grammar is interconnected with pragmatics.

## INTRODUCTION

Much work in language acquisition is based on the presupposition that there exist two parallel processes of development: language development proper, consisting of the acquisition of a vocabulary and of a grammar, and communicative or pragmatic development, namely, learning how to use one's linguistic repertoire in order to communicate with others. This conception rests on a separation established by Saussure (1922) between what he saw as two separate entities, *la langue* and *la parole*. *La langue*, language proper, he saw as a system of symbols and of rules for their meaningful combination. This system is autonomous and independent of its possible uses or users; both the symbols (words) and the grammatical rules can be defined a priori, on a context-free, abstract level. The other entity, *la parole*, speech, he saw as one of the uses the linguistic system can be put to.

With minor modifications, the very same distinctions underlie present-day mainstream linguistics, with its emphasis on the autonomy or 'modularity' of the various components of the linguistic system. The most extreme version of this conception is Chomsky's thesis regarding the existence of a 'dedicated language faculty' including the fundamental skeleton of universal syntax, which is thought to be innate; pragmatics is of course seen by him as mere language use, and it is 'extralinguistic', namely, not part of the innate faculty. Much of the study of language acquisition is based on these premisses, and in particular the school of thought that sees syntactic development as based on the maturation of innate universal principles. In the following, I shall argue that the separation of pragmatic and syntactic development is untenable. On the contrary, syntax is necessarily built upon principles of pragmatic communicative behaviour. This approach is usually called Integrative Functionalism (Croft 1995).

The conventional modular view of language as consisting of a priori and context-independent lexicon and grammar, subsequently used for communication purposes, is not universally held by all authorities. In what may be called – with some overgeneralization 'the radical functionalist view' – people have long been arguing for the ontological precedence of communication over the ostensibly frozen abstract linguistic system.

In the first place, it has been claimed that the very form and meaning

of linguistic signs are derived from communication. There exists an influential tradition in philosophy, the so-called use-conditional theory of meaning (e.g., Strawson 1970, Wittgenstein 1953), according to which word-meaning is nothing else but the communicative uses to which words may be put. This position has considerable following among philosophers, linguists and psychologists (e.g., Allwood 1981, Alston 1964, Fillmore 1971, Gibbs 1984, Grice 1957). On this assumption, it is incorrect to talk about an *a priori*, abstract lexical meaning to words; meaning is always an *ad hoc* achievement in particular contexts.

Moreover, the same *ad hoc* communicative character has also been claimed for what is otherwise seen as a *a priori* and formally frozen rules of grammar. Quite a few formal grammars built on pragmatic principles have been suggested by linguists (e.g., Halliday 1985, Van Valin 1993). In this view, all formal aspects of language – including grammar – are no more than tools for the production of intelligible speech acts. A contemporary spokesman for the same radical position is Hopper (1998) who maybe goes one step further and claims that all fixed grammatical rules are an illusion or, at most, temporary and partial:

In the emergence view, there is no natural fixed structure to language. Rather, speakers borrow heavily from their previous experiences of communication in similar circumstances, on similar topics, and with similar interlocutors. Systematicity, in this view, is an illusion produced by the partial settling or *sedimentation* of frequently used forms into temporary subsystems. [...] Grammar is a set of sedimented conventions that have been routinized out of the more frequently occurring ways of saying things. (Hopper 1998: 157–8, Hopper's emphasis)

The radical functional view implies that the relation between pragmatic and lexico-grammatical development is intrinsic, and that the two are identical. Even on this assumption, however, it is still legitimate to concentrate on children's mastery of the so-called 'sedimented' or 'fossilized' parts of the system. Without any doubt, there are in the linguistic system certain *a priori* fixed guidelines to the formation of meaningful utterances that are conventionally termed rules, and our task, among other things, is to explain how children learn these guidelines. Never forgetting that the lexicon and grammar could well be dynamic systems in which the *a priori*s are constantly modified in each utterance, it still makes sense to find out how it comes about that, in such an *ad hoc* system, children still demonstrate a great deal of structural constancy.

To summarize, the present study adopts a cautious radical functionalist

attitude: it is seen as possible (but rather difficult to test) that communication is *ontologically* prior to formal linguistic entities such as meaning and grammar; however, it seems very likely and also empirically testable that pragmatic knowledge is *developmentally* prior to formal knowledge, and forms the necessary basis for the establishment of the latter.

This possibility applies both to the development of the lexicon and to the development of syntax. As to the development of children's basic vocabulary, it has been already demonstrated that there is a very clear relation between the development of the lexicon and communication or pragmatics. Some of the work on this topic will be reviewed in the following section. In the present paper, I hope to show an equally clear relation between the development of syntax and communication or pragmatics.

It has been repeatedly pointed out that a child's initial language mainly consists of 'pure performatives' that do not describe object and events but constitute performances of pragmatic or illocutionary acts. Much or most of first words are a kind of 'analogue' language, in which a particular communicative or interactive meaning is mapped to its special key-word. If these are communicative meanings, like agreement, refusal, or requests, we get the use of single-word conventionalized forms such as 'yes', 'no', 'more' and so on. This heavily 'pragmatic' component of early speech consists of a set of general, unmarked forms for the expression of discrete communicative functions or meanings; most early words verbalize the general illocutionary element of a communicative intent rather than the specific domain to which it applies (Barrett 1981, Bloom 1973, Clark 1978, Greenfield & Smith 1976, Griffiths 1985, Halliday 1975, Ninio 1992, Weisenberger 1976). If these are social meanings rather than strictly speaking communicative ones, we get game vocalizations like 'peek-a-boo', or greetings like 'hi' and 'bye', markings of object transfer like 'thanks' and so on. This social-meaning component of early speech is heavily embedded in games, social routines, action schemas, events, scenarios, situations and other interactive formats (Barrett 1986, Bates 1979, Bruner 1975, Camaioni & Laicardi 1985, Greenfield & Smith 1976, Nelson 1985). With very few exceptions, neither the pragmatic nor the social meanings components of the initial vocabulary resemble the typical 'digital' vocabulary of later speech in which the majority of the vocabulary are context-independent, freely employable open-class tokens such as common nouns, verbs and other content words.

In an earlier paper (Ninio 1993) I offered an explanation for the nature of early vocabularies in terms of the structural requirements of the

learning task, rather than in terms of cognitive or other limitations in the children. I pointed out that the common feature of all early speech uses is that they rely on individually defined, mutually unrelated 'language games' that may be learned separately and do not depend on each other in any way. Each of these rudimentary 'language games' provides for the meaningfulness of a single linguistic form. Children's initial set of linguistic signs do not relate to each other by either syntagmatic or paradigmatic relations, being embedded in separate interpretative frameworks.

The claim is that this is an unavoidable feature of the learning task. Ever since Saussure (1922) and Wittgenstein (1953), it has been generally acknowledged that the central characteristic of language is that it is a *system* in which the meaning or value of linguistic signs is to be defined on the basis of their paradigmatic contrast with other units and their potential to enter into syntagmatic relations with other elements. It is immediately obvious that it is logically impossible for children at the onset of language acquisition to acquire linguistic signs of such system-bound nature. A child cannot be expected to acquire signs whose meaning or value is defined by their relation to other signs which the child has not learned yet. There are no relations *in vacuo*; it is impossible to learn connections between elements before the elements themselves are mastered.

It follows that, at the very onset of speech, young children just beginning to learn their first words cannot learn linguistic signs which are integrated into the linguistic system by a complex network of interrelationships with other signs, such as nouns, verbs, adjectives or other open-class items of vocabulary. Rather, children are limited to learning discrete or independent linguistic signs whose meaning is not determined by either paradigmatic or syntagmatic relational properties, but which are sustained by their own individual and discrete 'language games', such as interjections, vocatives, moves in rituals and in games, as well as unmarked general forms for the expression of specific communicative intents.

While the structural requirements of the learning task explain well why the earliest linguistic signs cannot be like the majority of the adult vocabulary, namely, system-dependent entities defined by their interrelation with other entities, the systemic explanation cannot by itself explain the pragmatic nature of the first words. This, however, can be accounted for by a general principle of development that postulates the behaviour of transitional phenomena. Let us call this the Janus principle, after the Roman god with two faces.

The Janus principle claims that all transitional objects of learning, by

necessity, must have two faces that face in opposite directions: towards the old system within which they were learned, and towards the new system which they therefore establish. In plain words, all new learning (items, rules) must make sense in terms of the system existing *before* the novelty has been established.

The major reason for this phenomenon is of course to do with learning: the learners must understand the new items as they are presented in the input to the learning process, before actually internalizing or learning them. That, of course, cannot yet be in terms of the novel concept itself. Learning is not done by leaps and bounds but by novelty sneaking up on the learners and presenting them with a *fait accompli*. They learn new kinds of objects as if they were old kinds of objects, but once they have learned them the system changes: the new knowledge already re-defines the system as one containing it, so all further 'new learning' of the same sort already has the novelty as its established context.

With respect to the entry into the linguistic system, this means that the first words children learn and understand, being transitional phenomena, by necessity must be interpreted by them using their existing interpretative apparatus which is their prelinguistic conceptual system. Speech is a kind of social action; the interpretative schemas applying to it at its onset are the ones children had been applying in the preverbal period to all meaningful social moves performed by people.

This view is in effect a version of the so-called 'continuity hypothesis' according to which children's early language is continuous with their preverbal communicative system: children acquire their first set of words by substituting conventional, verbal forms for the non-verbal expressions of their communicative intents (Bates, Camaioni & Volterra 1975, Bruner 1975, Carpenter, Mastergeorge & Coggins 1983, Nelson 1985).

On the continuity hypothesis, first verbalizations are equivalent to two kinds of meaningful preverbal acts: nonverbal communicative acts and nonverbal interactive acts. The heavily pragmatic component is equivalent to nonverbal-*communication* acts such as gestures, crying, vocalizations. The social-meanings-part is equivalent to nonverbal *interactive* acts like participation in shared activities.

The system starts with 'pure performative' transitional objects but it changes as it develops. In a process not yet completely understood, when there is a 'critical mass' of about 9-13 different verbally expressed communicative intents, the system undergoes rapid reorganization (Ninio 1994a). If at the beginning most of children's utterances were produced by mapping rules that expressed communicative intents by

mapping them directly and holistically to a fixed expression, the new system signals the shift to a more analytic style in which selected elements of the communicative message are expressed by specific terms. In the usual linguistic terminology, children learn to use reference, and it is employed by them to encode specific detailed options of communicative intents. In addition, they also begin to learn multiple mapping rules for the expression of the same intents in single-word utterances, which can be two or more different fixed expressions, or, more interestingly, one constant and one variable mapping rule. For example, object requests may be expressed at first by some constant expression like 'gimme', whereas after the analytic change they can also be expressed by verbalizing the specific object demanded ('bottle', 'ball'). The change in the nature of mapping rules brings in a great volume of open-class items such as common nouns, verbs and adjectives, so that the composition of children's vocabularies starts to resemble that of adults. The transitional phase of vocabulary acquisition is over.

At the end of the single-word period, single-word speech is still pragmatic in nature: all single-word utterances are generated by mapping rules which express communicative intents by a systematically selected single word. It can be said that some of these expressions are in paradigmatic relations, as alternatives for the single slot of the single-word utterance mapping identical communicative intents. These paradigmatic or associative relations are of course only rudimentary, but still they make possible the acquisition of open-class vocabulary elements. We may say that the whole of the single-word period is devoted to the acquisition of paradigmatic relations, from the transitional objects of its first 'keyword' period until the emergence of variable mapping and the establishment of reference.

The next developmental task is the acquisition of syntagmatic relations. By definition, all items of vocabulary acquired at the single-word stage lack syntagmatic features, as they are able and even required to operate without another word in the same sentence. In terms of the magnitude of the developmental task, the acquisition of syntagmatic relations and the learning of vocabulary items that possess the logical nature of predicates, in the context of single-word speech, is as difficult a step as the entry into language from a prelinguistic stage. As previously, the new learning requires a transitional solution: the very first combining predicates, and their relations with their syntactic arguments, must make sense in the terms of the child's existing linguistic system.

It is at present not well understood in what terms children formulate their first combinatory rules. Most authorities, including those who believe in innate grammatical knowledge, do not think that adult formal

categories like Verb or Transitive Verb operate in the period of the production of the very first word combinations with words that in adults would belong to the relevant categories. In the literature many transitional solutions have been offered, the best received being that children's initial combinatory rules are phrased in terms of semantic, not syntactic, categories. For instance, the first transitive verb – direct object (VO) combinations – were said to be generated on the basis of an expression rule that combines and orders in one utterance the word for an action with a word for the object it affects (see, for instance, Bloom, Lightbown & Hood 1975, Bowerman 1973, Braine 1976, Brown 1973, Maratsos 1982, Pinker 1984, Schlesinger 1974). However, the empirical evidence for the existence of such semantic categories in children's early linguistic systems is scanty. For example, it has been found that the first 10–20 transitive verbs in VO combinations do not tend to be active verbs with an affected object more frequently than non-active verbs (Bowerman 1990, Lieven, Pine & Baldwin 1997, Maratsos 1988).

The present approach suggests that the transitional rule system by necessity must be pragmatic in its nature. As we claim that, prior to the emergence of syntax, all single-word speech is pragmatic in nature, it means that the first word combinations also need to make sense in terms of the single-word pragmatic system. Therefore, it is claimed that the initial set of two-word expressions is created by combining and ordering two different *single-word* mappings of communicative intent in the same utterance. Some of the time these will be two constant keywords of the same intent, like 'yes', 'OK' as a positive answer, but mostly one of the mappings will be a constant and the other will be the expression of a variable element of the intent. For instance, such mapping generates combinations like 'again + X', for requesting the repetition of an action; 'again' is a constant for that intent, X is what is to be repeated in this particular instance. The ordering is given by the input; however, what is ordered here are two mappings and not the two words.

It is hypothesized here that the best candidates for entry into syntax are constants of communicative intents that combine in a single utterance with variables of the same intents. The first syntactic word-combinations are therefore predicted to consist of the equivalents of two single-word expressions of the same communicative intent, one constant and one variable.

This hypothesis has been tested for one child's very first word combinations (Ninio 1994*b*). The language corpus used in that study is of Travis, a child acquiring English. Travis is the child whose



TABLE 1. *The 10 earliest combining predicates in Travis's speech and their use as keywords of communicative intents*

Word combinations		Age at single-word use	Communicative intent
age	first sentence		
15.20	WHEREDA bottle	—	request for object
16.25	block GET-IT	16.24	request for object
16.26	BYE baby	16.25	greeting good-bye
17.01	HI fan	17.26	greeting on meeting
17.07	Mama HOLD	17.00	[not keyword]
17.07	AGAIN ... book	17.01	request to repeat activity
17.07	ball ... GONE	17.06	[not keyword]
17.09	MORE corn	16.14	request for more
17.10	steps ... NO	16.17	rejection/refusal
17.14	Maria GO	17.04	[not keyword]

development is reported in Tomasello (1992); the sources for the analysis were Table 8.2 and the Appendix of that book. Inspection of the contextual notes revealed that the first set of predicate words in one-word speech were constants of communicative intents, and that the first two-word combinations involved this very same set. Table 1 presents the first set of combining predicates in Travis's speech. The first 10 combining predicates include 7 predicates which are keywords of communicative intents, and, in particular, the first 4 word combinations are all produced with such keywords. Similar results were obtained in other studies. For example, the pivot type combinations reported by Braine (1963) were of this type when the constants of communicative intents were the pivots, such as 'hi', 'bye', 'more' and so on, and so were the first word combinations of Ruti, a child acquiring Hebrew (see Ninio 1999a).

Interestingly, Travis's first four combining predicates do not have single-word uses prior to their use as multiword utterances or, at the most, the single-word use is observed a day before the multiword combination is. Similar findings were reported by Braine (1963) regarding the words that served as pivots in his observations, namely that these words tend not to occur as single-word utterances. It seems that the build-up of multiword combinations from keywords of communicative intents with the addition of a specifying element does not necessarily take an existing single-word keyword as the basis for the novel, transitional multiword construction. Instead, these predicates tend to be

interpreted as communicative keywords immediately with a syntagmatic potential. This of course eliminates or considerably reduces the necessity of redefining the logical status of these words from non-combining zero-valency elements to combining predicates, with the onset of combinatorial speech.

The earliest combining predicates are, as a rule, not verbs but 'relational words' (Vihman 1999) that belong to an assortment of minor word-classes. The question is, can the suggested pragmatics-based transitional learning mechanism account equally for the acquisition of verb-based syntagmatic combinations? This is the issue addressed in the present paper. More precisely, the hypothesis is tested that the first combining verbs, both transitive and intransitive, will be constants of communicative intents which combine with variables of the same intents. The strategy adopted is to take the first combining verbs found previously in studies of the onset of syntax in longitudinally-observed children (Ninio 1999*a*, 1999*b*), and to check the status of the combining verbs as constants (or keywords) of communicative intents in an independent speech sample of both mothers and of children previously analysed for expression rules of communicative intents (Ninio & Yishai 1995). Both single-word utterances and short multiword utterances (2–4 words long) will be searched for the use of these verbs as single-word constant expressions of the relevant intents, excluding their use as part of multiword frozen expressions serving as holistic keywords. It is assumed that any single-word constant keyword used by the dyads to express a given communicative intent, whether or not actually observed as part of a multiword utterance, can potentially serve as part of one in a pivot-like multiword combination expressing the same intent.

The research strategy of the study is thus not a longitudinal one, hypothesizing that early multiword combinations with verbs arise from children's prior use of the same verbs in single-word utterances. Rather, the research strategy concentrates on the earliest multiword utterances and tests the claim that they are transitional utterances so that, instead of expressing a syntax-based syntagmatic relation between the two words comprising them, they are maybe construed by the children as combinations of constants of communicative intents with some variable material. It is hypothesized that the earliest verb-object and subject-verb combinations will tend to utilize verbs which are communicative constants and not verbs of similar semantic simplicity and availability to children which are not communicative constants. The latter will tend to combine with subjects or objects only later, after the communicative-keyword verbs had presumably paved their way.

As mentioned above, the research strategy of the study is not longitudinal, but instead it resembles so called 'corpus linguistics'. The study utilizes a very large data base of speech previously collected, both of young children and of mothers of young children. Altogether the sample consists of 96 speakers whose combined corpus consists of over 100,000 coded utterances; such a large sample is thought to be representative of the language community as a whole (of course of the relevant mother-child 'dialect') and not just the individual speakers. Thus the research strategy of this study is similar to large-corpus research in natural language processing: the large corpus is used to make generalizations about various kinds of rulefulness in language use in the community, and these are employed to illuminate various individual texts. In this case, the corpora of maternal and child utterances which have already been encoded for communicative intent and its expression-rules is used to illuminate (some other) children's choice of starting verbs at the onset of the multiword stage. The large communicative corpus is used to claim that the speech community, in general, uses these verbs as keywords to express various communicative intents, but of course no claim is made that any individual child does so.

In the present paper, detailed data from the longitudinal corpus of 21 children acquiring Hebrew as their first language will be presented. Modern Hebrew is a nominative/accusative language with a basic SVO word-order, which is however much less rigid than that of English. Verbs are crossmarked for the person, gender and number of the subject in most tenses, and for gender and number in the present tense. Hebrew is a partially subject pro-drop language, basically preferring not to express the subject by free pronouns whenever it is clearly crossmarked on the verb. In addition, it is much more acceptable to drop lexical object-phrases than in English, whenever the contextual conditions support it; so it is quite normative in colloquial speech to say '*kax!*' (take!), when handing over something to the listener. Third, the direct object noun, if definite, is preceded by the preposition '*et*' (ACC). Beyond these differences and a few others less relevant to the present topic, Hebrew is typologically fairly similar to English as far as its syntax is concerned.

## METHOD

### 1. *The first combining verbs*

The first transitive verbs in verb-object combinations and the first intransitive verbs in word-combinations were taken from published results (Ninio 1999a, 1999b). Although the samples of the two studies

overlap, they include a different number of longitudinally-observed children (15 in the transitive study, 20 in the intransitive, see below for details). Despite the inelegance of the design, it was thought that there is an advantage in staying with previously published data: readers interested in the details of the developmental patterns observed for each child can find them in the published papers, including the children's actual utterances and their fine-grained analysis, all of which is beyond the scope of the present paper.

*Sample and language recording* The studies used longitudinal home observations of children acquiring Hebrew as their first language. The sample for the first transitive verbs in verb-object combinations consisted of 15 children. One of the children, Ruti, was audiotaped by her parents twice a week between 1;6 and 2;4, for 20 minutes at a time. The recordings were immediately transcribed, and contextual information added. The other 14 children were audiotaped about once a week at home for 30 minutes, beginning at about 1;6 on the average, for 8–11 months; contextual information was added to the transcriptions. The observations were augmented by parental reports on emergent patterns. In all children the observations started before, or just as, word-combinations were first produced. Fourteen of the 15 children and another 6 children observed in similar circumstances formed the 20-strong sample for the emergence of intransitive verbs in word combinations. Table 2 presents the children's sample with information about sex, study period and number of observations.

*Data analysis* Utterances were transcribed in standard orthography. The corpora were then divided into utterances. An utterance was defined as a speech string which has sentence intonation contour and which is separated by perceptible pauses from other locutions of the same speaker. All utterances of two words or more were included in the data base. Immediate repetitions of a single word within the same speaking turn were not taken as adding to the length of the utterance.

Word-segmentation decisions of the original investigator were respected. Thus, Hebrew fused accusative-marker and nominal combinations 'et-ze' (ACC, this) are left as a single word if so transcribed by the original investigator. Utterances where a child makes a hesitation-pause between words are considered word-combinations, but not vertical constructions where two words belong to separate single-word turns at speech. Only spontaneous utterances were analysed. This excluded from analysis any utterances where a child immediately imitated a sentence produced by an adult, whether spontaneously or by request. In addition, recitations of texts of children's books or songs

TABLE 2. *Description of the longitudinal observations used in the study (N=20)*

Child	Sex	Age range during study period	No. observations
Ruti	f	1;06.00–2;04.00	125 (twice weekly)
Zohar	f	1;06.12–2;02.08	29
Shay (boy)	m	1;07.21–2;03.26	28
Paz	f	1;06.22–2;03.02	24
Or	f	1;03.21–2;02.06	38
Omer	m	1;03.03–1;10.10	23
Ayelet	f	1;01.08–1;10.20	34
Mordexai	m	1;08.08–2;03.00	20
Rotem	f	1;07.19–2;03.16	31
Yonatan	m	1;06.00–2;03.29	36
Shira	f	1;04.18–2;02.16	31
Matan	m	2;01.03–2;04.03	16
Reut	f	1;05.12–1;11.25	21
Bet	f	1;10.16–2;06.20	27
Merav	f	1;06.04–1;11.16	22
Naama	f	1;08.08–2;02.24	27
Shay (girl)	f	1;06.18–2;02.05	29
Yuval	m	2;01.01–2;07.27	30
Hana	f	2;01.22–2;07.11	20
David	m	2;00.08–2;03.04	13
Adi	f	1;07.02–2;07.22	51

were also excluded, as well as elicitations of completion from the child, either of texts or of words in non-text utterances.

Utterances including a verb were identified and classified into verb-stem groups. A given verb stem was defined by its 3-consonantal root, e.g., H-L-K (go) and by its *binyan* or derivational template, e.g. *pa'al* as in '*halak*' (went-3s[ingular]m[asculine]). All forms of person, number and tense inflections for the same verb-stem were included in the same stem-category, including infinitives, e.g., '*laleket*' (to go). The same root in another *binyan* was considered as a different verb stem. For example, the same consonant-root H-L-K can derive a stem in reflexive, '*hithalek*', which is also an intransitive stem, meaning, roughly, 'walked around-3sm'. These two stems were considered to be different verbs in this study.

There is a great deal of labiality in Hebrew, that is, the same derived verb-stem can be used in transitive as well as intransitive sentences. As a result, the categorization of a given stem as transitive or intransitive

was not always self-evident. As a rule, a verb accepting a direct-object which is not a strict cognate object or any other obligatory complement without a preposition (except the accusative 'et') was considered a transitive verb. Verbs receiving predicate complements such as '*haya*' (be), and other copulative verbs were excluded from analysis. For another reason the verb-stem '*kara*' (happen) was also excluded; this verb appeared exclusively in the formulaic question '*Ma kara?*' (What happened?) was also excluded, and it is highly questionable whether it is anything but a frozen expression for children at the relevant age.

## *2. Communicative keywords*

*Sample* Speech samples were taken from a videotaped observational study (Ninio 1984). Forty-eight infants acquiring Hebrew as their first language were observed and videotaped in a free interaction session with their mothers in their homes. Half were studied longitudinally, six times at intervals of two months, and half cross-sectionally. The age range of the infants during observations was 0;10–2;8. Overall there were over 80 hours of observations. The mothers of the cross-sectional sample had post high-school education, while the mothers of the longitudinal sample were half of a middle-class and half of a lower middle-class background. The sex of the infants was counterbalanced in each subsample. All children were of normal health, of intact homes, and the longitudinal sample were all first-borns. The subjects were randomly selected from birth records and recruited through letters and home visits. Each mother was paid a fee for her participation.

*Procedure* Children were videotaped in 30 minutes' unstructured home play with their mothers. Mothers were asked to behave as they usually do at that time of the day, but were asked to stay as much as possible in the same room with the child. Mothers were told that we wished to obtain a naturalistic sample of infants' interaction with their mothers, but were not told before the end of the study that either maternal or child language was to be the special focus of analysis. The 24 mothers of the cross-sectional sample were invited within a week of the videotaping to the laboratory and asked to describe in detail what had happened in the videotaped interaction period, while watching the taped observation. Their comments were tape-recorded and utilized in analysing the observational sessions.

*Data analysis* All utterances by the mothers and children were transcribed in standard orthography. A word immediately repeated within the same speaking turn was considered only as a single token. All utterances were marked with a detailed code for the communicative

intent expressed, using a category system developed in the study by Ninio & Wheeler (1984). The category system classifies the verbal-communicative function of speech on two structural levels: on the level of a strip of talk called an *interchange*, and on the level of individual utterances. A talk interchange is a group of adjoining utterances that have a shared interactive meaning. The system has 65 categories of talk interchanges, according to their interactive significance. They fall into families of different modes of using speech: action negotiation, discussions, markings of events, performances of moves in game formats, clarification episodes, etc. The interchanges are further distinguished according to the type of interactive state or event they are related to: for instance, negotiations can be of entering into co-presence or of leaving, of getting into focussed interaction or of leaving it, of initiating joint action or ending it, of performing single acts or of stopping acts in progress.

On the second level the communicative function of the single utterance is classified, within the relevant interchange. For instance, in a verbal exchange that comprises a negotiation of the next activity, a certain utterance might suggest a specific new activity to be engaged in, while another utterance might serve to agree to carry out that suggestion or else might reject it. There are 64 categories of speech acts for individual utterances which are moves in interchanges.

Determination of the communicative intent underlying an utterance was done on the basis of the verbal and nonverbal interactive context of the utterance, as judged from the videotaped observations. As far as possible, this decision was made independently of what the speakers said. Coding was aided by considerations of the participants' nonverbal behaviour, by further clarifications put on the utterance, and by the future course of the conversation. The coding of the cross-sectional sample was assisted by maternal descriptions of the observational session. All corpora were coded twice, by two different, highly trained coders. Blind recoding of five randomly chosen corpora consisting of 2934 utterances revealed an intercoder agreement of 83.1% ( $\kappa$  value 79.1). Subsequent to the reliability check, all disagreements were discussed and reconciled.

*Defining mapping rules* Each word of utterances 1–4 words long was categorized for the kind of mapping it constituted of the communicative intent. The following codes were used:

- F Fixed: expressing the intent by a constant word regardless of specifics of intent
- V Variable: lexicalizing a variable element E of the message by a word covarying with that element

- H Hearer: lexicalizing the element Addressee
- S Speaker: lexicalizing the element Speaker
- R Repetition: repeating or rephrasing a previous utterance
- T Text: reciting a rote-learned text.

For details of the coding system, see Ninio (1992). Here we shall describe in detail only the coding of the Fixed category, which is the most critical for the present study.

A word was coded as a Fixed expression of a communicative intent if it realized that intent by a constant word which was unchanging, regardless of specifics of intent. This is the kind of expression we have been considering as keywords of specific communicative intents. Such realization rules were defined in three circumstances:

- (a) A word was holistically mapped onto the message, such as 'here' onto a marking of action completion, or 'hello' onto the performance of a move in a pretend telephoning-game.
- (b) A word expressed a constant element of the message such as 'more' in the expression of the communicative intent, 'Speaker proposes that speaker (and/or addressee) repeat previous action', where the utterance encodes the element of continuation, but not the elements of speaker, addressee, the directive force, or the specific nature of the action. This component of the message is categorized as a fixed element as it remains the same whether the action is one of drinking, eating, being given Lego pieces to combine or being tickled, and its expression is similarly constant across the different activities.
- (c) A word expressed a variable element of the communicative intent by a constant form, e.g., by pronouns. For example, the utterance of 'this' in the expression of the communicative act 'Speaker suggests the initiation of a joint activity +/- focused on an object' was considered a fixed proform, although the word expressed the element of the 'object' which potentially changes with specific circumstances. If the same element of the communicative intent were expressed by common nouns (e.g., 'bottle' or 'ball'), this would be coded as a Variable expression. General deictic utterances such as 'here', 'there', 'this', 'that', etc., were always considered fixed expressions.

The fully coded data base consisted of 103,632 utterances, 46,564 of them single-word utterances and 57,068 multiword utterances of 2-4 words per clause.



TABLE 3. *Distribution of the first two verbs appearing in VO combinations in the sample of 15 children\**

Verbs		No. children	
Hebrew	English	first	first two
<i>raca</i>	want	10	13
<i>lakax</i>	take	1	4
<i>natan</i>	give	1	4
<i>asa</i>	make/do	2	3
<i>hevi</i>	bring	0	2
<i>ra'a</i>	see	1	1
<i>shama</i>	hear	0	1
<i>axal</i>	eat	0	1
<i>shata</i>	drink	0	1

\* Based on Ninio (1999a).

## RESULTS

### *Transitive verbs in verb-object combinations*

Table 3 presents the distribution of the verbs that were the first two verbs to appear in verb-object (VO) combinations in the 15 longitudinally-observed children. There was a great deal of overlap in the starting verbs of the different children: only 9 different verbs accounted for the 30 verbs used by the sample as their first two VO-verbs. In 13 out of the 15 children, '*raca*' (want), was either the first or the second verb to get a post-verbal DO.

Next, we checked in the coded mother-child corpora the use of the 9 transitive verb-stems with which children begin to produce VO combinations as keywords of communicative intents. Table 4 presents the results. The analysis shows that the 7 verbs most often used by children to start the VO word-combinations, served as keywords in the expression of one or more different communicative intents. The 8th and 9th verbs in order of frequency of occurrence as starting verbs of the VO combination ('eat', 'drink') did not serve as keywords of communicative intents. It seems that there is a correlation between the probability that a verb-stem will be used as a keyword for communicative intents and the probability that it will be the starting verb of the VO combination: '*raca*' (want) is the verb-stem used by far the most often

TABLE 4. *The first transitive verbs appearing in VO combinations in the children's sample and the communicative acts for which the verb is used as a keyword*

Verb	Communicative acts
<i>raca</i> (want)	open-ended question about hearer's wishes for new activity; request the initiation of a new activity; request the continuation of an activity after a break; request the repetition of an action; request an act on a known object; request the ending of an activity; request move, turn, or role in activity to addressee; request addition of a recursive act; request a new focus of activity; request performing move, to initiate a new activity; state intent to carry out act in immediate future; ask for addressee's permission to carry out act; refuse to do as requested.
<i>lakax</i> (take)	mark object transfer; perform move in tickling game; request the initiation of a new activity; request a new focus of activity; propose repetition of last unit of activity with role change.
<i>natan</i> (give)	request that addressee perform an act.
<i>asa</i> (make/do)	request an act on a known object; elicit mimicking of noises made by animals, etc; request the initiation of a new activity; request/urge that addressee start activity; request move, turn, or role in activity to addressee.
<i>hevi</i> (bring)	request the initiation of a new activity; declare possession of objects.
<i>ra'a</i> (see)	direct hearer's attention to focus; request hearer to show object during discussion; yes/no question asking for evaluation of acts; statement providing information about initiation of activity; request/urge that addressee start activity; request addition of a recursive act; request an act on a known object; state intent to carry out act on known object; dare hearer to initiate a new activity; dare hearer to perform act.
<i>shama</i> (hear)	direct hearer's attention to focus.
<i>axal</i> (eat)	none.
<i>shata</i> (drink)	none.

as a keyword, and it is also the verb that is most often learned by children as the first or second combining verb in VO combinations. Other stems which are relatively popular as first combining transitive verbs – '*lakax*' (take); '*natan*' (give); '*asa*' (make/do) and '*hevi*' (bring) – are used as keywords in a few communicative intents. The least frequently adopted starting verbs do not serve such a function at

TABLE 5. *Sentences with 'roce' (want) among the first two sentences with verb-object combinations*

Hebrew	English gloss
<i>roca et-ze</i>	WANT (FEM) ACC-this
<i>ani roca pica</i>	I WANT (FEM) pizza
<i>roca ze</i>	WANT (FEM) this
<i>roca ze</i>	WANT (FEM) this
<i>roca ze</i>	WANT (FEM) this
<i>roce et-ze</i>	WANT ACC-this
<i>lo roce et-ze</i>	not WANT ACC-this
<i>roce hala</i>	WANT chala
<i>roca sipur</i>	WANT (FEM) story
<i>roca sukariya</i>	WANT (FEM) candy
<i>ani roce maclema ze</i>	I WANT camera this
<i>lo roce lishon</i>	not WANT to-sleep
<i>roce Aladin</i>	WANT Aladin

all. The exception seems to be '*raa*' (see), which is entered in Table 4 as a widely used keyword but which very seldom occurs as a starting verb in verb combinations. Actually most keyword uses of this stem – all except for attention-directing and asking for evaluation – are for an idiomatic expression '*nir'e*' which is literally 'we shall see', used colloquially to mean 'let's see'. Probably this form (which is not adopted by children until a very late date) should be excluded from the statistics.

Children's starting utterances with '*raca*' (want) in VO combinations actually use this verb in its capacity as a keyword. Table 5 presents the sentences with '*raca*' as either the first or the second verb to get a post-verbal DO in the children's sample. It is easy to see that the sentences with '*raca*' serve the children mostly as requests for a new object or activity, in which cases the verb serves as a keyword for the request. In the minority of cases, the sentence serves as a refusal to suggestions regarding a new activity, using the two-word keyword combination '*lo roce*' (don't want).

The word serving as the DO of 'want' in these sentences encodes the variable element of the communicative intent, which is the object or activity requested (or refused). In many sentences, however, the

TABLE 6. *Distribution of the first intransitive verbs appearing in word-combinations in 20 children\**

Hebrew (stem)	English gloss	First	First two
<i>ba</i>	come	13	14
<i>nafal</i>	fall	2	7
<i>halak</i>	go	2	5
<i>yashav</i>	sit	1	2
<i>yashan</i>	sleep	1	1
<i>'af</i>	fly	1	2
<i>zaz</i>	move	0	4
<i>baka</i>	cry	0	1
<i>kaav</i>	hurt	0	1
<i>kam</i>	get up	0	1
<i>yaca</i>	exit	0	1
<i>tas</i>	fly (plane)	0	1

\* Based on Ninio (1999b).

expression chosen is a pronoun (mostly 'ze', this), in other words, yet another expression that remains fixed despite changes in the specifics of the communicative situation. In the latter, the sentence consists of two constants or keywords of the communicative intent. In sentences where the object word is a common noun rather than a pronoun, the sentence consists of the combination of a constant and of a variable of the communicative intent.

Inspection of sentences with the other frequent starter verbs 'make/do', 'give' and 'take' showed that they were similarly employed (see Ninio 1999a). It is clear that the initial sentences children generate with transitive verbs in the VO pattern utilize the functioning of the relevant verbs as constant keywords of communicative intents.

#### *Intransitive verbs in combination*

Table 6 presents the distribution of the intransitive verbs that were the first two verbs to appear in multiword combinations in the 20 longitudinally-observed children. Once again, there was a great deal of overlap in the starting verbs of the different children: only 13 different verbs accounted for the 40 verbs used by the sample as their first two combining verbs. In 14 out of the 20 children, 'ba' (come) was either the first or the second verb to appear in multiword utterances.

TABLE 7. *The first intransitive verbs appearing in word-combinations in the children's sample and the communicative acts for which the verb is a keyword*

Verb	Communicative acts
<i>ba</i> (come)	call hearer's attention; call hearer's attention from afar; order hearer to wait for speaker during speaker's absence; request that hearer come in order to prevent his leaving; request the initiation of a new activity; request performing move to initiate a new activity; request/urge that addressee start activity; request the ending of an activity; request move, turn, or role in activity to addressee; request addition of a recursive act; offer to help addressee; request the continuation of an activity after a break; request repetition of last unit of activity; request a new focus of activity; request an act on a known object; dare hearer to perform act; request starting an act; request to do something to end/stop hearer's act; mark object transfer; agree to do as requested; permit hearer to perform act; perform move in telephone game; commiserate/comfort addressee; request for clarification of verbal communication; direct hearer's attention to focus.
<i>halak</i> (go)	threaten addressee as a request that addressee perform an act; perform move in tickling game.
<i>yashav</i> (sit)	order hearer to wait for speaker during speaker's absence; request that hearer come in order to prevent his leaving; perform move in swinging game; perform move in dancing game (' <i>uga uga</i> '); perform move in other games.
<i>yashan</i> (sleep)	threaten addressee to request the initiation of a new activity; perform move in dancing game (' <i>uga uga</i> ').
<i>kaav</i> (hurt)	commiserate/comfort addressee.
<i>kam</i> (get up)	request/urge that addressee start activity.
<i>nafal</i> (fall), ' <i>af</i> ' (fly), <i>zaz</i> (move), <i>baka</i> (cry), <i>yacu</i> (exit), <i>tas</i> (fly (plane))	none

Next we checked the use of the 14 intransitive transitive verb-stems with which children begin to produce word-combinations as keywords of communicative intents. Table 7 presents the results. The analysis shows that '*ba*' (come), the verb most often used by children to start the

TABLE 8. *Sentences with 'ba' (come) among the first two sentences with intransitive verbs in word-combinations*

Hebrew	English gloss
<i>Aba bo</i>	Daddy COME (IMP)
<i>Marina boy</i>	Marina COME (FEM IMP)
<i>Bo elay</i>	COME (IMP) to-me
<i>Aba bo</i>	Daddy COME (IMP)
<i>Ima boy</i>	Mommy COME (FEM IMP)
<i>Zizi bo</i>	Zizi COME (IMP)
<i>Aba boy</i>	Daddy COME (FEM IMP)
<i>Ima ... bo</i>	Mommy COME (IMP)
<i>Ima bo</i>	Mommy COME (IMP)
<i>Boy leechol</i>	COME (IMP) to-eat
<i>Aba bo</i>	Daddy COME (IMP)
<i>Mik bo</i>	Mik COME (IMP)
<i>Boy shama</i>	COME (FEM IMP) there
<i>Boy ... habayta</i>	COME (FEM IMP) home

intransitive word-combinations, served as keyword in the expression of no less than 25 different communicative intents. Other verbs among the starting set also had keyword uses, but these uses were more marginal than for 'ba'. Moreover, children's starting utterances with 'ba' in multiword combinations actually use this verb in its capacity as a keyword. Table 8 presents the sentences with 'ba' as either the first or the second verb to appear in multiword utterances in the children's sample. All the sentences with 'ba' are imperatives, and serve the children exclusively as requests, whether to approach the speaker or to initiate a shared activity. In both cases, the verb serves as a keyword for the request. As we observed with regard to transitive verbs, the other verbs are less likely to serve as keywords and also less likely to be among the first two combining intransitive verbs in children's speech.

## DISCUSSION

The results of this study support the hypothesis that children's first combining verbs, whether transitive or intransitive, tend to be keywords of communicative intents. The favourite entry-level word-combinations with verbs use 'want' as the first transitive verb getting a direct object,

and 'come' as the first intransitive verb with some kind of a related word, such as a subject, a vocative, or an adverbial adjunct. These two verbs serve as communicative keywords for a long list of related communicative acts, mostly to do with requesting actions and activities. The very first multiword utterances constructed with these verbs as their pivotal predicate indeed use the verbs in their capacity as communicative keywords. The phenomenon returns with most of the other verbs that generate the first and second multiword utterances of the desired kinds; however, the less likely a verb is to be the first or the second combining verb, the less likely it is to be a communicative keyword.

These word combinations are basically equivalent to two single-word expressions of the same communicative intents; one is a constant keyword (the verb) and the other is another element of the same intent, sometimes the element of the addressee, sometimes a variable such as the name of an object requested, and sometimes a constant expression of the same elements in the form of a pronoun.

These results imply that the concept of a predicate in all probability arises from the concept of a fixed keyword mapping the constant element of a communicative act, contrasting with variable expressions of the same intents. In other words, the concept of syntagmatic relations emerges from the relation of a communicative constant with another expression of the same communicative intent that provides more specific or detailed information. Interestingly, according to this developmental model, the archetype or antecedent of syntactic relations is closer to appositional specification than to a true valency complementation: each of the combining elements can, potentially, serve as an independent expression of the same communicative meanings, and the variable element merely adds details over the information provided by the constant. The possible significance of this developmental finding for linguistic theory is beyond the scope of the present paper; however, it certainly fits in well with widely sounded arguments for the wholly or partly appositional nature of basic syntactic relations (complementation, adjunction) in many language families, past and present.

The question to ask now is why do children begin verbal word combinations with verb stems which are keywords of communicative intents? First, probably because the verbs used in mother-child discourse are much more likely to be communicative keywords than verbs generally are.

There are very many verb stems in Hebrew, probably around 13,000, some of them of course archaic and others seldom used in any conversation. Only a tiny minority of them ever occurs in mother-infant

discourse. On the basis of the 100,000 or so utterances recorded and coded in the present project, it was found that the whole of mother-infant discourse utilizes at the most 200 different intransitive stems and 270 transitive and ditransitive stems. In this small verbal vocabulary, however, the proportion of stems serving as keywords of communicative acts is quite high, about 12%. Although there has been no formal study of the subject, informal observations show that these keyword-verbs may exhaust all the vocabulary of such items in normal non-specialist conversations in Hebrew. The same 50 or so keyword-verbs constitute, of course, a minute proportion of all verbs in Hebrew; it is significant that they are so heavily concentrated in mother-child discourse.

It seems that the verb vocabulary of mother-child discourse is heavily built around these keyword-type items. The frequency data support this idea: in the data base of maternal multiword utterances there are overall 32,695 utterances with verbs; verb stems which serve as keywords of communicative intent ( $N = 52$ ) are more than ten times as frequent as non-keywords, a mean of 390.6 utterances per verb, whereas non-keyword stems ( $N = 406$ ) occur with an average frequency of 30.5 utterances per verb. This means that, of all maternal multiword utterances with verbs, 20,311 (62.1%) are constructed with keyword type verbs.

The verbs starting the transitive and intransitive word-combinations – ‘want’ and ‘come’ – are especially frequent in maternal input speech (see Ninio 1999a, 1999b). It could be claimed that these verbs are the first to be learned in word-combinations because of a sheer frequency-effect. However, the relatively high frequency of keyword-verbs in the input speech is not a factor which can be isolated from the use made of these verbs in interaction. Rather, it appears true that in input speech (as in natural language in general), frequency is inherently correlated with generality, prototypicality or simplicity. In the present case, high frequency is apparently an *outcome* of the use of the relevant verbs as communicative keywords: this means not only that the words have central communicative-interactive relevance in the dyadic interaction, but also that the meaning of the relevant items is more transparent than otherwise, and it is a good communicative strategy to use them with young children.

The other side of the coin is, of course, that high use frequency is also the *reason* for the use of the relevant verbs as keywords of communicative intents. Being a marker of some complex content like illocutionary force means that the relevant word has undergone a measure of grammaticalization for the role. Indeed, in the linguistics literature it is acknowledged that such communicative keywords exist,



and sometimes they are even called by a special term 'pragmagrams', to distinguish them from 'grams' which are the grammaticalized markers of pure grammatical contents such as tense, aspect or case (Abraham 1991). The keyword-verbs of the present study without doubt have undergone at least semi-grammaticalization, losing as usual some of their meaning in a process of semantic bleaching, but also gaining pragmatic meaning. For instance, the use of 'come' in the sense of 'let's' is widespread in the data, as in everyday speech.

One rather unexpected result of the study is the finding that the number of different communicative intents for which a verb serves as a keyword affects the verb's chances to be among the initial set of syntactically combining verbs of its kind. Just to be used as a keyword for one or two different communicative intents is apparently not as facilitating of early word-combination as being the keyword for many different intents. It is possible that the variety of communicative acts which can be encoded by the relevant verb reflects the verb's semantic lightness, as well as a high probability that, whenever the verb is used, it serves as a communicative keyword and not as the specific detail of some communicative act. Both factors could be facilitating of early syntax, and they may also reflect a higher frequency of use. A topic for further study is how the pragmatic variety, frequency of use and semantic lightness of a verb contribute, separately or connectedly, to the verb's potential to be combined early in multiword utterances.

Up to this point I have emphasized that the reason why some verbs are acquired first in word-combinations is probably due to their use as keywords of communicative intents. I showed that these verbs are semi-grammaticalized markers of illocutionary force, and claimed that the very notion of word-combinations is arrived at as a kind of combination of two single-word expressions of a single communicative intent, one of them a constant marker and the other a carrier of elaboration/specification of the general illocutionary force.

However, this creates a paradoxical situation. In previous studies it has been shown that the very same starting-verbs are typical grammaticalized markers of their syntactic combinatory property – transitivity or intransitivity – in many languages (Ninio 1999a, 1999b). It has been claimed that in English and in Hebrew, too, these same verbs are the best exemplars of their linguistic domain, being generic verbs with light semantics that demonstrate their combinatory properties in the most transparent fashion. This makes them into the 'best exemplars' or the 'best models' of the whole domain, and learning them first is equivalent to learning the 'principle' of the whole domain. It was even shown that the first transitive verbs provide a great deal of facilitation

for the learning of other verbs, as it is expected from learning the 'best exemplars' of a field. Is this not a contradiction with the claim that the first-learned verbs are transitional elements, belonging – properly speaking – to the 'pragmatic past' of the emergent syntagmatic linguistic system?

Apparently, rather than being a contradiction, this situation demonstrates in the sharpest possible way the Janus-faced property of well-functioning transitional objects. From the point of view of having to learn them in the context of the previous system in which there is no syntax as yet but only single-word expressions of pragmatic intents, the relevant items must be ones that function extremely well as words carrying constant pragmatic meanings to which further elaborations can be added. From the point of view of the emergent system in which there are syntagmatic relations, they must function extremely well as logically predicate words with transitive or intransitive syntactic valency, so that any further learning may use their example as a model. The outcome is that the same items possess a double dose of partially grammaticalized content: they are at the same time both markers of communicative intent and markers of syntactic combinatory possibilities. It remains to be seen if all transitional linguistic entities are transitional to such a transparent extent. In any case, this finding raises important questions about the relationship in general between 'grams' and 'pragmagrams', between pragmatic and grammatical grammaticalizations, and between the pragmatic and the grammatical aspects of the linguistic system in general.

Moreover, this finding lends support to Hopper's (1998) conceptualization of grammar as 'the partial settling or sedimentation of frequently used forms into temporary subsystems'. Although Hopper talked about a diachronic process, it was found in this study that the developmental process similarly turns the earliest acquired, very frequent forms used for communication into the models for grammatical patterns.

In summary, the present study showed that children's emerging syntactic system is heavily dependent on, and is derived from, their presyntactic pragmatic system. Rather than belonging to separate 'modules', pragmatic and syntactic development seem to form a single indivisible whole. The conclusion is that the linguistic system should not be compartmentalized in ways that separate syntax from pragmatics, nor 'use' from 'language'.

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