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Pathbreaking verbs in syntactic development and the question of prototypical transitivity*

ANAT NINIO
The Hebrew University of Jerusalem

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ABSTRACT

The first verbs to participate in VO and SVO combinations, and the temporal parameters of the spread of these combinatory patterns over different verbs were investigated. The longitudinal language observations of 16 children, one acquiring English, the others Hebrew, were examined. The children were observed once a week for 3–12 months, the observations starting when the children were still in the single-word stage (1;1–2;1) and ending when they were well into multiword speech (1;8–2;7). The results indicate that the more verbs children already know to combine in a certain pattern, the faster they learn new ones. Apparently children induce from individual word-combinations some general principles that facilitate further learning. The 'pathbreaking verbs' that begin the acquisition of a novel syntactic rule tend to be generic verbs expressing the relevant combinatorial property in a relatively pure fashion: the same verbs that children first combine with direct objects, are typical grammaticalized markers of transitivity in many languages. These verbs do not have HIGH TRANSITIVITY as defined by Hopper & Thompson (1980). Rather, they express fundamental

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The research reported in this paper was supported by a grant from the Spencer Foundation. The data presented, the statements made and the views expressed are solely the responsibility of the author. Address for correspondence: Department of Psychology, The Hebrew University, Jerusalem 91905, Israel. e-mail: msninio@mscc.huji.ac.il

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'object relations' of incorporation into, and ejection from the personal. Crosslinguistic evidence indicates that this may be the basic transitivity construct in languages. The results raise the possibility that lexical-specific learning of positional patterns is sufficient to account for the formation of syntactic abstractions.

INTRODUCTION

It is well known that children's early syntactic rules do not get immediately generalized to all the lexical items to which they could and should apply. This phenomenon is most conspicuous when some of the candidate lexical items are already within the children's productive vocabularies. For example, Bowerman's daughter Eva had at 1;5 a sizeable verb vocabulary which she used in the form of single-word utterances, but – for a time – she only generated two-word utterances with the verb *want* which she combined with various object nouns and verbs referring to activities. The next verb combining with an object appeared only a month later, beginning a period when many different verbs combined with noun objects in a verb–object (VO) pattern. A similar phenomenon occurred with the verb *do* which was the only verb combining in a subject–verb–object (SVO) pattern in the first month when such combinations first emerged (Bowerman, 1976, 1978).

In other children the same phenomenon is manifested in the inordinately long period of time in which they produce a certain type of syntactic combination only with one or two selected lexemes, before they even begin to acquire the other instances of the same lexical category to which the novel construction could be applied. For example, most children begin the production of complex sentences with a very few complement-taking verbs like *want* or *can't*; other verbs of this type are not acquired at all until months later (see Pinker, 1984 for a review and a discussion of this phenomenon).

This phenomenon – the selective employment or acquisition of appropriate vocabulary in the initial stages of novel combinations – may be quite typical of early speech (see also Slobin, 1985, for several examples, and Clancy, in press, for a recent report) but it is not well-integrated into formal models of syntactic development. These early-combining verbs appear to fulfil some special role in acquisition, behaving as if their function were to allow the child to learn the general principles of a particular syntactic pattern on a lexical basis. Apparently, the knowledge gained by learning to generate the word-combination with these first verbs can be transferred to other verbs and facilitate their acquisition in the same positional patterns. Although there is no systematic information in the literature on the spread of a particular type of word-combination past the first-combining verbs, the impression is that after the initial phase when only one verb appears in the relevant patterns, acquisition speeds up and within a relatively short time several

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different verbs emerge in the same kind of word-combination. For example, Bowerman's Eva who for a month produced VO combinations only with *want*, produced in the next two months the same type of combination with at least seven different verbs (Bowerman, 1978). The accelerated learning past the first verb suggests that *want* was a pathbreaking verb, easing the spread of the verb-object combination to other verbs.

There is only one developmental theory at present that allocates a clear facilitating role to the first verbs combining in a particular syntactic combination. Interestingly, Eva's developmental data poses a problem for this theory rather than lending support to it. This is Pinker's (1984) innatist theory of 'semantic bootstrapping' in which he suggests that children's acquisition of syntactic roles such as subject and direct object is mediated by innate syntax–semantics correspondence rules. Facilitation of acquisition of the direct-object role should come from the first VO combination expressing a semantic relation of a voluntary dynamic action to the object affected by that action. This should trigger the innate correspondence rules linking this semantic relation to the syntactic verb–direct object relation. Once the innate concept is triggered, children should be in the possession of an abstract categorical rule for the expression of verbs with their syntactic direct-objects, and it is expected that the spread of the relevant construct to other candidate verbs would be very fast. This is apparently what happened with Eva's VO combinations once she mastered the production of *want* + X. However, there is a grave problem with this explanation: *want* is a stative, not an active verb, and *want X* does not express the semantic relation supposedly innately linked to the VO syntactic relation. Namely, the facilitation apparently provided by *want* to the acquisition of the VO pattern in Eva is actually counter-evidence to the semantic bootstrapping hypothesis as formulated in Pinker (1984).

Apparently, it is not an isolated occurrence that Eva's first combining verb in a VO-combination is not an active verb. Other investigators have also reported that in some children, the first productively combining transitive verbs are stative rather than active, and include verbs such as *want* and *see* (e.g. Wells, 1974; Braine, 1976; Lieven, Pine & Baldwin, 1997). In addition, active verbs with an affected object are not more frequent than non-active verbs among the first 10 or 20 transitive verbs in VO and SVO combinations (Bowerman, 1990; Lieven *et al*., 1997; Maratsos, 1988). Apparently, active semantics is neither a condition for early acquisition in transitive word-combinations nor does it have a potential bootstrapping role into transitive syntax. If the earliest combining transitive verbs do have a pathbreaking role, this role should be conceptualised in other terms than the innate semantics–syntax linking rules formulated by Pinker.

The present study was undertaken in order to clarify the developmental picture with regard to the earliest combining verbs, focusing on two transitive patterns, VO and SVO. It had three goals:

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(1) To find out how general is the phenomenon that syntactic word-combinations start with a single verb, with that verb remaining the sole combining verb for a long period.
(2) To find out if acquisition speeds up after the first combining verbs, namely, whether the first combining verbs facilitate the learning of the same positional pattern with other verbs.
(3) To find out what are the first transitive verbs in VO and SVO combinations, in order to characterize the primitive concept of transitivity underlying children's initial production of transitive word-combinations.

These questions are of relevance to two interconnected theoretical issues in the theory of syntactic development. The first issue is when and how children get to possess general or abstract syntactic knowledge such as the concept of a verb or of the transitive verb form class, the concept of the direct object or the subject grammatical relation or the concept of an abstract positional pattern such as a postverbal complement slot and so forth. The two options offered in the literature are (a), that such knowledge is innate, and there is a discrete moment quite early in development when innate concepts get triggered so that children pass suddenly from a period when such concepts are not functional at all in their word combinations, to a period when abstract concepts are fully functional all at once; and (b), that there is an extended period during the acquisition of early word-combinations when children do not operate at all with general or abstract categories of any kind, but rather, they learn positional patterns on an individual-lexical basis. The former, innatist, approach is well exemplified by Pinker's (1984) model of 'semantic bootstrapping'; the latter, radical-lexical approach, by Tomasello's (1992) 'verb island' hypothesis as well as by Lieven *et al.*'s (1997) lexical-positional learning model.

The communality of these two, otherwise diametrically opposed, approaches is that they do not allow for the gradual consolidation of general (or abstract) concepts and categories during the initial period of word-combinations. According to the innatist hypothesis, there is a discrete jump at some point in the early period from a completely pre-syntactic and apparently lexically based word-combinations, to a full-blown abstract rule system applying to the relevant part of the grammatical system. Thus general rules are not thought to be induced by children by some gradual process from individual lexical patterns, but rather, the general or abstract knowledge is thought to be retrieved from inactive storage in the genetic system, achieving fully operative status all at once by some triggering process.

From a different perspective, according to the radical-lexicalist model early verbs constitute isolated 'islands' that develop their miniature syntax independent of each other. There is no basis for generalization or induction

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of more abstract rules at this period of development: children do not yet perceive different verbs as possessing syntax-relevant communality. Integration of these isolated patches of syntax is a later process, occurring at some future date well beyond the period that a child learns to generate multiword positional combinations with her first 10, 20 or 30 verbs.

There is however another possibility, namely, that when children start to learn to combine individual verbs in various positional patterns, they also begin to consolidate some more general or abstract knowledge about the verb form class, about the different complements verbs take, and about the positional patterns involved. If such general learning occurs, it should be manifested in the facilitation that earlier lexical-specific learning provides for later lexical-specific learning. The temporal parameters of the spread of the VO and the SVO combinatory rules over different verbs are expected to help decide among these differing models of development.

The second issue to which the results of this study are potentially relevant is the question, what is the prototypical semantics underlying transitive syntax. As mentioned above in connection with Pinker's (1984) semantic bootstrapping hypothesis, there is in the developmental psycholinguistics literature, and moreover in the linguistic literature, a rather unexamined vague consensus that the most 'natural' or prototypical semantics underlying transitive constructions is one of a volitional animate actor strongly affecting the state of an inanimate patient by some overt dynamic action. In developmental theorizing, this hypothesis has brought about the expectation that children's earliest transitive constructions, namely, VO or SVO combinations, be associated with the prototypical BASIC MANIPULATIVE SCENE in which the child is a volitional actor affecting the state of an inanimate patient. This kind of dynamic 'transitive scene' is said to underlie not only children's earliest word combinations but also – with a more general actor involved – to constitute the semantics of prototypical transitive constructions in adult language on a universal basis. In particular, such scenes are claimed to be the semantic underpinnings of PROTOTYPICAL TRANSITIVITY, CARDINAL TRANSITIVITY, or HIGH TRANSITIVITY in Hopper & Thompson's (1980, 1984) seminal work on crosslinguistic expressions of transitivity in adult language. In both child language and adult language, less centrally transitive constructions would then be extensions from the prototype.

However, as it was found by Bowerman (1990), Lieven *et al.*, (1997) and others, this is apparently incorrect as a generalization about the earlier period of syntactically transitive verbs in children's speech. If these results repeat in the present study regarding the very first verbs children use in transitive combinations, this means that the 'received wisdom' of the highly dynamic active scene being the primitive semantic underpinning of transitivity needs a careful re-evaluation.

In the present paper, detailed data from the longitudinal corpus of 16

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children will be presented, one acquiring English, 15 acquiring Hebrew as their first language. 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 definitive, is preceded by the preposition *et* (ACC). Beyond these differences and a few other ones less relevant to the present topic, Hebrew is typologically fairly similar to English as far as its syntax is concerned.

METHOD

Participants and language recording

The main language corpora used in this study are of Travis, a child acquiring English, and Ruti, a child acquiring Hebrew, both girls. Travis is the child whose development is reported in Tomasello (1992); the sources for the analysis were Table 8.2 and the Appendix of that book. Tomasello's was a diary study concentrating on emergent patterns; Travis's speech was daily recorded by her parents, and in addition they made 60 minute long audiotaped and videotaped recordings of her once a month. The start of the systematic recording was at 1;0, and continued till 1;11·0. Until 1;8·8 every sentence was recorded; thereafter only if its structure was more complex than of those produced previously. 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.

In addition, 14 other longitudinal corpora of Hebrew speaking children were analysed. They were audiotaped about once a week at home for 30 minutes, beginning about 1;6 on the average, for 8–11 months; contextual information was added to the transcriptions with special emphasis on the communicative-pragmatic force of the utterances. The observations were augmented by parental reports on emergent patterns. In all children the observations started before word-combinations with verbs were produced. These additional Hebrew corpora were included in the study in order to allow for a greater measure of generalization of the results, and this even though no comparable English sample was available. The major reason for this decision was that the phenomenon of pathbreaking verbs in English-speaking children has already been well-reported in the literature, ever since

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TABLE 1. *Description of the longitudinal observations used in this study*

Child	Sex	Language	Study period	Frequency of observations	No. of observations
Travis	F	English	1;03·18–1;08·08	Daily (diary)	
Ruti	F	Hebrew	1;06·00–2;04·00	Twice weekly	125
Zohar	F	Hebrew	1;06·12–2;02·08	Weekly	29
Shay (m)	M	Hebrew	1;07·21–2;03·26	Weekly	28
Paz	F	Hebrew	1;06·22–2;03·02	Weekly	24
Or	F	Hebrew	1;03·21–2;02·06	Weekly	38
Omer	M	Hebrew	1;03·03–1;10·10	Weekly	23
Ayelet	F	Hebrew	1;01·08–1;10·20	Weekly	34
Mordexai	M	Hebrew	1;08·08–2;03·00	Weekly	20
Rotem	F	Hebrew	1;07·19–2;03·16	Weekly	31
Yonatan	M	Hebrew	1;06·00–2;03·29	Weekly	36
Shira	F	Hebrew	1;04·18–2;02·16	Weekly	31
Matan	M	Hebrew	2;01·03–2;04·03	Weekly	16
David	M	Hebrew	2;00·08–2;03·04	Weekly	13
Reut	F	Hebrew	1;05·12–1;11·25	Weekly	21
Adi	F	Hebrew	1;07·02–2;07·22	Weekly	51

Bowerman (1976), but no comparable documentation exists for Hebrew-speaking children.

Table 1 presents the longitudinal sample with information about sex, study period, and number of observations.

Language coding

Word-segmentation decisions of the original investigator were respected. Thus, the analysis follows Tomasello's decisions about segmentation, e.g. apparently unsegmented verb-clitic combinations like *get-it* are considered single words and not two-word combinations. Similarly, Hebrew fused accusative-marker and nominal combinations *et-ze* (ACC 'this') are left as a single word if so transcribed by the original investigator. Vocatives are not considered subjects of imperatives, e.g. *Daddy*, *open this top* (Travis, 1;7·22) is not considered an SVO combination. 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 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 were also excluded.

The first two utterances of VO and SVO-combinations by the children were coded for the illocutionary act carried out, using the Ninio & Wheeler (1984) coding system. Coding was done on the basis of the contextual

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comments accompanying each utterance in the corpora. Appendix A presents the first sentence with each of the first two verbs emerging in VO combinations, for the 16 children of the sample. Appendix B presents the same information on SVO combinations. The appendices also present the ages at which the two 'emerging sentences' were produced, and the time elapsing, in days, between the emergence of the first and the second combining verb.

RESULTS AND DISCUSSION

The results of the study will be presented and discussed in two parts. Part 1 will review the results regarding the temporal parameters of the development of transitive syntax, and will examine the implication of these results for different theories of the learning process. Part 2 will present the results regarding the identity of the earliest combining verbs in transitive word-combinations, and will discuss the implications of the findings for different conceptualizations of the core semantics of transitivity. The results of the study will be summarized in the Conclusion section following the Results and Discussion section.

Part 1. Temporal parameters of development and the learning process

The temporal parameters of the onset of the VO and the SVO patterns. The first question to be examined is, do the VO and the SVO patterns typically begin with a single combining verb that remains for a considerable period the only one produced in the novel construction? It should be noted that the statistics are for any expressed VO or SVO, regardless of what else is in the sentence. Among utterances constituting the first occurrences of certain verbs with a direct object there could be some that include a preverbal subject as well. In these cases, the utterance would be coded both as an early VO combination and as an early SVO combination.

As to VO, the second verb getting a postverbal object is produced after a considerable time lag after the first verb in all 16 children; in this group of children, the first verb is the only verb in this construction for a period lasting, on the average, 43·6 days (S.D. = 25·0, range 17–104 days).

Only 13 children produced SVO combinations within the period of the observations. For one child (Shay) who produced SVO sentences with only one verb before the end of the observations, the time between the first SVO sentence and until observations ended was used as a conservative estimate of the time elapsing before the second SVO verb emerged.

The phenomenon of a long period with only one combining verb returns in the context of SVO combinations, with the time lag between the first two verbs being 42·2 days on the average (S.D. = 43·8, range 12–150 days). The time lag does not differ significantly from that of VO for the same children. We may conclude that the phenomenon of pathbreaking verbs like Bowerman's Eva's *want* and *do*, preceding the wider application of combinatorial

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rules, is apparently a quite general phenomenon among children, and that it repeats in the development of two different syntactic patterns: when learning to combine a transitive verb and a postverbal direct object; and later, when learning to generate a subject–verb–object construction for transitive verbs.

The temporal spread of the VO and SVO patterns over different verbs. Figures 1 and 2 present two graphs each, documenting the development of

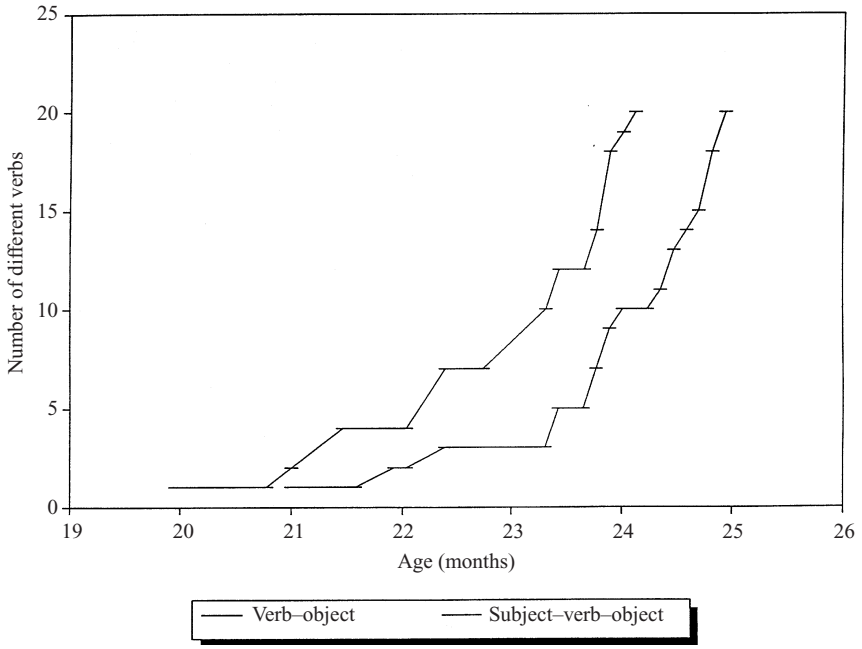


Fig. 1. Cumulative number of different verbs in VO and SVO word combinations produced by Ruti, as a function of age.

VO and SVO word-combinations in, respectively, Ruti and Travis, as a function of age. Appendices C and D present the data on which the graphs are based. The dependent measure is the cumulative number of different verbs participating in each type of construction. Each verb is counted at the age when it is first produced in the relevant syntactic construction. There was no early SVO among Travis's first 20 VO combinations; for Ruti, 3 of her 20 earliest VO utterances with given verbs were already SVO-combinations (the 7th, 11th and 15th).

In both children, both cumulative series show a rising exponential or geometrical function, starting very slowly and accelerating gradually.[1] The

[1] Ruti's graphs was re-drawn so that the 3 SVO sentences were excluded from the VO graph. This made no significant difference to the graph; it still shows a gradual speed-up of learning, only the slope of the curve at the later period reduces somewhat.

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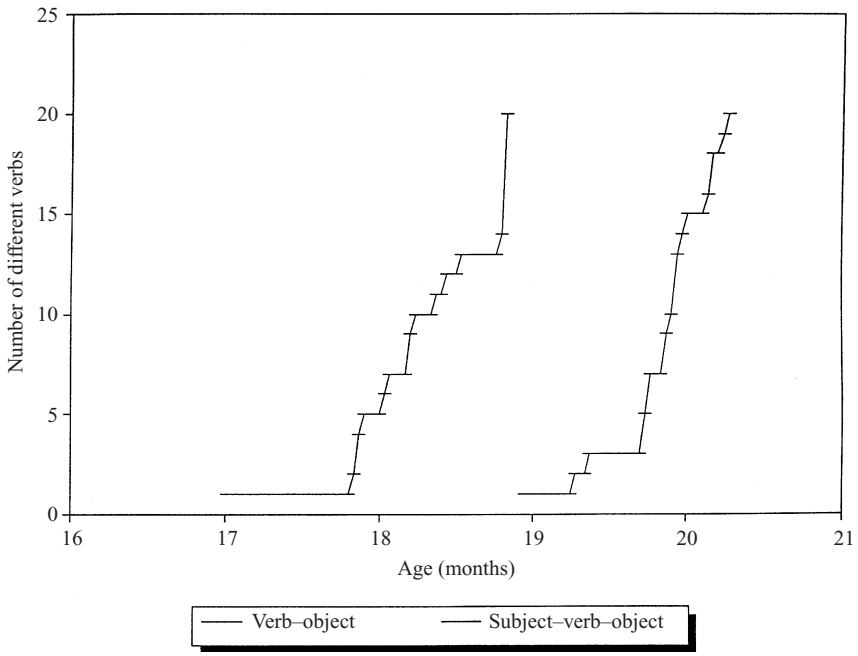


Fig. 2. Cumulative number of different verbs in VO and SVO word combinations produced by Travis, as a function of age.

two graphs of a given child are almost identical in their shape. It is evident that these graphs have the characteristic shape of typical gradually accelerating learning curves: the time it takes to apply the new rule to yet another verb is much longer at the beginning of acquisition of that rule, and it gets shorter the more verbs the children have already learned to produce in the relevant pattern. The very long time it takes for the second verb to follow the first, pathbreaking, verb is not an independent phenomenon on its own, but the start of a gradually speeding-up acquisition process. It is apparent that the same process recurs in the case of the two different combinatorial rules explored here, VO and SVO.[2] It should be added that the first verbs starting the VO and SVO combinations, namely, *get-it* and *made* for Travis and *roca* 'want', for Ruti, were productive, with *get-it* maybe the most prolific of Travis's combining verbs at this period. This finding lends credence to the

[2] Both Travis and Ruti had, two months before VO combinations began, a period of pivot-like word-combinations, with typical predicates *there* **X**, *bye* **X**, *where* **X**. This initial period is very similar to the pivot-stage documented by Braine (1963). When the development of these pivots is plotted, extremely similar results to the VO and SVO patterns are obtained: they show a typical precocious first combining predicate, and a gradual acceleration of acquisition of other predicates. Formally, these pivot words belong to several different form classes, but it is doubtful that this distinction is meaningful for children at this stage. For more details see Ninio (1996).

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idea that the very first VO and SVO verbs may start a developmental process during which an abstract rule forms for generating VO and SVO patterns.

The fact that the same speed-up of acquisition occurs both in VO and SVO is one of the central pieces of evidence suggesting that the speed-up is specifically tied to the number of previously produced verbs in the same kind of combination. In principle, accelerated acquisition could be due to some general developmental advance to which many aspects of language acquisition are sensitive. For instance, many plottings of the mean length of utterance in longitudinally-collected samples have the gradual speed-up shape (e.g. Bloom, Lightbown & Hood, 1975), so it could have been the case that children get faster at, for example, combining verbs with objects, as a function of getting better at combining morphemes in general. However, a non-specific developmental advance would not generate TWO temporally separate gradually-increasing graphs, each beginning with a very slow learning rate. If there were no specific effect of the particular combinatory pattern on the speed of learning, the second (SVO) graph would start with the slope already achieved by the first learning task, and learning would not slow down afresh.

There is one possibility that the accelerating shape of the two learning curves represents some factor not specifically connected to the number of previously produced verbs in the same combinations. Each curve may represent the development of a new ability to generate longer prosodic envelopes. If VO combinations were the first two-word combinations in the speech of the children, and SVO, the first three-word combinations, the slow-starting and accelerating learning curves for these two kinds of multiword utterances could have reflected children's cumulative practice with planning longer prosodic envelopes, regardless of the syntax of these utterances. However, neither the VO nor the SVO positional patterns posed a new prosodic challenge to these children. Before uttering the first VO-sentence, both Ruti and Travis had already produced very many two-word utterances, and see Note 2 for details of this pivot-type period of development. Similarly, before uttering the first SVO-sentence, both children had already produced many three-word utterances. The accelerating learning curves do not reflect the development of a non-specific prosodic ability at the relevant period.

To summarize, it is difficult to attribute the gradual speed-up of the learning curves in Figures 1 and 2 to a non-specific factor that does not connect the gradually increasing speed of learning to facilitation, generalization or transfer from existing verbs that the children already know how to combine in the relevant pattern. Such facilitation occurs at two different stages of acquisition of syntax: when learning to combine a transitive verb with a postverbal object, and when learning to combine a transitive verb with a preverbal subject and a postverbal object. It is very likely that the same

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gradual speed-up due to facilitation will be observed in other developmental tasks, and see Note 2 regarding a similar-shaped graph obtained from Ruti and Travis's early 'pivots' or intransitive predicates combining with their single argument.

These results suggest that when children learn to combine specific verbs in various positional patterns, they also acquire some more general or abstract knowledge that can facilitate further learning. The observed facilitation can only be attributed to their increasing knowledge of the positional pattern, namely, what it takes to combine a verb with a direct object or with a direct object and a subject, and to their developing concept of transitive verbs, namely, the general characteristics of words that take such complements. The accelerating shape of the learning curves reflects the cumulative nature of this developmental process: there is more facilitation after two verbs than after one verb, and so on. Namely, the results show that these more abstract concepts consolidate gradually, rather than either not being functional at all in children's word combinations, or suddenly becoming fully functional at some given moment.

This means that the learning curves obtained do not support the notion that a verb category or the syntactic subject or direct object categories emerge all at once at any point during the investigated period, as a result of the triggering of innate syntactic knowledge. The most convincing counter-evidence comes from the comparison of the SVO and the VO growth curves, which have essentially a highly similar shape in both children. There is no indication that the later SVO pattern is acquired instantaneously or even considerably faster than the earlier VO pattern, as should be the case if there were an immediate transfer of knowledge from the first verb or verbs, to other verbs that are eligible to participate in the relevant construction; learning is gradual rather than instant. If it were true that later-acquired syntactic rules make use of the innate concepts previously triggered, we should see a much faster rate of acquisition of the SVO format. In the case of the SVO construction, whatever initial learning takes place on a lexical-individual basis, this new knowledge should be immediately applicable to all the transitive verbs that the children already possess; in the Travis corpus, by the time the first SVO is produced, there have been about 25 different verbs in VO combinations, and on an innatist hypothesis, she should by then possess an already-triggered verb (or maybe transitive verb) abstract construct. Instead, the emergence of the SVO pattern is no less gradual than that of the earlier VO. Ruti's data shows a similar pattern.

On the other hand, the results do not seem to support a radical lexicalist model such as Tomasello's (1992) verb island hypothesis, according to which at this period of development each verb develops its syntactic combinatory patterns independently of other verbs, by the means of expansional or combinatory processes that do not take input from whatever else is happening

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TABLE 2. *Distribution of the first two verbs appearing in VO combinations in the sample* ($n = 16$)

Verbs		Number of children ($n = 16$)
Hebrew	English	
RACA	WANT	13
LAKAX	TAKE	4
NATAN	GIVE	4
ASA	MAKE/DO	3
HEVI	BRING	2
—	FIND	1
—	GET	1
RA'A	SEE	1
SHAMA	HEAR	1
AXAL	EAT	1
SHATA	DRINK	1

TABLE 3. *Distribution of the first two verbs appearing in SVO combinations in the sample* ($n = 13$)

Verbs		Number of children ($n = 13$)
Hebrew	English	
RACA	WANT	9
ASA	MAKE/DO	6
AXAL	EAT	2
SHATA	DRINK	1
HEXIN	PREPARE	1
BANA	BUILD	1
CIYER	DRAW	1
LAKAX	TAKE	1
SAM	PUT	1
SAGAR	CLOSE	1
—	RIDE	1
YEXOL	CAN	1
MARSHE	ALLOW	1

in the child's linguistic system. Rather, as we saw, there is apparently a great deal of facilitation or generalization from one verb to another in the process of learning a new combinatorial rule. Such facilitation must be based on some more general knowledge beyond the lexeme-specific individual positioning pattern for the verb's own semantic agent or object complement.

These results raise the possibility that acquisition of syntactic patterns proceeds in general on two levels: the lexical-specific and the general-abstract. Learning occurs on both levels simultaneously: each positional pattern is lexical-specific and at the same time, teaches the child something

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general about the pattern itself that can transfer to other candidate verbs for the same combinatorial format. The amount of abstract knowledge the child adds when learning each verb in the positional pattern can be estimated by the amount of facilitation contributed by each verb. Although this is counter-intuitive, the most facilitation is provided by the first verb, and the marginal improvement added by each individual verb gets progressively less the more verbs the child learns. It took these children an inestimably long time to produce the first VO or SVO combination, but once they did it, the second verb followed after an average of 40-odd days. Although the intervals continued to shorten with each new verb, the greatest reduction in learning time is from not knowing even one verb in these combinations, to already knowing one single verb. What we thought was an inordinately LONG time until the second verb arrived, was in reality a much SHORTER time than it took to start producing VO or SVO combinations in the first place.

Inspection of the learning curves in Figures 1 and 2 reveals that most of the massive facilitation is provided by the first and second verbs in each type of word-combination, and that even the third verb already has a very small additional facilitating effect. This implies that most of the general or abstract knowledge about the VO and the SVO positional patterns are acquired in the context of the first two combining verbs in each pattern. Apparently, breaking into a new syntactic combination means solving the conceptual problems associated with that pattern once and for all. This puts a heavy burden on the first two verbs, as they must provide strongly prototypical instances of the relevant combinatorial patterns.

Part 2. The earliest combining verbs and the core semantics of transitivity

The question we shall turn to now is the following: what are the two earliest combining verbs, and what can be learned from them about the nature of VO and SVO transitivity?

The first verbs in transitive word-combinations. Table 2 presents the distribution of the verbs that were the first two verbs to appear in VO combinations, in the 16 longitudinally observed children. As Travis is acquiring English and not Hebrew as the other 15 children, the table lists Travis's first two verbs in the English column, which contains glosses of the Hebrew words for the other children.

There was a great deal of overlap in the starting verbs of the different children: only 11 different verbs accounted for the 32 verbs used by the sample as their first two VO-verbs. In 13 out of the 16 children, *raca* 'want', was either the first or the second verb to get a post-verbal DO; other relatively frequent verbs were *lakax* 'take' and *natan* 'give'. Inspection of Appendix A reveals that every child had at least one of the following group of verbs as one of his or her first VO-verbs: *want*, *get*, *give*, *take*, *bring*, *find*. These 'obtaining' verbs account for 78·1% of all VO verbs. In addition,

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three children used the Hebrew verb *asa* which is a pro-verb meaning both *make* and *do*; it was used in verbal collocations such as '*to make BM*'. Less frequently used verbs were the Hebrew equivalents of *see* and *hear*, namely, verbs of perception, and of *eat* and *drink*, namely, verbs of ingestion or consumption.

Of the 16 very first VO utterances produced by these children, 15 (93·75%) were requests, and of the first two different VO constructions, 27 of the total 32 (84·4%) were requests. Almost without exception, these utterances expressed the child's desire for an object she did not have. If we want to define the basic scene for the production of the earliest VO utterances, the scene consists of a child who does not have the named object in her possession, who does not act on the object in any way, does not manipulate it, nor affect its state, and whose only actual action is the production of a speech act naming the relevant object as the object of desire. The semantic relation expressed by the first VO combinations is not that of a voluntary dynamic action upon the object affected by that action, as predicted by Pinker's (1984) theory of innate syntax–semantics linking rules.

Table 3 presents the distribution of the first two verbs to appear in SVO combinations, for the 13 children who produced SVO sentences during the observed period. There are 27 such verbs instead of the expected 26, as two children contributed 3 verbs each because of tied developmental ordering, and one child produced only one verb in an SVO pattern before observations ended (see Appendix B).

The set of verbs which are produced early in SVO constructions is similar to the verbs produced early in VO constructions. As before, the Hebrew equivalents of *want* and *make/do* are the most frequently used, with *eat* following. However, the relative frequency of these verbs is different for SVO. Indeed, most of the set of 'obtaining' verbs such as *get*, *give*, *bring*, *find* do not occur as SVO verbs. The share of the remaining verbs of this group, *want* and *take*, is only 37% of all verbs produced by the children, compared to the 78·1% which was the total share of the 'obtaining' verbs in the VO set. The set of verbs to do with creating, namely, *make/do*, *prepare*, *build*, *draw* increases by three verbs, and its share increases to 33·3% of all verbs produced; in the VO set these accounted for only 9·4% of all verbs. The proportion of all verbs to do with consumption, namely, *eat* and *drink*, also increases from 6·2% in the VO-set to 11·1%. In addition, there are in the SVO-set some modals (*marsha* 'allow', *yexola* 'able') and some other verbs not in the VO-set, each used by only a single child.

The utterances generated with these verbs were less likely to be requests than the emerging VO utterances: only 25·9% of the first two utterances (7 of 27) were requests for an object the children wanted, the rest were descriptive statements. The most frequent and typical SVO utterance (12 or 44·4%) was a description of a scene to do with the creation and consumption of objects.

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Only three utterances (11·1 %) depicted an active manipulative scene where the direct object is an object affected by the action referred to by the verb, using *put*, *ride* and *close*. Even these utterances are close semantically to the 'obtaining' and 'creating' sentences, as *put* was used to describe the mother's giving the child a blanket by placing it on her; *ride* described a puppet 'possessing' a horse by mounting it; and *close* described the turning off of the television set by the father so that he 'un-created' the pictures on the screen.

To conclude, children use as their first two VO verbs one of a small group of verbs, including one of the 'obtaining' verbs *want*, *get*, *give*, *take*, *bring*, *find* plus, less frequently, *make/do*, the 'perception' verbs *see* and *hear*, and the 'ingestion' verbs *eat* and *drink*. A similar phenomenon occurs also with the first SVO-verbs, with the 'obtaining'-verb *want*, the 'creation'-verbs *make/do*, *prepare*, *build*, *draw*, and the 'consumption'-verbs *eat* and *drink* as the common core.

Comparison of the first combining verbs for VO and SVO in individual children

Regardless of the general overlap between the starting-verbs of VO and SVO for the group as a whole, individual children do not initiate their VO and SVO patterns with the same two verbs in the same order. Of the 13 children who produced SVO combinations during the observed period, only 5 (38·5 %) started SVO with the same verb as VO. One child had an SVO sentence as her first VO sentence; omitting this case from the statistics decreases the overlap to 33·3 %. Similarly, among the 12 children producing SVO with a second verb, only two (16·7 %) used the same verb as her second VO verb. In sum, the order of the first SVO verbs did not replicate the order of the first verbs produced in the VO pattern.

More than that: most children did not even use their first SVO verbs in VO sentences previously to the emergence of SVO. SVO emerges months later than VO in this sample, but only a minority (4 children) generated the first SVO combination by the extension of an existing VO pattern. The majority of children (9) used new verbs which they immediately started combining in the SVO pattern, rather than first generating VO sentences with them. There is no inherent reason why these verbs could not have been used in a VO pattern; three were *want* and four, *make/do*. Other children did use these verbs in VO combinations, even in their very first. These results show that most children do not develop SVO constructions strictly on the basis of the VO positional pattern of particular verbs. If there is some transfer of learning from the already-established VO pattern to the new SVO construction, it does not seem in most cases to consist of using the lexically specific information about individual verbs and their positional patterns, and extending the latter to include another positional slot for the subject. Given the pattern of results, there are two choices. We can either conclude that the

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learning of SVO proceeds in the majority of cases completely independently of the VO construction which is by then well-established in children's productive grammars. Or, if that option seems unlikely, we may conclude that in learning SVO, children make use of some generalized knowledge accumulated while learning the VO-pattern, rather than building the new construction on strictly lexical-specific formats. Such generalized knowledge is claimed in this paper to account for the pattern of temporal facilitation within the developmental history of the VO pattern. The same generalized and hence transferrable knowledge about how to build VO combinations is apparently what serves as the foundation on which children start to learn the production of SVO. Given the general nature of this knowledge, the verbs that start SVO do not have to be strictly identical to the verbs that already combine in the VO pattern in order for the knowledge to be transferred. However, it certainly helps transfer of knowledge if the new items are similar to the old ones, and this is apparently the case with the first SVO verbs relative to the verbs already combining in VO patterns.

Factors determining the choice of the first verbs in VO and SVO combinations

The similarity among the starting VO and SVO verbs of different children, but the difference between the first VO and the first SVO verbs of individual children suggest that there is a group of favourite transitive verbs which are used by children to start either VO or SVO combinations, but there does not exist a single factor that determines for a particular child which verb will start both VO and SVO combinations. For example, it could have been the case that the most frequently modelled transitive verb in the input to a particular child is the first verb with which that child begins both VO and SVO word combinations. Such an overall frequency effect can not account for the data at all, as children do not start VO and SVO with the same verbs in the same order.

Another possibility is that all verbs occurring in VO combinations in the input form one candidate group, and all SVO verbs, another candidate group for acquisition in combinations, and that children choose the first verbs according to their relative frequency in the input among these specific candidate verbs. For example, the VO group could be all transitive verbs occurring in two-word VO imperatives, and the SVO group, all transitive verbs occurring in three-word descriptive utterances. Whether the actual verbs chosen by each child are the most frequently modelled verbs in the VO or the SVO pattern in the input is at presently unknown, but it is possible to evaluate this likelihood by looking at some examples. Travis's choice of *get it* as her first VO verb and of *made* as her first SVO verb is quite typical of these children's choices, the first as it is an 'obtaining' verb, the second, a 'creation' verb. However, checking Tomasello's notes on her parents' speech

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does not indicate that either of these verbs were especially frequently modelled by them. *Get it* was used by them as a response to Travis' expressed desire for an object ('You go get it') or when the phone was ringing ('I'll get it', 1992:304). *Made* was used in sentences like '— made that' (p. 297). From these descriptions, it is unlikely that either verb was more frequently used than *want*, which is mentioned in very many of the parental-model examples, for instance, 'Do you want some more?' (p. 290); 'Do you want to — again?' (p. 298); 'Do you want to do it?'(p. 298); 'Do you want to come with me?' (p. 299), 'Do you want to do it too?' (p. 299), 'Do you want to do it yourself?' (p. 302); 'Do you want that back?' (p. 307) and so on. Nevertheless, Travis did not use *want* as her first VO or her first SVO verb, and actually she did not use *want* at all until 6 months after she started VO combinations. Apparently, high frequency in the input is not a sufficient condition for a particular verb to be selected as the first or second verb in VO and SVO transitive word combinations.

High frequency may however by a necessary condition: none of the verbs chosen by the sample as starting verbs are low-frequency verbs in the language. In addition, Ingham (1993/94) reported on the maternal input to one child acquiring transitive word combinations in English, and the verbs *want*, *like*, *do*, *find*, *need*, *see*, *get*, *read*, *eat* and *close* were, in this order, the most frequent verbs in the VO pattern. Similarly, in a large sample of Hebrew-speaking mothers, the most frequently used transitive verbs in combination were the Hebrew equivalents of *want*, *make/do*, *put*, *bring*, *give*, *see*, *say* and *take*. *Raca* 'want' and *asa* 'make/do' were in particular extremely frequent in the input speech.[3] Although more descriptive data is needed, it seems safe to conclude that the starting-verbs for VO and SVO in our sample are indeed high-frequency verbs in parental input speech.

The data can be best summarized by the following generalizations:

(a) The starting-verbs for VO and SVO belong to a group of high-frequency favourites, in particular *want* and *make/do*, but also *give*, *take*, *find*, *eat*, *drink*, *see* and *hear* and so on.

(b) There is an ordering of preference among these verbs, with *want* the most favoured and *make/do* the second, and the others, less preferred, but this is a group-statistical ordering, not within individual children.

[3] These estimates of the relative frequency of various verb roots in the multiword input are based on a search in a computerized database of transcriptions of videotaped home observations of 48 Hebrew speaking mothers addressing their 10–32 month old children (Ninio, 1984). These mothers produced a total of 21,966 utterances in which transitive verbs occurred in multiword combinations of any kind. The most frequently used transitive verbs in word combinations were the following: raca 'want': 3261 utterances (14·9% of all utterances, pooled over 48 mothers); *asa* 'do/make': 2922 (13·3%); *sam* 'put': 1932 (8·8%); *hevi* 'bring': 1153 (5·3%); *ra'a* 'see': 1107 (5·0%); *natan* 'give': 1000 (4·6%); *higid* 'say': 554 (2·5%); *sixek* 'play': 419 (1·9%); total of the eight most frequent verb roots: 12,348 (56·2%).

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There is not a single child who starts VO with *want* followed by *make/do* and also starts SVO with the same two verbs in the same order.

(c) VO is biased to begin with 'obtaining' verbs; SVO, with verbs of creation and consumption, but these biases are not absolute.

(d) Children do not repeat in the first two SVO verbs the order of the first two VO verbs, and mostly start SVO with a verb they did not start VO with.

The best interpretation of these results is that there is a SINGLE group of favourite transitive verbs that tend to serve as the starting verbs for VO and for SVO. Children sample them mostly without replacement for VO and for SVO, in accordance with the preferences and biases noted above. Within these constraints, which of the candidate verbs will actually start VO or SVO-combinations seem arbitrary, and it is probably due to accidents of especially transparent modelling events and the like (see Nelson, 1987). Namely, the most frequently modelled verbs may be passed over in acquisition, as long as the first verbs belong to the 'correct' set of transitive verbs.

Generic transitivity as the major characteristics of early-combining transitive verbs

We saw that the set of transitive verbs most likely to be acquired early are all rather basic, frequent verbs; they also encode meanings which are pragmatically important for young children to express in their own utterances. They certainly answer to the description of general purpose, or semantically light verbs, which, according to Clark (1978) begin acquisition before more specific verbs are acquired.

Important as these features are, there is another, very striking characteristic shared by the first transitive verbs acquired by children. Crosslinguistic evidence suggests that these verbs may be no less than GENERIC transitive verbs. The coincidence is striking: children use as their pathbreaking transitive verbs the very same verbs that we find utilized for the grammaticalization of the transitivity construct, in languages that utilize some closed-class or bound-morpheme verbs to express in the required contexts a transitive action–object relation. These are auxiliary verbs, or bound morphemes derived from verb-stems, serving a transitivity-establishing, defining or enhancing function in many different languages and language-families of the world. They surface as typical verb-transitivizers, bound-verb verbalizers on nouns, extension-markers and so forth, namely, verbs serving to establish the grammatical role of the Direct Object, or to define or redefine the argument-structure of other verbs as transitive. In many languages these verbs undergo reanalysis as grammatical morphemes, with the semantic

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bleaching typical of grammaticalization, and thus come to represent 'pure transitivity' rather than their own specific semantics.

Examples of closed-class or bound-morphemic verb roots expressing verb–object relations include the following:

(1) The transitive proverb-auxiliaries of Indo-European languages, e.g. *make/do* or *have*; as well as the obligatory transitive auxiliaries of many languages belonging to Native American, North Australian, Oceanic or New Guinea language families, mainly *make/do*, but also *take*, *bring*, *carry*, *hit*, *put*, *see*, *consume* (e.g. Dixon, 1980).

(2) The verbs participating in expanded predicate or idiomatic verb–object constructions in Indo-European, Semitic and other languages, called 'colourless verbs' in the context of Persian, e.g. *do*, *give*, *have*, *make*, *take*, *get*, *put*, *pay* (e.g. Quirk, Greenbaum, Leech & Svartvik, 1985).

(3) The dependent verb roots or bound-morpheme noun-verbalizers of many languages such as S. Paiute, Classical Nahuatl, Yana, Algonquian languages, Eskimo, Quileute, Salish languages, Wakashan languages, Malay, Chukchee, Yukaghir, Dyirbal and other Australian languages, e.g. *make-build*, *have*, *get*, *want/need*, *consume*, *look-for* (e.g. Comrie, 1985).

(4) The 'desiderative' bound-verbal element that transitivizes the verbal stem (basically a verbal noun) to which it is added in various languages, such as Innuit Eskimo, Luiseño and Kamchadal; for example *want* or *need* (e.g. Bybee, 1985).

(5) The verbs used to add a patient to otherwise intransitive verbs, or to highlight the patient of transitive verbs in the serial-verb constructions of Tibeto-Burman, Mon-Khmer, Austro-Tai, New Guinea, Austronesian, Muskogean, or the West African Niger-Cordofanian languages such as Kwa, Gur, Bantoid and so on, e.g. *take* which is the prototypical patient-introducer in most languages, but also *carry*, *put*, *get*, *have*, and so forth (e.g. Lord, 1982).

(6) The verbs used to add a beneficiary to intransitive and monotransitive verbs in many languages, for example in Micronesian languages (Jacobs, 1976), e.g. *give* which is the prototypical recipient-introducer cross-linguistically.

(7) The verbal-extension affixes of polysynthetic languages which are derived from the verb stems for *give*, *take* and so on, used to redefine the argument-structure of the verb in Cahuilla, Coeur d'Alene, Nez Perce, Klamath, New Guinea languages and more (e.g. Foley & Olson, 1985).

(8) The Indo-Iranian (e.g. Hindi) 'vector verbs' that add a sense of High Transitivity to already transitive verbs, namely, a sense of full

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affectedness of the patient, e.g. *give*, *take*, *throw*, *let-go*, *strike* etc, (Hook, 1991), and so on. Many of these verbs have undergone full grammaticalization into adpositions, casemarkers, particles or bound verbal affixes (e.g. Blake, 1994; Givon, 1975; Lord, 1982). Others are intermediate between full verbs and auxiliaries (e.g. Hindi 'vector verbs', Hopper & Traugott, 1993).

As Blake (1994), Foley & Olson (1985), Givon (1991), Lord (1982), Traugott & Heine (1991) and others have noted repeatedly, there is an extraordinary degree of overlap in the lexical items which are candidates for undergoing grammaticalization in general, and in the set used for establishing verb–patient relations in different languages, in particular. Over and over, the verbs *want*, *make/do*, *have*, *take*, *give*, *get*, *bring*, *hold*, *put*, *see*, *consume*, and so on, are used as transitivity-defining morphemes. The grammaticalization evidence suggests that these verbs express a fundamental, inalienable, core notion of transitivity, one that can be made use of when such a semantic-syntactic component is needed in a clause that otherwise does not possess it.

Moreover, the grammaticalization evidence also suggests that the relevant verbs express this notion of transitivity in some manner which is closer to the surface than in other transitive verbs. Grammaticalized lexemes have to undergo semantic bleaching in order to be applicable to a wide range of different contexts, and the more specific the original semantics of a verb, the less likely it is that the verb would be a good candidate for grammaticalization. This means that the verbs we are concerned with tend to have extremely general meanings; most of their semantics consists of some schematic notion of transitivity, with the addition of a minimal specific element. This is what makes them into, relatively speaking, the most GENERIC transitive verbs available in languages. This generic feature is of course only relative, because these verbs do have specific semantics; moreover, it is well documented that they tend to keep some of their non-generic semantics even under grammaticalization, a phenomenon known as 'persistence' in the literature (e.g. Hopper & Traugott, 1993). Nevertheless, the component of meaning equivalent to the possession of a transitive argument-structure overlaps with their semantics to such a degree that grammaticalization is a possibility.[4] Among all other verbs, they represent in the purest way the core notion of syntactic transitivity.

[4] The phenomenon reported for transitive verbs is equally valid in the case of intransitive verbs. For example, in a cross-sectional sample of children, 1;6, the intransitive verb–subject combinations produced by the greatest number of children used the roots *go* and *fall*; the equivalents of one or the other of these verbs typically serve as grammaticalized intransitive auxiliaries e.g. in Chinook (Silverstein, 1972); generalized prepositions, e.g. in Kwakiutl (Boas, 1947); locative extension-markers, e.g. in Mandarin (Li & Thompson, 1981); or bases for compound verbs, e.g. in Ungarinyin (a non-Pama Nyungan language of North Australia, Dixon, 1980). Due to space limitations, the subject will not be further treated in the present paper, but see Ninio (in press).

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In Hebrew and English, these generic transitive verbs are only semi-grammaticalized, as they are all free lexemes. However, even in these languages there are grammaticalized uses for these verbs, such as *do* serving as an auxiliary and pro-verb, and *take*, *get*, *make* and so forth serving as pivots of idiomatic verb–object constructions. These uses increase the frequency of the relevant verbs in speech; but in any case, frequency is a condition for grammaticalization. As Traugott & Heine (1991) say:

> 'Given that a form A is a candidate for grammaticalization both because of its semantic content and its salience, a further condition has to apply for grammaticalization to take place: The form has to be used frequently. The more grammaticalized a form, the more frequent it is (Bybee *et al.*, Givon on serial verbs, Hook). The seeds of grammaticalisation are therefore in a correlated set of phenomena: Semantic suitability, salience, and frequency. Only the third actually leads to grammaticalization and hence to fixing, freezing, idiomatization, etc.'

The complex of features consisting of semantic suitability, salience, and frequency is apparently also the reason why children start transitive word-combinations with these generic verbs.

The concept of Core Transitivity evidenced by the early-combining transitive verbs and by grammaticalized markers of transitivity

We have seen that children's earliest combining transitive verbs overlap to an amazing degree with the verb stems typically used as grammaticalized markers of transitivity in various languages of the world.[5] This finding lends direct support to Slobin's (1985, 1997) claim that Basic Child Grammar is built on a stock of fundamental 'grammaticalizable concepts'. The question is, what does the relevant core concept of transitivity consist of?

The first candidate is Hopper & Thompson's (1980) well-known notion of High Transitivity, which is often taken as synonymous with prototypical

[5] Hollebrandse & van Hout (1994) found that four children acquiring Dutch used a similar set of verbs to produce idiomatic verb–object combinations such as 'give a kiss' or 'make photo' at some relatively early stage of development. Their subjects seemed to prefer these verbal collocations to their full verb variants, e.g. 'make a drawing' was preferred over 'draw' (p. 83). The production of such 'light verb constructions', as the authors call them, seems to be a related yet distinct phenomenon from the earliest verb–object combinations discussed in the present paper that were on the whole regular verb–object noun combinations. Three of the Dutch children, the ones that produced most of these collocations, were considerably older than the children of the present study, between 2;4 and 3;10; they also had an MLU of about 2·30 at the relevant period and thus were a long way from their earliest verb–object combinations. The fourth child who was at a comparable developmental stage as the present sample produced very few 'light verb' combinations, similar to the sample reported here. Nevertheless, the Dutch study is relevant to the present study in that it suggests that children can make relatively early use of the semi-auxiliary potential of verbs such as *make* or *give* to creatively generate novel verbal collocations, a point emphasized by the authors.

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transitivity. According to Hopper & Thompson, the meanings universally expressed by highly transitive sentences are depictions of dynamic active events, involving a volitional actor acting on a highly affected object. The activity is said to be 'carried-over' or 'transferred' from an agent to a patient. It seems an obvious developmental hypothesis that children start acquisition with the prototypical members of the adult construction, and indeed Goldberg (1995) predicted on these grounds that children's first transitive word combinations in languages like English should express semantic High Transitivity. This prediction is similar to Pinker's (1984) expectation that the first VO or SVO combinations possess active semantics. Goldberg bases her prediction on Slobin's work (e.g. 1985) which is an exploration of the conditions under which transitive clauses first get overt morphological marking in children's speech. Such markings are, for example, accusative inflections (in Hungarian, Turkish, Russian or Polish), direct object marking prepositions (as in Hebrew), or ergative markers for the agent nominal (as in Kaluli). In summarizing literature on this latter phenomenon, Slobin concluded that children first use grammatical morphemes expressing transitivity in discussing a 'prototypical transitive event' or 'a prototypical manipulative activity scene', one exhibiting what Hopper & Thompson (1980, 1984) have identified as High Transitivity. Slobin (as well as Hopper & Thompson) were concerned with identifying the conditions under which a clause is explicitly marked as highly transitive; developmentally, such markings may emerge later than the first word combinations of verbs with direct objects (e.g. in Kaluli, Schieffelin, 1985, or Korean, Clancy, in press, where the first direct objects in verb–object combinations lack casemaking). Goldberg, however, believes that Slobin's findings directly carry over to early syntax in a language lacking morphological markers of transitivity such as English, so that the earliest lexically expressed transitive arguments are also expected to be produced when the sentence describes a basic 'manipulative activity scene' (Goldberg 1995).[6]

However, the results of the present study do not support this hypothesis. An examination of the set of transitive verbs most likely to be acquired early, and the utterances they are used in with direct-object complements, immediately reveals that they do NOT have High Transitivity. As we saw above, the basic event underlying children's first transitive sentences does not consist of the performance of a dynamic action on a highly affected object, but rather, of a request to obtain an object the speaker does not at present

[6] Take note however that in his more recent work (e.g. 1997) Slobin reduced somewhat the functional load he is placing on the Prototypical Scenes of his earlier work. He now believes that children's grammaticalized notions probably have as their conceptual starting point a combination of 'prototypical scenes' and of language-specific categories that the child picks up directly from his or her own language environment from the very start. This added complexity in Slobin's recent thinking does not effect of course the use that Goldberg makes of his work of eg. 1985.

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possess. The most prominent early combining transitive verb, *want*, is not even an active but a stative verb. In general, the earliest combining transitive verbs do not have highly affected objects even when they depict completed actions and not requested ones. The group of 'obtaining' verbs that includes, in addition to *want*, also *get*, *give*, *take*, *bring* and *find*, refer to events in which the objects are minimally affected: typically, they merely change temporary possessor. The 'creation' verbs *make*, *do*, *draw* and so on do not have affected objects but objects created in the action. The 'perception' verbs *see* and *hear* (which are stative verbs) have objects which are the source of perception but not otherwise affected. Lastly, the 'ingestion' verb *eat* and *drink* have objects which are consumed, not affected by an action. None of these verbs resemble in their semantics the typical highly transitive verbs such as *kill*, *break*, *burn*, *cut*, *freeze*, *roll*, *clean* and so on, which involve a highly active subject who changes the state of an object by the act. Indeed, most of children's early combining verbs belong to what is usually called a class of 'possessive' or 'ingestive' verbs. These lexical types of verbs are distinguished formally in many languages by the kind of the resultative construction into which they enter; for details see Nedjalkov (1988). Nedjalkov & Jaxontov (1988) characterize 'possessive' verbs as transitive verbs that 'describe situations changing (mostly or exclusively) the state of the underlying subject rather than the object of the action'. In addition, as Golovko (1988) points out, 'possessive' verbs imply 'a very low degree of subject's activity; the subject takes hold of an object, keeps it, etc'. Children thus start transitive word combinations with verbs that involve a not very active subject whose change of state is the essence of the event.

What becomes intriguing now is that the same semantic profile is shared by the set of verbs typically grammaticalized as transitivity-inducers: the prototypical object introducers such as *take* or *give* are no more 'highly transitive' than children's early verbs. These results are rather surprising. Hopper & Thompson's concept of High Transitivity is usually considered to define prototypical transitivity; but neither the developmental nor the grammaticalization evidence supports this conception.

The question is, if not High Transitivity, what then is the notion of transitivity or verb–patient relations that is so close to the core of concept that languages use it to mark transitivity, and so salient for children that they start acquisition with it?

High transitivity and inalienable transitivity

Returning to Hopper & Thompson, it appears that this 'core' type of transitivity may be the exact opposite of what they call High Transitivity. The reason for this is not hard to find. The very first criterion for the phenomenon that they are trying to characterize is that there is an overt and obligatory morphological marking of the transitive verb–patient relation in

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the clause, either on the verb or, in the form of case-marking, on the agent or patient nominal (Hopper & Thompson, 1980). But this means that they take a MARKED transitivity relation as their core prototype; their work is the study of MARKED TRANSITIVITY. Linguistic practice would then guide us to look for the features of the UNMARKED case as the more basic.

As an illustration, let us look at one of Hopper & Thompson's examples of a marker of high transitivity. They demonstrate that in Spanish, human or human-like object nominals (which also need to be definite and referential) are marked by a special preposition *a*. Inanimate objects are not so marked. Now on any theory of linguistic markedness, it is the unusual or unexpected instance which is marked; the prototypical and expected instance is unmarked. Indeed, according to Silverstein's study of split casemarking (1976; and see also Blake, 1994), proper nouns and common nouns referring to humans are the least likely among nouns to get overt marking for agentivity (e.g. ergative case-marking in split-casemarking languages); but they are the most likely to get accusative marking if patients in accusative and split-casemarking languages. The typical agent is human; the typical patient is inanimate; an overturning of these expectations is what triggers overt marking of the unusual grammatical and semantic role. Hence, what Hopper & Thompson consider an example of High Transitivity in Spanish, is in actuality a transitive clause with a marker for a LESS typical transitive-object.

If High Transitivity or 'marked transitivity' is just that, the unusual and non-prototypical MARKED case of transitivity, it follows that a transitive clause scoring 'low' on Hopper & Thompson's criteria of transitivity is the UNMARKED or basic case. Such a clause may not be one that involves an activity 'carried-over' or 'transferred' from an agent to a patient; it may involve stative or non-action verbs such as *want*; the actions may be atelic, namely ones not provided with an endpoint such as *make noise*; the actions may be inherently ongoing and non-punctual actions like *carry*; the actions may be by non-volitional agents such as *like*; the clauses may be negated rather than affirmed; the mode may involve 'irrealis' encoding of events (future, imperative, desiderative, etc.) rather than 'realis' (indicative mode); the agent participants may be low in agency such as with *wish*; the patient may be relatively unaffected by the action, namely, the patient may be one which is not 'completely affected' or 'disposed of'; it may be moved, or it may change possessor, but it will not be inherently changed; the object-patient may be relatively non-individuated, i.e. the referent of a common noun, of an inanimate noun, of an abstract noun, of a plural, mass or non-referential nominal expression.

According to the crosslinguistic facts presented by Hopper & Thompson, transitive clauses exhibiting Unmarked Transitivity may be formally marked by the immediate adjacency of the patient nominal to the verb stem, and by the absence of the formal morphological markings used to signal High

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Transitivity. The only criterion of 'high' transitivity that these clauses seem to fulfil rigorously is that the clause should explicitly (lexically) encode the patient participant.

Review of the criteria for Unmarked Transitivity raises the possibility that the core concept underlying it is the notion of transitive VALENCY itself, or Inalienable Transitivity of the verb. In the absence of any special reason for highlighting the patient, in the absence of individuated patients and highly volitional agents, realis description or perfective aspect, and in the absence of any special marking on the verb or on the agent and patient nominals – the patient is still inalienable from the verb, in the deepest semantic sense. And the reason is simply that the semantics of the verb imply the patient, always and under all circumstances of using the verb for different pragmatic purposes. When a speaker does not want to foreground the patient but merely to use the verb in some utterance, the patient is also, by necessity, part of that utterance, even if some languages allow it not to be explicitly expressed in some circumstances.

Apparently, some verbs such as *take*, *give*, *hold*, *carry* and so forth, have a stronger inherent tie with their direct object arguments than other verbs which describe agent-controlled actions with a greater impact on the patient. The former verbs describe a person making contact with, relinquishing contact with, or else keeping in his or her possession, an object; the concepts expressed deal with a fundamental fact of the interaction of the human and the object participants, which cannot be further decomposed. The same applies to *make* or *do* as verbs depicting the creation of an object or an 'object of result', as in 'make noise' or 'do a handstand'. But notice: a verb depicting an action with an inalienable direct object does not describe an action which is 'transferred' or 'carried over' from the agent to the patient. This latter notion only applies to verbs that describe, at the same time, a human action and the change of state resulting from it, for instance, *break* or *kill*. The feeling that the action is somehow 'transferred' to the patient arises because the verb explicitly expresses the change of state of the patient; but, precisely for this reason, these verbs are not naturally transitive. Rather, in many languages such verbs are derived causatives, based on basic intransitive verbs describing the change of state of the patient without implying the involvement of an agent in the event (see Comrie, 1985 for a review).

Instead of High Transitivity and a dynamic action affecting an object, the semantics of the earliest combining verbs and of the grammaticalized inducers of transitivity seem to revolve around what in a different context is called 'object relations' (Klein, 1957). All these verbs deal with the literal and metaphoric ingestion and ejection of an object by a human being. The 'obtaining' verbs depict a person taking temporary possession of an object, or bringing it within the personal domain. The 'consumption' verbs depict a person physically ingesting an object, and the 'perception' verbs depict a

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kind of mental ingestion. Finally, the 'creation' verbs depict the physical or metaphorical discharge of an object from the body or person of a human being.

It is important to note that the objects involved in these actions are not inalienably possessed objects like body parts. They are, rather, separate objects that potentially can be possessed or ingested, but not necessarily so; these objects have an existence independent of the person, and thus their movement 'inside' and 'outside' the person or the personal domain is a source of tension and noteworthiness. These verbs thus describe the most significant actions that a human being can perform on a separate, autonomous object: inclusion in, and exclusion from, the personal. Because the objects are inherently autonomous, simply taking hold of them counts as an act of profound meaningfulness. 'Take hold of' is indeed the original sense of the Mandarin accusative marker *ba* which is used to signal that an object is 'completely affected' by the depicted action (Li & Thompson, 1981). Apparently, the key notion of object affectedness that gets grammaticalized is one taken from a human perspective, namely, a change of status *vis à vis* a person, and not from a purely objective viewpoint, as a change of physical state would be. Thus, on the developmental as well as the grammaticalization evidence, 'object relations' are the prototypical concepts underlying syntactic transitivity.

This conclusion is strongly reminiscent of an analysis of developmental findings regarding children's use of English personal pronouns by Budwig (1989, 1995). Budwig suggested that children at the onset of word combinations incorporate in their definition of the concept of prototypical agentivity not only direct physical action but also attempts to persuade others to act on their behalf, as well as other communicative acts aiming to get control over objects. As in the present analysis, the children investigated by Budwig apparently used a subjective, human perspective for defining agentivity as the performance of all meaningful actions that bring about a change in the environment, rather than adopting an objective, physics oriented perspective in which agentivity necessarily implies an actual overt motor act that causes a physical change in some object. The difference between Budwig's approach and the present one is that Budwig thought that this definition of agentivity is a temporary and developmentally immature stage, so that later on children converge on the adult prototype of agentivity, defined as consisting of volitionally acting causers. The present approach emphasizes that young children's concept of the prototypical semantic core of transitivity as 'object relations' is identical to the adult prototype, judging from the grammaticalization evidence. Indeed, it is quite possible that the children Budwig observed may have improved their control of the English pronominal system without at the same time altering their basic concept of agentivity.

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Returning to the choice of the verbs beginning transitive word combinations, it seems that verb stems expressing object relations have an unusually strong transitive syntactic valency, in the sense that they tend to be consistently transitive rather than labile.[7] The reason is their semantics: they exist in the lexicon to depict person–object relations, and neither of the participants is cancellable. We might contrast these verbs with other transitive verbs that imply a more active subject or a stronger physical impact on the patient object but which are less inherently transitive. Some like *push* or *kick* can be alternatively conceptualized as agentive intransitive events, as they involve a conspicuous motor act by a person. Others like *break* or *open* can be alternatively conceptualized as patientive intransitive events, because they depict a change of state of the object which can potentially happen without human involvement or causation. By contrast, the object relation verbs like *get* or *take* depict a basic human–object transaction that is hard to reduce to an agentive or patientive description. Strong inherent transitive valency and little specific semantics is what turns these verbs into generic, prototypical transitive verbs.

CONCLUSION

The results of this study suggest that children learn new combinatorial rules first for a few verbs in a piecemeal way, but immediately begin transferring some more general and abstract principle to other verbs so that applying the same combinatory principle to new verbs becomes progressively easier. This process is equivalent to the gradual consolidation of an abstract grammatical relation such as the verb–object relation, as well as to the consolidation of a similarity-class of verbs to which the relevant principle applies, namely, a lexical form-class which is relative to, and specific to, the syntactic rule applying to its members.

Apparently, the source of the generalizable knowledge is the first two or three verbs that combine in a novel syntactic pattern. These verbs tend to be generic verbs that express the relevant combinatorial property in a relatively undiluted fashion. Thus the earliest lexical-specific transitive concepts are the most general lexical concepts possible. The specific pathbreaking verbs may vary with each major step in syntactic development; for each step there

[7] Consistently transitive modelling of 'object relations' verbs by adults (e.g. Ingham, 1993/94) may be a serious contributing reason why children acquiring English learn to produce these verbs early in transitive constellations. However, searching through transcriptions of videotaped home observations (Ninio, 1984) revealed that Hebrew speaking mothers quite often omit the direct object in utterances with the favourite starting verbs for VO such as *roce* 'want', *kax* 'take', or *ten* 'give'. This inconsistent usage which is quite acceptable in Hebrew does not reduce the popularity of these verbs as the earliest in combination. Apparently, optional direct object omission in contextually transparent circumstances, in a language that allows it, does not impair the conceptualization of these verbs as inherently transitive.

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may be some verbs which represent the most appropriate prototype for the relevant syntactic combination. These verbs break the path for other verbs to follow without having to undergo the same difficult process of learning everything from scratch.

The initial set of combining transitive verbs, and the sentences children generate with them, do not have High Transitivity; on the contrary, they encode states and activities that have relatively low impact on their patients, such as a change of possession. Instead, they encode a fundamental, inalienable relation between the verb and its direct object, stemming from the fact that these verbs depict the basic actions regulating object relations. Crosslinguistic evidence indicates that this may be the basic transitivity construct in languages. The verbs that children first combine with direct objects are the verbs that typically get grammaticalized as markers of transitivity in many languages. The concept underlying prototypical transitivity both crosslinguistically and developmentally is thus inclusion in, and exclusion of objects from the personal domain; this is the most significant type of transaction a human being can have with autonomous objects. This concept is probably a semantic component of the meaning of all transitive verbs; this is what makes the generic verbs expressing it in a relatively 'pure' fashion, the pathbreakers of transitive syntax.

Bootstrapping or pathbreaking into transitive syntax through generic verbs like *want* and *get* and *made* is not like semantic bootstrapping – it does not require innate or other 'linking rules' to pass from a semantic generalization to a syntactic one. These early combining verbs literally express the primitive 'grammaticalizable notion' underlying syntactic transitivity. The extension required from children when they are to learn other, non-prototypical verb–object combinations is to recognise that the same primitive notion is operative even when these later verbs are only partially similar to the first verbs in their semantics. As we can see in Ruti and Travis' first 20 verbs, these follow-up verbs are mostly more specific 'obtaining' verbs such as *wear*, *put*, *take out* or *buy*; or more specific 'creating' verbs like *draw*, *write*, *read*, *tell a story*, *build*, *prepare* and so on. Even when the follow-up verbs are truly manipulative, state-affecting verbs such as *close*, they contain a semantic component of a human being affecting an inanimate object by symbolic possession or creation. The crosslinguistic evidence on the semantically neutral use of the grammaticalized transitivity-markers implies that the meaning of generic transitive verbs is close enough to this core transitive meaning, so that the first combining verbs can serve as models for generalization and facilitation for other, more complex, transitive verbs.

If the proposed process of acquisition starting with, and assisted by, generic verbs is found to be a general phenomenon in syntactic development, it raises the possibility that lexical-specific learning of positional patterns is sufficient to account for the formation of syntactic abstractions. Further

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research is needed to test the validity of this hypothesis. In addition, an important next step is the incorporation of the suggested process of acquisition in a general theory of learning.

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APPENDIX A

THE FIRST TWO VERBS EMERGING IN VO COMBINATIONS, AND THE FIRST SENTENCE WITH EACH, IN THE LONGITUDINAL SAMPLE ($n = 16$)

	Utterances		Age at production	
Child	Hebrew	English gloss	Age	Interval (days)
Travis	—	GET-it hat	1;05·01	25
	—	FIND-it funny	1;05·26	
Zohar	Roca et-ze	WANT (FEM) ACC-this	1;06·12	21
	Kxi mishak	TAKE (FEM IMP) toy	1;07·03	
Ayelet	Taase kaletet	DO (IMP) tape	1;06·19	70
	Tavi od	BRING (IMP) more	1;09·00	
Shira	Ani roca pica	I WANT (FEM) pizza	1;06·20	46
	Tni li gvina	GIVE (FEM IMP) me cheese	1;08·05	
Paz	Roca ze	WANT (FEM) this	1;07·02	104
	Kxi bamba	TAKE (FEM IMP) bamba (kind of food)	1;11·03	
Adi	Roca ze	WANT (FEM) this	1;07·21	63
	Adi oxelet Gerber	Adi EATS (FEM) Gerber	1;09·24	
Rotem	Tni li bis	GIVE (FEM IMP) me bite	1;07·24	55
	Rotem taase kubiya	Rotem will-MAKE square	1;09·19	
Ruti	Roca ze	WANT (FEM) this	1;07·29	31
	Yavi daysa	will-BRING porridge	1;09·00	
Omer	Roce et-ze	WANT ACC-this	1;09·00	21
	ten li 'et/exad	GIVE (IMP) me pen/one	1;09·20	
Shay	Lo roce et-ze	not WANT ACC-this	1;09·09	68
	Ten bis	GIVE (IMP) bite	1;11·18	
Mordexai	Roce hala	WANT chala	1;10·03	29
	Kxi et-ze	TAKE (FEM IMP) ACC-this	1;11·01	
Reut	Roca sipur	WANT (FEM) story	1;10·28	23
	Shomaat tustus adom	HEAR (FEM) motorcycle red	1;11·20	
Or	Lo asiti kaki	not I-MADE/DID BM	1;11·20	66
	Roca sukariya	WANT (FEM) candy	2;01·24	
David	Lir'ot et habayit	to-SEE ACC the-house	2;00·18	17
	Ani roce maclema ze	I WANT camera this	2;01·05	
Matan	Kax mocec	TAKE (IMP) pacifier	2;01·11	38
	Lo roce lishon	not WANT to-sleep	2;02·19	
Yonatan	Roce Aladin	WANT Aladin	2;02·05	21
	Lishtot mic	to-DRINK juice	2;02·26	

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APPENDIX B

THE FIRST TWO VERBS EMERGING IN SVO COMBINATIONS, AND THE FIRST SENTENCE WITH EACH, FOR THE LONGITUDINAL SAMPLE ($n = 13$)

Child	SVO sentences		Age	Interval (days)
	Hebrew	English gloss		
Travis	—	Maria MADE this duck	1;06·29	10
		Big Bird RIDE horsie	1;07·08	
Ruti	Shay roce kadur	Shay WANTS (a) ball	1;09·00	28
	Ish ose raash	Man MAKES noise	1;09·28	
Zohar	Ani roca banana	I WANT (FEM) banana	1;11·29	12
	Ima sama smixa	Mommy PUT (FEM) cover	2;00·13	
	Aba lakax bakbuk	Daddy TOOK bottle		
Paz	Aba asa ambatya	Daddy DID bath	2;00·06	38
	Ani roca et-ze	I WANT ACC-this	2;01·16	
Or	Aba sagar et hatelevizia	Daddy CLOSED ACC the-television	2;1·28	16
	Ani roca misparayim	I WANT (FEM) scissors	2;2·14	
Ayelet	Ani roca miklaxat	I WANT (FEM) shower	1;9·12	24
	Od exad lo ose klum	Another one not DOES nothing (harm)	1;10·05	
Rotem	Rotem taase kubiya	Rotem will-MAKE square	1;9·19	26
	Rotem maxina oxel	Rotem PREPARES (FEM) food	1;10·14	
Yonatan	Yonatan ose kaxol	Yonatan MAKES blue	2;3·10	26
	Yonatan ciyer para	Yonatan DREW (a) cow	2;4·06	
Shira	Ani roca pica	I WANT (FEM) pizza	1;6·20	150
	Ani yechola et ze	I CAN (FEM) ACC-this	1;11·18	
David	Ani roce maclema ze	I WANT camera this	2;1·5	18
	Uri bone migdal	Uri BUILDing tower	2;1·5	
	Ani oxel tapuxim	I EAT apples	2;1·23	
Shay	Ani roce kcat orez	I WANT some rice	2;1·21	(66)
	(No other verbs appear until the end of observations at 2;3·26)			
Mordexai	Chana roca sika	Chana WANTS (FEM) pin	1;11·1	119
	Shari marsha lehorid et hagarbayim, naxon?	Shari ALLOWS (FEM) to-take-off ACC the-socks, right?	2;3·0	
Adi	Adi oxelet Gerber	Adi EATS (FEM) Gerber	1;9·24	16
	Adi shota mic bakbuk	Adi DRINKS (FEM) juice bottle	1;10·8	

Note: No SVO sentences were produced by Matan, Reut, and Omer.

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APPENDIX C

C1. RUTI'S FIRST 20 VERBS GETTING POST-VERBAL DIRECT OBJECTS: AGE OF EMERGENCE

Age	Utterance	Gloss
1;07·29	Roca ze	want this
1;09·00	Yavi daysa	will-bring porridge
1;09·14	Ose raash	makes noise
1;09·14	Oci etze	I'll-take-out this
1;10·11	Lasim mayim	to-put water
1;10·11	Al taase ze	don't do this
1;10·11	Ima takri ze	mommy will-read this
1;11·09	Ima kax ze	mommy take this
1;11·09	Lisgor ze ima	to-close this mommy
1;11·09	Lehorid et-ze	to-take-down ACC-this
1;11·13	Ima kanta et-ze	mommy bought ACC-this
1;11·13	Talbish et-ze	wear ACC-this
1;11·23	Lekapel et-ze	to-fold ACC-this
1;11·23	Liftoach et-ze	to-open ACC-this
1;11·27	Aba ciyer ze	daddy drew this
1;11·27	Lehaziz et-ze	to-move ACC this
1;11·27	Aba letaken et-ze	daddy to-fix ACC-this
1;11·27	Aba tadbik et-ze	daddy, glue ACC-this
2;00·00	Ima tikshor et ha-seret	mommy will-tie ACC the-ribbon
2;00·03	Ima tenaki et-ze	mommy, clean ACC-this

C2. RUTI'S FIRST 20 VERBS PARTICIPATING IN SUBJECT–VERB–DIRECT OBJECT COMBINATIONS: AGE OF EMERGENCE

Age	Utterance	Gloss
1;09·00	Shay roce kadur	Shay wants (a) ball
1;09·28	Ish ose raas	man makes noise
1;10·11	Ima takri ze	mommy will-read (FEM) this
1;11·20	Ima kanta et-ze	mommy bought (FEM) ACC-this
1;11·20	Sheima talbish et-ze	that-mommy will-CAUS-wear ACC-this
1;11·23	Ani ekra et-ze	I I-shall-read ACC-this
1;11·23	. . ani sama ze	I put (FEM)-this
1;11·27	Aba ciyer ze	daddy drew this
1;11·27	. . aba asa cafcefa	daddy made (noise of) horn
2;00·00	Ima tikshor et ha-seret	mommy will-tie ACC the-ribbon
2;00·11	Ruti lo shomaat shir	Ruti not hear (FEM) (a) song
2;00·14	At axalt hakartiv hahu	you ate-2sgf the-popsicle the-that
2;00·14	. . ani mocet et aba	I find (FEM) ACC daddy
2;00·18	Ata roe ze ratuv	you see this (is) wet
2;00·21	Tali carix laasot hakol	Tali needs to-do everything
2;00·24	Aba tiken et ze	daddy fixed ACC this
2;00·24	Aba hidbik et ze	daddy glued ACC this
2;00·24	Aba lakax et hamocec sheli	daddy took ACC pacifier my
2;00·28	Ani mesaderet ze. .	I put-in-order (FEM) this
2;00·28	Ani axzik et ze	I I-shall-hold ACC this

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APPENDIX D

D1. TRAVIS'S FIRST 20 VERBS GETTING POST-VERBAL DIRECT OBJECTS: AGE OF EMERGENCE

Age	Utterance
1;05·01	Get-it hat
1;05·26	Find-it funny (label for picture)
1;05·27	Open door
1;05·27	Yaya (draw) mans
1;05·28	Catch rocks
1;06·01	Ride horsie
1;06·02	Hammer table
1;06·06	Hold Weezer
1;06·06	Get-out kisses
1;06·07	Bite finger
1;06·11	Throw da ball
1;06·13	Got-it Weezer
1;06·16	Touch light
1;06·22	Step-in water
1;06·24	Lock that Lulu
1;06·25	Fix this
1;06·25	Blow balloon
1;06·25	Hit ball
1;06·25	See this
1;06·25	Read this

D2. TRAVIS'S FIRST 20 VERBS PARTICIPATING IN SUBJECT–VERB–DIRECT OBJECT COMBINATIONS: AGE OF EMERGENCE

Age	Utterance
1;06·29	Maria made this duck
1;07·08	Big Bird ride horsie
1;07·11	Weezer did it
1;07·22	Weezer kick-it arms
1;07·22	Cinnamon lick-it hands
1;07·23	Girl have that umbrella
1;07·23	Pete hurt the fingers in there
1;07·26	Maria hit me
1;07·26	Maria told me have one too
1;07·27	Dana called me Lauren
1;07·28	Danny got me
1;07·28	Daddy take the bottle
1;07·28	Weezer drinking the eggs
1;07·29	Mommy get sauce
1;07·30	Daddy buy this
1;08·03	Cookie Monster love cookies
1;08·04	Look Weezer climbing a tree
1;08·04	Bunny Rabbit playing music
1;08·06	Daddy singing chicken
1;08·07	Daddy put-a…new pajamas on

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