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**THE EMERGENCE OF SYNTAX:
THE ACQUISITION OF TRANSITIVITY**

by

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A thesis
presented to the University of Ottawa
in fulfillment of the
thesis requirement for the degree of
Doctor of Philosophy
in
the Department of Linguistics



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"Children begin with detail, and learn up to the general,
they begin with the contiguous, and gradually
comprehend the universal."

Thomas Hardy.
Jude the Obscure.

ABSTRACT

This thesis examines the hypothesis that children attend to and encode events of cardinal transitivity in their early utterances. It is argued that Hopper and Thompson's 1980 parameters of cardinal transitivity can lead to a clear and concise description of what kinds of events allow children to "bootstrap" their way into syntax. A transitivity grid is developed, based on research in infant and child perception and cognition, by which utterances can be rated in terms of cardinal transitivity. This grid is applied to selected verbs in a corpus taken from a diary study. It is shown, based on the analysis of the data, that this hypothesis cannot be disproved. The knowledge the child can be assumed to have to generate the utterances he does is represented formally in terms of Conceptual Semantics, which is shown to be a promising theory in accounting for children's early acquisition of semantic and syntactic knowledge.

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My mother contributed to this work in many ways; baby-sitting while I worked on weekends, recording the odd bit of data, and even remembering what I said at the two-word stage! I would also like to thank my son's day-care teachers, in whose able and caring hands I entrusted Ainsley while I went off to do research on him. Knowing he was well looked after contributed immeasurably to my ability to concentrate on my work.

This thesis is dedicated to Ainsley, who started putting words together at 20 months and hasn't stopped since.

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CHAPTER 1

Development of the Research Question

1.1. Introduction

Over the past thirty years or so there have been two different research trends in study of child language; one empirical and the other formal. Smith 1988 draws a distinction between language acquisition and language development: the former is an idealization of the actual process children go through when learning their first language, and is based on a model of instantaneous acquisition (i.e. all language data is available to the child at the same time), while the latter looks at language learning in real time, and examines the various stages and processes children go through before arriving at full mastery of their first language. Although some researchers feel the two domains are incompatible, others, for example Harris and Davies 1987, believe that the incompatibility between research into child language development and linguistic hypotheses regarding the nature of language acquisition is "illusory" (p. 19). Chomsky 1981 makes a similar point, suggesting that the idealization to instantaneous acquisition can be "relaxed" (p. 10) to account for stages in development.

1.2. Research in Child Language Development

Research in early child language development has generally confined itself to describing the structures which emerge in child language and the order in which they emerge. What follows is not intended to be a survey of the enormous amount of work that has been done in the field, but merely touches on some of the most important trends. See Brown 1973 for a survey of early work in the field, and de Villiers and de Villiers 1985 for a more up-to-date review.

Based on the examination of corpora, children's early utterances have been described from a formal point of view in terms of pivot/open constructions (Braine 1963); telegraphic speech (Brown 1973); or Phrase Structure Rules and Transformations (Bloom 1970, McNeill 1970, Menyuk 1969). Children's early utterances have also been described in terms of the semantic relations they express, based on Case Grammar (Bowerman 1973) or Generative Semantics (Antinucci and Parisi 1973, Schlesinger 1974). Much subsequent work was restricted to attempting to determine whether two-word utterances were based on syntactic or semantic categories, paralleling the debate in formal linguistics between Transformational Generative Grammarians and Generative Semanticists (Newmeyer 1980). Braine 1976, on the basis of a synthesis of the available data, interprets early utterances as "limited scope formulae" mapping components of meaning into positions in surface structure, and expressing a specific and often narrow range of semantic content. He suggested that children at the early two-word

stage had neither semantic or syntactic categories which were isomorphic with those of the adult grammar, but rather semantically-based categories which were of a much narrower scope than the adult categories. As Brown and Leonard 1986 point out, Braine's interpretation has been accepted by most researchers in early child language development, and has been applied to other languages (Pye 1987 with Quiche Mayan for example); used to account for later multi-word utterances (Ewing 1981); and employed to pursue other issues, for example the influence of well-established words in children's lexicons on the scope of their early formulae (Brown and Leonard op cit.) Children's early speech has also been described in terms of communicative function (Bates and McWhinney 1979 and 1982, Halliday 1975, and Painter 1984) or of speech act theory (Griffiths 1979). More recently, researchers working within a Chomskyan framework have described early language acquisition in terms of Government-Binding Theory (Hyams 1983, 1986, 1987, Radford 1990).

None of the above descriptions has provided an explanation of how children arrive at encoding whatever kind of underlying relation is posited in a systematic and consistent fashion. Although children must extract the means their language has for expressing grammatical relations from the language they are exposed to, this question has been largely ignored in the literature in child language development, and many researchers merely describe the knowledge children can be assumed to have in order to generate the

sentences they do, or invoke general learning principles to account for syntax learning. This results in "superficially interesting observations but very little insight" (Atkinson 1987:28).

1.3. Research in Learnability

While researchers in child language development looked at the development of children's speech based on corpora of children's utterances and a sometimes pre-theoretical linguistic basis, there has also been a great deal of work done in learnability, which concerns itself with discovering the (largely innate) mechanisms which constrain children's choices of a possible grammar, and which allow children to select one grammar over another. Researchers in learnability "attemp[t] to deduce properties of the language learner from what is known about the mature state" (Wexler and Culicover 1980:xv). Based on principles of logic, mathematical formalisms and proofs, their only empirical basis is often the fact that all children, unless severely deprived or retarded, learn the language of their speech community effortlessly and quickly (Chomsky 1965, 1975, 1981, 1986).

Although the emergence of syntax has been of great interest to researchers in early child language development, some theorists, for example Chomsky 1980:41, do not feel that these "fluttering motions of a bird before the system of flight has matured" can provide any insights into the final, steady state which the adult

native speaker attains. However, within the parameter-setting model of first language acquisition this stage is of particular importance, as it provides the basic knowledge of language children must have before they can set subsequent parameters, assuming that at the early multi-word stage children have determined whether their language is configurational or non-configurational, and the order of constituents (i.e. head initial or head final (Chomsky 1986:82)). As Nishigauchi and Roeper 1987:94 suggest, "the determination of the features of the input data that have 'epistemological priority' in Chomsky's (1981) terms becomes the primary problem".

Theorists have recently become interested in how semantic relations and/or pragmatic context in the earliest stages of language acquisition aid in the development of syntax. As early as the mid-sixties, Chomsky 1965:32 proposed that there must be a partially semantic basis for the acquisition of syntax, which, he suggests, makes a strong claim for innate concept-forming abilities of the child and the system of linguistic universals that these abilities imply. He goes on further to say that although certain kinds of data and experience may be required to set the LAD into operation (a triggering function), they do not necessarily affect the manner of its functioning (1965:33). This is later called, in Chomsky 1980, the "ignition key" hypothesis: the ignition of a car must be turned on in order to start the engine, but the structure of an car engine is not determined by the act of turning it on (p. 172).

In other words, although children may make use of non-linguistic data when they begin their linguistic analysis, these data do not influence the form the grammar will take. Chomsky 1980:54 makes a distinction between computational and conceptual aspects of language, and suggests that children at very early stages of language acquisition may use the conceptual system to comprehend language when language-specific knowledge is not available.

Similar views are expressed in Chomsky 1981:10:

"...we want the primitives [primitive basis of concepts composing the theory of Universal Grammar] to be concepts that can plausibly be assumed to provide a preliminary, pre-linguistic analysis of a reasonable selection of presented data, that is, to provide the primary linguistic data that are mapped by the language faculty to a grammar..."

Researchers in learnability have also taken the position that early grammar acquisition may be facilitated by semantic and pragmatic factors. Wexler 1976 hypothesizes that children construct meaning based on context, and that this semantic information places formal constraints on the grammar to be acquired. Wexler and Hamburger 1973 and Wexler and Culicover 1980 show that syntax would be unlearnable unless children were able to make use of information from the underlying structure of sentences, which they take to be derivable from the meaning. The latter posit a universal level of semantic representation in which the elements are unordered. The semantic representation of a sentence is available to children from the situation the utterance occurs in and the meaning of the

individual words, based on "a universal characterization of the human perception of events, objects, relations, properties etc." (p. 607 fn. 26), which they call a "semantic grammar". In order to learn the "base grammar" (p. 83) they assume that children infer the grammatical relations implicit in the semantic grammar; the relationships between elements are universal and children need only learn the order of the constituents. However, they give no indication of what form this semantic grammar would take, although it is assumed for the purposes of their theory. Similar views are expressed in Wexler 1982.

Much of the work in learnability cited thus far follows from the since discarded Standard Theory (Chomsky 1975:81), and in fact Atkinson 1987 suggests such learnability theories have not been able to account for the empirical facts in language development because they are based on a model which has proven to be descriptively inadequate. However, the levels they discuss are consistent with current theory, although children are now hypothesized to be fixing parameters rather than learning transformations. For example, Borer and Wexler 1987, working within the parameter-setting model of language acquisition, make similar assumptions, namely that contextual clues enable children to infer thematic relations.

Grimshaw 1981 was among the first of the learnability theorists to give some substance to the hypothesized semantic/syntactic

correspondences which facilitate early grammar acquisition. Under her theory, the LAD contains an evaluation metric in which a grammar is more highly-valued if there is a isomorphism between form and function. She proposes Canonical Structural Realization Rules (CSRs) which are of the type:

CSR (object) = noun

CSR (action) = verb

and are, she claims, present in children's two and three-word sentences. However, she points out that although semantic categories may facilitate the acquisition of formal syntactic categories, there is not always a one-to-one correspondence between syntactic form and semantic type and children must learn both a word's meaning and its syntactic realization.

With the odd exception these hypotheses are not supported by empirical evidence and are either too general or too abstract to be testable. This is standard research procedure - a certain element may be assumed for the purposes of theory construction without being elaborated (Wexler and Culicover 1980) - but as a result of this type of approach, there is no means of connecting the proposed models to empirical data.

Because Pinker 1984 provides what is probably the most extensive discussion of the idea that children use meaning and context to

infer syntactic categories and relations, and because he supports his arguments with reference to child language corpora, it will be discussed at some length in what follows.

1.4. The Semantic Bootstrapping Hypothesis

Pinker 1982, 1984, following from Grimshaw 1981, puts forth the Semantic Bootstrapping Hypothesis (SBH), which states that: "... the child initially uses semantic notions as evidence for the presence of grammatical entities in the input" (1984:82). Like the learnability theorists discussed above, Pinker maintains that grammatical notions such as noun, verb and subject are not available to pre-syntactic children, who must somehow extract these entities from the input. He does assume that children have access to "such notions as physical object, physical action, agent of action and so on" (p. 39) which are available perceptually. He also assumes that there is a one-to-one correspondence between semantic and syntactic categories in discourse addressed to children by their caregivers, although this correspondence does not always hold in the adult grammar. These correspondences are of the type:

people and physical objects = Noun;
physical action and change of state = Verb;
agent of action = Subject.

and are inferred from semantic relations in the events children are exposed to and which are described by the caregiver. The SBH predicts that children's earliest sentence combinations will respect these syntactic/semantic correlations (p. 57).

According to Pinker, not all language the child is exposed to is processed: the relevant input is that can be interpreted based on the child's current knowledge (mostly meanings of individual words) and the context in which the utterances occur. Once semantically-induced rules have been acquired, the canonical semantic associations (i.e. Agent - Action - Object = SVO) are no longer used, and children proceed to acquire the language of the speech community based on a distributional analysis of the input. Pinker makes it clear that the semantic bootstrapping hypothesis does not suggest that children lack formal syntactic categories, or that their initial categories are defined by semantic criteria: rather children possess innate formal categories which are posited in response to the input which is processed. Because an element has certain semantic properties, children are able to associate it with a syntactic category (p. 257).

Pinker assumes that children acquire "a rule-governed system conforming to Bresnan and Kaplan's theory of Lexical Functional Grammar" (p. 14) which includes c-structures (Phrase Structure Rules) and f-structures (predicate entries). He shows how the SBH and distributional learning can account for a variety of linguistic

phenomena which children acquire, two of which are relevant to children's very early grammars, namely the order of constituents in Phrase Structure Rules, and lexical entries. For example, using the meaning of individual words and the context in which the utterance occurs, children would be able to interpret the sentence:

(1) Snails eat leaves (Pinker 1984:53)

as Agent - Action - Object and analyze it as SVO. The knowledge acquired by means of semantic bootstrapping, i.e. that the subject precedes the verb in English, would allow children to infer that, in the following sentence:

(2) Snails resemble grass (Pinker 1984:53)

'resemble' is a verb, although it is not a canonical action or change of state verb¹.

Although the SBH is plausible, consistent with what many other learnability theorists have proposed, and able to account for a variety of linguistic phenomena which children must acquire, there are several problems with Pinker's hypothesis which will be addressed here. First of all there is the issue of defining what Pinker 1984:56 calls "the most perceptually transparent members of the set" of Agent Action Object = SVO sentences which children process. Verbs are defined by Pinker as actions or changes of state, which at first glimpse appears to constrain the child's hypothesis space adequately. However, verbs like 'remember' are

¹This type of inference has been called syntactic bootstrapping (Gleitman et al 1987, Hirsh-Pasek et al 1988, and Landau and Gleitman 1985).

often considered verbs of changes of state (van Voorst 1983), although it is unlikely that they would be perceptually salient to the child and are not among the verbs which are early-acquired. Furthermore, according to Lebeaux 1988, the verb 'appear' is a change of state verb in the sentence 'John appeared' as 'John' undergoes a change of state and is therefore [+affected]. Similarly, 'find' is considered a verb of change of state where the subject rather than the object is affected (van Voorst 1983). Although such non-canonical verbs of change of state would not be a problem for the SBH as either the caregiver would not use them or the child would ignore them, they do indicate that what constitutes a perceptually salient verb for the child should be more precisely defined, as the category is not narrowed down sufficiently.

Not only are semantic properties connected with the syntactic category Verb too general, 'physical object' is too broad a category to relate to grammatical Object. Nelson 1973 categorized children's first fifty words and found that the object names tended to be those which could be acted upon by the child - i.e. shoes and socks rather than other objects of clothing that children cannot manipulate as easily. Other researchers have made similar findings. Pinker can account for this, as he states that in order for semantic bootstrapping to take place children must know the meanings of individual words. Children would not be interested in and therefore not learn the words encoding other types of physical objects. However, again there is a lack of precision in the

semantic properties associated with the category 'physical object', which fails to account for the fact that children tend to encode similar meanings in their first words and sentences (Bloom 1970, 1973; Bowerman 1973; Braine 1976; Slobin 1973, 1985 among others).

A similar point can be made with regards to the semantic roles of Agent and Theme (Pinker calls the latter "physical object"), which are not clearly defined. Pinker seems to regard them as semantic primitives, although it has recently been suggested that semantic roles are derived, and in fact represent parts of a verb's meaning and are arrived at by means of predicate decomposition (Jackendoff 1983, 1987; Laughren 1988; Rappaport and Levin 1988 among others). Van Valin 1990, working within the framework of Relational Grammar, makes a similar assumption. Within a different framework, Ladusaw and Dowty 1988 similarly do not view semantic roles as primitives, but rather as a set of entailments relating to the meaning of the verb. These researchers view thematic roles as labels which incorporate various aspects of a verb's meaning and its relationship to its arguments². As Rappaport and Levin 1988 point out, there is often little consensus as to what exactly these labels mean, apart from their structural relationship with the verb they are predicated on. Similarly, Jackendoff 1987 suggests that

²This view is not shared by all theorists working with thematic relations. For example, Culicover 1988:37 views them of "components of the linguistic representation of meaning" rather than "derivable from it", although he does not "exclud[e] the possibility that the second may ultimately prove to be correct".

semantic roles are convenient labels for particularly significant structural relationships which hold between a verb and its arguments in conceptual structure.

A second problem is that Pinker's hypothesis puts a great deal of reliance on the input children receive from their caregivers, who must not only be sources of input in child-adult discourse, but must also "filter out" non-basic sentences³. Following Snow 1977 he assumes the speech addressed to young children is based on the here and now⁴ and is highly predictable. Pinker assumes that children derive grammatical relations from "basic" sentences, which he defines, following Keenan 1976, as sentences which are "simple, active, affirmative, declarative, pragmatically neutral, and minimally presuppositional" (p. 46). Input to young children must therefore consist only of basic sentences: either caregivers do not produce non-basic sentences in their speech directed to children, or children ignore non-basic sentences because they cannot interpret them. Pinker also suggests the possibility that both processes are at work. Pinker 1984:31 gives passives and nominalizations as examples of structures caregivers must avoid at the earliest stages of syntax acquisition (when basic word order is being acquired) for semantic bootstrapping to work: the former because the canonical Subject = Agent relation does not hold, and

³Braine 1987 makes a similar point.

⁴Brown and Bellugi 1966 were the first, to the best of my knowledge, to use this term.

the latter because it is the noun rather than the verb which represents the action (i.e. 'I'm going to give you a spanking'). This is a factor which cannot be controlled, and predicts that children receiving this type of input would end up with rather different grammars than children who heard only canonical sentences, which, based on empirical studies, does not appear to be the case.

The SBH also requires that caregivers use only basic sentences. Two defining criteria for basic sentences are that they be affirmative and declarative, although it has been shown that children receive a large proportion of both imperatives and negatives (Newport, Gleitman and Gleitman 1977; Snow 1977 for example). Furthermore, the type of caregiver/child discourse Pinker refers to may be limited to white, middle-class, western cultures, and there are examples in the literature of children who receive very different input yet follow a similar route in development, although the SBH requires that caregivers follow children's lead, and talk about things the children are interested in. Pinker does recognize this. He qualifies the statement that input to young children respects semantic/syntactic correspondences, "at least for the English-speaking child" (p. 62). However, he is explicitly attempting to account for how very different languages are learned; i.e. Irish (A VSO language) and Walpiri (a non-configurational language), so the theory should account for the fact that children in different cultures may

receive very different input, yet follow similar routes in development.

Schieffelin 1985 discusses children learning Kaluli (a language spoken in Papua New Guinea), to whom little direct speech is addressed. Rather all discourse takes place between the mother and a more mature interlocutor (either an older child or an adult), and the child is instructed to "say like this". Pye 1986 found that speech addressed to children learning Quiche Mayan had different characteristics than those generally associated with caregiver talk. Similarly, the Ute (and other indigenous Northern Plains cultures) do not give much referential/ propositional input to their young children, and child-initiated interaction is not encouraged (Givon 1985). Berman 1985 reports on differences in parental input to children learning Hebrew based on class differences. Presumably this again would result in rather different grammars, although children from varied linguistic and cultural backgrounds seem to express similar meanings in their early utterances.

Another characteristic of caregiver talk which Pinker views as crucial to the initial stages of language acquisition is the lack of displaced reference. Although this is a characteristic of some caregivers' speech, Wells 1985 found that even in a fairly homogeneous group of 128 English-speaking children the type of input received was qualitatively and quantitatively different.

Children who received optimal input at the early stages of their language development, the kind upon which the SBH rests, were more advanced in their language development than children whose caregivers directed the topics of conversations and incorporated more displaced references. However, the different types of input did not affect the route of development.

For these reasons, there is a weakness in a theory that requires caregivers, either consciously or unconsciously (Pinker is unclear on this point) to filter out certain kinds of sentences in their discourse with young children, to allow children to direct the topic of conversation, and to base all conversations on the 'here and now', in order for semantic bootstrapping to take place.

According to Pinker, the other way in which input is selected for processing is through the children's own efforts. Pinker proposes an input filter whereby "the child only processes for purposes of rule induction those sentences whose meanings are available contextually" (p. 30). There are a number of problems with this filter, which I will discuss. First of all, this formulation is rather vague and general and therefore cannot be disproved. Second, different children would presumably process different sentences, because the environment would provide different utterances which would be interpretable from context. Children might therefore end up with rather different first grammars depending on which meanings were available to them. This filter

again fails to account for the fact that children tend to encode very similar meanings in their early utterances (Bloom 1970; Braine 1976; Brown 1973; Slobin 1973, 1985 among others)⁵.

Although the SBH provides an indication of what types of semantic information will enable children to "bootstrap" their way into syntax, that is, information which children can connect with the linguistic input to ascertain early syntactic relations, I have shown that the SBH is weak in several respects. First of all, the semantic/syntactic correspondences Pinker describes are not constrained adequately; agent, action and object do not narrow down children's hypothesis-testing space adequately. Pinker maintains that certain basic sentences are addressed to children and processed, but no reason why certain sentences should be privileged is provided. Second, I have shown that there is a weakness in a theory of language learning which puts the onus on caregivers to provide appropriate input. Not all children, even within the same linguistic or cultural group, receive the same type of input, and different cultures have very different child-rearing practices from white, western, middle-class societies. Children may not receive the type of input which, under the SBH, is crucial for language acquisition. Clearly there is a need for some kind of "semantic bootstrapping", but the kinds of perceptual/conceptual/semantic

⁵There is also the rather curious use of the word "induction", which seems at odds with the rich constituent and function structure and highly-elaborated lexical entries Pinker hypothesizes.

categories must be made more specific, and the types of sentences which are interpreted by children defined more clearly in order to account for the fact that children encode similar meanings despite varying linguistic and cultural backgrounds, and despite different input, in terms of both quality and quantity.

What the SBH shares with the learnability theories discussed above is the hypothesis that in children's early grammars there is a one-to-one form/meaning relationship between the events children witness and the linguistic input used to describe them. Although these correspondences are required for children to begin to acquire syntax, they are present only at the initial stages of language learning, as these relationships do not hold in the adult grammar. Syntactic categories are not reducible to meaning despite the fact that early grammars may make use of these correspondences. There are two separate yet interacting systems of representation.

What is required is a more specific and detailed description of syntactic/semantic correspondences which emphasizes children's predisposition to attend to certain types of events rather than the caregivers' efforts to describe these events. I believe that Slobin 1981, 1985 provides a possible solution.

1.5. The Transitive Event

Slobin 1981, 1985 has drawn insights from both general linguistics and cross-linguistic research in language development to account for how children begin the process of grammaticalization, i.e. how they first crack the syntactic code. He presents a testable hypothesis regarding which specific aspects of meaning allow children to determine grammatical relations which go beyond the data in the input. Slobin hypothesizes that as children begin to acquire the basic syntax of their language, only certain conceptual relations are going to be expressed grammatically, and suggests that transitive events are likely to be among the first. He adds that at the earliest stages of grammaticalization, only "prototypical" transitive events (those which are most salient to the child) will be encoded in "canonical" form ("the most basic grammatical forms available in a language" (1981:185)), and that these canonical forms will only later be extended to include less prototypically transitive events. Slobin bases his concept of a prototypical transitive event on Hopper and Thompson 1980, who define a cardinal transitive clause (prototypical in Slobin's terms) as one in which there is "a human-like A[gent] behaving actively, volitionally and totally upon a definite, referential O[bject]" (p. 274). Slobin looks at language development data from several languages to substantiate his claim. The evidence is plausible for languages in which transitivity is encoded by means of case markings (ergative or accusative). In Kaluli and Russian,

case markings (ergative and accusative respectively) are at first used by children only to mark nouns in constructions with verbs describing events which are of cardinal transitivity. The evidence for languages in which transitivity is encoded by means of canonical word order (i.e. SVO = Agent/Action/Object in English) is less conclusive, relying mainly on comprehension studies from later stages of language development (comprehension of passive structures for example) where children are well beyond the early stages of grammaticalization. It is important to point out that Slobin hypothesizes that children encode (emphasis mine) events which are of cardinal transitivity, as they are somehow more salient. This is consistent with the assumption in the child language development literature that children talk about what is important to them. I will extend Slobin's hypothesis to suggest that children are predisposed to attend to events which are of cardinal transitivity, and this attention allows them to infer the grammatical relations expressed therein ("canonical structures" in Slobin's terms).

It is well-known that children selectively attend (Newport et al 1977) and that there is a difference between the language children are exposed to ("input") and what they actually use in constructing their grammars ("intake") (White 1980)⁶. The cardinal transitive event provides a means for children to structure their experience, and the language used by caregivers to describe these events serves

⁶Juana Munoz Licerias has pointed out to me that the distinction between input and intake was first made by Corder 1967, with reference to second language learning.

as input. This hypothesis does not require that the caregiver only talk about certain types of events, or that the input be addressed to the child. Children attend to events of cardinal transitivity, and whether the caregiver describes them to the child or to another interlocutor makes no difference: the child is 'tuned in' to these events and will pay attention to the language used to talk about them.

Nelson 1985, 1986 hypothesizes that the event serves as the basis for the child's "discovery" (1986:8) of language, but as Mervis 1987 quite rightfully points out, her claim is too powerful as it implies any event is input for the child. The cardinal transitive event limits the power of such a proposal, narrowing down the types of events children will attend to.

In what follows I will examine H & T's parameters of transitivity, which will be modified and in some cases rejected in order to be compatible with what is known about children's perception of the various parameters which compose a transitive event. First, based on research in infant and child development, I will show that H & T's parameters have perceptual and cognitive counterparts, and that children seem to be predisposed to attend to these aspects of transitive events. I will then test Slobin's hypothesis, that at the earliest stages of syntactic development children use events of cardinal transitivity to bootstrap their way into syntax, based on data taken from a diary study of a child 20-23 months. Finally, I

will show how these parameters of transitivity and the concepts they represent, which the child can be assumed to possess in order to generate the utterances he does, can be formalized in terms of Jackendoff's 1983, 1987 Conceptual Semantics.

CHAPTER 2

Methodology

2.1. The Diary Study and Single-Case Design

Slobin 1981 suggested that the issue of children's sensitivity to "canonical" word order in English could be more easily explored in comprehension studies with older children than in the analysis of speech production at the earliest stages of grammatical speech, although he did make reference to the development of transitivity in very young children whose languages used case-markings to encode the syntactic relation (Kaluli and Russian). Given that the most common data collection technique in early language development (henceforth LD) is typically a half- or one-hour speech sample collected on a weekly, bi-weekly or even monthly basis, this suggestion makes sense, since:

- (i) language growth at the earliest stages is very rapid, and it is possible that a type of utterance would appear in the child's production and disappear in the period between two consecutive speech samples; and
- (ii) the researcher can only look at the speech sample at a given point in the child's development and draw inferences based on differences between two samples, with no real insights into intervening developments.

My study is based on a diary record¹, in which data collection is continuous. Because data collection is ongoing, it is possible to study in detail all the changes in speech production from day to day, which would be missed in a time sample. The methodology is therefore well-suited to testing the hypothesis that children begin by attending to and encoding highly transitive events, and subsequently begin to encode events of lower transitivity, since the history of the use of each verb in transitive constructions can be traced from day to day. It is also easy to see how frequently verbs occur in transitive constructions, and when they arise and drop from use. As Fletcher 1985:11 suggests, because important changes in children's language development can take place in a matter of days, researchers should begin with frequent samples from a small number of children in order to ascertain the developmental axis. A diary record provides an uninterrupted 'moving picture' of an individual child's development, rather than a frozen 'snapshot' at a given point in time.

2.1.1. Use of Diary Studies in Language Development Research

The diary study was the only legitimate research tool in LD before the advent of readily accessible audio and video recording equipment (De Laguna 1927, Leopold 1939 and Stern 1930 are well-known examples whose work has frequently been used as a data base

¹ A diary record is the data base, and a diary study is the research based on the diary record.

for modern researchers.) This methodology has recently regained acceptance, particularly with researchers working within an ethnographic (Ochs 1979, Schliefferin 1979) and interactionist (Halliday 1975, Painter 1984) tradition. The diary record has also been employed to study children's developing phonological systems (Menn 1979, N.V. Smith 1973), and early lexical development (Dromi 1987). It is an appropriate research tool whenever the researcher is interested in day-to-day changes in children's language development. As Braunwald and Brislin 1979 say in their important paper regarding diary study methodology: "Now the selection of the handwritten diary record as a research methodology is made for theoretical reasons rather than by technological default." (p. 21).

The diary method is well-suited to testing the hypothesis that children will initially encode only highly transitive events and only later begin to encode those of lowered transitivity, as the history of each verb in transitive constructions can be traced from day to day, with no gaps.

2.1.1.1. Problems with experimental techniques

At a conference which dealt with child language development within the descriptive framework of linguistic theory at the time, Chomsky 1964:36 disagreed with the use of production data by LD researchers and stated:

"...one can find out about competence only by studying performance, but this study must be carried out in devious and clever ways if any serious result is to be obtained."

This statement led to the adoption of a wide variety of experimental techniques in LD research, including elicited imitation, toy manipulation, acting out and picture selection based on comprehension, and even grammaticality judgements.

The advantages of such experimental techniques are well-known: the researcher has control over the situation and can therefore eliminate many potentially confounding variables; it is possible to get a representative sample of a linguistic structure which may occur infrequently in the child's speech; and the experiment is replicable and can be administered to large numbers of subjects, and can therefore be seen as being more generalizable. The drawbacks of experimental techniques are not discussed as frequently, and will be summarized in what follows.

Although there are problems inherent in using production data for research in LD, as Hyams 1983 points out, the researcher often has no other choice due to difficulties in administering traditional experimental tasks to very young subjects. Furthermore, the task itself may influence children's responses, and their responses may be affected by the cueing procedure (Bennett-Kastor 1988).

In a review of the comprehension literature with young children (toy manipulation, acting out, and pointing to pictures), Bennett-

Kastor op cit lists three possible responses children may make when given instructions in an experimental situation. It is possible that child subjects will:

1. follow the instruction, giving a response which is in accordance with the command, or the response the researcher anticipated;
2. give a response which does not conform to the instruction; or
3. fail to respond, or respond in a manner which is not interpretable.

She points out that when a response is given, there is no way of knowing on what basis it was made (i.e. syntactic comprehension or knowledge of the world) and if no response or an unexpected response is given, there is no way of determining whether the children did not understand, or whether they failed to respond due to boredom or fatigue.

The following summary of a variety of experiments with toddlers documents some of the problems that may be encountered in using comprehension tasks with young children. Rodgon 1976 describes a comprehension task which tested 16-21 month-olds' preferences for long and short commands. She noted that "The number of commands obeyed by any subject was far fewer than the total number of commands administered." (p. 56). Benedict 1976, testing the

lexical comprehension of children 10-16 months found that subjects stopped paying attention after a short period of time. She hypothesized that they grew tired of the experimental situation. Similarly, Nelson and Bonvillian 1978, who tested comprehension of names for concepts (either 'made up' or low frequency) with 21-22 month old children noted that: "... the children chose to concentrate on their own play rather than trying to satisfy the requirements <of the task>, as 2-year-olds will often do." DeLoache 1980 notes that the reason there is little memory research with very young children is that they are difficult subjects, as they must first comprehend the task and then co-operate in carrying it out.

Elicited imitation is another experimental technique which has been frequently used in LD research. Both Chomsky 1964 and Menyuk 1963 suggested that children's imitations of grammatical and ungrammatical sentences could provide evidence of their underlying grammatical systems. Although spontaneous imitation had been discussed previously in the LD literature (Fraser, Bellugi and Brown, 1963), Slobin and Welsh 1973 used controlled elicited imitations as a "probe to discover the child's underlying linguistic competence" (1971:486). This position is supported by R. Clark 1977, Kail 1975, Menyuk 1977, Rodd and Braine 1970, and C. Smith 1973 among others. More recently, Radford 1990 views "imperfect imitations" as a "valuable source of evidence regarding the child's competence" (p. 18). The underlying assumption is that

in order to repeat an utterance the subject must associate it with an internal representation and then reconstruct it in terms of that representation. Lust et al, 1987, looking at experimental techniques with somewhat older children, provide an excellent review article where it is argued that elicited imitation is a closer reflection of competence than the act-out task. However, since neither comprehension nor production tasks are a direct reflection of competence, researchers must always take into consideration the fact that children know more about language than either their comprehension and production performance indicates. Taken in conjunction, both sources of data provide a fuller picture of children's linguistic knowledge.

Recent innovative experimental techniques, for example the "preferential looking paradigm" (Golinkoff et al 1987, Hirsh-Pasek et al 1988) have made it possible to administer experimental tasks to very young children which are "less taxing to the child" (Hirsh-Pasek et al 1988:3) and provide another source of data on children's language development. Within this paradigm, based on Spelke's studies in intermodal perception (Spelke 1976,1979), subjects sit with their mothers between two video monitors. A speaker, which is placed between the two monitors, plays an audio tape which describes one of the two video-recordings. There is also a light which flashes every 3 seconds to draw the subjects' attention back to the point between the two video monitors. The subjects' task is to find the screen that matches the linguistic

description, while a hidden observer records their eye fixation. Although this is a promising technique in that it may keep the children's attention for a longer period of time than other experimental procedures, there is still the problem of interpreting unanticipated responses or the lack of any response whatsoever, which may be due to either lack of comprehension or lack of attention.

Another potential drawback with experimental studies is that they tend to focus on one specific aspect of children's language, and therefore "cannot offer a broader perspective on the child's overall linguistic development" (Radford 1990:10). However, this is also a drawback with other methods of data collection, and will be discussed below.

2.1.1.2. Advantages and Disadvantages of the Diary Study

The various methods of data collection in LD research (time sampling using audio or video recording equipment, the diary record, experimental laboratory techniques) have a unique and complementary role to make towards an understanding of how children learn language. As discussed above, the diary study was the most appropriate tool to test my hypothesis.

According to Braunwald and Brislin 1979, the diary record is a source of ecologically valid (Neisser 1967) descriptive data which,

unlike time sampling, is sensitive to:

- 1) infrequent forms which might not occur in a one-hour time sample);
- 2) the order and rate of change in language development; and
- 3) the most advanced utterances the child is capable of producing.

Because data collection is continuous, it is possible to collect samples from a variety of situations (the home, day care, restaurants, museums, the child's grandmother's home in my case) where children have control over the situation to a greater extent than they do in an interval sample which is typically recorded in the child's home or a research laboratory, often with the same toys. Since young children are grounded in the here and now, the environment will govern what they talk about. As Braunwald and Brislin 1979 point out, if a given behaviour does not occur in a recorded speech sample taken at fixed intervals, it may mean either that the child is capable of producing it but did not do so during the period of the recording, or that the behaviour is beyond the child's abilities. Continuous data collection allows the researcher to determine which possibility is in fact the case. For example, Braine 1976, on the basis of Bowerman's 1973 corpus of Seppo, a boy learning Finnish for whom data were collected at 23 and 26 months, claimed that Seppo did not have a productive verb-object rule, but rather a "limited scope formula" which was restricted to

the movement of (toy) vehicles. It may well be the case that this type of verb-object construction was the only type that Seppo ever produced over the 3-month period, but it is equally possible that Braine's conclusion is an artefact of the sampling method: if Seppo only played with vehicles during the two 2-hour periods his speech was recorded, that would be all he talked about.

As Bennett-Kastor 1988 points out, any naturalistic approach to the study of child language is problematic, as many variables cannot be controlled for and the results cannot be replicated (although Painter 1984 conducted a diary study which more or less replicated an earlier one done by Halliday 1975). Another major disadvantage is the generalizability of results, which will be discussed below.

2.1.1.3. Generalizability in Language Development Studies

It is a basic assumption in modern linguistics that all humans acquire language in the same way, on the basis of degenerate and restricted data, independent of intelligence and variation in individual experience (Chomsky 1965, 1975, 1980, 1986 for example). All adult native speakers can make judgements regarding grammaticality, ambiguity and paraphrase, although "... it may be necessary to guide and draw out the speaker's intuition" (Chomsky 1965:21). These judgements are similar, despite the fact that there is great variability in adults' use of language (range of

vocabulary, use of complex structures, etc.) Similarly, although individual children may learn at different rates, produce varying amounts of speech and talk about different things, at a given point they all have the same internalized grammar. Generally speaking, larger scale studies looking at individual differences in language development and individual learning styles find differences in the rate of language development rather than what is eventually acquired (Bates 1988, Wells 1985, 1986). In an important contribution to validation in the field of child language development, Wells 1985, in his study of a large representative sample of 128 subjects, found a sequence of development which supported and confirmed those proposed on the basis of much smaller samples. And, on the other hand, individual case-studies can flesh out broad-based studies, which, by necessity, must be much less detailed.

A large number of corpora now exist, and it is possible to compare information regarding language development with other children in the literature, and comparisons generally show that there are similar patterns of development (Fletcher 1985). If one looks over the studies in child language development over the last twenty-five years, it is clear that the types of utterances children produce have changed very little, although the focus of the researchers and the theories used to account for these utterances have varied a great deal.

The diary study has further potential drawbacks which also must be taken into consideration. One possible disadvantage of the diary study is the fact that the observer is subjective. First of all s/he is usually a parent, and second is usually actively involved in the situation. However, Braunwald and Brislin 1979 suggest that the data can be made more objective if the researcher describes the context in which the utterance occurred. This detailed information can be used to justify the researcher's interpretation, and also allows different conclusions to be drawn from the data. Ochs 1979:43 points out that the problem of "selective observation" is not eliminated with audio or video recordings, but merely postponed until the material is transcribed. (There are however methods for cross-checking the accuracy of transcriptions that are not possible with diary records.)

The fact that the researcher is actively involved in the situation while concentrating on collecting data may also lead to other difficulties. Some children, for example Hal (reported in Painter 1984), do not appear to be conscious of the fact that their language is being recorded. Other researchers have remarked that their subjects were aware that their utterances were being recorded (either electronically or orthographically), and encouraged the researcher to record what they had just said (Braunwald and Brislin 1979, Scollon 1976). Presumably the children enjoyed the attention their utterances were given, which might mean that they would talk more to get attention, so that their utterances could be atypical.

My experience was somewhat different, as can be seen from the following notes taken during the first week of my study.

"Gets frustrated when I note down his utterances - raises his voice and whines". (20.12)

"A gets upset/angry when I record his utterances...A doesn't like it and I find it distracting - I am processing his utterances and recording them rather than responding to him. I almost wish he wouldn't talk so much, to lessen my recording burden." (22.12)

I wrote down no further comments of this type, so assume that A. got used to my split attention as I became more proficient and/or discreet at note-taking.

Another potential disadvantage of the diary study is that because the researcher focuses on only a pre-selected aspect of the child's language development, s/he may miss other phenomena which might occur, or will have insufficient data on the other phenomenon to draw any strong conclusions (Ochs 1979). In my case, because I was recording only multi-word utterances I did not systematically record the appearance of new verbs as they occurred in isolation. This has made it difficult to make a conclusive statement regarding the subject's verb-learning at a point where, as it turns out, it was highly significant. These gaps can be alleviated to a certain extent by looking at different studies on other children at the same stage in linguistic development.

2.1.2. Single-Case Experimental Design

The major difference between a diary study and a single-case experimental design is that purpose of the latter is generally to evaluate a given intervention or treatment, which is the independent variable, whereas diary studies in LD investigate development over time, and the independent variable is maturation. However, there are many similarities between the two, and many of the same comments apply.

Single case experimental design is used widely in research in psychiatry, communication disorders, clinical experimental neuropsychology, and cognitive rehabilitation, as well as social work and education (McReynolds and Kearns 1983, Wilson 1987). Before the development of statistical methods in the 1920s, most research in psychology was single case or small sample (less than 5 subjects) and some very important results were attained, the most famous of which are Broca's research with Tan, and Wundt's individual introspective research on sensation and perception (Kazdin 1982:6).

2.1.2.1. Advantages and Disadvantages of Single-Case Experimental Design

Many of the advantages of the diary study are equally applicable to single-case experimental design. First of all, the data are ecologically valid. Second, single-case experiments can generate

new hypotheses which can be tested with larger samples (Barlow & Hershen 1984, Kazdin 1982) and can therefore be viewed as pilot studies (Wilson 1987). In clinical psychology, as in LD research, data from groups and individuals can contribute separate but uniquely important sources of information (Kazdin 1980:7). And in single-case design, continuous assessment over time allows the researcher to determine patterns in the data that might be missed in time sampling (Kazdin 1982:89) just as it does in the diary study. Volsiner 1983 discusses the problems inherent in group data in developmental neurolinguistics, and suggests that the "longitudinal analysis of individual cases" (emphasis in original) is the optimal research strategy for studying the development of lateralization.

There is a potential problem of researcher subjectivity in single-case experiments just as there is in diary studies. However, this can be countered by ensuring that objective measures are used and data collected systematically, and by attempting to control for as many variables as possible (Kazdin 1982:89). The issue of validity and generalizability in single-case studies is argued convincingly in Wilson 1987.

2.2. Data Collection

2.2.1. The Subject

The subject was my son, Ainsley (henceforth A), a healthy, normally-developing first-born and only child, although there was a three-year old girl and her mother living with us through most of the data collection period. He spoke his first word at approximately 12 months, and acquired more words over the next six months. However, his preferred method of communication during this time was 8-10 syllable intonational phrases which were meaningless (to me), and were not "consistent phonetic form[s]" (Radford 1990:18). These verbalizations were usually combined with hand gestures. For example, he would say 'dadadadadadadada' while pointing at a chair, which meant 'put me on the chair and push me around' (the chair had wheels). I can remember saying to another mother that he would probably learn to 'talk' if I didn't understand him so well. By the time the study began, when he was twenty months old, he had 113 words in his active vocabulary, although he understood many more, and the majority were names of objects. This is consistent what has been observed with other children at the one word stage (documented by Bates 1979, Benedict 1976, Dromi 1987 and Nelson 1973 for example).

2.2.2. Procedure

Braunwald and Brislin's 1979 paper "The diary method updated" provided a useful source of advice regarding what data to record, and Ochs 1979 had interesting insights regarding lay-out. I was not familiar with the literature in single-case experimental design at the time my study commenced, but in general followed its precepts.

The data were collected over a three-month period, from the appearance of A's first two-word utterances to the beginning of his morphological development; from what Radford 1990 calls the lexical stage to the functional stage, or from Brown's 1973 Stage I to Stage II. Every utterance of two or more words which A produced in my presence was written down, on a daily basis, approximately four hours per day. There were times when I did not keep a record for the full four hours/day, and some days were missed, but in general data were collected every day. Depending on the situation, entries were written either on the pre-designed forms or on slips of paper which were later transferred to the forms. The information collected included:

- (i) gross suprasegmental information (i.e. intonation contour, pauses);
- (ii) the utterance itself, in very broad phonetic transcription at the beginning and in English

- orthography as A's pronunciation improved;
- (iii) a gloss of the utterance;
- (iv) the situation in which the utterance occurred;
- (v) the purpose of the utterance, both communicative and other uses of language, including practice, substitutions and routines.
- (vi) the linguistic context surrounding the utterance.

The forms, which were on 8 1/4 x 14 inch sheets, were set up in the following way:

FIGURE 1
Data Entry Form

Date		Age			
Utterance	I.C.	Gloss	Setting	Type	C.A./Comm.

Below are two sample entries, one of which occurred in the first week of the study and another which occurred during the last week.

- 21.12.08 (day.month.utterance number)
- (i) ↘ ↘ ↘ ↘ Intonation Contour
- (ii) [yiyt], [tɪ] x 3 Utterance
(,) = slight pause
(x3) = word repeated 3 times
- (iii) light, turn (on)
- (iv) A. points to window, says 'dark'.
- (v) Routine.
- (vi) I expanded. 'When it gets dark, people turn on the lights in their houses.'
- 13.03.35
- (i) ---
(Once intonation contours were mastered, I recorded only exceptions.)
- (ii) Ainsley Balcom found needle x 5
(x5) = utterance repeated 5 times
- (iii) A playing with sewing stuff.
- (iv) Description.
- (v) Talking to himself.

The entries were very detailed at the beginning. However, it was not necessary to record utterances with the same amount of detail as A's language production advanced. Once he had consistent word order and control over his phonological system he became much easier to understand, and glosses were included only when necessary, for example:

31.01.05 lie down, light. Bring down light

([He] [w]anted me to put the lamp on the floor so he could play with it.)

Fletcher 1985 cautions against the use of orthographic

representation of children's early utterances, as it may not represent what the child actually meant, and that the analysis is based on the transcription rather than what the child actually meant (p. 15). For example, [əv] could be 'of' for the child, but represented as 'have' by the recorder (i.e. "I could of/have done it"), and the sound sequence [ɪn] could represent the preposition "in", or be a general purpose preposition. Similarly, Ochs 1979 points out that sound play may not be seen in corpora if traditional orthography is used. However, in my corpus major lexical categories were generally clear from context, and if not I recorded them in broad phonetic transcription. Second, I represented morphemes phonetically (once they began to appear) until there was a consistent sound/meaning correspondence. For example, I began transcribing the progressive morpheme as [ɪŋ] until it began to occur with frequency and consistency, and the allomorphs of the plural/possessive/third person and past were also represented phonetically.

Braunwald and Brislin 1979, working in an ethno-cultural tradition, suggest keeping notes about other aspects of the child's development. Although I did not keep such notes, the day care centre which Ainsley attended throughout the period under study (and in fact until he was 2;6) kept extremely detailed notes regarding A's health, daily activities and even what he ate and when he slept, which they kindly consented to give me. The only significant event during this time, when he moved from the junior

toddlers to senior toddlers group, seemed to have no effect on his language development, although it was a topic of conversation.

2.2.3. The Data Base

To simplify data analysis, all of the relevant utterances were transferred to separate sheets (organized by VO, SVO, SV(O) and SV). The utterances were then organized by verb, and cross-referenced by date.

In order to test the hypothesis that the first events to be attended to and encoded using basic word order will be of cardinal transitivity, and that less transitive events will only be attended to and expressed once basic word order has been established, I looked only at the seven most frequent verbs in the corpus. Each of the seven exemplar verbs occurred a minimum of 25 times in VO constructions during the three-month data collection period. Together, the seven exemplar verbs make up 48% of the VO utterances in the corpus (262/542).

In all cases, frequency is determined by the appearance of the verb in VO constructions. The main reason for this is that VO is the most frequent structure in the corpus with the potential for expressing a transitive relation, as can be seen in Table 1:

TABLE 1

Frequency of Structures Expressing Transitivity

Total number of utterances in the corpus	2792	
Total number of VO utterances	542	(19%)
Total number of SVO utterances	121	(4%)
Total number of SV(O) ² utterances	61	(2%)

Furthermore, the VO construction was one of the first to emerge, and was consistently productive (with one gap in Period 1), while SVO constructions, for example, do not even occur twice in the same day until more than half-way through the period for which data were collected. Similarly, SV constructions were predominantly intransitive (134/195 or 69%) and those expressing transitive relations did not, in general, occur until the VO construction with the same verb was well-established.

My rationale for looking at only the seven most frequent verbs in VO constructions is:

- (i) A large number of examples of a given verb allowed me to arrive at a transitivity rating based on the child's use rather than on an adult-imposed meaning. (I am assuming

²SV(O) represents a transitive utterance where the Object is not overtly expressed. This number includes two instances each of SV(O) constructions with 'bake', 'drink' and 'eat', where there is not an obligatory object in the adult grammar.

that A's utterances reflect his mental representation of a given transitive event.);

- (ii) According to Anisfeld 1984, the high frequency use of a given structure shows that it has been recently acquired and is being practised to perfect its use. Typically these verbs were frequent for a short period of time and then decreased in use;
- (iii) With fewer tokens, it would be difficult to ascertain whether the utterance had been broken down into its component parts or if it was an unanalyzed chunk (Peters 1983);
- (iv) More tokens of a given type of verb also allow a lexical representation to be built up that reflects the child's knowledge.

I divided the total time under study into four separate periods according to when the exemplar verbs first became productive. However, the exemplar verbs and the periods they represent should be viewed as points on a continuum, reflecting the culmination, in productive use, of the actual grammatical knowledge they exemplify. Table 2 shows the exemplar verbs and in what period they first became productive.

TABLE 2
 Exemplar Verbs
 for each Period

Period 1	December 20 - January 27	Turn (on/off)
Period 2	January 28 - February 15	Shut;Open
Period 3	February 16 - February 29	Eat;Share;Burn
Period 4	March 1 - March 20	Find

2.3. Analysis of Data - Transitivity Scale

As discussed in Chapter 1, Slobin 1981, 1985 hypothesizes that children beginning the process of grammaticalization will begin by encoding events which are, in his terms, of prototypical transitivity. He bases this concept on Hopper and Thompson's (H & T) 1980 work on parameters of transitivity, which are shown in Table 3 below.

TABLE 3

Hopper and Thompson's Transitivity Scale

	HIGH	LOW
A. PARTICIPANTS	2 or more participants, A and O	1 participant
B. KINESIS	action	non-action
C. ASPECT	telic	atelic
D. PUNCTUALITY	punctual	non-punctual
E. VOLITIONALITY	volitional	non-volitional
F. AFFIRMATION	affirmative	negative
G. MODE	realis	irrealis
H. AGENCY	A high in potency	A low in potency
I. AFFECTEDNESS OF OBJECT	O totally affected	O not affected
J. INDIVIDUATION OF OBJECT	Object highly individuated	O non-individuated

From Hopper, P. and Thompson S. 1980. Transitivity in grammar and discourse. Language 56:256.

In what follows, I will present H & T's parameters of transitivity, which will be modified and in several cases completely dropped so that the parameters represent the knowledge children can be assumed to possess as they begin to acquire syntax. (Although these parameters are ostensibly universal, individual languages appear to select from among the different parameters rather than using them all. For example, Shayne 1982 found that only four of H & T's parameters were operational in San Carlos Apache.)

To support the existence of these parameters in early child language, I will refer to a number of works in infant perception and cognition, and earlier stages of language development. These references should not be viewed as an exhaustive survey, but are numerous enough to give support to the hypothesized parameters.

2.3.1. Participants

According to H & T, two or more participants (at minimum Agent and Object) are required for a transfer of action, which is central to the definition of transitivity. In what follows, I will show that infants perceive and distinguish the two participants that must be present in a transitive clause.

According to Trevarthan 1974 (cited in Bruner 1972), from the first few weeks after birth, infants distinguish the category of people from the category of things. Bell 1970, in her study of 33 infants 8;6 to 11;0 months, found that by this age subjects realized that both objects and people possessed permanence, although there was a decalage between the two (animate before inanimate). Similarly, Ashaed and Perlmutter 1980, based on a study of parental reports of eleven infants 7, 9 and 11 months of age, found that the children would search for people in variable locations before they would search for objects, suggesting that people are endowed with permanence before objects. These studies all show that people and

objects are distinguished and endowed with permanence by the time infants are 12 months old.

I will now show that it can be assumed that infants can distinguish Agents from other participants in transitive events. Robertson and Suci 1981 showed infants films in which there were puppets representing an agent, a patient and an observer (non-participant). Before the action took place, the subjects paid equal attention to all three participants, but both during the event, while an agent pushed the patient down, and after the event, the infants paid particular attention to the agent. In an experiment to teach toddlers nonsense words for participants in events which they were shown on a film, Grace and Suci 1985 found that the subjects tended to learn the word for the agent more readily than either the patient or the observer (non-participant), again suggesting that children have a perceptual strategy of attending to the agent. This is supported by Rescorla 1981, who found that by the age of two, children's comprehension vocabularies were larger for agents and actors than for inanimate categories. Golinkoff 1981 reviews the literature regarding whether "minimally verbal infants" (p. 423) (ranging in age from 1;3 to 2;0), pay more attention to events in which there is a role reversal (i.e. the agent becomes the patient) than to events in which there is an action reversal (i.e. the same agent reverses the direction of the action on the recipient) and concludes that both agents and patients are salient categories which are used by infants in processing events. Corrigan

and Odyas-Weis 1985, in an experiment in which subjects were asked to place a token on a picture of "the one doing the X-ing", found that children 1;2 to 1;8 could make a functional distinction between actors and patients. We can therefore conclude that infants, well before the ontogenesis of grammar, distinguish people and objects and pay particular attention to agents in transitive events.

Looking at the relationships that are encoded by children in their first words, it is generally accepted that children at the one-word stage (immediately before the stage under study) have the concept of both Agent and Object. According to Bloom 1973, these notions come from the child's conceptual relations: persons perform actions and things are affected by actions.

At the early multi-word stage, both participants are not present in the speech signal. Greenfield and Smith (G & S) 1976 interpret the lack of overt subjects as showing that children at the one-word stage do not express situational elements that can be taken for granted, and suggest that the agent is only expressed when it cannot be assumed from the conversational context. They claim that since the object is directly involved in the action involving a change of state it is more salient to the child and therefore more likely to be expressed³. This process continues at the two-word

³These findings may appear to contradict Rescorla 1981. However, Rescorla talks of comprehension vocabularies, while G & S are looking at the words produced by children at this stage.

stage, where the object is more likely to be expressed than the agent in transitive constructions with a verb (Bloom 1970, Brown, Cazden and Bellugi 1973, Hyams 1983, 1986, Menyuk 1969, Painter 1984 for example). Many researchers suggest this lack of subjects is due to processing and memory limitations, while Hyams 1983, 1986 attributes the lack of overt subjects in the early stages of children's speech to their fixing (in some cases erroneously) the null subject parameter so that subjects are optional. Lebeaux 1987 proposes that the lack of overt subjects in the utterances of children at this stage is due to the fact that they cannot assign case to an external argument. Recently, P. Bloom 1990, based on his detailed analysis of Brown's 1973 corpus, supports the earlier contention of earlier researchers that the lack of overt subjects in children's early utterances is due to processing limitations.

Therefore, although the agent is not usually present in the speech signal in my data, an utterance will be scored for two participants (and high in transitivity for this parameter) if the agent is clear from the context, and definite. (In most cases the agent is either A or me in the corpus, often corresponding to whether the utterance was a description or a request.)

2.3.2. Kinesis

Under H & T's analysis, in a transitive event something happens;

the object changes position or state when there is a transfer of action. An action is transferred but a state is not (e.g. 'hug' vs. 'like'). High transitivity is marked by the degree of directed physical activity; there is physical movement and a kinetic quality. This parameter interacts with the affectedness of the object: a physical action results in the object being changed.

According to Lempert and Kinsbourne (L & K) 1983, movement is a powerful visual stimulus which even neonates attend to, and the human perceptual system is biased towards movement and sound. Gibson and Spelke 1983 also note that neonates attend consistently to moving objects. Using habituation paradigms and preferential sucking techniques, researchers have been able to test this with very young infants. Bower 1982 found that motion is detected by children as young as two weeks, although they may not recognize the same object in motion and at rest at that age. Bower et al 1971 found that infants followed objects in motion, as motion makes them more perceptible against their background. Kagan 1971 discovered that even infants two days old paid more attention to moving or intermittent light than to a continuous light source. And according to Nelson 1982, preverbal infants (8-12 months) attend to and remember dynamic qualities of actions more than stative perceptual qualities. Yonas and Owsley 1987 showed that infants were sensitive to kinetic information, which, they claim, gives the infants information about the spatial properties of objects. Similarly, although Fox and McDaniel 1982 found that infants 4-6

months old preferred biological motion, they point out that infants typically prefer moving objects over static ones. This empirical research all supports Nelson and Horowitz's 1987 hypothesis that the mammalian brain is "pre-wired" to attend to motion: infants attend to motion and track a moving object so soon after birth that it must be an innate predisposition rather than a learned response.

Looking at how kinesis is encoded linguistically by very young children, Rodgon et al 1977, in their study of children at the one-word stage, take Piaget's position that early language is tied to action, either as an accompaniment to it or to express ideas involving action. They found that 66% of three children's single-word utterances occurred while the children were performing an action. The fact that children's early utterances are often accompanied by actions has also been noted by de Laguna 1927, Sinclair de Zwart 1971, and Werner and Kaplan 1963 among others. Bloom et al 1975 studied development of locative expressions and found that those describing movement appeared before those describing final location, and concluded that dynamic events were more salient to the child than stative events. Furthermore, Stephany 1978, investigating verb use in four Greek-speaking children 20;10 to 22;25 found that there were only 54 tokens of stative verbs, compared to 914 tokens of verbs encoding the result of an action and 459 tokens of dynamic verbs encoding an ongoing activity, suggesting that the children were attending to kinetic events.

It is clear from this summary of both perceptual and language development research that very young children attend to motion, and that actions involving motion will be highly salient. An utterance will be high for this parameter if there is a definite action involving motion, and low if the verb does not describe a kinetic action.

2.3.3. Punctuality and Aspect

Although H & T admit that there is a strong correlation between punctual actions and perfective predicates in that both indicate an effective transfer of action, they view the two as separate phenomena. A punctual action is defined by H & T as one in which there is no obvious transition between the onset and the completion of an action: for example 'kick' is a punctual action with a marked effect while 'carry' is ongoing. Aspect is defined in terms of telicity: an event of cardinal transitivity is telic in that there is a complete transfer of action and a definite endpoint. How Punctuality and Aspect are expressed by means of morpho-syntactic devices is contrasted with Aktionsart or "inherent lexical aspect" (Comrie 1976) where the aspect or punctuality of an action is part of the verb's meaning and is not encoded by means of auxiliaries or inflectional morphemes.

It is not clear that a child beginning to put words together would make these fine distinctions between punctuality and aspect, and I

have therefore chosen to combine the two. Because inflectional morphemes and auxiliaries are absent from children's speech at this stage, determination of punctuality and aspect will be based on Aktionsart, either "inherent in verb or conveyed by the interaction of the verb and its arguments" (Tenny 1987:11) and the situational context of the utterance. This use of context to determine punctuality follows from Bickerton's 1989 contention that the situation the verb occurs in determines its punctuality, rather than the verb itself being inherently punctual.

The crucial aspect of these two parameters from the point of view of early child language is the idea of a complete transferral of action (aspect) with no obvious transition between inception and completion (punctuality). To the best of my knowledge there has been little work on children's early conceptions of these phenomena, although much has been written about their expression of tense and aspect immediately after the period under study. (See Cziko 1989 for a review of the literature.) Borton 1979 (cited in E. Clark 1983) found that 3-month-old infants attended to changes of state; that is, they paid attention to results that were the outcome of a motion. And Leslie 1979 (cited in Clark *passim*) showed that infants 4-8 months old could distinguish processes from events.

Looking at the types of events encoded linguistically by toddlers, according to G & S 1976, children at the one-word stage attend to

change and do not differentiate between initial state, process and resultant stage: that is, they notice change without any awareness of an intermediary process. Similarly, Stephany 1978, in her analysis of early verb use in young Greek-speaking children, found 914 tokens which were perfective and punctual, and only 459 tokens which were continuous, which suggests that perfective, punctual events were preferred by her subjects. Berman 1985 reports that young children learning Hebrew use present and past markings on verbs, even at the one-word stage, using the past morpheme with punctual verbs to mark the end-state, and the present marker to mark ongoing processes. According to Aksu-Koc and Slobin 1985, by 21 months Turkish children use different morphological affixes to distinguish punctual events, where there is a change of state, from durative processes, which are ongoing. With the children in this study, the punctual marker appeared first. These observations appear to consolidate the important distinctions inherent in the Punctuality and Aspect parameters: end result rather than transitional phase is salient to the child, and punctual events are more likely to be attended to and encoded than ongoing processes.

When English children do begin to encode tense and aspect, immediately after the stage under study, they use '-ed' when describing an event that has just occurred with an end result which is still in evidence (perfective rather than past), and '-ing' to describe an ongoing event in progress with no clear result, durative and with no natural endpoint (Antinucci & Miller 1977,

Sachs 1983, Weist 1982 for example). Czikó 1989 investigates Bickerton's hypothesis, first enunciated in Bickerton 1981 and continued in subsequent work, that the punctual/non-punctual distinction is part of the "bio-program", that is, innate, by reviewing 60 empirical studies of language development in a number of languages (English, French, Greek, Hebrew, Italian, Japanese, Polish, Serbo-Croatian and Turkish). His analysis of these previously-published studies showed that children during or immediately after the period under study do make a distinction between punctual and non-punctual use of verbs, and that they initially use the past morpheme not to express past time, but rather to express "some combination of the punctuality and perfectivity of the event being described" (p. 30).

An event will be scored as high in transitivity for this parameter if it is punctual, of very brief duration, and with a clear end result.

2.3.4. Volitionality

This parameter is defined by H & T in terms of the deliberateness and spontaneity of the Agent. Highly transitive clauses require the voluntary and planned participation of the Agent (i.e. 'write' vs 'forget' someone's name; 'listen to' vs 'hear' the music, where the agent is volitional in the former examples). In clauses of cardinal transitivity the agent has active control over the

activity. This, according to H & T, requires a human, or at least animate, Agent.

As discussed above under Participants, infants perceive the two participants, Agent and Object, in a transitive event. However, the notion of an agent who is not the child is rather fuzzy. Bates and MacWhinney 1982 discuss the infant's intentional use of a human agent towards a goal, and Anisfeld 1984 talks of how children at the one-word stage use people to achieve their ends rather than acting on the object directly themselves. Both Bates 1976 and Gelman and Spelke 1981 conclude that children at the one- and two-word stages perceive objects and persons as instruments. Similarly, Bowerman 1974 describes the subject category in early child language as bearing the thematic role of both agent and instrument. Thus, agents who are not the child may actually be viewed by children as instruments for achieving their ends. On the other hand, Bruner 1972 maintains that infants have the idea of "inter-subjectivity", that is, they know that other people can act intentionally. He claims that before infants have the ability to move on their own, they perceive the caregiver as an agent while the children are the recipients. Once children gain the ability to move independently, these roles are reversed. And Ashmead and Perlmutter 1980, who observed children 7-11 months old over a six-week period, found that by 11 months of age infants were aware of others as agents. Although in 53/57 causal events reported by parents the agent was the child, in what they call "social

interactions" in 63/92 cases the agent was another person, showing that children knew others could act independently. The caregivers were not being perceived as instruments in these cases, as the children were anticipating events they did not initiate or want to occur (i.e. having their faces washed).

French 1971 suggests that children prefer an agent in subject position due to its perceptual salience as an initiator. Although the idea of the initiator in subject position due to perceptual salience holds only for languages which are subject-initial, it seems to me that "Initiator" might be a more appropriate category for describing volitional agents in early child language, incorporating both Agent and what has been called Instrument, that is agents who are not the child and who are used by the child to achieve the child's ends. Volitionality will therefore be defined in terms of an entity capable of initiating an event.

With regards to H & T's requirement that the Agent be animate, it is not clear whether the child's concept of animacy corresponds to that of the adult. According to Piaget 1979, even after the children have entered school they may attribute human-like qualities to "remote" objects they do not understand (i.e. the sun). However, other researchers (Gelman and Spelke 1981, for example) suggest that there are methodological problems with Piaget's experiment, and that even adults would be hard-pressed to answer questions such as "Does the sun move by itself?". Carey

1985 suggests that a full understanding of the concept of animacy takes years to acquire, as it requires a knowledge of biology.

E. Clark 1979 views the thematic relations of Agent and Object in early child language in terms of the concepts of mover ("Actor") and moveable ("Object"), where the mover can be the caregiver, the child or a vehicle ('The car pushed the truck') and moveable objects include clothing and toys. Lempert & Kinsbourne 1978, 1981 suggest that children at the early stages of language require no notion of animacy: they first encode the notions of animate subject or inanimate object more in terms of movement, confounding mobility and intentionality. Bloom et al 1975 state that movement, not animacy controls early word order, and Bowerman 1974 claims that agency is not initially equated with animacy in the child's mind, and that independent movement or ability to initiate an action was used to classify objects, rather than animacy. Corrigan and Odyas-Weis 1985 also found that two year old children did not use the notion of animacy to identify the actor in a transitive event. Golinkoff and Kerr 1978 made similar findings, and suggest that since pre-linguistic children do not distinguish animate from non-animate actors that there should be a broad category of "action initiator". According to Slobin 1985:1186, when Polish and Russian children first begin to use overt case markings to mark Patients, they use the same accusative form for both animate and inanimate

objects, although the adult language distinguishes between the two⁴.

Animacy therefore relates to the agent/instrument issue discussed above: any object capable of independent movement may initiate an action. I will therefore assume that children beginning the two-word stage have the concept of a volitional Agent, although the concept may be narrower than the adult's. Volitionality is to be understood in terms of the ability to move independently and to instigate an action. As I mentioned earlier (under Participants) the child normally does not encode the Agent of a transitive event in speech, but it is nearly always clear from the context and, in my study, almost invariably either the child himself or me. Therefore in most cases the utterance would be coded as having a volitional agent, although my participation might not always have been voluntary!

⁴There is a problem with reality as opposed to representation for children and researchers alike. Dolls and toy animals are often considered animate in the child language literature, although they are clearly not animate in the true sense of the word, but represent animate entities. Rispoli 1987 provides an answer to the conundrum: he proposes an animacy continuum with the two poles representing "true animates" and "inert animates", and what he calls "animate surrogates" (i.e. dolls, stuffed animals) and vehicles (toy trucks and cars) falling somewhere in between.

2.3.5. Mode

This parameter is defined by H & T in terms of real and unreal, the former being indicative of high transitivity. Real events actually occur, while unreal events do not occur or occur in a non-real world, and may be conditional or hypothetical.

It is not clear that children's conception of reality conforms to that of adults. However, it is generally accepted that children's language, at least at the early stages, is based on the here and now, and therefore on a real event in the real world. For example Sachs 1983 found that before the age of three, her subject made only occasional references to objects or events based on fantasy or prior experience. At 17 months the child requested absent objects, but only when the object had a unique referent, and even at 3 years of age, conversations not based on an activity in progress were of short duration. Greenfield & Smith 1976 made similar observations.

However, at the earliest stages in language development the child produces utterances which are associated with an entity or event in the environment and firmly bound to that entity or event. In other words, early words can be viewed as "part and parcel of certain behavioral routines and not separable from them" (Anisfeld 1984:33). Bates 1979 refers to this phenomenon as "contextualized speech". The process of decontextualization at the very beginning of oral speech is characterized by movement from a restricted,

context-bound use of words which depends on perceptual support, to a use of words which can occur in a broad range of situations with decreasing perceptual support. She suggests that contextualized one-word speech occurs before children learn that words refer to objects and actions; they are not yet capable of breaking down a situation into its component parts. A word therefore refers to the entire event rather than to a particular aspect of the event (an object or action for example).

As will be seen in my discussion of the data, this process is also at work during the two-word stage, although it is discontinuous. A number of utterances are not related to a real transitive event and did not or will not occur, but are triggered by a word or entity in the environment, and are never used outside that situation. I hypothesize that the child has no mental representation of the events in question and is therefore unable to break them down into conceptual constituents. The utterances in question are also low in other parameters of transitivity, suggesting that non-cardinal transitive events were more difficult for the child to analyze. This parameter will be represented in terms of decontextualized (real) and contextualized (unreal), the former being high in transitivity.

2.3.6. Individuation of Object

For H & T, the crucial aspects of individuation are referentiality and definiteness. The individuated entity is discrete, bounded, and separate from its environment.

According to Piaget 1979, children do not possess object permanence, that is, an appreciation of the autonomy of objects as separate from their environment, until the age of approximately 12-14 months. At this point, the object is disassociated from its context and endowed with permanence. Other researchers, for example those cited below, question Piaget's findings, and suggest that the concept of object permanence is available much earlier, and that it is a methodological problem in Piaget's work which causes him to conclude that object permanence occurs fairly late. Bower 1982 suggested that it was due to infants' inability to lift the cloth hiding an object which led Piaget to his conclusions.

Bower 1982 found that children as young as 2-4 months were surprised when an object didn't reappear after being covered by a screen, and five-month-old infants reached out to grasp a previously visible object when a light was turned off, suggesting that for the young infant, an object is bounded in space and spatially located. Further evidence that infants perceive objects as being unitary and separate from their surroundings comes from Spelke and Born 1982 and Gelman and Spelke 1981, who found that

infants were puzzled when an object broke up and part moved in tandem with the background, but not when the entire object moved. Similarly, according to Streri and Spelke 1988, by the age of four months infants appreciate the fact that objects are separate from their environment and have permanence, and Baillergeon 1987 found that by 4 1/2 months of age infants understood object permanence. Rose 1988, in an experiment based on a habituation paradigm in which infants were exposed to a light which traced out a pattern of objects of different shapes, found that by 12 months infants could unify movements of the light and give the object configurational coherence, as the subjects were able to recognize objects after seeing only the moving point of light.

It is clear from all of this research that infants perceive objects as bounded entities and view them as separate from their surroundings. Furthermore, because children's early speech is generally grounded in the here and now, their words will have definite, specific reference at all times. For example, Sachs 1983 found that by 17 months her subject could use the name of an object whether it was present or absent, but could use displaced reference only with a unique object. A similar point is made by Brown and Bellugi 1964, and E. Clark 1979. Gordon 1988, in his research on children's learning of the count/mass distinction, suggests that initially children encode the difference between nouns which are individuated from those which are not, and hypothesizes that the notion of individuation is innately available to the language

learner, who therefore learns the count/mass distinction quickly.

An utterance will be high in transitivity for this parameter if the object is separate from its surroundings and has a definite referent.

2.3.7. Affectedness of Object

According to H & T, a highly transitive clause describes a change which is apparent and visible. If there is a physical action, causing the Object to be moved or altered, the Object is totally affected and the event therefore high in transitivity for this parameter.

Nelson 1973, in her study of the first 50 words children use, found that words relating to changeable states were learned before those relating to unchanging attributes (i.e. 'allgone', 'dirty', 'hot' vs 'red', 'round', 'pretty'). Similarly, Bigelow 1987, studying 4 blind children, found that their first words also referred to perceptual changes in objects, although in a different modality than sighted children (auditory, tactile or olfactory rather than visual changes). Greenfield & Smith 1976 found children's one-word utterances encoded change, and hypothesized that it is attending to change that enables children to distinguish "entities" (things) and "relations" (actions or changeable states). Bates and MacWhinney 1979, 1982 also found that children's single word utterances

expressed new, changing or uncertain information. These results suggest that children at the one-word stage orient to and comment on the changing element in a situation.

These findings are confirmed in non-linguistic modes at even earlier stages. Lempert & Kinsbourne 1983 discuss the fact that the "immature attentional system" (p.321) is sensitive to novel or changing elements in an event. Kagan 1971 found that infants naturally attend to events in which there is a high rate of change in physical characteristics, and suggests that this is inherent in the structure of the central nervous system (p. 58). An utterance will be considered high in this parameter of transitivity if the object is physically moved or changed.

2.3.8. Dropped Parameters

Agency

According to H & T, if agency is high there is a transferral of action; the clause describes a perceptible event with perceptible consequences. Low agency could denote an internal state rather than an action. The index of agency is: third person human pronoun > Proper noun > human noun > inanimate noun. This parameter has been dropped as the basic idea is covered under Kinesis and Volitionality.

Affirmation

This parameter is based on affirmation and negation, with the former being high in transitivity. In a negative clause, the action of the verb is deflected and therefore less direct.

In children's early utterances, both Bloom (1970) and Brown (1973) distinguish between two types of negation which have the following functions: 1) to express non-existence; and 2) to reject something. Typically, at the early stages of language development, children express rejection or refusal by 'no' in isolation, while non-existence is expressed in a sentence, and is generally considered to occur after the two-word stage. In my corpus, sentence negation occurred late in the period under study, and the only occurrences of negation with transitive constructions were both imitations ('no touch light'; 'mustn't touch tape'). This parameter is therefore irrelevant for the period under study.

Table 4 summarizes the information presented in the previous section, providing a modified scale of transitivity on which the child's utterances will be scored.

TABLE 4

Modified Scale of Transitivity

PARAMETER	TRANSITIVITY	
	HIGH	LOW
1. Participants	at least two: Agent and Object	one only; A ambiguous or indefinite
2. Kinesis	perceptible motion; physical activity;	no perceptible motion; result or state
3. Punctuality and Aspect	non-durative; clear endpoint	ongoing; no clear endpoint
4. Volitionality	A instigates action; capable of independent movement	non-instigator
5. Mode	decontextualized; a real event; based on here and now	contextualized; unreal; associative
6. Individuation of Object	definite, specific reference; independent of setting	indefinite; no referent
7. Affectedness of Object	apparent and visible change	no perceptible change

Dropped Parameters

1. Agency	potent agent	core notion covered under (4)
2. Affirmation	affirmative	no negation of events in child language at this stage

2.4. Calculation of Transitivity

In order to test the hypothesis that the child would begin by encoding events of cardinal transitivity and only later apply the word order to events of lower transitivity, it was necessary to calculate a transitivity rating for each exemplar verb, based on the modified parameters of transitivity described above. The transitivity rating was computed by examining the utterances which occurred during the first period in which the verb in question became productive in VO constructions. Any differences between the utterances during that period and in subsequent periods are noted. For each parameter of transitivity the number of utterances which are to be considered high in transitivity is divided by the total number of utterances with that verb to give a score of one or less for each parameter. For example, for "turn" in Period 1, there were, out of a total of 11 utterances, 8 in which there is a definite agent which is obvious from the context, $8/11 = 0.7$ which gives a transitivity rating for the Participants parameter of 0.7 out of 1.0. There are a total of seven parameters so that the highest possible score, indicating cardinal transitivity, is 7.0.

In Chapter 3, I will apply the modified parameters of transitivity to the seven exemplar verbs, and based on their transitivity ratings, show that Slobin's hypothesis cannot be disproved. I will show that the subject begins by attending to and encoding events of cardinal transitivity and subsequently applies the grammatical devices thus acquired (SVO word order) to events which are of lowered transitivity.

CHAPTER 3

Data Analysis and Interpretation

3.1. Introduction

In Chapter 2, I presented at some length my rationale for looking at only the seven most frequent verbs in VO constructions in the corpus. To briefly summarize my arguments, examining only the verbs which occurred at least 25 times each in the corpus allowed me to derive a meaning for the verb as it was used in transitive constructions by the child rather than based on an adult lexicon. Furthermore, the frequency of use over a short period of time suggests that the verbs were recently acquired, and the use of the verb with a large number of Objects (or at least referents in the case of 'shut' and 'open') indicates that the Verb + Object constructions had been analyzed into their component parts. Table 5, which shows the seven exemplar verbs and the period in which they first became productive, is repeated here from the previous chapter (Table 2) for the reader's convenience.

TABLE 5

Exemplar Verbs

Period 1	December 20 - January 27	Turn (on/off)
Period 2	January 28 - February 15	Shut;Open
Period 3	February 16 - February 29	Eat;Share;Burn
Period 4	March 1 - March 20	Find

3.2. Period 1: Turn (on/off)

'Turn (on/off)' is the exemplar verb for the first period under study. As can be seen from the following chart (Table 6), the verb as it occurs in VO constructions is high in transitivity: in almost all cases there is a volitional agent performing a discrete action with a clear result on an object with definite reference.

TABLE 6

Transitivity Rating for 'Turn' in Period 1

TURN (ON/OFF)	Period 1	Dec. 19 to Jan. 27
Number of utterances = 11		<u>TRANSITIVITY RATING</u>
1. <u>Participants</u>		0.7
Agent =	Ainsley 5	Object = light 6
	Mother 3	TV 2
	ambiguous 2	radio 1
	indef. 1	record player 1
		vaporizer 1
<p>The two ambiguous cases both involved definite, human agents who were potential initiators.</p> <p>The implied indefinite agent was 'people', based on a routine we often repeated, where I would look out the window and say "It's getting dark. People are turning on the lights in their houses". The utterance in question ('turn light') was preceded by 'dark' uttered by A as he looked out the window.</p>		
2. <u>Kinesis</u>		1.0
<p>All involved the physical activity of manipulating a plug, knob, or switch.</p>		
3. <u>Punctuality and Aspect</u>		0.9
<p>For the child there is a direct action (touching a knob or switch) with an instantaneous result, in that the object visibly or audibly changed, except in the case of the vaporizer where there is no obvious result.</p>		

4.	<u>Volitionality</u>	0.9
	One indefinite agent, where it is not clear what the child understood 'people' to be. In the ambiguous cases, either of the two potential agents was capable of independent action.	
5.	<u>Mode</u>	0.9
	All but one are decontextualized. The other is a routine. (See <u>Participants.</u>)	
6.	<u>Individuation of Object</u>	0.9
	One routine in which the object had no definite referent.	
7.	<u>Affectedness of Object</u>	0.9
	Change apparent except in one case (vaporizer). In all other cases there was either a visual or auditory change, with a light, radio, or TV going on or off.	
<hr/>		
	TOTAL	6.2/7.0

3.2.1. Discussion

Although 'turn' is high in transitivity, and it is clear that A is attending to events related to the verb, 8/11 of the utterances in Period 1 had deviant word order according to the adult grammar of English, that is OV rather than VO. For example:

21.12.02 light.turn

23.12.01 radio.turn

There was also a great deal of repetition, and each word had its own intonation contour, which I have not reproduced here for expository clarity (See the first sample entry in Chapter 2 for an example.) This is also true of other transitive constructions¹ which occurred at the same time, and suggests that although A was

¹I am calling them transitive constructions here as word order was variable, VO and OV, SV(O) and VS(O).

attending to transitive events, he had not yet found the syntactic means of encoding them. During the same period there were several other patterns, mainly locatives and Adj + Noun constructions, with consistent English word order, but in general word order was unpredictable. As well as a lack of consistent word order, the utterances during this period are characterized by hesitancy, repetition and circularity; what Braine 1976 called "groping".

There is also a gap of over two weeks during which time no transitive constructions occurred. Nor were there many two-word utterances of any kind during these two weeks. Towards the end of the period there was a re-emergence of transitive constructions with predominantly VO order, culminating in the high-frequency use of 'shut' at the beginning of Period 2.

3.2.2. Subsequent Periods

The transitivity rating remains high for 'turn' in subsequent periods: out of a total of 64 VO utterances with 'turn (on/off)' in Periods 2, 3 and 4, only four are contextualized routines similar to the one described above in Table 6 under Participants. There are also four instances of what I called "practice" as there appeared to be nothing in the conversational context A was referring to, and there was no communicative purpose for the utterance.

For example:

05.03.70 turn on [yIt]
 turn [yIt] on
 turn on [yIt]

(Not clear what he is referring to. It is definitely a lax vowel. (A says [yɪt] for 'light', with a tense vowel. I have glossed it as 'it', as this form also occurred in other types of constructions around this time, and seemed to fill a pronominal function.)

There are too few of these to affect the transitivity rating significantly. In general the events described involve a volitional agent performing a punctual action with a clear result on a wide variety of well-defined objects in the speech setting (19 different complements).

3.2.3. Verb + Particle Constructions

Typically, children at the beginning of the two-word stage use either a verb or a particle/preposition to express a verbal function. A began Period 1 using the verb 'turn' alone, and then used the Verb + Particle, Verb + Object or Object + Particle² in free variation:

21.01.12	turn on	Pointed to bathroom tap.
21.01.02	turn light	Coming up from basement. He wanted to turn the light off.
24.01.04	radio on	Turning volume knob on the radio.

As can be seen from the dates, these occurred towards the end of

²Not necessarily in this order.

Period 1, when transitive constructions began to re-emerge. During Period 2, A became aware that the particle combined with the verb, and the Object + Particle was usually used to describe a state, i.e. "the X is on/off".

There are only 3 occurrences of Verb + Object + Particle³ constructions in Periods 1 and 2, but by the end of Period 3 A had fixed on the Verb + Object + Particle ordering of elements, although earlier utterances had incorporated both possibilities (i.e. 'turn mixer on'; 'turn on mixer') and both are possible in the adult grammar. During Period 3, nearly half (47%) occur in a three-day period towards the end of the period, and all but 1/11 were Verb + Object + Particle. This high-frequency use over a short time supports Anisfeld's 1984 observation that the child will practice something that is newly-acquired. In order to produce utterances of this form, A had learned several things, namely that the particle is an obligatory part of certain verbs, and that it can be separated from the verb⁴.

In Period 4 'turn' always occurs with the particle, and most are of the Verb + Object + Particle construction. There are only 4/34 cases where the verb and particle are not split. Interestingly enough, two are ungrammatical in the adult grammar, as the Object

³Again, not necessarily in this order.

⁴This was not always the case with intransitive verbs for example. Over a month after the period of study (29.04) I recorded that A had said "sit down-ing".

must immediately follow the Verb when it is a pronoun. A's errors indicate that he is aware of both the split and unsplit possibilities and uses them, even if one is not present in the input. The following "practice" sequence indicates that A is aware of both possibilities, even with a pronoun:

05.03.70 turn on it
turn it on
turn on it

The pronoun was also used to express communicative functions:

08.03.43 turn on it A Pointed to blender.
 blender, blender
 turn on it
 (I noted that his speech was
 very measured for this
 utterance.)

For the utterances with full NPs it is possible that A is respecting adjacency in case-marking in that he does not allow the particle to intervene between the verb and its object. Clearly the adult grammar of English does allow this, but it has been suggested that adjacency is the unmarked case (Chomsky 1981:94). There are not enough examples with pronouns to draw any conclusions⁵.

⁵ Baker 1979 discusses the potential problem this type of data provides for theories regarding the generality of children's grammars vis a vis the adult grammar, and proposes that children who produce utterances of the type Verb + Particle + Pronoun have not yet determined the "enclitic status" (p. 543) of object pronouns. For children at this stage, both object pronouns and full NPs can occur in the same environment. Once children realize that object pronominals have a different status, their grammars would be revised. As White 1980 suggests, children's grammars can be restructured when the current grammar does not account for what the child perceives. In this case, reanalysis would take place. Fischer 1976 found that children by the age of 3 1/2 -4 rejected sentences of the structure Verb + Particle + Pronoun.

3.3. Period 2 - An Open and Shut Case

There is a large increase in both the variety and number of utterances which occur during this period. The number of VO utterances goes from 19 in Period 1 to 71 in Period 2. There is also an increase in the total number of utterances, from 273 in Period 1 to 379 in Period 2. Period 1 was more than twice as long as Period 2, although as I noted above, there were days during the former period in which there were no two-word utterances. There were an average of 6 utterances per day in Period 1, and 21 per day in Period 2.

There are two verbs which meet the criteria for exemplar verbs during this period, 'shut' and 'open'.

3.3.1. Shut

As can be seen in Table 7 below, 'shut' in VO constructions exemplifies cardinal transitivity. All utterances with this verb have basic English word order, and there are no other characteristics of groping in VO or other constructions. Other constructions which occurred during this period are similar to those first reported in Brown 1973 and subsequently confirmed by other researchers. The most frequent were Locatives, Possessives, Indexicals (i.e. "that/there X"), Adjective + Noun, Noun + Adjective, SV, SV(O), SVO, and Verb + Instrument.

TABLE 7

Transitivity Rating for 'Shut' in Period 2

SHUT

Period 2

Jan. 28 - Feb. 15

Number of utterances = 20

TRANSITIVITY RATING1. Participants 0.9

Agent =	Ainsley	15	Object =	door	17
	Mother	4		drawer	3
	ambiguous	1			

In the 15 cases where A was the Agent the utterance was a description accompanying his action. Where I was the Agent, 3/4 were requests, and one a description of my action. In the ambiguous case, he said 'stick. shut door'. His grandmother usually put a yardstick through the kitchen drawer handles when A came over, but had neglected to do so. Presumably the Agent would be either me or GM, but the utterance might also be interpreted as a general comment with an indefinite Agent ("one", "you").

A did not differentiate 'door' and 'drawer' in his pronunciation; both were pronounced [dowə]. I therefore used the referent to determine which was intended. (There is a potential objection to this, in that A may not have perceived or intended a difference between the two. However, A, like other young children, had many homophones which referred to different objects: [vʌvʌ] referred to both "Grandma" and "Debra", and [dɪdɪ] to both "Teddy" and "Daddy", where I assume the referents were clearly distinguished in his mind.

In all but one utterance both participants were clear and definite.

2. Kinesis 0.9

In all but one case (that involving the stick discussed under Participants) there is a dynamic action involving movement; an Agent acts directly on a door or drawer which changes position.

3. Punctuality and Aspect 1.0

All are punctual events with a clear endpoint; the object comes to rest in a closed position.

It might be argued that 'shut' meant "move" or "swing", as 3/9 of the earliest utterances with this verb accompany the action of swinging a door. However, early in the period, it is clear that A distinguished the two actions, as the entry below shows:

03.02.04	shut door	Closing cupboard door.
03.02.05	door open	Opening door.

Therefore, because the majority of early utterances accompanied the action of causing a door/drawer to go to a closed position, and because distinction is made quite early in the period, I will interpret the event as having an endpoint.

4.	<u>Volitionality</u>	1.0
	Even in the ambiguous or unclear cases the Agent is a potential instigator.	
5.	<u>Mode</u>	1.0
	16/20 are descriptions accompanying or immediately following an action; 4/20 are requests and are accompanied by a gesture (pointing). All are decontextualized.	
6.	<u>Individuation</u>	1.0
	Although the only objects to occur with the verb are 'door' and 'drawer', they have a wide variety of referents. 'Door' refers to the door of a toy garage, a dryer, record cabinet; a bedroom door, the kitchen door, a revolving door in a kitchen cupboard (2), a cupboard door (4), the car door (4), and a door of a toy mailbox. 'Drawer' referred to kitchen drawers. All objects have a definite referent in the speech setting.	
7.	<u>Affectedness of Object</u>	1.0
	Objects are moved and change position in all cases in Period 2.	
TOTAL		
		6.8/7.0

3.3.1.1. Discussion

The events described by VO constructions with 'shut' are of cardinal transitivity. The fluency of the utterances indicates that A had acquired basic word order and is no longer groping for the means of expressing transitive events. Almost half (9/20) of the VO utterances with 'shut' occur in the first three days of the period. This finding, like the use of 'turn' above, is consistent with Anisfeld's 1984 observation that:

"the profuse occurrence of a particular type of utterance suggests that the child has recently acquired this pattern and is rehearsing it, much the way children behave with respect to recently-acquired sensorimotor schemes or new words." (p. 20)

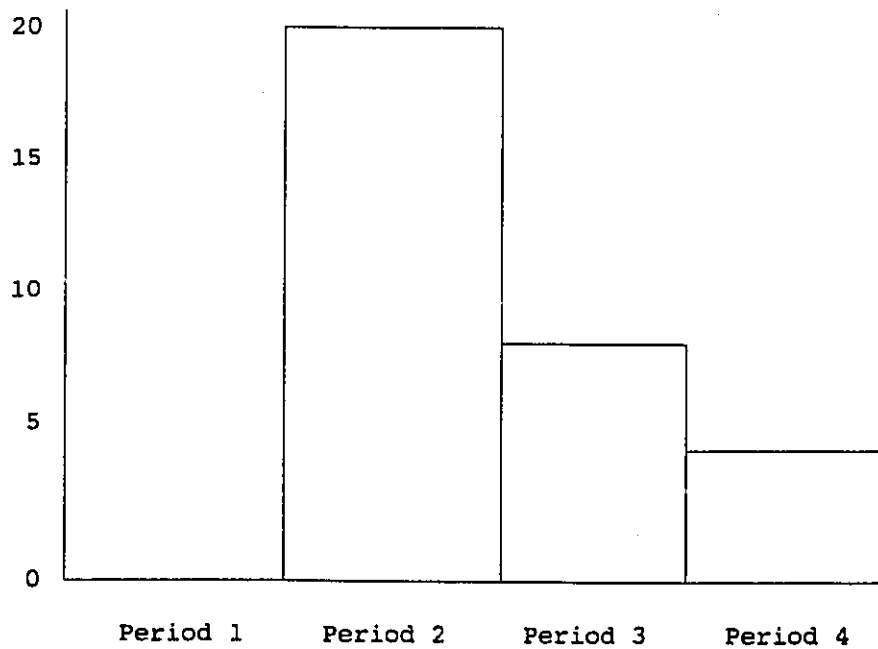
The frequency of VO utterances with 'shut' over a brief period suggests that A had recently acquired new syntactic knowledge, and was practising it.

3.3.1.2. Subsequent Periods

'Shut' is the most frequent verb used in VO constructions in Period 2. However, unlike most other verbs, constructions with 'shut' decrease in productivity in subsequent periods, as can be seen in Figure 2 below.

FIGURE 2

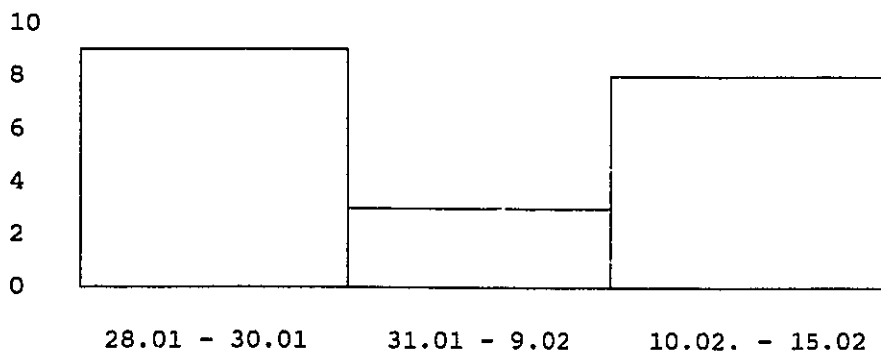
Frequency of 'Shut' over Data Collection Period



In the subsequent periods, only 1/12 Agents was ambiguous, and could have referred to either a definite or indefinite agent ('one', 'you'). All other parameters of transitivity remained high. Although the types of objects named by 'door' change in subsequent periods, and include an electric shaver box, clasps on suspenders, the door to controls on the TV and the "doors" on an old-fashioned toaster, there is still a definite endpoint, although in 2 cases (book and clasp) the change is not as apparent. And even during Period 2 constructions with this verb were not consistently productive, and, as can be seen in Figure 3.

FIGURE 3

Frequency of 'Shut' during Period 2



Almost half of the total number of VO utterance (9/20) occur during the first three days of the period, with another surge in productivity (9/20) towards the end of the period. Furthermore, unlike some of the other exemplar verbs ('turn' and 'open' for example) 'shut' rarely occurs in other constructions; there are

2 SV(O) constructions, both in Period 3, and no SVO constructions with 'shut' in the entire corpus. There are 4 other constructions with 'shut' which express some kind of locative or instrumental meaning. There are also several instances of lexical equivalents, but only a total of 3 in periods 3 and 4 (1 VO construction with 'slam' and 2 with 'close'). All evidence points to the same conclusion: this verb is clearly not productive for A after Period 2. It is of cardinal transitivity, and occurs very frequently for a short period of time. This is consistent with Anisfeld's 1984 observation that once children acquire new knowledge they will practice it, and relates well to Chomsky's 1965 competence/performance distinction: A has recently acquired new syntactic knowledge and is practising it to improve performance. In this particular case, by attending to cardinal transitive events with 'shut', A was able to fix basic word order, culminating in the high frequency use of VO constructions with 'shut' early in Period 2. Once basic word order is fixed, A just does not attend to or talk about events with this verb any more.

3.3.2. Open

'Open', the other exemplar verb for Period 2, begins to occur after the high frequency use of 'shut' at the beginning of the period. ('Turn' also begins to occur again at about the same time.) As can be seen in Table 8, 'open' also expresses cardinal transitivity, although it does not become productive until after the high-frequency use of 'shut' early in the period.

TABLE 8

Transitivity Rating for 'Open' in Period 2

<u>OPEN</u>	Period 2	Jan. 28 - Feb. 15
	Number of utterances = 8	<u>TRANSITIVITY RATING</u>
1.	<u>Participants</u>	0.9
	Agent = Ainsley 5 Object = door 6 Mother 2 drawer 1 ambiguous 1 shampoo 1	
	In 4/5 cases where A is the Agent he is describing his action, and in 1 case he is requesting a change in Agent (i.e. that he rather than I open the door). In the 2 instances where M is Agent, A is requesting that I perform the action. The ambiguous case may be an intention, with A as agent, or a routine (See <u>Mode</u>).	
	Unlike 'shut', there is a non-door/drawer object, 'shampoo' (glossed as "shampoo bottle").	
2.	<u>Kinesis</u>	1.0
	All are dynamic actions involving movement.	
3.	<u>Punctuality and Aspect</u>	0.7
	In 6/8 cases there is a punctual event with a clear endpoint; the door or drawer comes to rest in an open position. With 'open shampoo' there is a punctual event but the endpoint is not obvious, and 1 case of 'open door' was when M was unlocking the door and A wanted to, where the action is not punctual.	
4.	<u>Volitionality</u>	1.0
	Even in the ambiguous case the agent would be volitional.	
5.	<u>Mode</u>	0.9
	All but one is decontextualized. One I have interpreted as a routine, as this type of utterance increases in the next period. (See below for discussion.)	
6.	<u>Individuation of Object</u>	1.0
	Although 'door' occurs as the object 7/8 times, the word has a wide variety of referents (cupboard door; car door (2); laundry room door; dryer door; door to Debra's room; door of toy mailbox. There is one non-door object ('shampoo').	
7.	<u>Affectedness of Object</u>	0.9
	The Object changes position, except in the case described in (3) above, where A was putting a key in a lock, not moving a door.	

TOTAL

6.4/7

3.3.2.1. Discussion

Given that its transitivity rating is similar to that of 'shut', and that it is in fact the "transformation" of the former event (Gibson and Spelke 1983:20), the fact that 'open' did not emerge until 'shut' was firmly established is difficult to reconcile with the transitivity hypothesis, which would predict the simultaneous emergence of the two verbs. Furthermore, the two initial occurrences of 'open' to describe a transitive event had non-standard word order from the point of view of both A's and the adult grammar:

03.02.04	shut door x 2	Closing cupboard door.
03.02.05	door open	Opening the door. (He is describing his action.)

and

07.02.05	door open	He in car, with door closed. I outside. (He is requesting that I open the door.)
----------	-----------	--

There is also a similar utterance with the Agent expressed which occurred around the same time:

03.02.03	door open Ainsley	Opening cupboard door.
----------	-------------------	------------------------

These facts would appear to contradict the transitivity hypothesis, as it seems A is not able to apply VO word order to another verb of high transitivity, and these utterances could be interpreted as showing that a separate pattern is learned on a verb by verb basis, as is suggested in Braine 1976 for example. There is however an alternate explanation, which I will discuss in 3.3.2.3 below.

3.3.2.2. Subsequent Periods

The reader will recall that 'shut' occurred frequently for a short period of time during Period 2, and then decreased in use. 'Open', on the other hand increased in productivity in subsequent periods, and its transitivity rating remained high, although there was a lowered score in some parameters. In Periods 3 and 4, in 7/26 cases the Agent was ambiguous. With regards to the Object, in subsequent periods, 'door' referred to house doors, dryer doors, a picture of a door in a book, the moveable arm of a picture frame, toaster sides and a shape box. There are also a number of non-door objects (Vaseline jar, window, purse, present, bottle, sewing machine), which indicate that the representation of the event was expanding to incorporate different actions on different objects. Although the actions involving non-door objects are still what Slobin 1985 calls "manipulative activity scenes", the movement and result are less obvious than with doors. Only 3/26 VO utterances in periods 3 and 4 are contextualized routines, although there are a number of SV(O) and SVO utterances (60% of the total with the verb 'open') which are of this type⁶.

⁶The stimulus is a dryer, which only day-care teachers could touch. They often said "Only X can do Y", where X was an adult.)

03.03.16	[ow] Diane open	Looking at dryer at daycare
03.03.17	open dryer door	
03.03.18	[ow] Diane open dryer	
03.03.19	open dryer x ~15	Singing, with each syllable clearly accentuated.

([ow] is glossed as "only".) The VO routines in Periods 2, 3 and 4 were quite similar to this.

3.3.2.3. Predicate Adjective Constructions

So far I have noted two phenomena regarding A's use of 'open': first that it began to occur after the productive use of 'shut' in the beginning of Period 2, and with deviant word order; and second that it increased in productivity in subsequent periods while 'shut' decreased. As I mentioned above, this could be interpreted as suggesting that word order needs to be learned on a verb by verb basis.

However, the gap in productive use between the two verbs may also be attributed to the fact that in both the input and in A's grammar there were competing word orders for 'open': one to describe transitive events and one to describe either the resultant state ("The door is open") or a subject + verb relation in which the subject is the "theme", that is, the object whose motion is being asserted (Gruber 1965), for example "The door opened"⁷.

A faces a conundrum with 'open'; he was exposed to various types of utterances containing this word which he needed to sort out. Again assuming that children's utterances reflect what they are attending to, A produced a number of utterances with 'open' which did not describe a transitive event.

⁷I realize that "shut" in the adult grammar has the same properties, but this is not reflected in the corpus.

30.01.08	door open	We were at elevator, waiting for door to open. In car and while waiting I had been telling him we'd push the button and the door would open.
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This delayed imitation occurred at the beginning of Period 2, when 'shut' was becoming productive. In the adult grammar, one analysis of this phenomenon is that the Theme is raised to subject position, although I am not claiming that A has this analysis.

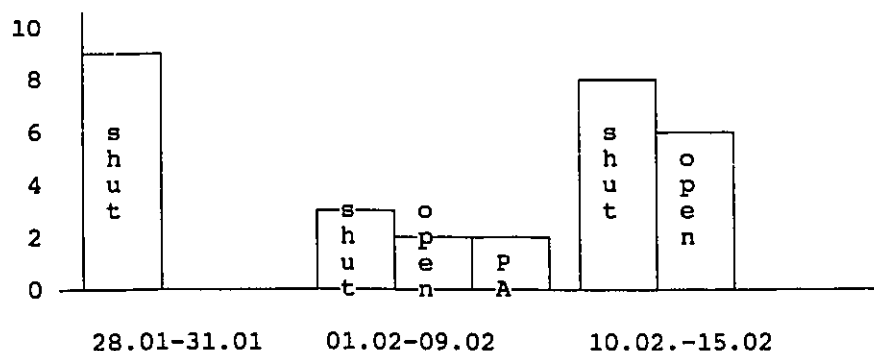
At around the same time, there are two occurrences of 'door open' where 'open' was not a verb, but an adjective in 'post-verbal' or 'predicative' position (Crystal 1985:27) or a clause with an adjective predicate (Radford 1990:65), and what I will call NAdj.

02.02.10	door open	Points to open door.
03.02.09	ohoh.door open	Points to basement door, which is usually kept shut for safety reasons.

Figure 4 represents this information on a time-line, where it can be seen that after several days of productive use of 'shut' there is a plateau, during which time the OV and NAdj utterances with 'open' occur. Then 'open' in transitive constructions reappears with correct word order (VO) and some frequency, and 'shut' begins to recur frequently as well. NAdj constructions with 'open' do not reappear until the next period.

FIGURE 4

Comparison of 'Open' and 'Shut' in Period 2



However, is it correct to attribute to the child the knowledge of two separate categories, Verb and (Predicate) Adjective, at this point in his development, or would it be more accurate to say he has two separate, word-based patterns?

Radford 1990:32 gives a number of criteria for determining whether children at the early multi-word stage have lexical categories, one of which is "direct syntactic evidence of the emergence of systematic word combinations"⁸. In my corpus there are a number of NAdj constructions with 'open' and with other predicate adjectives; both "pure" adjectives like 'dirty' and 'hot', as well as adjectives derived from verbs, like 'broke(n)' and 'stuck'⁹.

⁸The others are productive use of morphological endings, completions and responses to Wh-questions (p. 31). Like Radford, I found that morphemes were not consistently used at this point.

⁹I am not claiming A is aware of this relationship; they could be homophones for him. Although Pinker 1984 states that in order for the semantic bootstrapping hypothesis to work children at the

(There are a wide variety of attributive adjectives in the corpus which were used in multi-word utterances. Possessives occurred early and frequently, and other frequent adjectives were colours (41), 'big' (5) and 'sharp' (12). These adjectives never occurred predicatively, with one exception:

14.02.09	light green	Telling Debra what he had done in the car. Referring to turn indicators (green lights flash).
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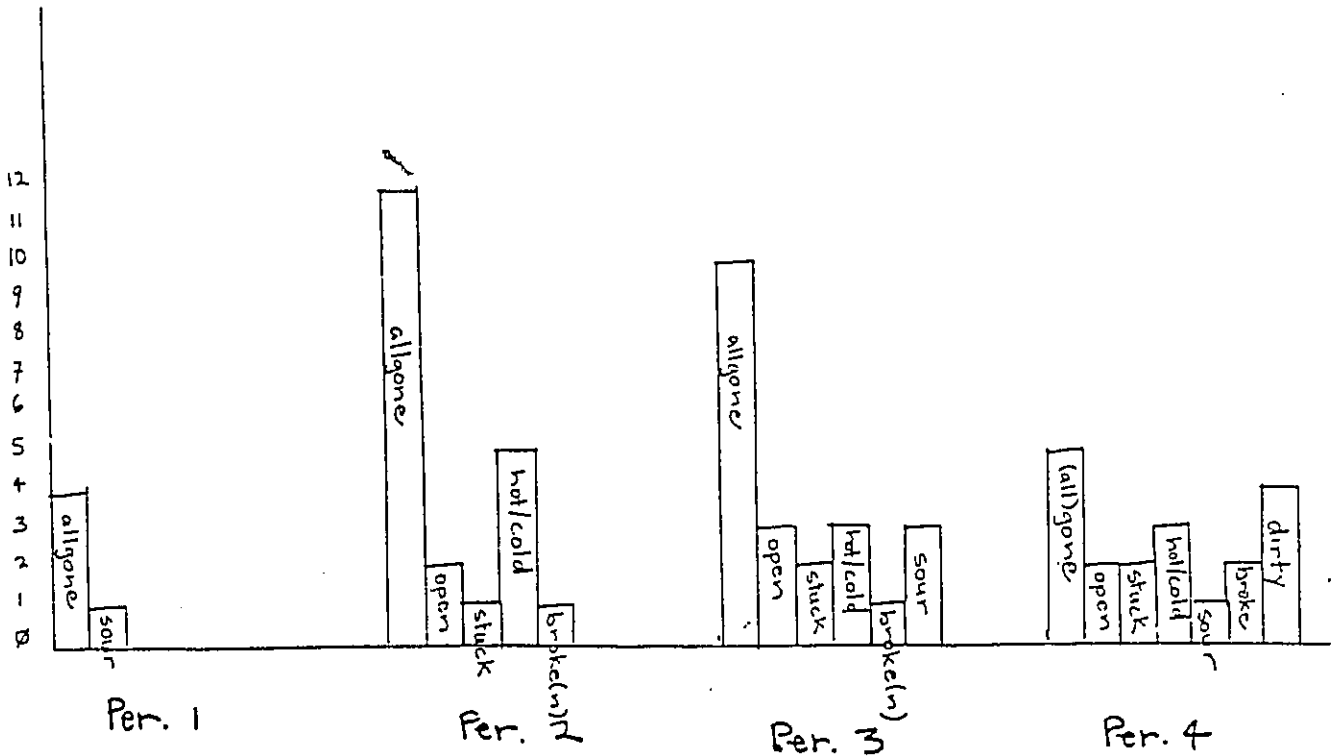
I am not including utterances with a noun and 'off' or 'on' as it is not clear if they are predicate adjectives, verbs or particles for A (if not all three)).

Figure 5 shows all of the spontaneous NAdj utterances produced by A and the frequency of their occurrence.

early stages of the acquisition of syntax should not be exposed to homophones which belong to separate lexical categories (i.e. "hug" as a N and a V), Macnamara 1982 suggests children can tolerate such ambiguity, although they prefer one-on-one correspondences. For example, the word "turn" as a V for A was extremely productive and had several meanings; i.e. turn on and turn around. It also belonged to different lexical categories; the verbs mentioned above and a noun in structures like "(it's) X('s) turn".

FIGURE 5

Noun + Adjective Constructions

**Allgone**

Like other English-speaking children at the same stage, A uses the word 'allgone' early and frequently during the two-word period. After Period 1, when A acquired basic word order, there were 26 utterances, all 'X allgone' with the exception of:

28.02.81 allgone propeller Playing with a toy airplane. It folds up to make a truck. (First time 'propeller' occurs in a 2-word utterance.)

The majority described the disappearance of a variety of objects, people and animals. Four were a response to the question "Where's X?". (As mentioned in footnote 8, another criterion Radford 1990 proposes to support the existence of lexical categories of children at this stage is responses to Wh-questions.)

Stuck

Another fairly frequent predicate adjective is 'stuck', which first appears during Period 2. There are no problems with word order, and it occurs with a number of nouns (phone, chair, string, hammer, foot). The following entry gives a sense of how it was used as an adjective, which changed very little over the course of the study:

14.02.42 ohoh. phone stuck Taking toys out of box,
trying to extricate
telephone.

Hot, Cold and Sour

'Hot' (and less frequently 'cold') first occurred as attributive adjectives and did not appear predicatively until Period 2. The following exchange suggests that A was familiar with the two different word orders. It occurred after 4 utterances in which 'hot' was used predicatively and 3 in which 'hot' was used attributively.

16.02.22	sitdown stove		Points to stove.
		M	Oh no, you mustn't sit down on the stove.
16.02.23	stove hot	M	What did you say darling? (I didn't understand, but realized what he had said after .24)
16.02.24	hot stove		Very clearly enunciated.

'Sour' was only used predicatively, and referred to the quality of (green) apples, grapefruit, and milk. (A drank soya milk, which was sold in lemon juice concentrate bottles, and he associated the bottle with the acidic taste of lemon juice.)

I have shown that A can be assumed to have a lexical category of predicate adjective, based on a variety of lexical items which are productive and exhibit consistent word order. We can therefore conclude that A had two lexical entries for the word 'open'; one a verb and the other an adjective which would be a property predicated on an object. It may be that 'open' in transitive constructions was later to emerge than 'shut' and was initially characterized by incorrect word order as A had to sort out these two possibilities.

By the end of Period 2 A had acquired and practised basic word order, first with 'shut', then with 'open' and 'turn', and finally with infrequent verbs which begin to move away from cardinal transitivity.

3.4. Period 3: Consolidation and Experimentation

During this period there is a large increase in the total number of utterances; from 379 in Period 2 (an average of 21 per day) to 1060 in Period 3 (an average of 76 per day). VO utterances increase numerically from 71 to 215, but the percentage increase is not significant; from 19 to 20% of the total number of utterances. Word order continues to be consistently adult-like (VO), with both familiar (i.e. 'turn', 'shut', 'open') and new verbs. There are three verbs which meet the criterion for exemplar verbs during this period; 'eat', 'share' and 'burn', all of which mark a move away from encoding events of cardinal transitivity.

With less frequent verbs there are several tendencies during this period. First of all, the move away from cardinal transitivity exhibited by the exemplar verbs is paralleled with less commonly used verbs. A number of verbs of contact begin to occur; the most frequent of these being 'hit', but 'tickle', 'whack', 'touch', 'poke', 'bite', 'rub', 'pinch' and 'hug' are also used. (They are listed in order of decreasing frequency.) These verbs are lower in transitivity as there is no visible change. Verbs which encode the result rather than the action also begin to appear, the most frequent being 'break' and 'fix'. There are also some verbs which express a more generalized action, result or series of actions, like 'hurt', 'play' and 'clean'.

I will begin the discussion with the verb 'eat'.

3.4.1. Eat

As can be seen in Table 9 below, 'eat' as it occurred in transitive constructions was much lower in transitivity than the previous exemplar verbs.

TABLE 9
Transitivity Rating for 'Eat' in Period 3

<u>EAT</u>	Period 3	Feb. 16 to Feb. 29
Number of utterances = 15		<u>TRANSITIVITY RATING</u>
1. <u>Participants</u>		0.7
Agent =	Ainsley 9	Object = tree 2
	Mother 1	Smarty 3
	chick 1 ¹⁰	various 10
	ambiguous 1	
	unclear 3	

The ambiguous case involved a definite, human agent.

The unclear cases were similar to pattern practice drills. In each case the presence of a food item triggered the utterances 'eat toast/garlic/celery'. In only one case was he actually eating, and he did not like celery. I did not interpret the other two as requests, and he made no adverse response. This pattern practice continues and increases with the verb 'eat' in the subsequent period, where 8/19 utterances are of this type.

¹⁰According to Gibson and Spelke 1983, pictures represent events and are a good source of information about the world for children. And Macnamara 1982:75 states that although pictures may not refer to physical objects, they have individuality and continuing identity for the young child. I have therefore considered the chick to be an agent, although A was describing a picture in a book.

2. Kinesis 1.0

For A, the action seems to entail putting an object into the mouth, optionally with an instrument. There is therefore a physical action with transferral. It does not necessarily involve chewing and swallowing, as the following entries suggest:

18.02.67 eat water Trying to eat pineapple juice with a spoon.

03.03.09 eat cigarette I smoking a cigarette.
A: "cigarette"
M: "cigarette"
A: "eat cigarette"

3. Punctuality and Aspect 0.5

Assuming 'eat' means "put into the mouth" it is a punctual event rather than an ongoing process. However, the endpoint is not visible. I have therefore given half points for this parameter.

4. Volitionality 0.8

In 3/15 cases there is no clear agent. (See Participants.) In the ambiguous case, either agent would be volitional. The chick, although an animal in a book, would be perceived as capable of independent action. (See footnote 10.)

5. Mode 0.8

3/15 are routines, and are not decontextualized.

6. Individuation 0.9

One object ('toast) for which there is no referent in the speech setting.

7. Affectedness of Object 0.0

There is no apparent change¹¹. Many objects were part of a mass which would not be visibly changed if a portion of their mass was removed, for example a container of Smarties, a bunch of grapes, a bowl of chili, scrambled eggs. Some might be partially affected, for example an apple.

TOTAL

4.7/7.0

¹¹Tenny 1987:77 discusses verbs of consumption in which the Object undergoes a change gradually. She uses the metaphor of a series of snapshots, and suggests that only the final snapshot would mark the change in the object.

3.4.1.1. Discussion

Perhaps erroneously, I chose to separate VO, where the O is a food item, from V + Instrument, where the Instrument was an eating implement (fork, spoon, hands). 'Eat' first occurs with an Instrument in Period 1, and there are a total of 12 utterances of this type in the corpus. If, as mentioned previously, 'eat' means "put into the mouth" for A, these Instruments might actually be the objects of the action. This argument would hold for the initial occurrences of two-word utterances with 'eat', which were all V + Instrument, but during Periods 3 and 4 the two structures co-occur. Similarly, there is one utterance which occurs at the same time as the bulk of the VO utterances with 'eat' in Period 3 that suggests A is aware of both Objects and Instruments, although he does not yet know the word order for combining the two:

26.02.100 Pom.fork.eat.cake	Describing a picture in a Babar book, of a little elephant (Pom) with a piece of cake and a fork held in his trunk.
-----------------------------	---

3.4.1.2. Subsequent Period

The routine utterances discussed above increased in the subsequent period, where 8/19 utterances were of this type. In these situations, A would point to or pick up a piece of food and say 'there, there'. I would provide the name of the food item (e.g. "That's lettuce") and he would use the new vocabulary item in a VO

structure with the verb 'eat' (e.g. 'eat lettuce'). In some instances, the mere mention of a food item would evoke the same response. In many cases these were food items which A didn't like, so the utterances could not be interpreted as intentions (i.e. "I'm going to eat X"); nor did he ingest the items in question, so the utterances were not descriptions (i.e. "I'm eating/ate X"). The whole situation surrounding the utterances suggests a primitive word game, and it may have been a way for A to practice new lexical items in context. These routine sentences might also be interpreted as a generalization ("people eat X").

In Period 4, although nearly half the utterances were routines, there is only one case where there was not a referent in the speech setting:

03.03.10 eat pomme

(I was telling GM how A had called an apple a 'pomme' yesterday and had probably learned it at daycare (bilingual French/English).)

Therefore, apart from the parameter of Mode, the transitivity rating for 'eat' does not change in the subsequent period.

Over-extension

In Period 4, there are several transitive utterances with 'eat' which express an incorrect meaning:

- 18.03.75 A. eat giraffe
 18.03.76 A. AB¹² eat giraffe by self
 M. No, you feed the giraffe.
 18.03.77 A. AB feed giraffe x 3
 18.03.78 A. feed giraffe x 4

(A was pretending to feed a giraffe in a picture book.)

It is possible that for A, 'eat' did not mean "put into one's own mouth", but rather "put into X's mouth". Alternatively, since grammatical subjects are generally causal agents in transitive clauses, he may have intended the meaning "AB makes/causes the giraffe (to) eat".

A similar phenomenon occurs with the verb 'buy':

- 20.03.58 Daddy man buy shoe. Points to his new shoes, which we bought yesterday. (The salesperson was bearded, like A's father.)

At the time the utterance occurred I noted the parallel with 'eat', which had occurred two days previously. There are only two other transitive utterances with 'buy', both of which are used correctly:

¹²When A began using lexical subjects, he often referred to himself as Ainsley Balcom (AB).

- | | | |
|----------|----------|---|
| 08.03.06 | Mama buy | Talking about his toolbox, a new acquisition. |
| 09.03.03 | Mama buy | Showing his father his new toolbox. |

After I stopped recording utterances systematically (at the end of Period 4), there was one instance of 'look' being misused in a similar fashion:

- | | | |
|----------|---------------------|--------------------------------|
| 25.03.61 | look duck vaporizer | Showing vaporizer to toy duck. |
|----------|---------------------|--------------------------------|

although both 'look' and 'show' had been used appropriately in a variety of utterances during Period 4, for example:

- | | | |
|----------|--------------------|--|
| 11.03.44 | look book | In room with all of his books. I got one out. |
| 01.03.42 | show Mika airplane | Ran into room where M was with airplane in his hand. |

There are also several instances where a normally intransitive verb with a human actor as its subject is used transitively, so that the theme is in post-verbal position and there is an understood Agent.

- | | | |
|----------|----------------|---|
| 31.01.02 | lie down light | Wanted lamp to be moved onto floor where he could play with it. |
|----------|----------------|---|

This over-generalization of causatives is well-attested in the literature. (Bowerman 1974, 1982 was the first to discuss the issue.)

3.4.2. Burn

The reader will recall that H & T's parameter of Mode was modified to reflect processes at work in child language learning, and was

defined in terms of Decontextualized/Contextualized. An utterance is considered to be decontextualized, and high in transitivity, if it described a real event and was separable from that event. So far, the majority of utterances have been decontextualized, although some exceptions with 'eat' in VO constructions and 'open' in SV and SVO constructions have been noted. However, 'burn' and 'share', two of the exemplar verbs for Period 3, break this pattern.

Bates 1979 suggests that the process of decontextualization at the one word stage (which occurs between 9 and 13 months) can be viewed as a gradual move from what she calls presentational to representational symbolization, where presentational symbolization is the child's selection of a single word to "name" an object or event in the full presence of the object or event, while representational symbolization entails a mentally-represented referent in the absence of support from the speech setting. This process of decontextualization continues after the period which Bates studied and, according to Anisfeld 1984 is still in operation with two-year old children.

However, A does not begin the two-word stage with VO utterances which are highly contextualized and then gradually move towards decontextualized speech. To the contrary, his transitive utterances are almost completely decontextualized right from the beginning of his multi-word speech ("representational" in Bates'

terms), even before he has acquired basic word order. The utterances occur in a wide variety of situations, expressing a variety of communicative functions (descriptions, requests, intentions for example) and the objects words are varied, or at least refer to a number of different objects (in the case of 'door/drawer'). This suggests that A not only attends to, but is able to mentally represent events of cardinal transitivity and, as other researchers have shown, selects one word and later a combination of words to represent the event verbally. In general, it is not until Period 3, with the exemplar verbs 'burn' and 'share' that A's VO utterances are of the contextualized type and Mode, one parameter of transitivity, interacts with other parameters to give very low ratings for transitivity for these verbs.

Before looking at how 'burn' scores in parameters of transitivity, I will give several representative examples of the types of situations in which it occurred.

16.02.25 burn self In the kitchen. Points to stove.
 A sit down stove
 M Oh no, you mustn't sit down on the stove.
 A stove hot.
 M What did you say darling? (I didn't understand at first, subsequently reconstructed after the following utterance.)
 A hot stove
 A burn self
 A very very hot

This situation has most of the components that served as stimuli

TABLE 10

Transitivity Rating for 'Burn' in Period 3

<u>BURN (SELF)</u>	Period 3	Feb. 16 to Feb. 29
	Number of utterances = 19	<u>Transitivity Rating</u>
1.	<u>Participants</u>	0.0
	In all cases in Period 3 the object is 'self'. Because it is reflexive, there is only one participant ¹³ .	
2.	<u>Kinesis</u>	0.0
	There is no movement - the verb describes the result of various movements.	
3.	<u>Punctuality and Aspect</u>	0.5
	A had only burned himself once before the period under study, and it was not a serious burn (i.e. no visible mark). He therefore had little if any conception of what the verb meant. Assuming he did know what the verb meant it would be punctual as the result would be instantaneous. However, the verb describes a result rather than an action, and there would be no visible endpoint. I therefore gave half-points for this parameter.	
4.	<u>Volitionality</u>	0.0
	Because A's representation of the event is vague, it is difficult to assess whether he would perceive himself as instigating an action which resulted in burning. In the situations in which the utterances occurred, I assume the action would be accidental. Furthermore, A might perceive the hot object as being the instigator of the event.	
5.	<u>Mode</u>	0.0
	Only 1/19 is potentially decontextualized:	
	18.02.71 burn self (A put his finger in some hot tea.)	
	M A, that's hot.	
	A burn self.	
	The rest are routines, and highly contextualized, as discussed in the introduction to this Section.	

¹³Marantz 1984 describes the reflexive as a "semantically condensed" transitive structure.

6.	<u>Individuation</u>	0.0
	'Self' is the only object which occurs with 'burn' in this period. Reflexive pronouns are non-distinct from the subject (H & T 1980) and lack independent reference (Chomsky 1982:83).	
7.	<u>Affectedness of Object</u>	0.0
	None of the utterances referred to an actual event where A was visibly burned, and there was therefore no visible change.	
<u>TOTAL</u>		0.5/7.0

3.4.2.1. Discussion

I hypothesize that A does not yet have a mental representation for these events, but produces VO utterances in given contexts in order to "think out loud" (Gopnik 1987); that is, to analyze and store language and the situation associated with it in order to create a mental representation. A does not know what the verb means, but he does realize what types of situations it occurs in, and may be producing utterances in order to try to figure out what the event entails. It is also important to point out that although A does not know what the verb describing the event means, his word order is always correct. I propose a modification to the syntactic bootstrapping hypothesis, which, according to Hirsh-Pasek et al 1988:2:

"...suggests that children build their verb lexicon by capitalizing on the structural knowledge that they have about the various subcategorization frames in which a verb can participate...they [children] can also work backwards and deduce verb meanings by attending to syntactic cues, e.g. the number and arrangement of arguments."

A is able to deduce that 'burn' is a verb because of the argument structure it occurs in. However, this information gives no indication of the meaning of the verb, and it is unclear whether A grasps its meaning during the period under study. Although, as proposed by the syntactic boot-strapping hypothesis, A is able to use structural knowledge to decide that 'burn' is a verb, he is not able to deduce its meaning. The following example shows that A is not clear as to the meaning of 'burn':

23.02.64 A burn self I had told him not to touch the TV.

3.4.2.2. Subsequent Period

There was a change in A's use of the verb 'burn' in the subsequent period, and I would suggest that by the end of Period 4 A had at least a partial mental representation of the event encoded by the verb. Besides the use of burn + self becoming decontextualized in Period 4, other objects begin to occur with the verb. 'Tea kettle' occurs 3 times as the object of 'burn', while 'self' occurs 3 times¹⁴. The cases with the latter were decontextualized in that they referred to a past event which had really occurred. A did actually burn the tea kettle, and I seem to recall showing him the

¹⁴There was also one complex utterance with a non-reflexive DO of 'burn':

18.03.05 help Mama burn cigarette.

(Climbing into my lap. I smoking a cigarette.)

blackened bottom, although I have no written record of it. In these cases, A did instigate the situation resulting in the kettle's being burnt, and the Object had independent reference and was affected. This would change the transitivity rating for the parameters of Participants, Volitionality and Individuation.

3.4.2.3. Reflexivity

Earlier I claimed that although A had no mental representation of the event described by the verb 'burn' he was aware of the types of arguments it took; more specifically that it was a transitive verb taking an object, which in all cases in Period 3 was the reflexive pronoun 'self'. An objection might be raised that 'burn self' was an unanalyzed chunk. (Peters 1977 was the first, to my knowledge, to discuss this phenomenon.) However, although 'burn' did not occur with any other objects until Period 4, 'self' occurred frequently, both in isolation and in other multi-word utterances.

Because I recorded only multi-word utterances, part of what follows is somewhat impressionistic. I do recall him saying 'self' before and during the time data were collected when I wanted to take his hand as we were going up or down stairs. 'Self' in these cases meant "I want to do it by myself". I did record some instances of 'self' in isolation, but not consistently:

25.02. M "Do you want to brush your teeth?"
 A "self"

(A has a marker and is threatening to draw on himself.)

A "self"

27.02 (A managed to put the tape recorder on 'record' himself. It was quite difficult for him as he had to push both 'play' and 'record' at the same time. This was the first time he had done it, and he was very proud.)

A "self, self, self"

'Self' was replaced by the Preposition Phrase 'by self' in Period 4, either alone or in combination with other structures. There were a total of 17 utterances of this type, for example:

06.03.39 (Taking decoration off hook.)
 A "this off"
 (Hangs it back on.)
 A "this on.by self"
 (Looked at me proudly.)

There is one utterance which is strong evidence in favour of the argument that 'self' is separable from its linguistic context rather than part of an unanalyzed whole, as it is not an utterance which he could have heard. It also shows that he had some concept of what reflexivity entailed:

22.02.05 self ear A was screaming.

M Don't do that, you'll hurt Debra's
and Mika's ears.

A Michel ear (Michel is Mika's father)
mama ear
tape recorder ear
self ear
(I looked up.)

A Ainsley Balcom, Ainsley Balcom

I glossed 'self ear' as "my own ear", and interpret his repetition of his name as a correction for his initial utterance. This suggests that he was trying to express (inalienable) possession, but lacked the lexical item to do so.

'Self' also occurred with other verbs in VO constructions during Period 3; 'cut', 'poke', 'hit' and 'draw'. This is a further indication that the Object of 'burn self' was separable from the verb, and that A was aware of its reflexive nature. Many were similar to the routines with 'burn' in that the stimulus was a danger word or a dangerous object. For example:

26.02.03 cut self Points to coffee maker.

A hot.burn self
Points to electric can opener.

A cut self.

In Period 4 all verbs with reflexive objects decreased in productivity, but became decontextualized, describing a real event:

Agent =	Ainsley	16 ¹⁵	Object =	Mika	12
	Mika	1		toys	7
				indef.	1

2. Kinesis 1.0
 The adult meaning of 'share' is very abstract, and does not entail either movement or physical activity. For A it might be closer in meaning to 'give', in which case there is movement and action. ('Give' only occurred twice in utterances expressing transitive events in the corpus, both in Period 4.)
3. Punctuality and Aspect 0.4
 If the verb means 'give' it is a punctual action with a clear endpoint: a change of location. However, if the Goal is not present (in 10/17 cases), there can be no endpoint.
4. Volitionality 0.9
 A is the agent in 16/17 cases, and is capable of independent action (although he may not want to share). There is one indefinite agent.
5. Mode 0.0
 Only 1/17 is decontextualized. The rest are routines, an almost ritualized accompaniment to his play.

¹⁵Given the routine nature of the utterances, it might be argued that the Agent is indefinite; i.e. "one" or "you" should share. However, there is one early utterance with "share" where the Agent is overtly expressed:

16.02.40 AB.share.Mika A was playing with his toys, saying
 "Mika".
 A "AB.share.Mika"
 "share Mika"
 "share,share,share,Mika"

This occurred during the second day of the period, and in the same kind of situation as the VO utterances. Although there is some hesitation (SVO utterances were rare at this point), the meaning of the utterance is clear.

6. Individuation 0.5

I have considered both DO's and IO's as objects under this parameter. In some cases there are two objects, so the figures below will not add up to 17.

1/17 an indefinite pronoun ('body' meaning "people").
 6/17 are toys A is playing with
 12/17 are Mika (3/12 cases she is present; 9/17 she is absent)

Therefore, in 9/17 cases there is a definite referent in the speech setting (toys + Mika)

7. Affectedness of Object 0.4

Since the recipient was not present in some cases (10/17), the object would not change location.

TOTAL 4.2/7.0

3.4.3.1. Discussion

In Section 3.4.2., I described the contextualized nature of VO utterances with the verb 'burn', and suggested that A had no mental representation of the verb, although, by means of syntactic bootstrapping, he did know that it was a transitive verb with certain argument-taking properties. During the same period a similar phenomenon occurs with the verb 'share'. It is not clear to me whether the contextualized use of 'share' in VO constructions was due to A's lack of understanding of the meaning entailed by the verb, or whether it was syntactic complexity (i.e. the double object construction) that caused him to use the verb only in contextualized situations.

Typically these utterances were triggered by a situation in which A was playing with, or even looking at, a toy. Mika (the goal/beneficiary in the majority of utterances) was not even present in many cases, and if she was, she did not necessarily want to play with the toy in question. The utterances were often preceded or followed by 'Mika turn' (glossed as "It's Mika's turn"), another phrase A often used when he was playing with his toys, even if Mika wasn't present. In Period 3, the bulk of the utterances (16/17) were of the following type:

27.02.41	share toolbox Mika	A points vaguely in direction of his toolbox.
	A	turn, Mika turn toolbox
		share toolbox Mika
		share Mika

(I am not sure if Mika is present, but there is no mention of her in my notes.)

This verb as used by A in transitive constructions is very low in transitivity. The scores for the parameters of Kinesis, Punctuality, Aspect and Volitionality are reduced by the fact that the recipient ('Mika') is not present in most cases so there could be no spontaneous action on the part of the agent. Furthermore, there are many cases in which there is not a definite referent for the Object in the speech setting. The contextualized use of VO utterances with 'share' suggests that A has a limited, if any, mental representation of the event. Furthermore, the noun following the verb is human rather than inanimate, and A must also deal with a verb which is strictly sub-categorized for both an indirect and a direct object. (I am not claiming that the adult

grammar has this rule. See Table 11, under Participants.) As with 'burn', the contextualized nature of the utterances (Mode) interacted with the other parameters of transitivity.

3.4.3.2. Subsequent Period

In Period 4, DOs predominate, and they are not necessarily toys, unlike the previous period. Similarly, 'Mika' appears as the Indirect Object only once out of a total of three utterances with an explicit IO. Another difference in Period 4 is the (understood) Agent: all but 1 was A in Period 3, while in Period 4 there are 5 different Agents: A, M, Mika, bunnies in a picture book and the cat.

In Period 4 there are several utterances where the intended meaning is clearly transfer of an object:

07.03.07 share pen We were both using pens. He wanted mine.

And although the same contextualized use of utterances with 'share' occurs in Period 4, there is a broader range of situations in which they occur, for example:

(I showed him a picture of some babies playing with toys.)

10.03.22 share toy M What are the babies doing?
 A play toy
 AB play toy
 share toy

Furthermore, the use of 'share' becomes decontextualized during this period; it is no longer used as an accompaniment to play and has a real communicative function. An example is given under 07.03.07 above, where he is requesting an object. Moreover, in Period 4, there is only 1/10 cases in which the goal/beneficiary was not present in the speech setting.

To conclude this section, during Period 4 there is a move towards decontextualization of utterances incorporating the verb 'share': 'Mika' is not as prevalent as Indirect Object, and what can occur as Direct Object is expanded to include objects which are not toys. Furthermore, there are a larger number of agents and the utterances often refer to a real event (or to an event in a book). This suggests that A had figured out the meaning of the event described by the verb in transitive constructions, and had represented it mentally.

3.4.3.3. Indirect Objects

As mentioned above, 'share' is the first verb A uses productively which is subcategorized for two internal arguments. (As noted in Table 11, this is not a characteristic of the adult lexicon.) There are 3 instances where double object constructions occur during Period 3, but word order is variable.

21.02.05 [kɔpə] share Mika	I making pancakes. I assume that is the object, although he usually pronounces it more clearly.
25.02.07 share Mika garage	A playing with his toy garage. At GMS, Mika not there.
27.02.41 share toolbox Mika	A points vaguely in direction of toolbox. A "turn. Mika turn toolbox" "share toolbox Mika" "share Mika"

Double object constructions are rare in the corpus as a whole, and in general do not become productive until Period 4. However, A uses a number of verbs in such constructions, and does not appear to have any problems dealing with more complex sub-categorization frames. The adult grammar allows two word orders with some verbs of this class (V + IO + DO and V + DO + Prep OP), and although A is in the pre-functional stage (Radford 1990) and does not use prepositions in this type of construction, he is aware of the different possibilities, even with 'share', which does not allow both orders in the adult grammar.

'Show' occurs in several constructions, all but one in Period 4, with either a noun or a "clause" as its complement:

- 03.03.01 show nipple fish Playing with parts of his bottle. There's a fish mobile above the bed. Holds nipple up.
- 01.03.42 show Mika airplane Ran into the other room (Mika was there) with his airplane in his hand.

These examples indicate that A is aware of the two word orders.

'Show' also occurs with a "clausal" complement:

- 11.03.10 show L mixer down GM was bringing the mixer down.
- A mixer down x 4-5 (very excited, and ran into living room, where his aunt was sitting).
show L mixer down
tell L mixer down
- 18.03.14 show Sandi can opener is Sandi has just come over.
show Sandi mixer is
show GM mixer is
show Sandi mixer is
can opener is

'Tell' (see 11.03.10 above) and 'watch' each occurred once with a "clausal" complement:

05.03.53 watch Mama clean up

'Help' was a fairly productive verb with a "clausal" complement, occurring 7 times in the corpus, all during Period 4. The following example, which occurred near the end of the final period, shows how much A progressed during Period 4:

- 18.03.15 Mama help AB ride tricycle Sandi was pushing A on his tricycle. A sees me.

The only other verb in the corpus to occur in double object constructions was 'give', which occurred only twice:

09.03.14 give Mika hug

12.03.07 give plug Teddy bear

3.5. Period 4

Period 4 marks the transition from what Radford 1990 calls the pre-functional to the functional stage. During the latter period, function words and morphological endings begin to appear in children's spontaneous speech. During Period 4, the past form of both regular and irregular verbs, the /s/ morpheme as a mark of the possessive and third person singular, and the 'ing' ending to mark continuous aspect begin to occur frequently and regularly. Determiners ('a', 'the', '(a)nother') also begin to appear consistently, as do pronouns (particularly 'me' and 'it') and prepositions. It is important to point out again that the periods are to be viewed as points on a continuum: language development is continuous rather than divided into discrete stages, and all of these new developments in A's grammar had begun to appear, though not frequently, in the previous period.

Forty-five percent of the total number of VO utterances occur during this period (247/552), although the percentage of VO utterances as a total of the entire corpus does not increase significantly from the two previous periods (19% in Period 2; 20%

in Period 3 and 23% in Period 4). The number of different verbs used in VO constructions also increases. The exemplar verb for this period is 'find'.

TABLE 12

Transitivity Rating for 'Find' in Period 4

<u>FIND</u>	Period 4	March 1 to March 20
	Number of utterances = 25	<u>Transitivity Rating</u>
1. <u>Participants</u>		1.0
Agent =	Ainsley 17 Mother 7 Ambiguous 1	Object = wide variety of referents
2. <u>Kinesis</u>		0.2
	In 5/25 cases the VO constructions were used to request or describe an intention, and the meaning is more like 'look for'. In these cases the verb would involve activity, but would encompass a variety of actions (walking, lifting objects, etc.) In the majority of cases however A uses the utterances to describe a result and there is therefore no movement.	
3. <u>Punctuality and Aspect</u>		0.0
	In the case of the requests and intentions (with the sense "look for") the activity would be ongoing, and the endpoint uncertain. In other words, it could take a certain amount of time once the search was initiated, and there would be no guarantee that the object named would actually be located. In these cases the event is neither punctual nor telic.	
	In the cases where the construction is used to describe a result, there is no action, punctual or otherwise, and the endpoint is coded in isolation, in almost all cases by use of the past form.	
4. <u>Volitionality</u>		0.4
	15/25 are probably accidental - it is not clear that the items were found as a result of A's action.	
	In the 5/25 cases where the meaning was "look for" the Agent would be instigating the activity. In all of these cases A was looking for the object he found (a key on a key ring or a picture in a book for example) and was therefore responsible for the result.	

5. Mode 0.9
- 2/25 are practice of a form rather than a description or a request.
- I interpreted the first of the following utterances as a description, while those following were merely practice of a form.
- (He had asked for his yellow record. I went to look for it, found it, and gave it to him. He was very excited and happy.)
- | | |
|----------|--|
| 12.03.36 | found yellow record x 10 (Description) |
| | (Showing me the record in (36).) |
| 12.03.44 | found record.find (Practice) |
| | (Still playing with the same record.) |
| 12.03.46 | found yellow record (Practice) |
6. Individuation of Object 1.0
- In all cases, A was referring to a specific object, whether it was absent or not.
7. Affectedness of Object 0.0
- No visible change.

TOTAL 3.3/7.0

3.5.1. Discussion

This verb occurred only 4 times in transitive constructions before the period under study, but was very frequent during Period 4. This again suggests that A had acquired new knowledge and was practising it. As can be seen in Table 12 above, 'find' is lower in transitivity than any of the previous exemplar verbs (with the exception of 'share' and 'burn') but in almost all cases (23/25) is fully decontextualized. There are a number of reasons for the lowered transitivity rating. The event encoded by 'find' is the result of an action rather than a description of an action itself; the result can be accidental and the 'agent' is therefore non-volitional; and there is no visible change or transfer of action.

3.5.2. Tense/Aspect Marking

As I mentioned earlier, Period 4 marks a transition into a stage in which inflectional morphemes (among other things) begin to appear in the speech of English-speaking children. During this period A begins to use regular past endings, and some irregular verb forms also begin to appear. For A, 'find' has two forms, 'find' and 'found'. I have chosen to refer to the uninflected form ('find') as the "unmarked" form in the sense that it is not marked for tense, aspect or person. Before verb suffixes begin to occur (in Period 4 for the most part), almost all verbs appeared in this form, whether they described a past event, a request, an ongoing activity or a future intention.

With regards to the past forms ('found' in this case), generally speaking, children first encode aspect rather than past when they use past forms of the verb (either morpheme or irregular forms). (See Cziko 1989 for a survey of the literature.) A's use of 'found' is probably perfective rather than past, although I will call it 'past', as the other marker of perfectivity in English ("have") is not present, and due to the nature of the verb, either interpretation is possible.

In general there is a high correspondence between form and meaning in A's use of 'find' and 'found'. He almost always uses the past form to describe a result, while the unmarked form is used for

requests and intentions. In Period 4, in only 2/25 utterances with 'find' is there a non-correspondence between form and meaning.

12.03.14 found tape A was walking towards the tape recorder. I interpreted (14) as a request to get him a tape to put in it, due to the rising intonation. I brought him one and he was satisfied, suggesting my interpretation was the correct one.

In this case A should have used the unmarked form. This utterance was immediately followed by an utterance in which the form is appropriate:

12.03.15 found tape As I brought him a tape.

The only other example of a non-correspondence between form and meaning is shown below, where the past form should have been used.

14.03.13 find blender part He had found the lid to the blender and came out of the kitchen to show it to me.

There was one instance of hesitation, suggesting that A was not certain which form to use:

12.03.44 found record.find Showing me a record I had just found for him.

Although the form A used was the correct one, the unmarked form 'find' following suggests uncertainty.

In 1/4 SVO constructions with 'find' there was a lack of correspondence between form and meaning:

14.03.12 me find ignition key [He] had just located
ignition key on my key
ring.

Otherwise there is a form/meaning correspondence, although most utterances (20/25 VO, 4/4 SVO) described a result and were therefore in the past form.

3.6. General Discussion

Table 13 below summarizes the transitivity ratings for the seven exemplar verbs. It is clear from this data that Slobin's hypothesis cannot be disproved, as the child initially encoded events which were of cardinal transitivity (>6 out of 7) and later used the word order thus acquired to describe events which were of lower transitivity. This study therefore provides additional support for Slobin's hypothesis, based on data from a child learning a language in which transitivity is encoded exclusively by means of word order, rather than by overt case markings.

TABLE 13

Summary of Transitivity Ratings

Per.	Verb	Part	Kin.	P&A	Vol.	Mode	Ind.	Aff.	TTL
1	turn	0.7	1.0	0.9	0.9	0.9	0.9	0.9	6.2
2	shut	0.9	0.9	1.0	1.0	1.0	1.0	1.0	6.8
	open	0.9	1.0	0.7	1.0	0.9	1.0	0.9	6.4
3	eat	0.7	1.0	0.5	0.8	0.8	0.9	0.0	4.7
	burn	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.5
	share	1.0	1.0	0.4	0.9	0.0	0.5	0.4	4.2
4	find	1.0	0.2	0.0	0.2	0.9	1.0	0.0	3.3

The exemplar verbs indicate that A was working on more than one aspect of morpho-syntax simultaneously, and it is difficult to separate the move from A's encoding events of cardinal transitivity to those of lowered transitivity from other aspects of his language development. With two exceptions ('shut' and 'eat'), each of the exemplar verbs manifests a different morpho-syntactic construct the child must master. As discussed above, I hypothesized that 'turn' remained productive (and actually increased in use) in subsequent periods because it exemplified the verb + particle construction. Similarly, although both 'open' and 'shut' exemplify cardinal transitivity, and in fact the events described by the verbs are the transformations of each other, 'open' emerged later and continued to be productive, which I attributed to A's dealing with the fact that certain verbs (exemplified for him by 'open') had different lexical entries, namely where the Theme is the subject of the

sentence (The door opened) or where 'open' is a predicate adjective. 'Burn' was not only lower in transitivity than the previous verbs, it was also a verb which initially occurred with a reflexive pronoun in object position. 'Share' was the most productive ditransitive verb in the corpus, and A was dealing with the fact that verbs can have two post-verbal arguments, and that the noun following a verb could be [+animate]. And finally, 'find', which marks the transition to the "functional stage" (Radford 1990), was the first verb to be used which consistently encoded tense/aspect.

The verbs 'burn' and 'share' were both initially used in highly contextualized situations. I hypothesized that A had no mental representation for these events, or a partial one, and was producing sentences with these verbs in order to analyze the events (what Gopnik 1987 called "thinking out loud"). By means of syntactic bootstrapping he knew which arguments the verbs took, and used the utterances in contextualized situations in order to figure out their meaning, with a decreased burden on memory.

In Chapter 4, I will show how the modified parameters of transitivity can be represented in terms of Jackendoff's 1983, 1987 conceptual semantics, and develop lexical entries for the exemplar verbs in terms of Jackendoff's notation.

CHAPTER 4

From Transitivity to Conceptual Semantics

4.1. Introduction to Conceptual Semantics

I have shown that, by attending to events of cardinal transitivity, an English-speaking child was able to fix the word order of transitive clauses (SVO) and extend this word order to events which were lower in transitivity. In this chapter, I will show how the conceptual and syntactic knowledge the child possesses can be formalized and represented in terms of Jackendoff's 1983, 1987 Conceptual Semantics¹.

Jackendoff 1983 posits a level of mental representation at which information conveyed by language corresponds to information from other systems (vision, non-verbal auditory, olfactory, etc.) His Conceptual Structure Hypothesis assumes that "there is a single level of mental representation, conceptual structure, (emphasis in original) at which linguistic, sensory and motor information are compatible." (p. 17). According to Jackendoff, the mind is organized in such a way that it can segment sensory inputs and create unified representations of them, which he calls "creative categorization". This process involves the organism extracting information from particular examples in the environment ("tokens")

¹Jackendoff's 1990 Conceptual Semantics was not available to me when this chapter was being written. The work presented here is currently being reviewed in light of modifications and additions to the theory.

and generalizing this information to "types" in the mind. This process allows an infinite number of categories to be generated based on a finite number of primitives, is applicable to new situations, and learnable through the interaction of the environment with the organism's genetic predisposition to categorize. According to Jackendoff, this is done at the level of conceptual structure, where correspondences are made between the innate ontological categories and entities in the "real world" as perceived through the senses and projected in the mind. (A fundamental assumption made by Jackendoff is that meanings are mentally represented; the mind imposes structure on what is perceived in the "real world". The input from the environment is the "real world" while the world as experienced by the perceiver is a projected world which has been organized and stored in the mind.)

Under his view, thematic relations are not a list of theta roles, but rather:

"thematic structure is an innate organization with which the organism structures its experience. At most, the developing organism must learn the definition of location in a particular field in order to be able to develop a full range of event- and state- concepts in that field." (p. 210)

Jackendoff, following from Gruber 1965, suggests that basic concrete relations can be extended by the child to more "abstract" semantic fields. For example, he assumes that relations of motion and location are basic, and can be extended to other, more abstract semantic fields, i.e. to the Possessional, Identificational, Temporal and Circumstantial fields.

It seems to me that it is at this level that the transitive events discussed in Chapters 2 and 3 can be represented, as the child uses both visual and linguistic input to determine basic word order. As discussed in Chapter 2, the child attends to and perceives transitive events through the senses and hears the language used to describe them. Furthermore, it has been remarked, particularly by researchers working within a Piagetian framework, that children's own language is often an accompaniment to action, which connects information from linguistic and motor sources. This level of conceptual structure relates otherwise disparate sources of knowledge in a unified theory.

In Conceptual Semantics, every major phrasal constituent in a sentence corresponds to a conceptual constituent in the semantic structure, which is a major ontological category. For example, Places and Paths map onto Prepositional Phrases (in English), Things map onto Noun Phrases, and Events and States map onto Sentences. The meaning of a lexical item belonging to any major syntactic category (noun, verb, adjective, adverb) is "a function of 0 or more arguments that map into a conceptual constituent of one of the major ontological categories" (Jackendoff 1983:105). Arguments are also conceptual constituents, and are filled by readings of major phrasal categories for which a lexical item strictly subcategorizes (p. 110).

Place and Path functions are prepositions (in English) mapping a Thing or Place into a trajectory or location. A THING may be either animate or inanimate (for example, in 1c. above THING could be either "Mary" or "the ball" as in "Mary/the ball rolled down the hill".) Parentheses, unlike their syntactic counterparts, mark arguments of a function rather than optional constituents. (Jackendoff uses <> to indicate optional constituents.) All of these conceptual constituents have syntactic correspondences: an Event corresponds to a Sentence²; GO (an event function) corresponds to a Verb³; Thing corresponds to a Noun Phrase, while Path corresponds to a Prepositional Phrase. Argument positions in conceptual structure are linked with syntactic positions via coindexing in a verb's lexical entry, which is viewed as a part of the correspondence rule component of the grammar, linking (among other things), syntactic and semantic levels.

Although all syntactic constituents must be linked to conceptual constituents (basically the Theta-criterion (Chomsky 1981)), the opposite need not hold: there may be a conceptual constituent which has no corresponding syntactic constituent. For example, in the sentence

(2) Roseanne ate

²In the unmarked case. According to Jackendoff 1987:376, NPs can also express Events (i.e. "the earthquake").

³Jackendoff 1983 points out that this is an exception to the generalization that major ontological categories are X''' (major syntactic) categories.

at the conceptual level "some unspecified solid" is present, but is not linked to any Noun Phrase.

Another Event-function, which is crucial to my discussion is:

$$(3) \text{ EVENT} \rightarrow [\text{CAUSE} (i,j)]$$

Event

where i is the Thing causing the Event (i.e. the Agent) and j is the Event being caused. Sentence (3) can be expanded as (4) below:

$$(4) \text{ EVENT} \rightarrow [\text{CAUSE} ([\text{THING}_i] , [\text{GO} ([\text{THING}], [\text{PATH}])])_j]$$

In order to account for various syntacto-semantic phenomena, Jackendoff tentatively proposes a three-tiered approach to conceptual structure, (I refer the reader to Jackendoff 1987, Sections 8 and 9 for motivation of these tiers.) Under this enriched version of conceptual structure there are three separate tiers; a thematic tier which encodes motion and location, an action tier which encodes Agent/Patient relations, and a temporal tier which encodes the aspectual properties of events.

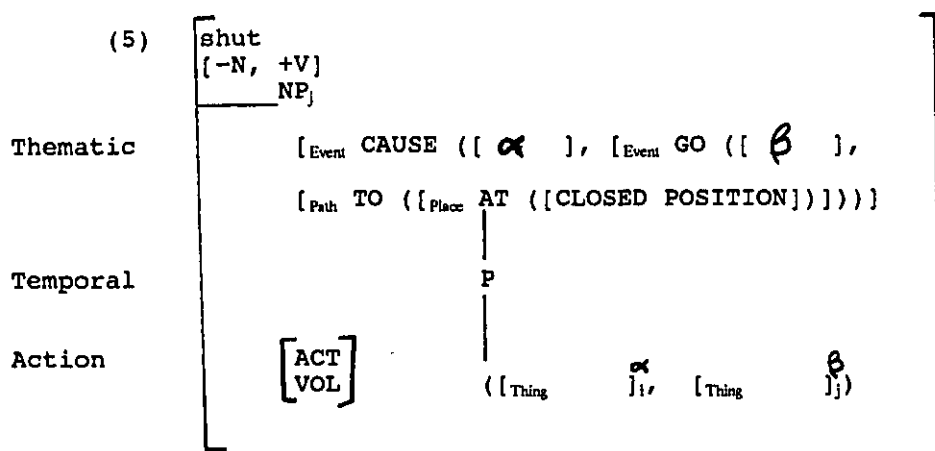
4.2. Application of Conceptual Semantics to the Data

I will now show how Jackendoff's Conceptual Semantics can be used to represent the knowledge the child has of the transitive events encoded by the exemplar verbs discussed in Chapter 3. I will begin the discussion with 'shut', which is of cardinal transitivity and

which was the first verb in the corpus to be used to express transitive events with standard VO word order.

4.2.1. Shut

Under Jackendoff's system, A's lexical entry for 'shut' would look like (5) below:



The information immediately under the verb is what is traditionally called its subcategorization frame, which indicates that 'shut' is a verb which is strictly subcategorized for a direct object. The information on the Thematic tier encodes the fact that there are two participants, an external instigator ([α]) and an object in motion ([β]), which is traditionally called the "Theme"⁴. GO represents the fact that the event is kinetic. Recall that there

⁴Jackendoff argues that thematic roles are not primitives, but rather particularly prominent configurations in conceptual structure. Under his view, thematic roles, like syntactic 'roles' (i.e. Subject and Object) are relational notions which are defined structurally.

may be constituents in conceptual structure with no syntactic counterparts: the Path function is lexicalized; that is, part of the verb's meaning and not linked to a PP in the syntax. Jackendoff 1987 gives several relevant examples which I have used to motivate this aspect of the lexical entry. The conceptual structure for the verb "run" is GO THING PATH, but the path may be unspecified as in "Mary ran". According to Jackendoff, well-formedness conditions on conceptual structure require that the Path argument be present conceptually even if it is not expressed lexically. Similarly, the verb "enter", as in "Mary entered the room" incorporates the meaning of "INTO" (path-place function), which is lexicalized. And "drink" means "cause a liquid to go into one's mouth" where again the path-place function is part of the verb's meaning, and is not mapped onto any syntactic constituent, although it must be present in conceptual structure. The parameters of Participants and Kinesis discussed in Chapters 2 and 3 are therefore represented on the Thematic tier.

The Temporal tier represents the parameter of punctuality and aspect; P indicates that the event is what Jackendoff calls a "point event", which is brief and non-durative. The Action tier, which is motivated by Jackendoff to account for Agent (volitional actor) and Patient (object affected) relations, incorporates the parameter of Volitionality (ACT VOL), i.e. an entity capable of independent movement which can initiate an action, and Affectedness, i.e. an object that is changed in some way. (If the

Object is not affected it is not represented on the Action tier).

The only parameters not represented in this lexical entry are Mode and Individuation. However, according to Jackendoff 1983, referentiality is the unmarked case, which will account for these two parameters.

Greek characters in the entry represent relationships between binder and bindee in conceptual structure. The bindee (on the Thematic tier) has no semantic properties except for its position in conceptual structure, and inherits its properties from its binding argument on the Action tier. Conceptual information, i.e. THING, is therefore not repeated on the Thematic tier, but the binding relation shows its co-reference. Roman characters in the entry represent syntactic/semantic correspondences. The rule for Argument fusion, Jackendoff's 1987 (29) states:

(6) Argument Fusion

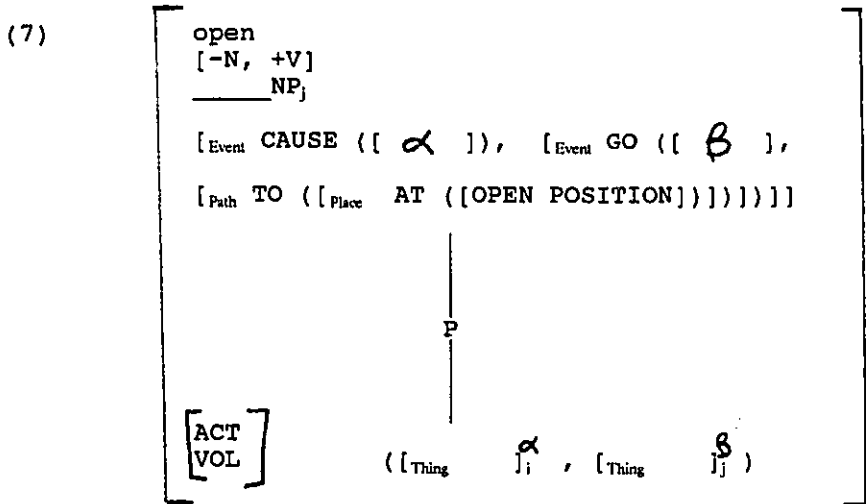
Into each indexed constituent in the reading of a verb or preposition, fuse the reading of the syntactic constituent in the sentence that satisfies the co-indexed position in the verb's subcategorization feature. Into the position indexed i in the reading of the verb, fuse the reading of subject.

Under Argument Fusion, the linking is from syntactic to semantic constituents. The child would initially, in the course of acquisition of word order, link a conceptual constituent to a

syntactic one (basically semantic bootstrapping). As will be seen, once children make this initial linking, they are able to determine syntactic constituents and relate them to semantic ones.

4.2.2. Open

'Open' is the transformation of 'shut', and its lexical entry is exactly the same, save for the Path function, which is to an open rather than shut position, as can be seen in (7) below.

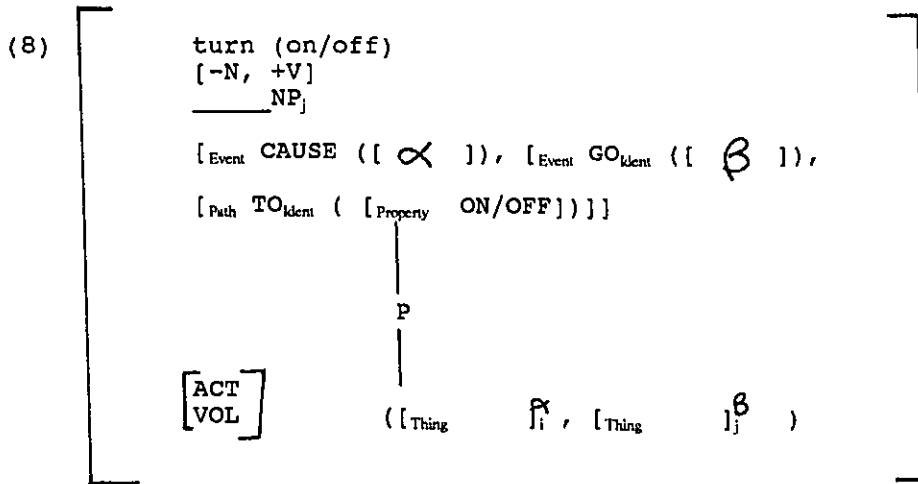


When both 'shut' and 'open' initially appeared in transitive constructions, the only objects to occur were 'door' and 'drawer', where the motion of the Thing along the Path is clearly visible. As discussed in Chapter 3, 'open' in subsequent periods began to occur with different objects, including a jar, purse, bottle and sewing machine, where the motion along a Path is much more abstract. This is consistent with Jackendoff's 1983 hypothesis

that children will extend concrete relations to more abstract ones. Otherwise the entry for 'open' is exactly like that for 'shut', except for the fact that the lexicalized Path function is to the open rather than closed position.

4.2.3. Turn on/off

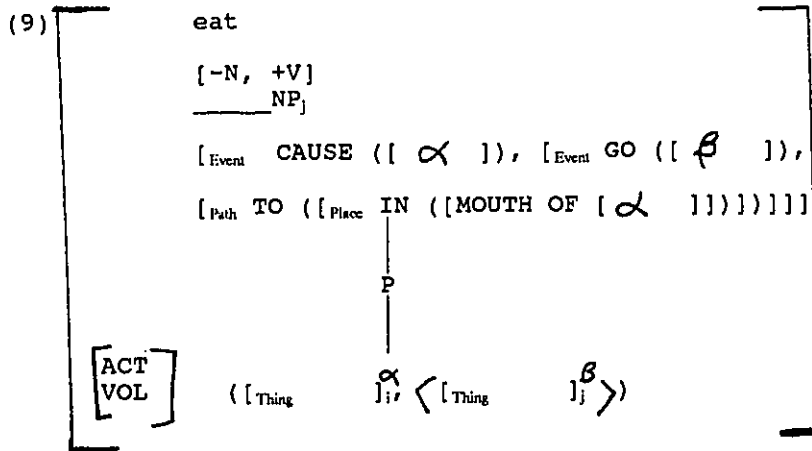
As discussed previously, this was the first verb used to describe transitive events, although it initially occurred without fixed VO order, and I suggested that the child was in a pre-syntactic period. Once 'shut' and 'open' had begun to occur frequently with standard VO word order, the child began to use 'turn' again, but with consistent VO order. This supports Jackendoff's hypothesis that verbs of motion are basic, and can be extended to verbs in other semantic fields. As can be seen in (8) below, the child has extended GO to what Jackendoff calls the Identificational field, where the argument of Path must be a Property.



The Property ON/OFF was at first lexicalized, but was later expressed overtly in the utterances as a particle. The Thing_j is still affected, although, similar to later objects with 'open', it does not change position.

4.2.4. Eat

Jackendoff 1987:386 gives a lexical entry for the verb 'drink' which is similar to the one I will give in (9) below for 'eat'. He states that it is "obviously an over-simplification"; however, I will suggest that it is exactly what the verb entails for the child at this period.



There is nothing in the occurrences of 'eat' in transitive constructions to suggest that the meaning of the verb entails chewing and swallowing⁵. Therefore, either the object to be consumed or what is traditionally called the Instrument (spoon, hand) would be Thing []_j, at least at this point in the child's linguistic development, which is the Theme (object in motion). The Object moves, but is not otherwise affected, so it did not initially have a position on the Action tier. The notation <...> indicates that an element is optional. Once the child's conception of the act of eating changed, this would be represented on the Temporal tier, and the type of event would change to an P R event, indicating an initial point at which the Actor would act on the Instrument, followed by a region of time to represent the process of chewing and swallowing.

The argument of the Place function (IN) is bound to the

⁵I would like to thank Alana Johns, who first pointed out this possibility to me.

Instigator/Agent. There were two occurrences of 'eat' in transitive constructions where this was not the case:

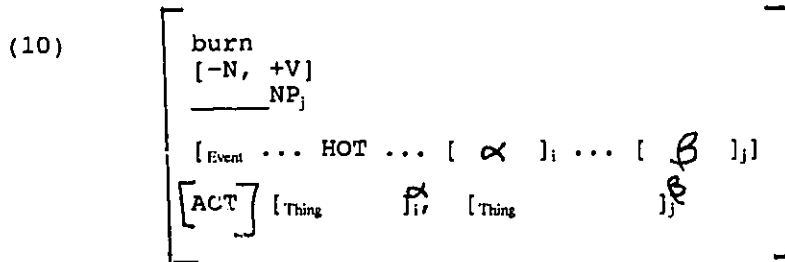
18.03.75 A was pretending to feed a giraffe in a picture book.

- A. eat giraffe.
- AB eat giraffe by self.
- M. No you feed the giraffe.
- A. AB feed giraffe. x 3
feed giraffe. x 4

It might be argued that A's lexical entry would allow this as the argument of the Path function was not bound to the Agent. However, the fact that only 2 out of over 50 utterances with 'eat' were of this type, and the fact that he was so amenable to correction suggests that it was the lack of a lexical item rather than an unbound Path function that caused the misuse of 'eat'. These were the only instances of 'feed' to occur in corpus.

4.2.5. Burn

In Chapters 2 and 3, I discussed contextualized speech, and suggested that A had little or no mental representation of the type of event entailed by the verb, but was able to, by means of syntactic bootstrapping, determine that 'burn' was a verb due to its relationship to its arguments. In (11) below it can be seen that although A has little conceptual representation of the event, the binding relationships which he requires to generate the utterances he does are very complex.



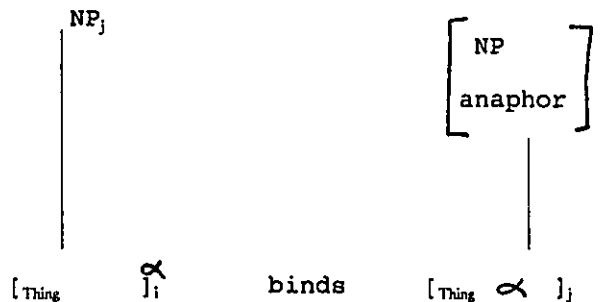
On the Thematic tier, all that can be represented is the fact that the event involves the concept of HOT, and that there are two participants. There is no temporal tier, as it is not clear what type of event it is for A (i.e. a point event, or an achievement) and only 4/33 occurrences of 'burn' in transitive structures were decontextualized, that is, real events. On the action tier, it is not clear that the Instigator is acting volitionally or whether the Object is affected. However, although Jackendoff 1987 does permit there to be an empty action tier, he does not make it clear how argument binding would take place if there are no arguments on this level⁶. In order to represent the complex binding relations the child knows, I have had to include this tier, although I do not believe that A's conception of the event would involve an Agent or a Patient, as the event could be accidental, and it was not until Period 4 that A saw any visible results of the verb.

In Period 3, when the verb 'burn' first began to occur in VO constructions, the only object was 'self'. I argued that despite this fact the constructions should be viewed as analyzed into V and

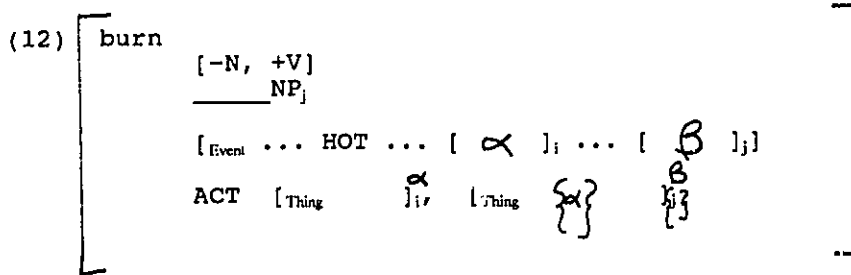
⁶He "leave[s] the issue open"(1987:406 fn 19). From my reading, it does not appear to have been resolved in Jackendoff 1990.

O, as 'self' occurred with other verbs ('cut', 'poke') and in other constructions (particularly PPs) and it was clear that A knew that 'self' was co-referential with the Subject (initially only A, later Mika and Mother as well). Therefore, initially the entry would have the Patient on the Action tier binding the Theme on the Thematic tier [β], and the Actor on the Thematic tier binding the Patient on the Action tier. The second argument of ACT on the action tier is simultaneously a binder and a bindee: the superscript β shows that it is a binder, and the α within the constituent shows that it is a bindee. This is represented formally in Jackendoff 1987:407 (78)b.:

(11) Conceptual Semantics



Once other objects which were not coreferential with the subject began to occur, there would be two options, indicated by {} within the entry. (Braces, ({}), as in syntactic notation, abbreviate two rules, so that either of the constituents within the braces is possible.)



Once A figured out what the verb entailed, the fact that in all cases it encoded the result of an action would be shown on the temporal tier: there would be a region of time (R) before which the result occurred, and a point action to indicate the result. The object would be optionally affected, as shown on the action tier. The important point with this verb is that syntactic bootstrapping allowed A to build conceptual representation after syntactic relations (i.e. word order) were in place.

4.2.6. Share

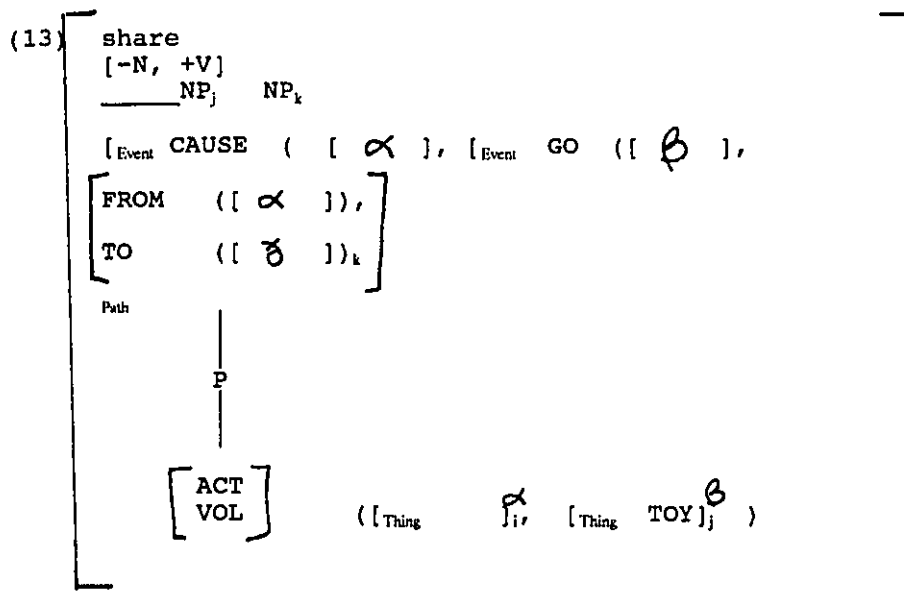
The meaning of this verb is quite abstract in the adult lexicon. According to the Concise Oxford Dictionary 1976, "share" as a transitive verb means:

"apportion (food, property, task etc.) among others, give each a share of; give away part of; get or have a share of, benefit from or possess or use of endure jointly with others".

However, the situations in which the utterances with 'share' occur suggest that for A it is a simple matter of giving the object to the other participant in the event, with a meaning which is closer

to "give"⁷. (Even at eight years old, A still thought 'share' meant to "let other kids play with your toys".)

Such a meaning is represented conceptually in the GO_{POSS} field, where an object changes (temporarily) from the possession of one individual to another. The lexical entry for 'share' is therefore a verb in the semantic field of possession, again supporting Gruber's hypothesis that basic Verbs of motion will be extended to other semantic fields.



Both subcategorized arguments are not present in the utterance. Originally the Goal (TO([β])) was the argument which was overtly expressed in the utterances, but the Theme was usually clear from the context (i.e. the toy that A happened to be playing with). Later the Theme was verbalized, and the Goal expanded to other

⁷ The verb 'give' occurs only 4 times in the corpus in transitive constructions.

entities. Furthermore, in Period 4 the object was not always a TOY, as was the case in Period 3. I hesitated to include the temporal tier, as the events described by this verb were initially contextualized; however, due to the elements present in the utterance, the consistent word order and the child's concept of the event I believe it is correct to include it. There is a problem with Jackendoff's system, which he acknowledges, in that the recipient is not represented on the Action tier but must be coindexed with the NP in the subcategorization frame⁸.

4.2.7. Find

Although Jackendoff 1987 can represent multiple lexical entries by means of formal notation, it was not possible for me to do so with 'find'. This is due to the fact that for A 'find' had two different meanings, whereas in Jackendoff's examples the verb had the same meaning and the only difference was the relationships among the arguments in the various types of events represented by the verb (i.e. 'hit'; 'dress').

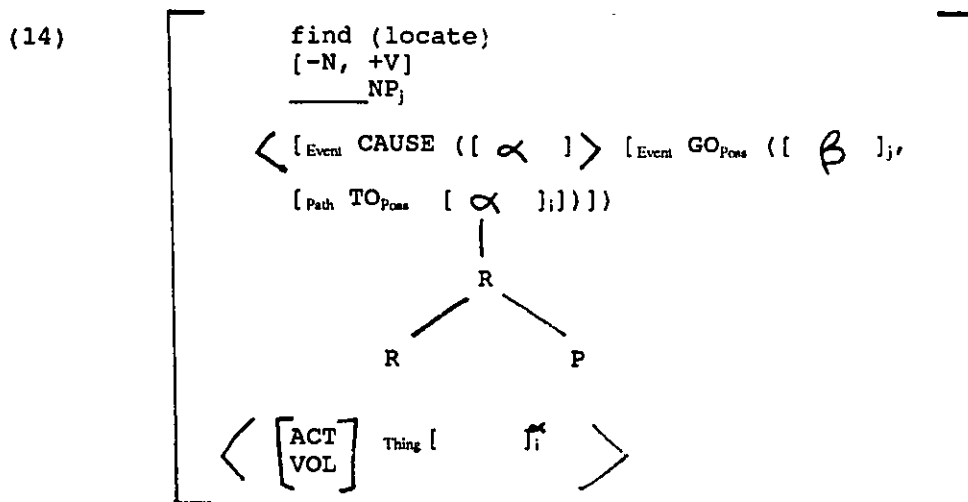
The two meanings of the verb for A were "to locate" and "to seek/look for"; and these differences were almost always consistently encoded by means of different forms of the verb. The "locate" meaning was encoded with the form 'found' representing an

⁸Jackendoff 1987 points out the preliminary nature of his work and the need for further research. In fact, he describes it as "tentative" and "incomplete" (pg. 394).

achievement, while "look for" was in the unmarked form ('find') representing an inceptive event. Although it might be argued that A did not make the connection between the two forms and that they were in fact two unrelated verbs for him, there is some evidence of hesitation which suggests that he was aware of the relationship between the two forms.

12.03.44 found record.find Describing the fact I had located his yellow record.

There are two instances where the inappropriate form of the verb is used; i.e. 'find' to represent an achievement, but in general there is a good form/meaning correspondence. The majority of the utterances with this verb (20/25 VO; 4/4 SVO) were achievement events.



Like 'share, this verb is in the semantic field of possession, where the object comes to be in the possession of someone. On the

Thematic tier, < > shows that the Instigator of the Event is optional, as the finding of the object in question may have been accidental. In other words, some cases are causative, in that the subject exercises control over the situation, while in others there is no initiator of the event.

Approximately one-third of the occurrences of 'found' ("locate") in transitive constructions involve an initiator who acted in order to bring about the event. For example, in (15):

(15) ignition x 3 found ignition	Inside car. A going through keys on ring. Touches different keys, saying 'no, no'. Finally found ignition key. (15) (02.03.21)
-------------------------------------	---

A had actually been looking for the item which was located. There are also several instances where A had not initiated the event, and the result was therefore accidental, as in (16):

(16) found ball	A climbed under a chair. There was a ball under the table, against the wall. (01.03.47)
-----------------	--

However, the majority of transitive constructions with 'found' (almost half) it is unclear whether or not A had actually been looking for the objects he found. These utterances were all like (17) below, although there were a variety of different objects:

(17) found screwdriver.	A ran and showed me his screwdriver. (02.03.18)
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There is no indication that he had been intentionally seeking the object in question. If the event is accidental, the Subject is co-

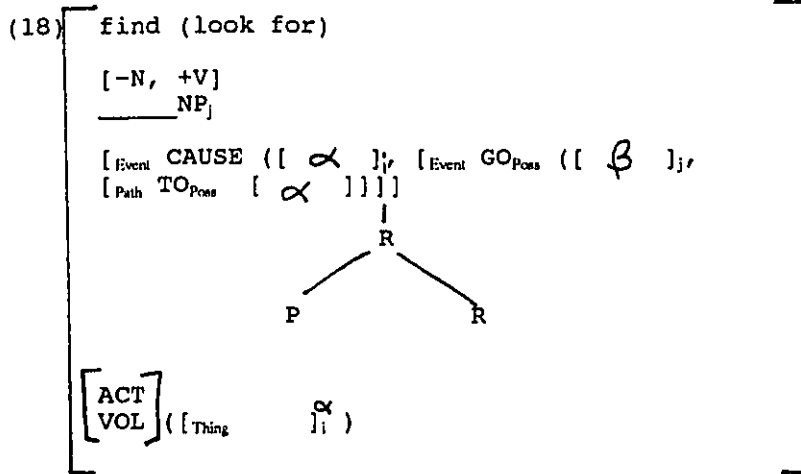
indexed with the Goal ($[\alpha]_i$); if it is intentional the Subject is co-indexed with the Instigator ($[\alpha]_i$).

The temporal tier is where there is the most notable change from previous entries, in that the event is not a point event but rather an achievement event, which is shown by the expansion of $R \rightarrow RP$, indicating that there was a region of time before the achievement of the event. This is clearly encoding the punctuality of the event, i.e. the endpoint rather than the event itself, and is the first consistent occurrence of a past/perfect marker.

On the Action tier, the ACT/VOL is optional, again depending upon whether the initiator deliberately looked for the object for a period of time before it was located. There is no $[\text{Thing}]_j^{\beta}$ on the Action tier, as the object is not affected.

As mentioned above, 'find' had a different meaning for A, namely "look for", and it was not possible to combine the two into one lexical entry⁹. The lexical entry for 'find' ("look for") is shown in (18) below:

⁹Ross 1972, cited in Jackendoff 1983, suggests that the verb 'look for' lexicalizes the meaning "try to find".



In this entry, Instigators are obligatory, as they initiate the search. However, the major difference is on the temporal tier, where again R is expanded, but in this case $R \rightarrow P R$, which marks an inceptive event: that is, there is a point in time at which the search is begun, and a region of time following. There is no endpoint, as there is no guarantee that the search will be successful. On the Action tier, there is a Volitional Actor which is linked to P, the inception of the event. Again there is no [Thing]_j on the Action tier, as it is not a patient (i.e. affected). In fact, van Voorst 1983 suggests that in transitive events with the verb "find" it is the Actor who is affected (although not visibly).

4.3. Discussion

The lexical entries presented above for the exemplar verbs in the corpus represent the lexical knowledge A can be assumed to possess to generate the utterances he does.

In Conceptual Semantics, the lexicon is viewed as part of the correspondence rule component of the grammar, relating inter alia, the semantic and syntactic components (Jackendoff 1987). The coindexing represents the fact that A is able to link arguments in conceptual structure with the arguments for which the verb strictly subcategorizes, and The Argument Fusion rule ((6) above) allows him to link the external argument with the Agent. These arguments are projected onto X' categories in the syntax. Initially, with the exemplar verb 'shut', A builds a conceptual representation for the event, which includes all of the parameters of cardinal transitivity, represented by the primitives in Conceptual Semantics, and links this representation with the linguistic input. Once the initial linkings are made, A realizes that the word order for English is SVO (basically semantic bootstrapping), and proceeds to develop similar entries for other verbs, whether they are of cardinal transitivity or not. Furthermore, his knowledge of word order enables him to develop entries for verbs for which he has an incomplete conceptual representation as well (syntactic bootstrapping).

As predicted by Gruber 1965, verbs of motion (in A's case 'shut' and 'open') are extended to other semantic fields, namely the identificational field in the case of 'turn (on/off)' and the possession field in the case of 'share' and 'find'. Initially A's entry for 'eat' is a verb of motion, but this would presumably be expanded to incorporate process, where the temporal tier would

change to represent an activity rather than a point event.

In the case of 'burn', I showed that A had an elaborate entry for this verb based on its syntactic properties, although the conceptual part of the entry was almost devoid of content. A began to build up a conceptual representation for 'burn' in Period 4, exemplified by the use of 'tea kettle' as an object, and presumably this representation would be completed as A gained more knowledge about the event entailed by the verb.

As discussed in Chapter 2, I made a methodological decision to look only at verbs which occurred a minimum of 25 times each in VO constructions in the corpus. Because of this, it was possible to construct entries for the verbs based on the child's conception of the events, rather than imposing an adult-based meaning on them. This is particularly true of the verb 'eat', which I have shown initially meant only "put into the mouth, optionally with an instrument", a point event rather than an ongoing activity. Similarly, the verb 'share' for A, based on his usage of it in transitive constructions, had a meaning closer to 'give'. We can assume that A has constructed or is in the process of constructing entries of similar detail for the other verbs in his lexicon, but that these lexical entries may differ from those of the adult.

CHAPTER 5

Conclusion

5.1. Support for Slobin's Hypothesis.

At the end of Chapter 3, I concluded that, based on my study, Slobin's hypothesis could not be disproved. I showed that A initially attended to and encoded events which were of cardinal transitivity, and subsequently applied the word order thus acquired to encode events which were lower in transitivity. This study therefore adds support to Slobin's hypothesis, based on data from a child learning a language in which transitivity is encoded exclusively by means of word order, rather than by the use of overt case markings.

There is however an important difference between my findings and those reported in Slobin 1981, 1985 for children learning Kaluli and Russian. The children cited by Slobin produced utterances describing transitive events which were of both cardinal ("prototypical" in Slobin's terms) and lowered transitivity at the same time, but marked subjects in Kaluli and objects in Russian only in those utterances which were of prototypical transitivity. These findings could be interpreted as suggesting that a child learning a language in which transitivity is expressed solely by word order would use basic word order ("canonical" word order in Slobin's terms) to encode events of cardinal transitivity ("prototypical" in Slobin's terms), while using deviant word order

to encode events which were not high in transitivity. However, this does not appear to be the case in my study. The data suggest that initially A attended to and therefore talked about only events of cardinal transitivity, and only later attended to and talked about events that were lower in transitivity. Once he discovered that English was an SVO language, by attending to events of cardinal transitivity as exemplified by the emergence of 'shut' in VO utterances at the beginning of Period 2, word order was consistently VO in transitive constructions regardless of the transitivity of the event being expressed, and generally speaking grammatical in all multi-word utterances. Deviant word order (ie. OV rather than VO) was very low after the beginning of Period 2, as can be seen in Table 14 below:

TABLE 14

Word Order in Action/Object Constructions

Period	1	2	3	4
Total A/O	19	71	215	247
Number * (OV)	13	5	9	8
Percent * (OV)	68	7	4	3

Action/Object (A/O) refers to transitive utterances which were either VO (grammatical) or OV (ungrammatical). In Period 2, 4/7 A/O utterances with OV order were with the verbs open (2), break (1) and fix (1) which I interpreted as describing transitive events

based on the context and function. However, A may have intended these to be Noun + Predicate Adjective utterances describing a state. In Period 4, 3/8 OV utterances were with the verb 'eat', and occurred one after the other. The number of ungrammatical utterances might therefore be lower than shown in Table 14.

The fact that my findings differ from those cited by Slobin could be attributed to two factors, which are not necessarily mutually exclusive: 1) differences in methodology; and 2) differences in the type of language being acquired. The data upon which Slobin bases his hypothesis were collected periodically rather than continuously. It is possible that a given time sample caught utterances encoding events of lowered transitivity co-occurring with utterances encoding events of cardinal transitivity. However, time sampling gives no indication of how long the children had been using the overt case markings to mark either Agents or Themes (DOs) in cardinal transitive events before the particular sample was taken. Furthermore, a time sample collected over a short period would give no indication of the relative frequency of utterances of high and low transitivity. For example, A did produce utterances describing events of lower transitivity almost from the beginning of the data collection period, but these were infrequent until the period in which lowered transitivity became the norm with exemplar verbs. When utterances occur infrequently, there is no way of telling whether they are unanalyzed chunks or examples of creative rule use. If the infrequently occurring structures expressing

lowered transitivity happened to occur during a particular time-sampling period, they could give skewed results regarding the co-occurrence of sentences describing events of cardinal and lowered transitivity.

The different findings could also be interpreted as suggesting that the development of different grammatical devices may proceed in different ways. In non-technical terms, A had learned that his language used word order rather than inflectional morphemes to encode basic syntactic relations. More specifically, word order appears, from my study, to have been applied "across the boards"¹, in that once A realized that the basic word order for English was SVO, he was able to apply it almost flawlessly to both transitive events and other structures. In more technical terms, once A realized that English is "head-initial" (Chomsky 1986), this knowledge was exemplified in all of his utterances, as he applied this knowledge to Adjective + Noun, Genitive Noun + Noun, Preposition + Noun, Determiner + Noun, as well as to transitive events of lowered transitivity (both VO and SVO). As these constructions emerged, there was no "groping" (Braine 1976) for word order. Braine 1976 gives a number of characteristics of children's speech which he interprets as indicating that they do not yet possess a rule for generating certain types of utterances. These include 1) hesitancy; 2) circularity; 3) repetition; and 4)

¹The distinction between "across the boards" and "piecemeal" learning is made in de Villiers and de Villiers 1985.

inconsistent word order. A's speech during most of Period 1 exhibited all of these characteristics. However, after the emergence of VO constructions with 'shut' at the beginning of Period 2, A's speech was free of all of these characteristics of groping. There was some hesitation, but it was quantitatively and qualitatively different from that in Period 1. Hesitation during Period 1 was similar to that in the following entry:

23.12.02 turn.turn.turn.turn.turn. light.light.light.

where there is a great deal of repetition of the individual words as well. Hesitation in subsequent periods was similar to that in the entry below, and tended to occur with new lexical items in VO constructions.

06.02.08 water turn. turn on.

(This was the first object which was not an appliance to occur in combination with the verb 'turn', and it is also one of the first occurrences of 'turn' with the particle.) The quantitative and qualitative differences in hesitation and other characteristics after the beginning of Period 2 suggest that with the emergence of 'shut' at the beginning of Period 2, A had learned that his language was configurational (Chomsky 1981) and had fixed the principal branching direction or order of constituents. After that time, word order was generally correct in all constructions as they emerged, and there is no evidence to suggest that they were learned on a structure by structure basis.

On the other hand, the fact that children learning languages which

employ overt case markers to encode transitivity do not appear to apply them "across the boards" can be attributed to "piecemeal" learning. (See footnote 1.) These inflectional affixes may be learned on an item by item basis, as the child would need to know the range of the application of the affix, and may be conservative in using it. The differences between across the boards and piecemeal learning might also be attributed to individual differences in learning style, which will be discussed in Section 5.4 below.

It may also be that the children studied by Slobin were at a later stage in their language development than A. Budwig 1989 studied English-speaking children at a slightly later stage in development than A., when overt subjects were more consistently used, and found that some of her subjects initially encoded the "prototypical" agent using 'my' while 'I' was used for subjects with the semantic role of Experiencer ('I want/like ...'). Her other subjects used self-reference (the child's name, 'I', 'my') to express the notion of prototypical agentivity. She compared her results with the Kaluli and Russian-speaking children discussed above, and concluded that American children used self-reference to indicate prototypical agents. Her findings could be interpreted as lending support to similarities in development between children learning different types of languages. However, her analysis is problematic in that although ergative markers were used by the Kaluli child to mark agents in cardinal transitive events, it is not clear to me how the

accusative markers used by the Russian child to mark the Object in events of cardinal transitivity relate to the notion of "prototypical agentivity". Her results regarding the marking of agents is therefore open to question, and it may be necessary to look at the interaction of the various parameters of transitivity, rather than taking one in isolation, in order to draw any conclusions regarding differences in learning due to different types of languages.

It is possible that both methodological and typological differences account for the different findings. Diary studies of children learning languages in which transitivity is encoded by means of case markings might shed some light on this issue, as the relative frequency of the use of case markings with events of cardinal and lowered transitivity could be compared.

5.2. Transitivity Grid

The modified scale of transitivity provides a child-based methodology for determining the degree of transitivity in an utterance which is objective, precise, and clearly delineates progress in linguistic development. This scale can be applied to children learning different languages who are at the same stage in development, and allows the researcher to determine the transitivity of a given utterance in terms which are based on empirical research on child perception/cognition/language rather

than on the researcher's personal intuitions. Moreover, if suitably modified to represent children's developing perception and cognition, such a grid can also be applied to the investigation of other issues in both first and second language development.

An important issue in first language development (henceforth LD) is the difference between children's comprehension and production. So far the support for Slobin's hypothesis has come from studies of children's own utterances. Further support might come from comprehension studies, using the preferential looking paradigm for example (Golinkoff et al 1986, Hirsh-Pasek et al 1988), where the transitivity grid could be used to calculate the relative transitivity of different events. It has been found that children's comprehension generally precedes their production, and studies investigating the comprehension of events of varying degrees of transitivity could provide further evidence regarding the types of transitive events children attend to. Such studies could support the idea that what children encode in their utterances is actually due to linguistic/perceptual priority rather than what they are interested in.

With regards to later stages in LD, there are conflicting interpretations to children's differential comprehension and production of passive sentences. For example, Maratsos et al 1985, Pinker et al 1987, found that at a certain stage children's comprehension of "actional passives" or "direct action verbs" (i.e.

'The doll was hit') is significantly better than their comprehension of non-actional passives (i.e. 'The doll was seen'). Similarly, Borer and Wexler 1987 suggest that at a certain point children's grammars exclude "non-actional passives" (i.e. 'The doll is seen' 'The doll is liked'). Lebeaux 1988 has a somewhat different proposal, suggesting that the movement rule which gives adult-like passives is initially only used with verbs in which the Theme is [+affected], and stating that it is affectedness rather than action which determines how the passive rule is applied.

A transitivity grid, suitably modified to represent children's development in perception and cognition may help to resolve the issue. First of all, the grid would give a clear definition of what children at this age would perceive as being cardinally [+affected] (the unmarked case), as affectedness is a often-used but poorly-defined concept in semantics. Similarly, the parameter of Kinasis, again child-based, would help distinguish events which were actional or non-actional more precisely, and in child-based terms. Furthermore, it is possible that all parameters of transitivity are involved in the development of the passive rather than the ones isolated by Maratsos et al, Borer and Wexler and Lebeaux.

In the field of second language development (henceforth L2D), Anderson 1987 uses the concept of telicity, which falls under the parameter of Punctuality and Aspect in the transitivity grid, to

account for how English learners of Spanish L2 develop their tense and aspectual systems. The results he reports are compelling, and looking at different parameters may give further refinement to the hypothesis. Similarly, Anderson 1990 suggests that further research in L2D is required regarding the "semantic space of 'duration'" (p. 22) in the learners' first language to account for their acquisition of the -ing marker in English. This phenomenon also falls under Punctuality and Aspect, and may also be related to other parameters of transitivity.

5.3. Conceptual Semantics and its interaction with other components of the grammar.

Jackendoff's Conceptual Semantics allowed me to formally represent the knowledge A can be assumed to have to generate the utterances he does in a manner which is compatible with the parameter-setting model of language acquisition. Children can therefore be assumed to possess the rich conceptual and lexical structure which Jackendoff posits when they proceed to fix subsequent parameters of the grammar. Jackendoff's view of the lexicon as a module of the linking rule component of the grammar suggests how the child's conceptual knowledge can be linked to syntactic representations.

Furthermore, Conceptual Semantics provides substance to the semantic/conceptual component of the grammar which is assumed by the learnability theorists discussed in Chapter 1. This level of representation is clearly defined and constrained in the types of

primitives which will be salient to the child. It is important to point out that for my purposes, Jackendoff's primitives were not primitive enough, and H & T's parameters, modified to represent the knowledge children can be assumed to possess, were employed to flesh them out and give them substance. These parameters, supported by research in infant and child perception and cognition, are stored in the verb's lexical entries, and can be viewed as the unmarked case for conceptual to syntactic linking.

Jackendoff's enriched theory of the lexicon, incorporating as it does both semantic and syntactic information, where categories in conceptual semantics are linked with syntactic (X') categories in the syntax, may appear to contradict the hypothesis made by many theorists in learnability and language acquisition; namely that once the initial linking are made between the events children witness and the syntax used to express them, children go on to acquire the language they are exposed to on purely syntactic grounds. This idea is explicit in Pinker's 1984 work, and is expressed succinctly by Macnamara 1982:133 "The child climbs to grammar on a semantic ladder and then kicks the ladder away". This type of position cannot be maintained under Conceptual Semantics, as both the syntactic and conceptual/ semantic information encoded in the lexicon are assumed to be a part of adults' grammatical competence. However, the direction of the linking is reversed: children initially use the conceptual knowledge to derive syntactic categories, but once syntactic categories are derived, mappings can

be made in the opposite direction; from syntactic to semantic. This is what Jackendoff 1987 proposes, and is consistent with the concept of "syntactic bootstrapping" discussed above. However, the contention of theorists that the initial semantic categories do not influence the form the syntactic component of the grammar is upheld - both categories are present, but are separate modules of the grammar which are related by correspondence rules.

When testing Slobin's hypothesis regarding the development of transitivity, I made a methodological decision to look only at the exemplar verbs. One reason for my decision was to enable me to arrive at a transitivity rating based on the child's conception and use of a verb in transitive events rather than on the adult meaning of the event. With a minimum of 25 VO utterances with a given exemplar verb, it was much easier to get an idea of what precisely the child intended in his utterances, and the breadth (or limitations) of the verb. These parameters of transitivity, which provided substance to Jackendoff's 1983, 1987 conceptual primitives, once applied to the exemplar verbs, have shown that a child just under 2 years of age can be assumed to have rich lexical entries for verbs, including both syntactic and semantic information. Jackendoff's notation formalizes the conceptual knowledge the child possesses, the fact that a given word is a verb that takes certain arguments, and the rules the child requires to link arguments in conceptual structure with X' categories in syntax.

One goal of conceptual semantics is that it be learnable given the time and experience constraints on child language learning. From my work, it appears that it is a promising theory which can account for certain aspects of language acquisition. Certain predictions, for example that basic expressions of motion are extended to other semantic fields, have been supported in part, and are a fruitful area for further research. Jackendoff's Conceptual Semantics, fleshed out by H & T's parameters of transitivity, provide substance regarding the types of semantic information that enable children to crack the syntactic code. This level of representation, assumed by researchers in learnability, now has theoretical and empirical support.

5.4. Limitations of the Study

As discussed in Chapter 2, the diary study was selected as the methodology for this study due to its suitability in testing Slobin's hypothesis. Each verb as used in transitive constructions could be followed on a daily basis and the relative frequency of types of verbs calculated. Fletcher 1985:11 suggests the need for a number of individual studies because important changes can take place between points at which language is sampled in a time study. This methodology was therefore selected for theoretical reasons. The study is also ecologically valid (Neisser 1967) in that it captured the child's naturally occurring behaviours.

However, there were drawbacks to the diary study methodology. First, because I was recording only multi-word utterances I did not systematically record new verbs in isolation as they occurred. It is therefore impossible for me to draw any strong conclusions regarding what happened during Period 1 where there were few VO utterances and few multi-word utterances of any kind. (Once I realized what was occurring I did begin to note verbs in isolation, but this was not done consistently.) Further studies which investigated only utterances expressing transitivity, be they single- or multi-word utterances, would provide a more manageable data base and possibly a clear, detailed picture of a "verb spurt", which I can only hint at as verbs in isolation were not recorded systematically. (Bates 1988 found that children who used predominantly nouns at one point also tended to be characterized by "verbiness" at a later stage, and these characteristics were found in the more precocious learners.)

Because this is a case-study, looking only at one child, the issue of individual differences is also important, as the pattern which emerged with A may not be replicated with children who have different learning styles or strategies. These individual differences are present from the time when children first begin to speak.

Dore 1974 drew a distinction between what he called "intonation babies" who use few words but produce many prosodic patterns to

convey their intentions and involve and influence others. In other words, they use language for social and functional purposes. "Word babies" on the other hand have a larger vocabulary and use language to label the objects in their environment. Nelson 1973, in her study of the first 50 words of 18 children drew a clear-cut distinction between two different types of children based on their early vocabularies. "Referential" children used language to name objects, and nouns predominated in their early lexicons. "Expressive" children, on the other hand, used language to manipulate the environment (i.e. to get what they wanted) and for interactive purposes. Verbs (e.g. 'want') and social vocabulary (e.g. 'hi', 'bye') predominated. Although Nelson did divide her subjects into referential and expressive classes, she viewed this distinction as a continuum rather than two unique styles. Bloom et al 1978 make a similar distinction, based on utterances of children at the early multi-word period. Under their analysis, some children had "pivotal" rules in which certain high-frequency words occurred in fixed positions and in which there were a large number of pronouns. They hypothesized that these pivotal rules were based on individual lexical items. The other type of child had "categorical" rules in which a wide variety of words were combined in different structures based on their category. The latter group also tended to use a greater number of nouns, which led Bloom et al to label them "nominal" children, while the children who used pivotal rules were called "prenominal". They suggested that the nominal children utilized an analytic approach to language,

breaking down the stream of speech into its component parts and using these categories in generating their own utterances, while the pronominal children employed a more holistic approach, using unanalyzed or semi-analyzed chunks of language. Unlike Nelson 1973, Bloom et al 1975 claimed that the two learning styles were a dichotomy; that is, that children were either one or the other style. This view was disproved by Bowerman 1978, whose daughter Eva exhibited a referential learning style for her first 50 words, but employed pivotal rules in her early two-word utterances, although she did not use pronouns. These findings indicate that there may be different learning strategies employed by the same child at different periods in her/his development, rather than a learning style used consistently.

These findings have been replicated by other researchers, most of whom view the types as points on a continuum in that a child may use one strategy more than another, and the same child may use different strategies at different points in her/his development. A at the one word stage was what Dore 1974 called an "intonation baby", using a sequence of syllables and an adult-like intonation contour to manipulate the environment. However, once he began his vocabulary spurt, nouns predominated in his lexicon, as they did for referential children². Although the number of verbs used productively in VO utterances developed gradually, there was no

²Nelson 1973 found that referential children were all first-born, as was A.

groping once 'shut' emerged, suggesting that he did have a broadly-based rule. Similarly, he used few pronouns, and when he began the most common was 'me' in subject position, suggesting that his pronouns were analyzed. It is possible that different results from mine might be found if children who used different strategies at different points in their LD were studied.

As discussed in Section 5.2 above, the differences between Kaluli and Russian speaking children may also be attributed to this factor. The differences between "across the boards" and "piecemeal" learning might also be accounted for by different learning strategies; "across the boards" being children employing a referential/nominal style, and "piecemeal" being characteristic of an expressive/pronominal style.

On the other hand, there have been two larger scale studies in LD which did consider the issue of individual differences, namely Wells 1985 (N = 128), and Bates 1988 (N = 27). Wells 1985 suggests that although the order of emergence of a variety of structures in the children's developing pragmatic, semantic and syntactic systems was not identical, individual differences should be viewed as "minor deviations that branch off from and rejoin the main thoroughfare rather than as separate individual routes" (p. 335). Similarly, Bates 1988 found that children who favoured analytic strategies, where rules were generalized rather than lexically-based, were more precocious in their LD, but that children who used

analyzed chunks based on rote learning eventually went through the same stages as the precocious children, though later. These findings suggest that different learning strategies may affect the rate, though not the route, of development.

This diary study supports Slobin's hypothesis, as did the time-sample studies of the Kaluli and Russian children. However, there is a need for more studies, both in previously studied and additional languages of both types.

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APPENDIX 1

EXEMPLAR VERBS

Key

A	=	Ainsley
AB	=	Ainsley Balccm (During Period 2-3, A took to calling himself AB in subject, and less frequently, in object position.)
M	=	Mother
< >	=	Information not in notes under entry.
()	=	Information in notes, in a different column. For example, on the forms there was a special column for 'Function', which I put in parentheses.
[]	=	(broad) phonetic transcription
*	=	non-standard word order

Turn (on/off)

Period 1

21.12.15	*light,turn x 3	<A> <p>oints to window. A: "dark" "light,turn x 3" M: "Yes, when it gets dark people turn on the lights in their houses."
22.12.02	turn x 3, light	Wanted me to turn on Xmas tree lights. I turned them on. M: "There, doesn't the tree look nice?"
22.12.14	turn x 3, light	In highchair, pulled back curtain and said "dark". 22.12.14 M: "Yeah, it's getting dark. Can you see the lights in the window?" A: "light x 2"
23.12.01	*radio,turn x 2	<A> <t>urned on the radio. (Description)
23.12.02	*light x 3,turn x 2	Radio and lamp on bed-side table - <A> often turns them off and on. Turned light on.

- 29.12.02 *light x 4,turn
x 6 Looking at a lamp which he isn't supposed to touch. Accompanied by gesture, turning hand in circular motion.
A: 8"light x 4, turn"
M: "No honey, you know you mustn't play with that light."
- 29.12.03 *vaporizer,turn
x 2 Looking at vaporizer. Points.
A: "vaporizer, turn x 2"
M: "No, Mummy puts water in the vaporizer and plugs it in when A goes to bed."
- 29.12.05 *record x 3,
turn In UR's bedroom.
A: "record x 3, turn"
M: "UR, could you play a record for A?".
UR puts on a record.
- 01.01.04 *light x 4,turn
x 4 In kitchen, he wants to turn on light.
- 19.01.01 *TV.turn Points to TV. (Request)
A: "TV.turn"
A: "on/turn/on/TV" <Represented as a vertical construction in original.>
- 21.01.02 turn x 3,light Coming up from basement.
A: "turn x3,light"
M: "Okay, you can turn the light off for Mummy."
- Period 2**
- 02.02.09 turn light In my arms, pointing to light switch. (Request)
- 04.02.03 turn water Trying to turn faucets on.
- 04.02.04 turn shower " "
- 06.02.08 *water.turn. At sink, attempts to turn water on.
A: "water.turn."
A: "turn on"
- 12.02.03 turn light Wanted to turn kitchen light on.

25.02.40 turn can opener Points to <electric> can opener.
<I> <l>et him <turn it on>.

25.02.42 turn mixer.on Points to mixer, whining.
A: "turn mixer.on"
Told him he could do so next week
when GM made cookies.

26.02.04 turn light Points to light on coffee maker,
which was off - is usually on. May
just be pointing out that something
was different. In fact, coffee
maker heating element broken - must
have just burnt out.

26.02.51 turn light,on In room, not clear what ref<erring>
to.
A: "very very dark"
M: "What's very very dark?"
A: "[suw] very very dark"
 "turn light,on"

26.02.59 turn light <A> <t>urned light on.

27.02.66 turn light on Went to bathroom to get doll.
(Request)

27.02.83 turn light off Points to kitchen light.
A: "turn light off"
(I picked him up so he could do
so.)
A: "turn on"
M: "What?"
A: "light on"

27.02.86 turn light on I picked him up so he could reach
the switch. He turned the light
back on. <See 27.02.83.>

27.02.88 turn light on Looked out of window. It was
getting dark.
A: "turn light on"
 "sleep x 3.bed"
 "sleep bed"

27.02.98 turn water In bathroom. (Request)

28.02.47 turn TV on Points to TV. (Request)

28.02.75 turn TV,on Debra turned the TV on.
(Description)

- 28.02.91 turn water on Asked him if he wanted to have a bath. Going towards bathroom. (Intention)
- 28.02.92 turn sink on Standing at the sink. (Description)
- 28.02.93 turn hot Turning water on in sink. (Description)
- 29.02.28 turn light on Practicing? Didn't point.
- Period 4**
- 01.03.35 turn light off Lying down on my bed.
A: "turn light off"
<I> <t>urned main light off.
Points to lamp.
A: "other light on"
I turned lamp on.
- 01.03.51 turn washing on Standing in washing machine.
Touched dial.
- 02.03.29 turn mixer on x 4 GM and he discussing the fact that they'd bake cookies tomorrow.
- 02.03.44 turn flash-
light, on Found a flashlight. (Intention)
- 02.03.45 turn flashlight
on x 3 Trying unsuccessfully to turn the flashlight on. (Description)
- 02.03.46 turn flashlight
on Handed the flashlight over to me. (Request)
- 03.03.28 *mixer turn on He wanted to turn on the mixer. I told him he could only turn it on if AL or GM was baking something. My comments followed by:

A: "Lynnie turn on mixer"
"GM turn on"
- 05.03.53 turn light off In bedroom. Points to light.
A: "turn light"
"turn light off"
"turn light"

(3 utterances)

- 13.03.36 turn light on Turned kitchen light on.
 x 5
- 13.03.37 turn light off Turned it off. (See (36).)
- 13.03.41 turn light on Looked out window.
 A: "turn on"
 "very dark"
 "people turn light on"
 "turn light on"
- 15.03.18 turn blender on Points to blender jar. Not a
 req<uest> because he hates the
 sound. If I ask him he says "NO".
- 18.03.23 turn coffee In living room. Points to kitchen.
 maker on
- 18.03.43 turn coffee Points to coffee maker. I had told
 maker on him previously that we only turn
 the coffee maker on when we get up
 in the morning. <See 18.03.23.>
 A: "get up"
 "turn coffee maker on"
- 20.03.42 turn mixer on In high chair. Points to mixer.
- 20.03.45 turn coffee Points to coffee maker.
 maker on M: No, when do we turn the coffee
 maker on?" (See 18.03.43)
- 20.03.46 get up.turn <See 20.03.45.>
 coffee maker on

Shut**Period 1**

No transitive utterances with this verb during Period 1.

Period 2

28.01.04	shut door	Playing with his <toy> garage, opening and shutting door.
28.01.05	shut door	Opening and shutting dryer door in laundry room.
28.01.08	shut door	Opening and shutting door of GM's <bed>room.
29.01.01	shut door	Closing revolving door in GM's <kitchen> cupboard.
29.01.03	shut drawer	Put candles in <kitchen> drawer and closed it.
30.01.01	shut [dowə]	In kitchen at GM's. GM ties up doors and puts yardstick in drawers when A visits. Had not done so yet. A: "stick"."shut drawer" (Not clear if 'door' or 'drawer'.)
30.01.02	shut door	Playing with rotating shelf, closing it.
03.02.04	shut door x 2	Closing <cupboard> door. A: "door open.Ainsley" "shut door" x 2 "door open"
07.02.04	shut door	In front seat of car, wanted me to close door.
09.02.13	shut door	Of car, points. (Request)
10.02.17	shut door x 4	Of car; points. (Request)
10.02.23	shut door	Of <toy> mailbox. (Description)

12.02.07 shut drawer Closing drawer so he could see something. (Description with Request tone <rising intonation>.)

12.02.21 shut door Opening and closing <kitchen cupboard> doors.

12.02.22 shut door See 12.02.21. Playing peekaboo while opening and shutting cupboard door.

14.02.17 shut door Playing with toolbox, which has a moveable side. <Lifting it up and down.>
A: "shut"."shut door"

14.02.30 shut door Closed cupboard door <in kitchen>.

15.02.11 shut door <I shut door> of car. (Description)

Period 3

17.02.24 shut door To bedroom at GM's. (Description)

18.02.45 shut door Playing with UR's electric shaver box.

19.02.37 shut door x 3 <Closing> door to controls of TV.

19.02.48 shut drawer Of cassette cabinet. (Description)

23.02.32 shut door Points to car door, which was open. (Request)

26.02.24 shut door <A> Had slammed door.
A: "shut door"
M: "Who closed that door?"
A: "AB door"

27.02.01 shut door Playing with clasp on suspenders.

27.02.02 shut door Playing with toaster. (Old-fashioned type with doors)

Period 4

01.03.07	shut door x 2	Debra and Mika came out of room, left door open. A: "door"."shut door". "shut door"
04.03.48	shut door	Closed book. (Over- generalization?)
05.03.37	shut door	Of Debra's room.
20.03.13	shut door	Trying to close door of <record> cabinet. (Request or Intention)

Open

Period 1

No transitive utterances with this verb during Period 1.

Period 2

03.02.05	*door open	Opening cupboard door. A: "door open Ainsley" "shut door" x 2 (Closing door.) "door open" (Opening door.)
07.02.05	*door open	He in car, with door closed, I outside. (Request)
09.02.12	open door	Of dryer at day care.
10.02.12	open door	I had put key in lock <of house door>, he wanted to. (Request)
10.02.18	open door	Trying to open door to Debra's room.
10.02.22	open door	Of <toy> mail-box. Followed by: A: "shut door"
13.02.21	open drawer	Opened drawer.
15.02.30	open shampoo	In bath. Has shampoo bottle. A: "open shampoo" "bubble"

Period 3

17.02.05	open door	Playing with moveable 'arm' of picture frame.
17.02.07	open door	See 17.02.05. A: "open door" : "break door" (<He> <h>ad broken this piece off another frame.) A: "open door"
18.02.22	open door	Of dryer <at GM's house>. (Description)

- 20.02.31 open drawer Standing at bureau; he often pulls drawers out. I fear it will fall out.)
 A: "open drawer"
 M: "No, you mustn't open the drawer."
 A: "mama" x 2
 M: "What do you want mama to do?"
- 20.02.32 open drawer A: "open drawer" <Following from 20.02.31.>
- 21.02.02 open door Points to picture in book (tiger). <Tiger is standing by an open door.> (VO or N + Att Adj ?)
- 22.02.27 open Vaseline On changing table at day care. Pointed to jar of Vaseline. (Desc/Request)
- 25.02.25 open door Opening drier [sic] door <at GM's>.
 A: "open door"
 M: "Don't open the door honey."
 A: "[ow] Diane open door"
 (Referring to drier [sic] at d.c., which I've told him only D. can open.)
- 25.02.45 open fridge Wanted Fridge door open so he could get mag<netic> letters.
- 26.02.63 open window Gestures towards window. (Request)
 A: "open window"
 M: "No, it's too cold."
- 27.02.70 *fridge open Hits the fridge door.
 A: "fridge open"
 M: "No, we have to keep the door shut so everything will stay cold."
 A: "stay cold" (Imitation)
 (Possible gloss is 'The fridge will open'.)
- 28.02.05 open door Wants to close and open doors of toaster <,which has moveable doors>.
 A: "toaster"."toaster open"
 A: "open door"
 (Both doors were open.)
- 28.02.23 open Mama.money Trying to open <my> purse.

- 28.02.50 open drawer Opening dresser door.
- 29.02.64 open present Talking about Christmas. Told him next winter we'd get an Xmas tree and we'd have presents.
(Conv. triggered by Xmas dec<orations> and S<anta> C<laus> that were in drawer.)
- 29.02.95 open door Took me to the door. (Request)
- Period 4**
- 01.03.14 open washing Putting something in washing machine.
- 03.03.17 open dryer door In laundry room <at day care>. Looking at dryer.
A: "only Diane open"
"open dryer door"
- 03.03.19 open dryer x 10 He had a marker and a catalogue.
M: "A, don't draw in the book."
A: "[ow] Mama draw book"
"[ow] Diane open dryer"
(Association [ow] + SVO)
"open dryer"
Singing, each syllable clearly accentuated. Word play?
- 06.03.19 open nipple x 3 Wanted me to take nipple off <bottle.>
M: "No, not until the bottle's empty."
(<A> ended by crying)
- 06.03.56 open box x 2 Brought me a small metal box, which was closed. (Request)
- 06.03.80 open drawer Points to coffee grinder.
A: "coffee grinder"
"open drawer"
"coffee bean drawer"
M: "No, you know you mustn't touch the coffee grinder."
- 11.03.16 open sewing machine Sewing machine on table, with cover on. A opened one side.

- 18.03.11 open door Trying to open shape "box". (2 connected parts which sep<arate> in middle.)
- 20.03.27 open drawer Attempting to open drawer. (Intention or Request?)
- 20.03.31 open drawer Trying to open drawer. Couldn't because <there was a> chair in <the> way. Whining.
A: "open drawer"
(I told him to move the chair.)
A: "move chair" x 2 (Imitation)
A: "AB move chair open drawer"
(Rising intonation.)

Eat

Period 1

No transitive utterances with this verb during Period 1.

Period 2

04.02.08 eat toast Eating breakfast. (Desc.)

Period 3

18.02.67 eat wawa <A> trying to eat pineapple juice with a spoon. ("Wawa" <glossed as> "water".)

18.02.72 e a t . e a t hamburger Points to me eating a hamburger.

19.02.70 eat toast A found jar of jam in cupboard.
A: "eat toast"
"jam on"
(Reported by GM.)

22.02.21 eat tree Eating grapes. Puts stem in mouth.

23.02.54 eat tree Eating grapes - holding stems.
A: "tree" x 2
"eat tree"

25.02.14 eat egg On GM's lap, she eating scrambled eggs. (Request)

26.02.99 eat apple <Looking at a book (Chicken Little).> Last page of book shows a chick eating an apple.

26.02.108 eat grape Eating grapes.

27.02.27 eat [əŋ] A: "eat [əŋ]"
M: "Eat what honey?"
A: "pineapple"
"Mama have [əŋ]"
Gave me the piece of pineapple.

27.02.73 eat garlic I dropped the garlic on the floor.
A: "that garlic"
"eat garlic"

28.02.56 eat chili Eating chili for dinner.

28.02.57 eat celery Still eating supper. A held up a piece of celery.
M: "That's celery."
A: "eat celery"
(Both new vocab. items tonight <-> 1st exposure.)

29.02.15 eat smarty Had Smarties in his hand.

29.02.18 *green eat Put green Smarty in <his> mouth.

29.02.27 eat smarty Eating Smarties.
A: "AB turn"
Put S<smarty> in his mouth.
A: "eat smarty"

Period 4

01.03.24 eat,cereal Showing me puffed rice.
A: "there" x 2
M: "That's cereal."
A: "eat,cereal"
Put it in his mouth.

01.03.97 eat celery Held up a piece of celery.
M: "That's celery."
A: "eat celery"

02.03.24 *necklace eat In carseat, playing with a necklace, which I assume he put into his mouth.

02.03.25 *only candy eat I had given him a candy while we were shopping.

02.03.28 *only necklace eat I dictating 25 and 25 to CM as I drove.

02.03.41 eat salad Eating dinner. <He> <h>ad salad dressing on his fingers. Licked fingers.
A: "eat salad"
"me eat salad"

- 02.03.43 eat salami Points to piece of pepperoni in pizza.
A: "there" x 2
M: "That's salami." (new word)
A: "eat salami"
- 03.03.09 eat cigarette I smoking a cigarette.
A: "cigarette"
M: "Cigarette."
A: "eat cigarette"
- 03.03.10 eat pomme I was telling GM how A had called an apple a 'pomme' yesterday and had probably learned it at daycare <bilingual, French/English>
- 05.03.31 eat celery Held up a piece of celery.
- 06.03.62 eat cracker Eating dinner (chili and crackers).
- 06.05.65 eat tomato Held up a piece of stewed tomato.
M: "That's a tomato."
A: "eat tomato"
M: "That's right"
- 06.03.67 eat tomato Held up a piece of tomato.
A: "tomato"."eat tomato"
- 06.03.71 eat onion Held up a piece of onion.
A: "there" x 2
M: "That's onion."
A: "eat onion"
Put piece of onion in my bowl.
A: "mama turn eat onion"
- 07.03.08 eat crayon Had crayon in hand. Looks at me with misch<ievous> look in eye.
- 07.03.27 eat crayon Had eaten a crayon.
- 11.03.29 eat ice cream In the kitchen. Sees ice cream. (Request)
- 18.03.66 eat nipple Chewing nipple <of bottle>.
- 18.03.75 eat giraffe Pretending to feed giraffe in picture book.
A: "eat giraffe"
"AB eat giraffe by self"
M: "No, you feed the giraffe."
A: "AB feed giraffe" x 3
"feed giraffe" x 4

18.02.71 burn self Put <his> finger in hot tea.
M: "Ainsley, that's hot."
A: "burn self"

20.02.34 burn self I told him to get away from the stove.
A: "hot. burn self"

21.02.30 burn self Points to teapot.
A: "teapot"(points)
"hot.burn self"

21.03.30 burn self <Approximately> 5 minutes later. In
bis living room, points to teapot <in kitchen>.
A: "teapot.burn self"

21.02.40 burn self Serving supper.
D: "Wait, it's too hot."
A: "too hot". "hot. burn self"
(Points to stove.)

22.02.09 burn self <A> knocked a cig<arette> out of ash tray.
M: "Be careful."
A: "burn self"

23.02.19 burn self <A> playing with <toy> cat. Wanted to put him on lamp.
A: "on light"
M: "No, pussycat will get burned if I put him on the light."
A: "burn self"

23.02.36 burn self I reciting "Pease Porridge Hot".
M: "Some like it hot."
A: "burn self"

23.02.64 burn self <I> told him nct to touch TV.
A: "burn self"

24.02.05 burn self We discussing GM's birthday cake for Sunday.
M: "And we'll put candles on the cake."
A: "hot.burn self"

26.02.02 burn self Points to coffee maker.
A: "hot.burn self"
(Points to can opener.)
A: "cut self"

26.02.06 burn self Talking about candles on GM's birthday cake. <See 24.02.05.>

26.02.75 burn self Told him not to put plastic on lamp as it would burn and start a fire.
A: "start fire" x 3
"hot fire"
"burn self"

28.02.19 burn self I pouring tea.
A: "tea". "make tea" x 4
"burn self"
"hot tea"

28.02.88 burn self Gesturing towards cigarette.

29.02.67 burn self Looking at "Pease Porridge Hot".
A: "very hot" x 3
"burn self"

Period 4

01.03.13 burn self A: "crock pot"
"burn self"
M: "Yeah, A burned himself on the
crock-pot".
(After conv<ersation> <above>,
practiced and expanded in kitchen.)

01.03.13 burn self A: "burn self"."burn self Mika"
bis

07.03.12 burn tea Bringing me a book. 1/2 hour
kettle x 2 prev<iously> at d<ay> c<are> I told
Sandy <day care teacher> that A had
burned a hole in the tea kettle
yesterday. (Points to stove.)

07.03.16 burn tea Looking at same book as in 07.03.12.
kettle x 8 <Babar Saves the Day>. Flipping
through pages of book.
A: "turn blender on" x 3
"burn tea kettle"
(Has other Babar book at GM's with
blender in it.)

07.03.24 burn tea Points to stove.
kettle x 5 A: "burn tea kettle" x 5
"AB turn(t) dial" x 2

08.03.53	burn stove	self	A putting money on stove. M: "Honey, M told you not to put things on the stove." A: "burn self stove"
10.03.05	help burn arette	Mama cig-	Climbing into my lap. I smoking a cigarette.

Share**Period 1 and Period 2**

No transitive utterances with this verb during these periods.

Period 3

- 16.02.08 share body He playing with toys, saying "Mika".
She always wants to play with his toys.
A: "share body"
M: "Yeah, A's a good boy to share
 with people."
A: "share people" (Imitation)
- 16.02.40 share Mika Playing with small photos of himself
in frame. I'm trying to get him to
share toys with Mika.
A: "AB.share.Mika"
 "share Mika"
 "share x 3 Mika"
- 16.02.64 share,book Mika looking at A's books.
A: "share, book"
M: "Yeah, it's very good for A to
 share his book with Mika.
 You're a good boy!"
A: "share book" x 3 (Imitation)
 (Note, no hesitation.)
- 19.02.87 share Mika Playing with <toy> milk bottles.
(Mika sleeping.) Points to bottles.
A: "Mika"
M: "No, those are A's bottles, but
 Mika can play with them too."
A: "Mika.share Mika"
M: "Yes, A's a very good boy to
 share with Mika."
- 20.02.41 share cooky <A> <holds up Cooky Monster <toy>
(Usually says "cooky monster" in
isolation.)
- 21.02.04 share Mika In highchair. No apparent context.
M: "What do you share with Mika?"

- 21.02.05 [k>ɸə] share Mika See (4) above. [k>ɸə] glossed as 'pancake'? <I was making pancakes at the time.>
- 21.02.26 share Mika Sees Mika when we get home.
- 21.02.35 share Mika Building tower with blocks. Points to tower. <Mika is present.>
- 21.02.52 share [miy] box Playing with music box. Mika comes over. [miy] = "music"
- 23.02.50 share tape recorder <A> <t>ouches tape recorder. <Mika is present.>
- 23.02.62 share Mika <A> standing on a box, putting string in hole. Mika wants to play.
A: "Mika turn" x 4
"share Mika"
- 25.02.07 *share Mika garage <A> <p>laying with garage. <At GM's, Mika not there.>
A: "share Mika garage"
"A turn garage"
- 27.02.41 share tool-box Mika <A> points vaguely in direction of toolbox.
A: "turn.Mika turn toolbox"
"share toolbox Mika"
- 27.02.41 share Mika <See 27.02.41.>
bis
- 28.02.12 share Mika Getting lettuce-spinner out. <Mika not home.>
x 6
A: Mika turn"
"share Mika" x 6
"Mama lettuce spinner"
- 28.02.34 share Mika A picked up one of Mika's dolls. <Mika was not home.>
A: "baby. Mika baby"
"Mika". "share Mika"

Period 4

- 01.03.89 share Mika Playing with helicopter. Mika not there.
- 01.03.96 share cracker Eating dinner. <A was> upset because I was eating some of 'his' crackers.
M: "You have to share the crackers with Mama"
A: "share cracker" (Imitation)
Several minutes after.
A: "share cracker" (Practice)
- 1.03.106 share Mama Playing with his toolbox.
A: "mama turn"
"share mama"
"Mika turn"
- 1.03.108 share AB See (105).
- 02.03.33 share Mika hat Pulling his hat off his head. Mika had put on the same hat the prev<ious> evening.
A: "Mika hat"
"share Mika hat"
- 05.03.57 share moon looking at a Miffy book. <I> <t>old him one bunny had a ride on the moon while the other waited his turn.
A: "share moon"
"AB on moon"
- 06.03.21 share glass I <was> drinking juice from my glass. (Request)
- 06.03.30 share glass Asked him if he wanted a<ppl>j<uice> in glass or bottle. (I had a glass myself.) <See 06.03.21.>
- 07.03.07 share pen Wanted my and his pencil.
- 07.03.55 share box Points to cat's litter box.
A: "Norton box"
"share box"
<Norton is the cat.>

10.03.22 share toy

Showed him a picture of babies playing with toys.

M: "What are the babies doing?"

A: "play toy"
"AB play toy"
"share toy"
"AB play toy"

- 05.03.02 found sewing machine Went to toybox. Pulled out telephone-shaped book.
A: "book.book"."telephone book"
I told him to find the picture of the sewing machine. He found it.
A: "found sewing machine"
- 05.03.06 found mixer Flipping through book in 05.03.02.
A: "mixer"x 2
"found mixer" (Description)
- 06.03.23 find mixer Looking at book which has, among other things, a pic<ture> of a mixer. Flipping thru pages. (Intention)
- 07.03.17 find very dark Looking for pict<ure> in book. In cave, have to turn on flashlight.
A: "very dark". very very dark"
"find very very dark"
- 08.03.11 found soap Shows me bar of soap in Debra's room.
A: "soap" x 2
"found soap"
- 12.03.04 found screw Ran into kitchen with screw from toy tool-box.
- 12.03.14 found tape Walking towards tape recorder. (Request <i.e. "Get me a tape">.)
- 12.03.15 found tape <I> rought him a tape. (Description)
(Much as I suspected, A doesn't dist<inguish> pres<ent> and past forms.)
- 12.03.36 found yellow record Had asked for yellow record <which went with merry-go-round>. I went to find it. Gave it to him. <He was> very happy. Laughing - excited.
M: "Look what I found Ainsley."
A: "found yellow record" x 10
- 12.03.44 found record. find Showing me record <in 12.03.36.>
A: "found record. find"
M: That's right. M found the yellow record."
A: "found yellow record"
(Imitation)

- 12.03.46 found yellow record Sev<eral> min<utes> later. (Still playing with his record.)
- 12.03.47 found scissors Came running out with nail scissors.
- 12.03.70 found merry-go-round Walks into room with <toy> merry-go-round.
- 14.03.13 find blender part Had found lid to blender. Came out to show it to me.
A: "find"."find blender part"
- 15.03.04 found marker x 5 Came running into kitchen with tin of markers.
- 15.03.11 found Mama car We are walking on the street towards our car. He could see it.
- 15.03.14 found Mama tape Came out of back room with some cassettes.
- 15.03.16 found birdy Came out of back room with a toy bird.
A: "birdy"
"found birdy"
- 18.03.41 find [nawm] Playing with <a jigsaw> puzzle. Arm piece missing. (Request)
<At about this time, several words beginning with vowels were re-analyzed by A as beginning with [n]. Presumably this is a result of his beginning to attend to determiners. For example, he had had the word "owl" in his vocabulary for months, but at the same time as "arm" became "narm", he began to say "nowl". Similarly, "egg" became "negg".>
- 20.03.55 find blender Has catalogue. I've shown him pictures of blenders in it before. (Request)