The study argues for a developmentally motivated view of language acquisition, and for multiple mechanisms to account for the passage from entry to exit in the process. Linguistic knowledge such as transitivity marking is not acquired in a single step, but involves partial and piecemeal knowledge on route from initial to end state mastery. And there is no strict dichotomy between the principled, rule bound knowledge of syntax and idiosyncratic knowledge of lexical particulars. Rather, children rely concurrently on a “confluence of cues”—prosodic, semantic, syntactic, and lexical—to bootstrap into, and move across, acquisition of linguistic structure. This view is consistent with the idea of “multiple bootstrapping” suggested by Szam (1987), but the notion of multiple cues applies beyond initial entry into a system, taking into account subsequent reconstructions across the developmental path.

In attending to these different cues, children are guided by different psycholinguistic factors (e.g., typological bias, rhetorical options, and levels of lexical productivity) and they have recourse to various acquisitional strategies (e.g., rate learning, avoidance, or overgeneralization), which interact in language learning and in language use.

The linguistic system analyzed in support of these claims concerns transitivity distinctions in Hebrew. I propose that knowledge of the major fact of transitivity, that predicates take one or more arguments, need not
be learned. Relatedly, children do not need to learn that there are different kinds of verb-argument relations in the most general sense of people performing an activity on their own or in relation to some other entity as against something happening or being in a state. These universal distinctions are expressed from the time children produce clausal-like utterances. The moment children start formulating clauses, they do so with all kinds of predicates (including existentials and possessives, which are not considered here), whatever their mother tongue. That is, there are two interrelated sets of universal semantic distinctions underlying children's acquisition of systems of transitivity. The major thematic roles such as the difference between doer and receiver or agent and undergoer, and the major types of predicates, such as the difference between activity, state, and event, between doing versus being or becoming. These are universal categories distinguished in the semantics of all natural languages in line with Talmy's (1983, 1988) proposals concerning a universal set of conceptual systems, which are shaped by and possibly also shape human cognition, and are specialized for verbal expression by grammatical means (Slobin, 1991). This shared, basic set of distinctions sets constraints on the hypotheses children can construct about possible form-meaning relations in the mother tongue and hence are presumed accessible to children at the phase of early syntax.

Children do, however, need to learn the particular means employed for marking these distinctions by the syntax of their language, through the grammatical devices of constituent word order, case marking, and/or (classifier or inflectional) agreement. In Hebrew, as in other languages, this knowledge is mastered rapidly, by around age 2.6, as part of early grammatical development (section 1). Children also need to learn the morpho-lexikal properties of transitivity marking specified by their native tongue. In Hebrew, as a Semitic language, valency distinctions are expressed by verb morphology, analogous to a few frozen alternations in Modern English (e.g., rise vs. raise, sit vs. seat, or call vs. tell); in the Hebrew counterparts of these pairs, both verbs share the same root (bare vs. bekim, yashav vs. hosbyt, or nifaq vs. nifil, respectively; section 2). In general, English relies on other devices: idiosyncratic lexical alternation (e.g., learn vs. teach, eat vs. feed); cf. Hebrew lamad vs. limad, axat vs. ke'axat); changes in syntactic configuration (the boy broke the window vs. the window broke); cf. Hebrew shaver vs. misabbar; or syntactic auxiliaries (e.g., sitcim = instransitive inchoative get sick vs. transitive causative make sick, cf. Hebrew xalla vs. xelal). As these examples suggest, children also need to learn the specific subcategorization properties of verbs and the membership of verb classes entering into different verb-argument relations, because these will differ from one language to another. For instance, the Hebrew counterparts of English verbs listed in Levin (1989, pp. 5-12) as sharing various transitivity alterations would fall into rather different groupings.

A number of interrelated claims about the nature of language development underlie my analysis of how children acquire the morphology of transitivity in Hebrew (section 3). First, language acquisition is viewed as a stepwise progression from unanalyzed, rote knowledge of started forms to structure-dependent, rule-governed representations of individual systems, which are subsequently integrated by knowledge of conventions of language use and how these systems function in extended discourse (Berman, 1986a). Second, language acquisition is construed as starting out with shared, cross-linguistic principles and constraints, and as moving toward greater sensitivity to typologically relevant factors, eventually being narrowed down to a highly language-particular construal of linguistic structures (Berman, 1986a). Third, this narrowing down from most universal to most particular explains the relatively early mastery of the syntax of transitivity, before systematic morphological marking of this distinction, which in turn precedes specific lexical knowledge about conventions of usage, lexical exceptions, and incidental gaps (Berman, in press-a).

These developments converge as follows along three interrelated dimensions in acquisition of transitivity distinctions as well as other domains of linguistic knowledge.

1. Item-based > structure-dependent > usage-sensitive
2. Language-shared > language type > mother tongue
3. Simple-clause syntax > word-level morphology > vocabulary mastery

Morphology, or word structure, has a special status in this analysis, as a highly language-particular phenomenon, which typically forms the basis for traditional structural classifications of language types. A central aim of this study is to examine how children proceed from a typological (Semitic) bias to language-particular form-meaning correspondences and eventual command of lexical specificity. The developmental pattern that emerges is accounted for by the interrelated factors of typological
logically pervasive structures constraining early grammatical development, target language preferences determining the range of expressive options available to children at different phases of development, and the relative productivity of a given device in both structure and use (section 5.2). These factors also explain when children acquire transitivity marking via the *binyan* verb patterns compared with other forms constructed through the *binyan* system: (a) existant resultatives and denominal verbs, acquired in parallel with transitivity distinctions; and (b) syntactic passives and action nominals, which constitute later acquisitions (section 4.3).

1. SYNTACTIC TRANSITIVITY

Structural cues that contrast transitive with intransitive constructions include word order, case marking, and subject-verb agreement. Examples (2) to (4) compare pairs of Hebrew sentences with (a) high and (b) low transitivity (Hopper & Thompson, 1980; Stobin, 1985). The prepositional *et* is the accusative object marker, and the letter *P* plus integer specifies each of five verb patterns. Agreement marking is noted for plural number (PL) and/or feminine gender (FM); masculine singular is taken as neutral, and not noted in the glosses.

   \begin{itemize}
   \item *Ron* split
   \item *shofax*OMthe juice
   \item *ba-mits* *nishtpa* [P2]
   \item *the juice* split
   \end{itemize}

(3) a. *ba-isha batida* [P5] et *ba-yeladim* (*me ba-mits*).
   \begin{itemize}
   \item *ba-isha* woman took-down + FM OM the boys (off the bed)
   \item *batida* off the bed
   \item *ba-yeladim* [P1] (*me ba-mits*)
   \item *the boys* got-down + PL (off the bed)
   \end{itemize}

(4) a. *ba-yeladim* *mesovers* [P3] et *ba-mattebiot* (*ai ha-xat*).
   \begin{itemize}
   \item *ba-yeladim* the girls - is-turning + FM OM the coins (on the string)
   \item *mesovers* the coins are-turning + FM (on the string)
   \item *ai ha-xat* (on the string)
   \end{itemize}

The transitive (a) sentences have the form Noun-Verb-Noun (NVN) corresponding to Subject-Object-Subject (SVO); the first noun is inanimate agent and the second is patient; the verb agrees with the first noun—its gram-

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7. DEVELOPMENTAL PERSPECTIVES ON TRANSITIVITY

matical subject—in number and gender; and the second noun—the grammatical object—is marked by *et* as accusative. That is, word order, grammatical agreement, and case marking conspire to mark these sentences as transitive. In the (b) sentences, the grammatical subject is also sentence initial and governs number and gender agreement with the verb. As intransitives, they need no second NP: when they do, its NP is obligatorily oblique, and takes a preposition other than accusative *et*, for example, *mi* 'from, off' or *al* 'on'. The (a) and (b) sentences also differ in verb morphology: (2a) and (2b) share the root sh-p-x *'spill'*, in two different forms—Transitive P1 and Intransitive P2; (3a) and (3b) share the root y-r-d, again in two different patterns, but here P1 marks the intransitive version; and in (4), the root s-h-b *'turn, rotate' is used in two more patterns, Trans P3 and Intrans P4 (see fn 1).

Children's initial construals of transitivity are guided by canonical schemas, as argued for in comprehension studies by Stobin (1981, 1982) for English, Italian, Serbo-Croatian, Turkish, and also Hebrew, and by Hakuta (1982) for Japanese in contrast with English. Hebrew-speaking children demonstrate rapid and early acquisition of three structural cues to transitivity: word order, object case marking, and subject-verb number and gender agreement—typically in that order. This combination of cues gives them early and reliable access to a canonical sentence schema of the form shown in (5) as characteristic of all, though not necessarily only, transitive constructions.

(5) \[ N_1 \rightarrow V \rightarrow P \rightarrow N_2 \leftarrow S \rightarrow V \rightarrow O \]

* N stands for the grammatical subject, which has zero case marking, and governs number, gender, and person agreement on *V*; *N* is a nominal complement, a nonsubject argument; and *P* is a case marking prepositional, which may but need not be the accusative object marker (OM) *et*, as in (6).

(6) (i) a. *bu daxeft* [P1] et *bakkadur* = He pushed OM the ball
   \begin{itemize}
   \item *bu daxeft* [P1] et *bakkadur* = He kicked at the ball
   \item *bu ha'at* [P5] et *ha-xamor* = He beat OM the donkey
   \item *bu ha'at* et *he-xamor* = He hit at the donkey
   \end{itemize}

(iii) a. *bu nissxax* [P3] et *he-ax sheilo* = He defeated OM his brother
   b. *bu hitagber* [P4] al *he-ax sheilo* = He overcame on his brother

(iv) a. *bu abav* [P1] et *ha-nissrak* = He liked OM the game
   b. *bu nebewa* [P2] *me ha-nissrak* = He enjoyed from the game

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3These cover all five active and middle-voice patterns, but exclude the two patterns of *pa'ei* and *bofei*, which function as passive-voice counterparts of P3 and P5 and as such are rare in child language input as well as output (see discussion in section 4.2).
Semantically, the same relations hold between the verb and the patient or object NP in the (a) and (b) sentences of each pair, but in the (b) sentences, the verb governs an object with prepositions other than et (be, te, at, me), which are both obligatory and nonalternating. Syntactically, the (b) sentences are less transitive, for instance, only the et-marked verbs like those in (a) permit passivization and construct-state nominalization. But they are closely parallel in surface structure and thematic relations. That is, all the sentences in (b) obey the schema in (5).

Children acquiring Hebrew can thus rely on different structural cues to transitivity: (a) word order—the surface array of argument nominals vis-a-vis the predicate; (b) case marking—zero versus accusative et or oblique prepositions; and (c) verb inflections—marking number and gender agreement between the subject nominal and the predicate verb. I argue that the unmarked, canonical SV(O) schema has such a privileged status that other word-order options are largely irrelevant to early acquisition of valency distinctions (section 1.1); the distinction between accusative versus nominative and other prepositional case marking is critical (section 1.2); and subject—verb agreement is a slightly later development that depends on command of the grammatical relations of subject and object (section 1.3).

1.1. Word Order: SV(O), VS, and YO

Basic word order of everyday Hebrew is clearly SV(O) in both structure and use, even though Hebrew also allows VS order (Lyon, 1976). In structural terms, all three predicate types—transitive verbs, intransitive activity verbs, and intransitive change-of-state verbs or so-called "unaccusatives" (Boyer & Grodzinsky, 1986; Peckham, 1978)—can take an initial subject, that is, occur in SV order; and SV but not VS constructions, allow either a lexical noun or pronoun, and both definite and indefinite NPs, as surface subject. Across a wide range of spoken corpora, including conversational usage and narratives of adults and children, we found very low occurrence of the VS option in either child input or output. Strings of a lexical verb followed by a lexical subject accounted for at most 5% of all clauses analyzed, while obligatorily predicate-initial existential and possessive constructions came to another 5%. The bulk of all utterances were either SV subject-initial, both transitive and intransitive, or else subjectless, predicate-initial constructions, for example, impersonals and verbs marked inflectionally for first or second person (Berman, 1990a). Further evidence for the strong bias toward SV(O) order is the general avoidance of object-initial OSV or OVS options, and the very few dislocations and other types of noncanonical word order that we found in preschool children's input as well as output, even though Hebrew tolerates a range of left dislocations and topologicalizations that move nonsubject arguments and adjuncts to utterance-initial position.

In sum, Hebrew child language input and output utterances are predominantly either SV or else lacking in a surface subject. Correlation of surface word order with the semantic distinction between actor-controlled activity versus patient-endured event or between different syntactic classes of intransitive constructions is thus not a reliable basis for children to acquire Hebrew transitivity (despite certain formal claims to the contrary, as in Boyer & Grodzinsky, 1986).

1.2. Case Marking and Grammatical Relations

In contrast to the lack of fit between surface word order and syntactic transitivity, the grammatical status of subjects compared with direct and oblique objects provides a highly reliable cue to transitivity distinctions. An important surface feature of the grammatical subject in Hebrew, apart from its syntactically unmarked position as clause initial NP, is that it alone has no prepositional case marking, and it governs verb agreement. Initial word combinations, in Hebrew as in other languages, typically lack any grammatical marking of the subject relation, but by early in their third year, children no longer manifest indiscriminate subject omission in contexts that require a grammatical surface subject. From ages 1;9 to 2;4, six different children (see fn. 4) learned to use a surface subject as required by Hebrew grammar, with verbs in the third person and/or in present tense, and they also started to alternate null subjects with third-person pronoun and expletive subjects (Arnon-Loem & Kfir, 1990; Berman, 1990a). Their shared acquisition pattern is charted in (7) for one highly precocious child (Smadu, a girl) and two others with more typical rates of language development (Hagai, a girl, and Lior, a slightly slower boy).

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660 unconventional lexical usages collected from the 6 children in our longitudinal sample, from parental reports on another 10 to 12 children, and from published records of Hebrew children's development in the 1930s to 1950s (Berman & Clark, 1993).
(7) Steps in Early Acquisition of Grammatical Subject and Null Subjects:

0 Programmatical
Low MLLU, no productive verb inflections
No surface subjects, no grammatical null subjects

I Initial Acquisition: Restricted Subjects
Some alternating verb inflections
Deictic as ‘it, this’ or lexical subjects
Occasional grammatical null subjects

- Smadar 1.6
- Hagar 1.7
- Leor 1.9

II Main Acquisition: Personal Pronoun Subjects
Productive verb inflection (all singular, some plural)
First and second person pronoun subjects, occasional third person (singular)
Past-tense verbs and with and without grammatical null subject
Present tense with/without grammatical null subject recoverable from context

- Smadar 1.8
- Hagar 1.10
- Leor 2.0

III Grammatical Subjects and Null Subjects Established
Full use of third-person pronoun subject, as required in all tenses
First- and second-person pronoun used with present-tense verbs
Elsewhere, first and second pronoun subjects reflect usage—typically dropped in past tense, and retained in future tense (non-impersonals)
Initial use of expletive as ‘it’

- Smadar 1.10
- Hagar 2.2
- Leor 2.4

The developments set out in (7), coupled with the findings for word order (section 1.1), indicate that once children have established the notion of grammatical subject, they can reliably identify it with the utterance-initial NP.

Recognition of the grammatical relation of “object” depends on more than linear order, because postverbal NPs may take various kinds of complements or adverbial adjuncts, in addition to object-type arguments. The most critical cue in this context is the accusative marker *et*, required with definite NPs as the direct object of verbs that govern accusative case—shown in the (3) sentences in examples (1) to (3). Acquisition of this marker was analyzed for cross-sectional speech samples using picture-description tasks with children from 1:10 to 2:8 (Zur, 1983) in addition to our longitudinal corpora (see fn. 4). Children typically used the accusative marker *et* as required by age from 2:3 to 2:6. Relevant developments are shown in (8) for the same three children as in (7).

(8) Steps in Early Acquisition of Direct Object Marker *et*:

<table>
<thead>
<tr>
<th>No suitable context</th>
<th>Desired in context</th>
<th>Initial usage</th>
<th>Well established</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>et</em></td>
<td><em>et</em></td>
<td><em>et</em></td>
<td><em>et</em></td>
</tr>
</tbody>
</table>

Other, nonaccusative case-markings are also potential cues to different degrees of transitivity. Acquisition of oblique nonnominative pronouns, obligatorily inflected for case marking, takes place at the phase of early grammatical development. By around age 2.6, children distinguish between nominative *bu* ‘the’ and accusative *eto* ‘him’, genitive *she‘ of him = his’, or nominative *eto* ‘with him’, while dative pronouns such as *lo* ‘to-him’ contrasting with *la* ‘to-his’ or *li* ‘to-me’ are among the earliest of these forms to emerge (Berman, 1995; 1998b; Kaplan, 1993; Rom & Degan, 1993). By this age, children use dative-marked constructions quite widely, of the kind that Borer and Groszinsky (1986) termed “possessive datives,” which I analyzed as serving to present an affectee rather than an agentive perspective on events (Berman, 1998a). For example, nominative-accusative SVO *dni she‘abaci et ha-xatsav / et ze ‘I split [P1] OM the-milk / OM it’ alternates with nominative-absolute *ba-xatsav / ze ‘nis-pax it* ‘the milk / it split [P2] to-me = went and got (itself split on me), or with subjectless *nis-pax it* ‘split to-me’ and, occasionally, with *nis-pax it ha-xatsav ‘got-split to-me the-milk’; and in place of nominative-accusative *bu poveet ha-balon ‘he burst [P3] OM the balloon’ children, possibly adults as well, prefer the dative *ha-balon biltiveet* to ‘the-balloon burst [P4] to-him’ or even verbal-initial *biltiveet ha-balon*.

In sum, by around the middle of their third year, children manifest knowledge of the basic syntax of verb-argument relations within the simple clause, including: cognizance of the grammatical relation of syntactic subject, typically the initial NP in the simple clause; specification of direct-object NPs by the accusative marker *et*, generally in contexts that manifest high transitivity (nominative, specific, and referential definite object NPs); appropriate use of verbs that govern other prepositions to form oblique objects, as in the examples in (6); and reliance on dative marking to reduce transitivity by referring to protagonists as affected-undergoers of events rather than as nominative agents of actions.
1.3. Morphological Marking of Agreement and Tense versus Predicate Transitivity

The distinction between subjects and nonsubjects is reinforced by children's increasing conformity to the rule that the subject noun triggers number and gender agreement on the verb (Levy, 1983a, 1983b). A range of sources—from spontaneous speech output in cross-sectional surveys (Kaplan, 1983; Mazur, 1989; Zare, 1983) and longitudinal studies (Berman, 1980; Berman & Weissgold, 1991)—reveal the following developmental sequence: Sentence Initial Subject > 3st or other prepositional marking on Object > Subject—Verb agreement. These findings are confirmed by a careful elicited imitation study. Gurl-Healing (1988) found that 3- and 4-year-olds (with a mean age of 3.3 and 4.3) both imitated and corrected input sentences in the form [O V or O] when presented with various types of NNV strings (e.g., they would change both bare [NV N] and 'et NV N] to [NV st N]); older children, from age 5 years, like adults, took appropriate account of the accusative marker at in sentence-initial position in the context [et O S V] and [et O V S], and they also paid increased attention to markers of subject—verb agreement.

It seems hardly surprising, then, if a child of less than 3 years old uses the same verb form in both the following [NV Pr N] contexts, one well-formed and one ungrammatical:

(9) a. ba' tinok nafal [P1] me ba' kisse
    the baby fell off the chair

b. *ba' tinok nafal [P1] et ba' kisse
    the baby fell [sic] on the chair

cf. ba' tinok bipit [P1] et ba' kisse:
    the baby made-fall OM the chair =
    knocked the chair over

Just such errors have been documented in the naturalistic speech output of different Hebrew-speaking children. This is shown by the examples in (10) from Hagar and Lor in the latter part of their third year as a single point, as outlined in (7) and (8), both already have command of the grammatical relations of subject and direct object.

(10) a. Hagar, 2;8:10, talking about a rabbit in a storybook:
    've ba' nafal latex hor ... ionat 'nafal olot—cf. P5 bipit
    and he fell into (a) hole ... Johnny fell him

b. Hagar, 2;8:27, to her mother, who is rubbing lotion on her legs:
    at nafal olil — cf. P5 nafita
    you + FM fall + FM sit + ACC - You're falling me.

The utterances in (10) are grammatically well-formed and reveal command of basic clause structure in 'word order, the accusative case form of the object pronoun, and subject—verb number and gender agreement. Other examples of such leveling of grammatically mandatory binyan distinctions from different children are analyzed in detail in section 3.4.2. Here, note that both Hagar and Lor have proceeded beyond the initial, prototypical past tense (perfective) use of the very common early verb meaning 'fall' or intransitive 'drop' (the P1 form of the root n-p-l), as shown by the present- and future-tense forms in (10b) and (10d). This same verb occurs with high frequency in narratives elicited from 3- to 4-year-olds (see fn. 4). All 16 children used a past-tense form of late鹏 nafal (or plural nafal) 'fell' to describe what happened to a boy (and his dog) in search of his missing frog; and over half of them also used the causative P5 form bipit 'make-fall, throw down' to describe what the animals they encountered did to the boy (Berman, 1980). That is, these somewhat older children did not misuse the intransitive form with a causative sense or in a transitive syntactic context.

Younger children, like Hagar and Lor, also know which thematic relations are involved in simple clause verb argument configurations—for instance, the animate patient to whom something happened and the locative source of that event in (10a), compared with the mother as an animate actor (who has done something to the child patient in (10b) and (10d), or the child who wants to perpetuate something to the adult in (10d). They also have command of the relevant syntax: SVO word order and locative compared with accusative case marking. What they do not yet know is the relevant verb morphology, which requires that the verb nafal 'fell' or bipit 'to-fall' from the root n-p-l can occur only with intransitive syntax; where it has a direct object, this verb must be morphologically transitive, in the P5 verb pattern, taking forms like past tense bipit 'made-fall, dropped, knocked down' or infinitive le-bipit 'to knock down' from the same root n-p-l. Consider, next, what kind of knowledge this entails.
2. LEXICAL MARKING OF TRANSITIVITY: THE BINYAN VERB PATTERNS

The morphological verb patterns known as binyan-im "conjugations" are outlined later with the aim of integrating syntactic, semantic, and lexical factors in a unified characterization, taking into account the task facing the language-acquiring child. (For a summary of other analyses, see Junger 1987). Three factors are analyzed as relevant to the acquisitional task: structural generality along the transitivity axis—that is, the correlation between morphosyntactic alternations in the binyan patterns and valency distinctions (section 2.1); semantic regularity—the extent of one-to-one mapping between binyan form and semantic content in terms of the verb semantics and the functional uniqueness of the verb—argument relations expressed by each binyan pattern (section 2.2); and lexical productivity compared with lexical convention—that is, the effect of processes for new word formation compared with knowledge of the established lexicon (section 2.3). The developmental prediction motivating this analysis is that generality of rule application and closeness of fit between form and function combine to facilitate and accelerate acquisition in this as in other domains of language knowledge.

2.1. Structural Generality: Syntactic Correlates of the Binyan System

The five patterns considered here (see fn. 2) display typical values for syntactic transitivity, where [+ Transitive] verbs are narrowly defined as occurring in SVO constructions and governing accusative case (i.e., the object nominal takes et) and [− Transitive] means all the rest. Under this strict definition, the patterns cluster as follows:

(11) [− Transitive] [+ Transitive]

P1 - QAL:
coxak laugh slatuf push

P2 - NAAL:
yashen sleep shuvur break
yrud go down sager open

P3 - PIFAL:
ni46pa go down ni46 get a fright

P4 - HIPPAEL:
binats wash oneself slupe x:; mend

Several properties relate syntactic transitivity and binyan verb morphology. (a) P1 is syntactically neutral, because it alone is equally available to both intransitive and transitive predicates. (b) Only, though not all, verbs in P1, P3, and P5 govern accusative case direct objects marked by et, as in the first sentence in each pair of examples in (2) through (4). (c) Verbs in P2 and P4 can be "loosely transitive" because they may require an object argument for, for example, P2 4rersel is 'go in to', nohen ne- 'take from' or P4 4t664 be 'look at', bitgabar et 'overcome on', but this will never be marked by et. And (d) verbs in the intransitive P2 and P4 patterns have no passive voice counterpart, in contrast to transitive verbs in P1, P3, and P5.

That is, children need to learn that verbs in P1 can be either transitive or intransitive, that verbs in P2 and P4 never govern accusative case, and that P3 and P5 are generally transitive and may, but need not, take direct objects. These are broad generalizations, however, rather than across-the-board rules of grammar, and they are not readily accessible to non-specialist native-speaking adults on the metalinguistic level of conscious awareness.

Another type of structural cue is provided by the fact that typical patterns of alternation hold between the five patterns. These are illustrated in (12), without regard for directionality, that is, the question of which patterns are "basic" and which are derived.

(12) Typical Interpattern Alternations:
a. P1 — P5 coxak laugh biceretb up
   — [− Tr] [+ Tr] y46pa go down bezetb take-down
b. P1 — P2 4rersel shuvur 4rersel
   — [− Tr] [+ Tr] sager 4rersel
   — [− Tr] [− Tr] 4rersel go-down
   — [− Tr] [− Tr] 4rersel get-a-fright
   — [− Tr] [− Tr] 4rersel get-a-fright
   — [− Tr] [− Tr] 4rersel get-a-fright
   — [− Tr] [− Tr] 4rersel get-a-fright
   — [− Tr] [− Tr] 4rersel get-a-fright

d. P3 — P4 4t664 blow up biron 4t664
   — [− Tr] [− Tr] ni46 go up biron 4t664
   — [− Tr] [− Tr] ni46 go up biron 4t664
   — [− Tr] [− Tr] ni46 go up biron 4t664
   — [− Tr] [− Tr] ni46 go up biron 4t664
   — [− Tr] [− Tr] ni46 go up biron 4t664

These alternations mean that any change in valency is marked by a morphological shift in binyan assignment. This is a more robust generalization than the distribution of transitivity distinctions set out in (11). There are only two classes of exceptions to this general rule of Modern Hebrew, both cases where a single P5 form can be either transitive or
transitive: (a) causative and inchoative versions of adjectives—for example, bishiv‘ ‘whiten’ means both ‘make white’ and ‘become white’, bitishib‘ ‘open’ means both ‘make ripe’ and ‘get ripe’; and (b) aspectual verbs for phases in a process, particularly kafal ‘begin, start’, which occurs only in P5 both in transitive and inchoative contexts (and, less normatively, kinosir ‘continue, go-on’, which does have an intransitive P2 altemant). But these exceptions are marginal, and largely irrelevant to children’s construal of the system. First, the intransitive inchoatives in P5 derive from Biblical Hebrew and are rare in everyday colloquial usage, where they are generally replaced by a periphrastic inchoative auxiliary plus adjective (e.g., ‘turn white’, ‘become ripe’) or by extension of the P4 intransitive pattern to nonnormative forms such as *bitala‘n ‘grow old’ (cf. zaken ‘be old’) kibitsalel ‘become ripe’ (cf. bishiv‘ ‘ripen’), and bitishal ‘turn white’ (cf. lavev ‘white’). Second, the verb ‘begin’ is used by children mainly in its transitive sense without any overt argument, in imperative bishiv‘ ‘start, begin’ analogously to P5 bishiv‘ ‘stop’ (which does contrast with intransitive P1 pasak or P2 afshak). These high-style, normative forms of inchoative adjectives, and an occasional aspectual verb, are the only instances that could provide learners with positive evidence for assuming that pattern switching is optional in Hebrew. The fact that valency alternation at the level of the sentence encodes morphological alternation at the level of the verb can thus be considered part of the grammar of Modern Hebrew.

2.2. Semantic Regularity: Form—Meaning Relations and Functional Uniqueness

The learning process could also be facilitated by an invariant mapping between *binyan* form and semantic content. However, this does not hold at either of the levels of inherent verb semantics or of thematic verb—argument relations. There is, again, only a partial fit between *binyan* pattern and the presumably universal division of predicates into the four classes of Aktionsarten or aspectual semantics distinguished by Dowty (1979), and defined by Van Valin (1990) as follows: state predicates refer to an entity being in a given state of affairs; activity predicates refer to an actor doing something, performing a (nonterminal) activity; accomplishment predicates refer to an agent or actor causing some entity to be in a state or become something; and achievement predicates refer to an entity becoming something, entering into or undergoing a change of state. Hebrew states can take the form of adjectives (e.g., náxum ‘be wise’), verbs in P1 (e.g., yado ‘know’), or in P5 (e.g., bishiv ‘understand’); activity verbs occur in P1 (e.g., kasakh ‘laugh’), P2 (e.g., xfers ‘smile’), or P5 (e.g., kisbés ‘vote, raise one’s hand’); accomplishment verbs can occur in P1 (e.g., daxay ‘push’), P3 (e.g., tish ‘fix’), or P5 (e.g., birgix ‘snore’); and achievement predicates can occur in P1 (e.g., kafo ‘freeze’), P2 (e.g., mésam ‘disappear’), P4 (e.g., bitul ‘fail’), and even P5 (e.g., bigix ‘arise’).

Again, children can rely on partial semantic generalizations, and on the partial interface between these and the structural distinctions noted in section 2.1: statives and accomplishments favor the transitive patterns P3 and P5, intransitive activities favor P1, achievement verbs favor P2 and P4. However, as the preceding examples show, lexical mismatches occur across the board, and in both directions: one semantic verb type can occur in different *binyan* patterns and 2 single *binyan* is not exclusively used for one verb type. Thus, P1 has several achievement predicates, like those meaning ‘freeze’, ‘hail’, ‘grow (bigger)’, as well as the common children’s verb nafat ‘fall’; P2 has an activity predicate such as níxun ‘enter’ = go in, walk into (also interpretable as achievement ‘enter = get inside’); P3 has a large group of activity verbs, including tayet ‘go for a walk’, stotk ‘play (games)’, cyer ‘draw, paint’; P4 has a subset of iterative and other activity verbs—for example, bitrot ‘run around’, bitul ‘look’; and P5 has some achievement (‘unaccusative’) type verbs as well as the inchoatives of adjectives noted in the preceding section. This bidirectional lack of functional uniqueness is also manifested in the type of predicate—argument relations expressed through the *binyan* patterns. For example, *enstate* relations can take one of three forms: the passive participial forms of CaCaC (e.g., sbasur ‘broken’, bishiv ‘inverted = upside-down’), meCaCaC (e.g., maweshit ‘cooked, not raw’, masadar ‘arranged, tidy’), and mCaCaC (e.g., murgás ‘sensed, tangible’, muddah ‘stuck [on]’); and, relatedly (see, further, section 4.2), passive voice can be expressed by P5 nefal (e.g., nignir ‘be stolen’, níbxas ‘be taken’), by P3 psitul (e.g., tish ‘be fixed’, sadar ‘be arranged’), and by P5 psitul (e.g., bishiv ‘be pasted’, bava ‘be brought’). Different subclasses of achievement predicates also have a mixed distribution, for instance, *reduplicates* are generally in P4 (e.g., bitmat ‘correspond, write one another’, bishiv ‘collide’, clash’), but they may occur in P1 rav ‘quarrel’ or P2 bitun ‘meet (one another)’ and adjective-based change-of-state inchoatives may be in P1 (kal ‘get sick’), P2 (makás ‘grow weak’), P4 (bitul ‘grow tired’), or P5 (bigix ‘get well, become healthy’), and their causative counterparts may also take different forms—as in P3 iyut ‘tie, make-tired’ or P5 bitish ‘weaken = make weak’.

*These forms follow the convention of using uppercase for root consonants and lowercase consonants and vowels for affixal elements in Hebrew derivational paradigms.*
It follows that under this analysis, the *binyan* patterns are construed as associated with the lexicon. That is, they manifest the irregularities and accidental gaps typical of derivational compared with inflectional systems of morphology, and so constitute more of a learning burden than the latter. On the other hand, children can be aided by attention to structural generalizations about transitivity alternations and the partial syntactic regularities noted in the preceding section. These combine with the usage-related factors of lexical frequency and productivity to explain children’s acquisition of this system as both relatively rapid and as staggered across different developmental phases.

2.3. Lexical Factors of Frequency and Productivity

The notion of “productivity” is applied here to explain children’s acquisition of *binyan* alternations (like other aspects of new word formation in different languages, see Berman & Clark, 1992) in a rather different sense than what is commonly accepted in linguistics or child language research. In the former, productivity is generally defined in purely structural terms (e.g., Jensen, 1990; Matthews, 1991). For example, an inflection like English -ed is productive in that it applies to nearly all verbs to mark past tense, in contrast to a suffix like infinitive -en, which is not productive because it appears on only a small number of existing verbs. In general, inflections or grammatical affixes are regarded as fully productive, and derivational word formation affixes as less productive, because they are more limited in where they can apply.

A rather different idea of productivity is adopted here, following on from earlier accounts of *speaker preference* in the domain of innovative noun and noun compoundations in Hebrew (Berman, 1987a, 1987b; Berman & Ravid, 1986; Clark & Berman, 1984) and see, too, Clark & Ravid, 1979), on productivity of new word formation in English), in this sense, productivity is linked (a) to transparency of form–meaning relations in the lexicon (section 2.2) and (b) to the activity of a word form type for the expression of a meaning not yet represented in the conventional lexicon. This characterization involves interrelated distinctions between lexical frequency and productivity (section 2.3.1), on the one

4In the field of language development, the notion of “productivity” has been used in a rather different sense. It was originally intended to capture the progression in children’s language use from an occasional word combination to producing five or more new ones in a single session (Brown, 1973). It also serves to characterize the move from head-based core learning to rule-based knowledge of the entire class of items and constructions, for instance, from using an inflectional suffix -ed on a single verb, to using it on a small group of verbs, to general application on all possible verbs (e.g., Garfield & Chafe, 1995; MacWhinney, 1978; Pinker, Lebcsuk, & Brown, 1987).

2.3.1. Frequency versus Productivity: The Special Status of P1

The preceding sections suggest that the P1 pattern enjoys a privileged status from several points of view. Semantically, it contains state, activity, and accomplishment predicates, as well as a few achievement verbs, including the highly salient verb *nafash* “fall”; that is, P1 has no specific semantic or functional bias, and its verbs equally refer to durative activities or to states, with or without a specified patient or location. Syntactically, P1 is unique in that it includes strictly transitive verbs governing accusative s, weakly transitive verbs governing oblique objects, and ditransitive verbs with no obligatory complement. P1 also enters into the most varied class of interpattern alternations. Intransitive activity verbs alternate quite regularly with P5 causatives (and some also have semantically specific or accomplishment counterparts in P5), whereas transitive P1 activity verbs have regular alternants in P2 achievement predicates or in P2 syntactic passives, and sometimes also in P4 reflexives.

From the point of view of usage (or the conventional lexicon), P1 verbs include most of the semantic level, semantically basic and least specific verbs typical of young children’s early verb usage—for example, the verbs *meme* and *go*, *sit and stand*, *give, put, and take*, *go up and go down*; as well as more specific but very common children’s verbs like *eat and drink*, *want and see*; and *sleep, laugh, or cry*. Finally, P1 verbs have the highest frequency of occurrence across different registers of adult usage (Schwarzewald, 1984, p. 70); they account for over half the verbs, both in types and tokens, used by children in a variety of cross-sectional
studies of preschool and early school-age usage (Berman, 1982a; Berman & Drum, 1984; Elbashir, 1989; Kaplan, 1983; Rabkin, 1985); and between 50% and 60% of the early verbs of the children we studied longitudinally (see fn. 4) were in P1, prior to productive mastery of verb inflection, up to age 2 years. The robustness of these findings is confirmed by the highly similar distribution of pattern usage for both verb types and verb tokens across all these different corpora, as follows. Twenty-five percent to 35% of the remaining verbs divide fairly evenly between the two [Transitive] patterns P3 and P5, followed by the two [Intransitive] patterns P4 and P2 in that order, accounting for between 10% to 5% of all verbs.

As against this predominance in frequency of usage from the established lexicon, P1 is uniquely not exploited for new verb formation in current Hebrew. This is partly due to structural constraints on the morphophonological alternations involved by P1 compared with other verb patterns. But it also relates to the preference of adults and children alike for making specialized use of other patterns to coin new verbs in Hebrew (see further in section 2.3.2). P3 is favored for transitive and P4 for intransitive verbs based on existing nouns (whether native Hebrew or loan words) and P5 for coined verbs from other verbs or adjectives. Avoidance of P1 collocations is almost total across a wide variety of spontaneous verb innovations as well as in experimental studies (Berman, 1989, 1990b, and see fn. 4). The only exception is reported in a study where both 4-year-old and adult respondents quite often relied on P1 to change the transitivity value of verbs derived from innovative, nudemintum roots (Alroy, 1992).

This runs counter to normal processes of new verb derivation in Hebrew: New verbs are invariably formed from existing verbs (e.g., P5 /khes/ 'implant' from P1 /chaot/), from existing Hebrew nouns or adjectives (e.g., P3 /shped/ from the noun /shped/ 'skewer'), or from loan nouns or adjectives (e.g., P4 /hit/ 'skinned' from /hiktem/ 'climate'). In these highly productive processes for new verb formation in Modern Hebrew, P1 plays no role, as children as young as age 3 already know.

These observations suggest that P1 verbs are learned, and used, as unanalyzed autoguisms, with no reference to how they interact with transitivity. This is generally true for initial acquisition of all early verbs, irrespective of binyan pattern, but it does not apply to subsequent use of verbs in other patterns (section 3.1). P1 has a privileged status semantically, syntactically, and in frequency of usage. Yet it is the least productive in the binyan system as a whole; it is rarely used to coin new verbs or for innovative alternations along the axis of transitivity.

2.3.2. Three Levels of Lexical Productivity. In earlier analyses, a distinction was drawn between structural productivity, defined as the formal options available to speakers through the grammar of their lan-


guage, compared with colloquial or speaker productivity, characterized by contemporary preferences in choosing from the range of grammatical devices for specifying form-meaning relations. Here, I elaborate these distinctions to a three-way contrast between nonproductive, semi-productive, and actively productive sets of form-meaning relations in the lexicon. These three degrees of lexical productivity are critically affected by the distinction between the established lexicon, which includes all the items at the less productive end of the continuum, and processes for new word formation, which account for those at its more productive end.

1. Nonproductive form-meaning relations have become frozen or fossilized, and so need to be learned by rote. An example would be the small groups of causative verbs in English that are derived either by vowel apophony (e.g., rise—raise, lie—lay, sit—seat, fall—fell) or by lexical suppletion (e.g., eat—feed, learn—teach, fall—drop, see—show). In Hebrew, use of morphological marking of aspect by binyan is similarly frozen in history, for example, P1 to P3 intensive aspect (compare /šbaš/ 'break—šbaš' 'shatter', /šalaš/ 'send—šalaš' 'send away') and P1 to P4 iterative aspect (compare /šalaš/ 'walk—šalaš' 'walk up and down', /šaš/ 'run—šaš' 'run around'). These play only a marginal role in marking the aspectual contours of events in extended narrative productions (Berman & Neeman, in press), and they are nonfunctional for purposes of new verb formation.

2. Semi-productive form-meaning relations are transparent, they are relatively easily recognizable by native speakers, and they include larger numbers of items. They also tend to represent options that are preferred by language-policy institutions, lexicographers, school grammars, and other representatives of the official language establishment. Nonetheless, they constitute closed classes, because they are not favored as a current device for new word formation, and they lack genuine colloquial, speaker productivity. This category includes (a) processes that are lexically defined, such as use of P5 /hit/ in Biblical Hebrew for intensive, dominated verbs indicating direction of movement (e.g., lešamši 'go left' from /šamš/ 'left', lešamši 'go north' from /šamš/ 'north'); and (b) processes that have been replaced by some other productive device, for example, use of the same P5 pattern in Mishnaic Hebrew for indicating both the causative and the inchoative section of color and other adjectives (e.g., lešamši 'white' from /šamš/ 'white' means both 'make white' and 'become white'; lešamši 'ripe' from /šamš/ means both 'make ripe' and 'become ripe'), whereas today the inchoative sense is taken over either by intransitive P4 or by syntactic periphrasis (see section 2.1).

3. Actively productive form-meaning relations are also transparent,
but they are not lexically restricted like the previous category. They constitute open-ended classes, as demonstrated by the following properties: (a) Speakers rely on them in spontaneous coinages to fill gaps in the contemporary lexicon; (b) they are favored as a means of new word derivation in structured experimental settings; (c) they are the source for selections and deviations from normative requirements in lexical usage stipulated by the language establishment; and (d) they are indicative of ongoing processes of language change in the usage of two groups of non-literate, less educated, and less self-conscious speakers (i.e., adult speakers of nonstandard variants and young children). These examples of such productive trends in the current lexicon of Hebrew for which both naturalistic and experimental data are available are: (a) reliance on P3 in forming new, denominal transitive-activity verbs, from native or loanword sources; (b) use of P5 in forming causative verbs from adjectives and from existing verbs in P1; and (c) preference for the passive participial pattern mCUCaC or else CaUCaC and rejection of the third option mUCaC for expressing resultant endstates.

Underlying this analysis is the assumption that language acquisition is directly affected by the kind of knowledge involved in items with different degrees of lexical productivity. In acquiring Type 1 nonproductive classes, children must learn the items by rote, then relate them to other associated forms (e.g., eat and feed), and eventually recognize what general semantic relationship obtains between them (e.g., that feed is to eat as show is to see or bring is to come). That is, item-by-item learning is the basis for gaining command of members of this class, both initially and subsequently. Eventually, however, they will be recognized as special instances of more general morphosyntactic classes and/or semantic classes, for example, causatives.

At the other end of the scale, command of Type 2 actively productive classes of form-meaning relations is more similar to acquiring command of grammatical rules. For instance, children need to recognize that P5 is a means of forming causative verbs in Hebrew, with intransitive verbs in P1 (e.g., P5 lebaCuaC 'move something' from P1 lebaCuaC 'move') and with adjectives (e.g., levaCuaC 'make wet' from raCuaC 'wet'). The prediction is that these active derivational processes will shape children's initial hypotheses, and enable them to extract relevant generalizations about the interrelation between syntactic transitivity, verb semantics, and morphological form. These alternations will be the basis for children's "creative errors," indicating that the child has the rule but lacks command of the conventional lexicon and of lexical exceptions. Such errors are evidence that these processes are in fact "active," and may suggest directions of possible language change.

7. DEVELOPMENTAL PERSPECTIVES ON TRANSITIVITY

In the middle lies learning that combines features of Type 1 item-based lexical learning and Type 3 rule-based structural learning. A later kind of knowledge are lexical conventions I have characterized as Type 2 "semiproducive." These may be anchored in processes that at an earlier stage in the history of the language were the canonical way for doing things, and hence are most often specified in schoolbooks and other normative descriptions. But in contemporary usage, they are lexically restricted in uninvolved ways to a frozen set of items. This appears to be the case with English use of the suffix -en to produce intransitive verbs with causative counterparts from (generally Germanic) adjectives, for example, conventional soften, unfold, compared with the currently productive -en suffix for producing (predominantly Romance-based) activity verbs like contemporary fullfills, definites. Such partial generalizations often tend to belong to a higher register, which would provide another reason for their being acquired later than either the item-based nonproductive (Type 1) alternations or the more regular, fully productive (Type 2) processes.

Processes manifest within the binyan system of modern Hebrew can now be reanalyzed as in (13), to distinguish between those that are (I) syntactically fully productive; (II) lexically fully productive or "active"; (III) lexically partially or semi-productive; and (IV) nonproductive, closed classes.

<table>
<thead>
<tr>
<th>(13) binyan Pattern</th>
<th>Transitivity Value</th>
<th>Semantic Class</th>
<th>Direction of Alternations</th>
<th>Degree of Productivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>basically a &quot;closed class&quot;</td>
<td>Activity &gt; P5 Causative</td>
<td>II = active</td>
<td></td>
</tr>
<tr>
<td>P2</td>
<td>Trans Accomplish &gt; P1 Accomplish</td>
<td>Activity &gt; P2 Passive</td>
<td>II = semi</td>
<td></td>
</tr>
<tr>
<td>P3</td>
<td>Trans Accomplish &lt; P3 Accomplish</td>
<td>Accomplish &gt; P5 Causatives</td>
<td>II = semi</td>
<td></td>
</tr>
<tr>
<td>P4</td>
<td>Trans Accomplish &lt; P3 Trans</td>
<td>Accomplish &lt; Nouns</td>
<td>IV = closed</td>
<td></td>
</tr>
<tr>
<td>P5</td>
<td>Trans Causative &lt; P1 Trans</td>
<td>Causative &lt; Adjectives</td>
<td>II = semi</td>
<td></td>
</tr>
</tbody>
</table>

As shown in (13), each pattern can be analyzed as currently coopted for a particular lexically active process; all other, non-syntactically governed form-meaning relations between verb content and verb morphology need to be learned piecemeal. The next section considers how children move into, and across, acquisition of this knowledge.
3. ACQUISITION OF BINYAN TRANSITIVITY
DISTINCTIONS

What, then, underlies children's acquisition of a system in which syntactic transitivity, verb semantics, and lexical morphology interact in only
parity syntactic ways? Earlier studies on the acquisition of the binyan
system yielded two main observations. First, early verb usage does not
entail any systematic alternation in verb morphology (Berman, 1982b).
Initially, children fail to use binyan patterns to express any or all of the
following functions: Syntactic distinctions of transitivity; semantic notions
such as causality or reciprocality; and lexical processes of new word
formation, for example, for denomination. Verbs are used by 2-year-
olds as unanalyzed amalgams from these three points of view, even after
children have command of the rich inflectional system of person, number,
gender, and tense marking. Second, knowledge of the system emerges
clearly after early grammatical acquisition, both syntactic and inflectional,
and is reflected in "creative errors" (Berman & Sagi, 1981). These may vi-
olate lexical convention, but they are not necessarily inappropriate in terms
of the transitivity values typical of the five binyan patterns (Berman, 1980).

These two observations are examined here in light of the reanalysis
of the binyan system sketched in Section 2, combined with more extensive
findings from naturalistic speech output (see fn. 4) and more recent
structured elicitation studies. As noted in the preceding discussion, chil-
dren are assumed to start out with the knowledge that predicates may
enter into different kinds of verb-argument configurations, and there are
different semantic types of predicates. This forms the basis for acquisi-
tion of language-particular knowledge of form-meaning relations, along
the following developmental route. First, children acquire what items
synonymous transitivity, expressed in Hebrew through SVO order and the
division between the grammatical relations of subject, direct, and ob-
once objects, add by inflectional marking of subject-verb agreement.
Second, they recognize that the grammar of their language requires mor-
phological marking of valency alternations, typically from around age
3, after basic clause structure is established. Next, they need to extract
out subgeneralizations regarding how this is achieved through binyan
pattern alternation, and this is accompanied, finally, by command of the
numerous lexical exceptions and form-meaning mismatches that charac-
terize the system.

This stepwise progression is motivated on the basis of a more general
model of language development (Section 3.1); factors impinging on ac-
quision such as typological imperatives, lexical productivity, and the
difference between grammatical and lexical knowledge (Section 3.2); and
strategies employed by children in acquiring the system (Section 3.3).

7. DEVELOPMENTAL PERSPECTIVES ON TRANSITIVITY

3.1. General Developmental Path

The acquisitional model adopted here views language acquisition as
proceeding in three major phases from (I) item-based rule learning to (II)
structure-dependent rule learning, followed by (III) discourse-sensitive
language use. This entails the following stepwise progression for acquisi-
tion of the binyan system, as well as other areas of language knowledge
and language use:

I. a. Early verb use is rote-learned, item-based
b. Initial alternations based on familiar exemplars, lexically
   associated isolates

II. c. Emergence of a generalized knowledge of the system,
   shown by lack of transitivity errors in choice of binyan
   forms and by juvenile interner strategies ("creative errors")
   in using verbs in nonprototypical contexts
d. Consolidated knowledge of the system, shown by in-
   creased spontaneous use of alternating forms of the same
   verb and by success on structured elicitation tasks with
   both familiar and novel items

III. e. Authoritative command, shown by mastery of lexical
   exceptions and partially productive lexical classes, by the ability
to coin innovative transitivity switches in structured
   elicitation; and by flexible deployment of binyan alter-
   nation for alternation perspectives in extended discourse

The progression delineated in (14) is consistent with MacWhinney's
(1978, 1982) proposals for the acquisition of morphology and early word
combinations, by the mechanisms of core, analogy, and combination, but
aims at a generally integrated developmental view, beyond these three
processes. My model is closely allied to the developmental phases prop-
osed by Karmiloff-Smith (1986, 1987), in characterizing knowledge ac-
quision as being initially bottom-up or data driven, then top-down
procedurally driven, and eventually integrated within a systemic con-
cceptual gestalt.

This developmental sequence was first proposed to account for the
acquisition of inflectional and derivational morphology (Berman, 1986b),
and has since been supported by findings in other areas for example,
the development of complex nouns (Berman, 1987a), narrative structure
(Berman, 1989, 1993a), and subjectless constructions (Berman, 1990a).
The same progression also holds for results of a recent study of binyan
alternation in structured elicitation settings (Berman, 1993b). But this
model fails to address two important developmental issues: the question of transitions, of how children move from Phase I to II and on to end-state Phase III knowledge; and the issue of cross-system ordering of acquisition, for example, why agreement inflections emerge earlier than binyan transitivity marking, or why causative-verb innovation is both earlier and more widespread, in Hebrew child language than intransitive verb formation.

3.2. Developmental Factors

To this end, and in keeping with the view of multiple bootstrappings and a confluence of cues proposed in the introduction, other factors need to be incorporated in this account of the acquisition process. The shift from Phase I to II is motivated by typological bias in the sense of the relative weight of particular structural properties of the target language (section 3.2.1); the relative order of acquisition within the binyan system is explained by the impact of lexical productivity and usage preferences (section 3.2.2); and the relative order across different linguistic domains—by the principled distinction between grammatical and lexical knowledge (section 3.2.3). Factors that motivate the shift from Phase II to III, such as lexical convention (Clark, 1983; Clark & Ciepl, 1979), and the impact of formal study and literacy are noted in section 4.

3.2.1. Typological Structure. Verb usage in the longitudinal corpora of six children at Phase I, Step (14a), during the period of initial word combinations and early grammar, confirms findings of cross-sectional distribuability (Kaplan, 1983) and diary reports (Berman, 1978; Dron, 1989). Initially, children use verbs in all five patterns, but the same child will rarely use a single verb root in more than one binyan pattern. A similar initial lack of alternating forms, and the view of early acquisition as “item-based” and “context bound,” have been noted for inflectional morphology and early word combinations, explained by MacWhinney (1978, 1982) as early reliance on rote learning, and in causative verb usage attributed by Bowkerman (1974, 1982) to learning based on unanalyzed analogs.

A separate question, not addressed in the present context, is what factors determine which forms of verbs are favored in early use. For example, children tend to use intransitive P1 never ‘eat’ and raccut ‘ride’ well before P5 causative ba’essei ‘feed’, hirsh ‘give a ride’; on the other hand, intransitive P2 nechpol ‘be split’ or nechka ‘stay, remain’ are used long before their transitive counterparts, but some transitive P1 verbs like sgar ‘shut up’ or mace ‘find’ occur before their P2 intransitive counterparts. In contrast, both P1 niyada ‘go down’ and P5 horad ‘take down’, both P2 nimek ‘go in, get into’ and P5 kisp ‘put in, insert’ may be used at around the same time.

I argue that these highly familiar initial exemplars form the basis for eventual rule extraction (Step 14b). This assumption corresponds to what Ingram (1985) called the “lexical principle,” by which children “learn individual paradigmatic alternations as separate lexical items . . . [and] first acquire(s) paradigmatic variants like ‘eat, eats,’ ‘dog, dogs’ as separate words, and only later realize that there is a separable plural morpheme ‘s’” (p. 85). At the phase of early grammar, around age 2, such alternations in the binyan system are few and far between, and there is as yet no evidence that children recognize that a more general relationship is encoded between, say, P2 nechpol as referring to a change-of-state (being spilled) and P1 hirsh as referring to someone’s activity (spilling something), or between P1 niyada for their own going down and P5 kisp for making someone or something go down. Nor, as a result, are children yet able to extend these form-meaning alternations to other, less familiar instances.

Two facets of verb acquisition thus need to be reconceived. The evidence is overwhelming that from ages 1.5 to 2.6, children rarely use the same verb with more than one transitivity value; that is, the same verb root will generally occur in only one binyan. But this poses a problem for explaining eventual acquisition of Hebrew grammar, which stipulates that a change in syntactic transitivity requires a change in verb morphology. These facts are confirmed by results of two picture-based elicitation tasks (Berman, 1993b). Children age 2.5 to 3.0 (mean age 2.9), 3.6 to 4.0, and 7.6 to 8.7 were presented with sentences containing familiar Hebrew verbs, and were required to provide verbs of inverse transitivity to yield two types of responses: (a) conventional, existing verbs and (b) novel, nonexistent items. On the (a) part, the 2-year-olds used the correct verb morphology to mark changes in transitivity only around one third of the time (37.5%), differing significantly from the 3-year-olds (66%), whereas the 8-year-old schoolchildren did significantly better than both younger groups (92%); and both younger groups did even better when their responses were rated as appropriate though not necessarily morphologically normative changes in transitivity—for example, morphologically acceptable but nonconventional forms, or suitable syntactic recastings of the input sentences—52% among the 2-year-olds, compared with 84% of the 3-year-olds. On the (b) part of the test, when
required to coin novel items, 2-year-olds were able to produce an appropriate response about one quarter of the time (26%). 3-year-olds were successful 59% of the time, and 8-year-old schoolchildren responded like adults, giving morphologically normative coinages around 70% of the time. That is, children in the latter part of their third year manifest good knowledge of transitivity, by age 3 to 4 they can alternate morphology of input verbs most of the time, and by age 8 they can do so innovatively, much like adults.

The first factor invoked to explain how children move forward from occasional familiar exemplars to rule extraction (i.e., from Phase I to II) is the structural factor of "typological imperative." This underlies the sensitivity that develops in children around 2 to 3 years old regarding what is "relevant" in their language, the realization that certain constructions, or linguistic systems have a favored structural status (Berman, 1986a, 1993b). The recognition in question is the fact that it is unpreferred, hence from their point of view nonlanguage-like in general, to use the same form of a verb in both the contexts [S V TO O] and [S V]. There is no communicative or semantic need to switch verb morphology in order to describe situations as intrinsically an event rather than a transitive action. Word order, case marking, and inflectional agreement markers will generally suffice. But a child must do so in order to be a Hebrew speaker. This exactly corresponds to the claim that gender or number agreement may not be necessary for communicative purposes, but is essential to and pervasive across Hebrew grammar. That is, following the initial role use of verbs as individual items, extended by lexical learning of pairs of isolated alternations, children's verb usage becomes typologically driven to attend to the Hebrew-particular fact of how transitivity affects the morphological shape of verbs. In other words, typological biases trigger rule learning in the most general sense of recognizing that some general linguistic category requires some kind of formal marking.

3.2.2. Lexical Productivity and Expressive Options. A second factor, interacting with target-language typology, is that of lexical productivity (section 2.3). This concerns a rather different kind of "bias," relating to factors of language use within the frame of typological structure. What I term rhetorical bias refers to the expressive options favored by speakers of a language (often at a given time in its history) for formulating certain relations of form and meaning. For instance, the relation of P1 transitive activity and P2 intransitive event verbs (cf. *lishpox* « mishpox 'spill') and between P1 intransitive activity and P2 causative verbs (*noredet* « be-bored 'get down' versus 'take down') are highly "productive" alternations in current Hebrew. Experimental findings confirm this.

Of four types of alternations elicited from 2- and 3-year-old children, those between P1 intr and P5 trans and between P1 Intr and P2 Intr and between scored highest, followed by P4 Intr alternating with P5 Trans, and even less for P2 Intr switching with P5 Trans (Berman, 1993b). These contrasts were even more marked on the innovative part of the test, where respondents were required to fill lexical gaps by creating verbs of inverse transitivity from lexically established verbs. Here, children age 2.3, and 8 years as well as adults did significantly better on creating novel causative verbs than on novel change-of-state intransitives. This is because causative predicates lack a periphrastic expressive counterpart in Hebrew, analogous to English *make swim, put to sleep, get to crawl*, whereas achievement predicates do have an expressive option with an auxiliary verb *nasea* or *ribya 'get, become' and so do reflexive predicates with *self* pronouns.

Both naturalistic data and structured elicitions thus reveal that once children recognize the typologically motivated structural demand for switching verb patterns to mark transitivity, once they abandon earlier rote learning in favor of rule-bound assignment of morphological transitivity, the particular lexical solutions they seek will be affected by increasing familiarity with the conventional lexicon combined with the impact of currently favored processes for new word formation.

Processes that are more "productive" in the sense applied here are children in recognizing certain alternations as expressing quite general form-meaning relationships in their language. And the factor of lexical productivity interacts with lexical familiarity and relative frequency of item use as follows: Productivity helps children extract generalizations; and frequency determines to which sets of items these generalizations are first applied. That is, children come to recognize the commonality of such early verbs as P1 *yerad* 'go down' and P5 *lehorid* 'take down' on the one hand and P1 *nafal* 'fall' and P5 *lebabli* 'make fall, drop' on the other; only later will they extend this to more specific, less high frequency verbs such as P1 *ahar* 'pass' versus P5 *lehora* 'make pass, convey'; similarly, alternations between P2 intransitive versus P1 transitive verbs will stand out with very familiar verbs like those meaning break, spill, tear; later they will be extended to less prototypical instances of such alternations, for example, the P2 unaccusative-achievement versions of P1 transitive activity verbs meaning catch, throw, write. Semiproducive alternations will also be mastered later, as part of the growing command of convention and the established lexicon.

3.2.3. Grammatical and Lexical Knowledge: Verb Tense versus Verb Transitivity. Initial unanalyzed use of verbs is exactly analogous to what children earlier do with verb tense marking. In Hebrew as
in other languages. To start with, most verb stems occur either in infinitive or imperative, or else in past- or present-tense forms—with past tense favored for telic achievement predicates (e.g., *nafal* 'fell', *nokdah* 'broke') and present tense for stative activities (e.g., *baze* 'cry', *yabdem* 'sleep'). The earliest verbs to show alternation are the high frequency, general purpose verbs such as the P1 verb with the root b-t-x 'go' (e.g., children might use both imperative *lax* (mld.)*sl* 'go away from here' and past tense or perfective *aba* (bkl.)*la* *anoda* 'Daddy has gone to work') or the verbs meaning *di*, *make*, and also *pt* , *give*, and *take*. And this is followed by well-established commands of the relevant distinctions between past, present, and future tense in forms and meanings (Berman & Dromi, 1984).

Yet the analogy between the two systems holds only so far, owing to critical differences between grammatical and lexical constraints. As noted, acquisition of morphological marking of transitivity through *binym* alternation emerges later than verb tense marking, which is typically well established by around age 2:0 to 2:5 (see example 7). Compare, for instance, the sentence in (15a), produced by Shnuder at age 2:3, with the required version in (15b).

(15) a. *Miryam omnret [P1] et koh-bad dipm*
   Miryam passes QM all the pages
   = Miryam goes over all the pages
   Miryam makes-pass QM all the pages
   = Miryam turns (over) all the pages

Example (15a) is grammatical because an intransitive verb form is used in a transitive context, but it can be interpreted as exactly what the child meant: She was complaining to her mother that Miryam (her older sister) kept turning the pages of the book, without giving her time to do so herself. Compare this to a hypothetical case where the child might have meant one of the following:

(15) c. *Miryam ta-savor [P1] el yaad*
   Miryam will-pass by me
   d. *Miryam be-savor [P5] et koh-bad dipm*
   Miryam passed = turned QM all the pages

Both (15c) and (15d) are grammatically well-formed, but if the child had intended to use present tense rather than future with the intransitive verb in (c) or rather than past with the transitive verb in (d), she would have been violating the temporal semantics of her entire utterance. In principle, children might use other cues for temporal marking of their utterances, such as adverbials like those meaning 'now', 'all the time', or 'the other day'. But in fact Hebrew-speaking children make minimal use of such options (Berman & Neeman, in press), so that the only indication of verb temporality within the simple clause remains verb morphology. Morphological neutralization of valency distinctions, in contrast, impinge on the categorization of the verb alone, rather than on the semantics of the entire proposition, because this is derivable by other cues to its verb-argument configuration (word order, agreement, case marking).

A related difference between verb tense marking compared with verb-transitivity marking is its *obligatoriness*, because grammatical tense has no "expressive options" in the language. Hebrew speakers must assign a temporal value to each sentence through verb tense marking, either past, or present, or future, and this value must be consistent with the temporal content of the event described. In contrast, they can select to present the same real-world event from different perspectives, as transitive or intransitive; for example, (15a) could be reworded as intransitive 'all the pages are turning = arc turning', just as Hagar could have said the equivalent of 'I fell (because of you) ' or 'Why did you push me?" in place of (10b) and (10c). Transitivity marking thus represents a pragmatic, discourse-based choice for speakers, compared with the semantic necessity for specification of verb tense. Besides, as already noted, alternations in transitivity can be expressed by syntactic paraphrase, for example, use of an auxiliary-type verb to yield the equivalent of 'Miryam does so that all the pages turn [intr]', or 'become old' rather than an inchoative verb, or use of pronouns meaning 'self' or 'one another' in place of morphological reflexives or reciprocals. Tense marking has no such options for semantic paraphrase in Hebrew.

A major reason why verb transitivity is acquired later than verb tense marking lies in the difference between lexical compared with grammatical knowledge involved by these two systems. Tense marking applies across the board, to all verbs that meet the syntactic criterion of being members of the major category V. Assignment of *binym* marking depends on the particular class of lexical items to which a given verb belongs, and so applies less generally across the grammar of the language. As a result, *binym* assignment can change across time without radically affecting the grammar of the language. But if tense/aspect systems change, the entire typological character of the language is bound to be affected (Givon, 1976). The limited productivity of the *binym* system, in the sense of its functional nonuniqueness and the structural and semantic gaps and anomalies that it displays (sections 2.1 to 2.3), is a further factor. Com-
3.3. Agitational Strategies

The strategies children employ and the things they are in acquiring the
language of their environment are critical in shaping their language development.

3.3.1. Immediate Use of General Purpose Verbs

Examples of immediate use of general purpose verbs are quite common among
the age of 3. Children say things like "I want to eat," "I want to go out," or "I want to
play." These are all grammatical and meaningful sentences. Children at this age
understand the distinction between "I want to eat" and "I want to eat that.

3.3.2. Immediate Use of Specific Purpose Verbs

Examples of immediate use of specific purpose verbs are also quite common.
Children say things like "I want to go to the park," "I want to go to the store," or "I want to
read a book." These are all grammatical and meaningful sentences. Children at this age
understand the distinction between "I want to go to the park" and "I want to go to
the park with my friends."
The structured elicitation test yielded relatively few such errors across 32 items—20 requiring established verbs and 12 lexical innovations (Appendix I-1). They accounted for only 5% of total responses from the youngest children, age 2;6 to 3. At least one such error was made by 8 out of the 10 youngest children, compared with only two of the older children (Lital, age 3;7, and Liat, age 7;9), and theirs were all on the innovative part of the test. The form of intransitive P1 verbs not being changed to novel transitive verbs in a causative context. These findings confirm that neutralizations are an early strategy, at a period when children have not yet recognized the typological imperative for alternative morphology along with syntax to mark transitivity changes. Fully half the errors were, as predicted, overtides of the basic P1, with no switch to causative P5—but these verbs elicited innovative forms, a task that is generally beyond the abilities of younger children. More errors were made by overextending intransitive to transitive contexts, seeming to confirm Bowernian’s (1974, 1982) claims for English. The only exceptions were from a single child (Yasmin, 3;0) who used P3 transitives in place of P4: ba-na-at 'maggal; the ball rolls + Tsaw, zek megad asav ‘it travels alone at once’. Finally, on both this test and an earlier pilot study, children extended P4 ba-nish verbs to transitive contexts with object marking of far more than with P2 nifal forming.

Parental observations and longitudinal samples of spontaneous speech show similar patterns (Appendix I-2). Neutralization errors were made at least once by around 20 different children; over two thirds were intransitive verbs used in transitive contexts; well over half were neutralizations to P1, and direct objects case marked by et occurred far more often with intransitive verbs in P4 than in P3. These findings indicate a phenomenon that is sporadic and yet consistent, occasional and yet robust, across different elicitation settings and different children. The claim that 2- and 3-year-old children, in the period of early grammatical development, do not know how to alter the transitivity value of the verbs they use seems strongly corroborated.

But how can these errors be explained? They are remarkable because, unlike the case for the analogous English errors documented by Bowern, Hebrew grammar prohibits the same verb form from being used with both intransitive and transitive syntax. This means that Hebrew-acquiring children have no “positive evidence” for overextending the transitivity value of verbs. Bowernian’s (1974, 1982) account of this phenomenon is supported by Gergely’s (1979) argument. His data included a required causative suffix, using intransitive verbs in a causative context, he explained this by a two-stage process model: children start out by using bare stems, by means of “affix-stripping,” and later they realize that attachment must be assigned wherever a verb is used causally. Such a strategy also characterizes how some
in English as overgeneralization of a rule that applies to part of the verbs in the target language might be upheld in one of two ways. It could be argued that children do have positive evidence, from the two small classes of Hebrew verbs that allow the same form both in causative and inchoative adjective-based verbs, both in transitive and intransitive process verbs (section 2). This must be rejected, because the P5 inchoative forms of adjectives meaning become red, healthy, white, are not found in 2-year-old Hebrew input or output, whereas the P5 verbs meaning start or continue typically occur with agent subjects but no object object, for example, In sentences like “No, I won’t begin,” “You can go on.” So it seems unlikely that children’s overgeneralizations derive from these marginal exceptions to the rule that the same verb cannot occur with both transitive and intransitive syntax in Hebrew. A more motivated alternative relates to the special status of verbs in the P5 pattern, described as having a privileged status: It has the highest frequency of occurrence across child and adult Hebrew. It alone is made up equally of verbs that are causatively transitive and intransitive, and it is semantically most “basic” or nonderived (section 2.3.1). All neutralization errors in Hebrew would then take the form of: Intransitive P1 verbs used in place of causative P5 verbs, and/or intransitive P1 verbs used in place of change-of-state P2 verbs. However, overextensions of P1 verbs account for only about half the examples listed in Appendix 1. And the fact that different children do sometimes use the intransitive P4 and P5 patterns with a direct object still needs accounting for. Thus the nature of endstate Hebrew cannot account for these errors as overgeneralizations from input data.

Other solutions have since been proposed to account for these phenomena: Pinker (1989) suggested that children may initially assign erroneous argument structure to the verbs they learn, whereas Braine (1988; Braine, Brody, Fisch, & Weisberg, 1990) argued that new verbs are acquired with a default argument structure, so that initially, their lexicon lacks any specific argument structure. My explanation is rather different. Initially, children acquire verbs with one specific argument structure (unlike Braine), and that argument structure is correct for that verb (unlike Pinker). The overextension errors they make in a language like Hebrew are due to lack of a relevant linguistic generalization: Use of a verb in a different argument structure than the one in which it is acquired demands a morphological operation on the form of the verb. This

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7. DEVELOPMENTAL PERSPECTIVES ON TRANSITIVITY

knowledge builds up as follows: (a) Each verb has a single argument structure. (b) A single verb form can be used with more than one argument structure. (c) When the initial argument structure of (a) is changed, the verb form must change. The precise synchronization and integration of knowledge components (b) and (c) will determine for individual children and individual verbs how often, if at all, the syntactic knowledge of (b) is applied without the language-particular morphological constraint of (c). Finally, knowledge-component (c) needs to be further constrained by (d) the principle of lexical productivity and (e) learning of lexical intrans.

3.3.3. Creative Errors and Other Later Strategies. What strategies are adopted by children once they proceed beyond the knowledge previously defined in (b), that verbs can be used with more than a single argument structure? To answer this question, different kinds of later, “creative” errors documented in earlier work on acquisition of Hebrew verb morphology (Berman, 1980, 1982; Berman & Sag, 1981) were extended to include the following categories: Periphrastic synactic means may include verb morphology, lexical mismatches arise through pattern matching, nonconventional use of P2 or P4 for intransitives, and of P3 or P5 for transitives, semantic marking operates on P1 verbs to express inchoativity by P2 or P4 and causativity by P5; and lexical innovation serves to fill genuine gaps in the established lexicon.

Hebrew has two main ways of marking transitivity distinctions: binyan verb morphology and syntactic peripheries. It transpires that children prefer the first option almost universally. The three main classes of intransitive predicates all have productive syntactic means of expression: reflexive by self pronouns (e.g., acmi ‘myself’, acmo ‘himself’), reciprocate by each other pronouns (e.g., colloquial exad et she-alin ‘one OM the other’), and inchoatives by an auxiliary verb meaning become: nibya, the P2 form of the verb become or nasa, the P2 form of the make form, do. Detailed analysis of the constructions in children’s Hebrew is beyond the present study. But there is evidence that children use reflexive pronouns from age 3; for instance, on the structured test described earlier, one child aged 3:6 said megagol et acmo ‘rolling OM himself’ in place of expected P4 megagol, and another age 3:9 said mesurev et acma ‘along with Fem OM herself’ in place of P4 minurev. These children are clearly beyond step (b), although they avoid verb morphology in these examples. A rather different picture emerges for syntactic constructions expressing reciprocals and inchoatives. I do not recall a single use of a reciprocal pronoun in all our extensive database, but there are several examples of morphological expression of reciprocals among
older children who overextend P4 to express this notion, for example, a boy age 4:3 says bayedim haza mitchaxim be-gan 'the kids kind of fight at school', in place of conventional P1 foxamin or P2 mitchaxim; a girl of 5:1 says lan ti o cibetet mitravim kozi bazman 'I don't like (ii) that (people) quarrel all the time' (cf. established P1 ravim); and a 6-year-old describes a game by saying ba-yetedot mishagshim be-emza 'the legs move in the middle' (cf. established P2 nisgashim). Similarly, to express inchoatives, preschool children rarely, if ever, use the auxiliary verbs meaning become; they do innovate inchoatives morphologically with P4, as in the following examples from different children age 3½ to 6: hitarats 'you got thin' from 'thin' tara, hitalashm 'got-stained' from ketem 'a stain', hitaveh 'got-dusty' from awak the noun 'dust', hitparat 'I got (my hair) untidy' from paru 'untidy', mitzossap 'getting dark' from tsozshap 'dark' (cf. established P4 bizadahun 'grow old', hitaye'af 'get tired', hitarage 'get angry').

Children's 'creative errors' in extending predicates to different syntactic contexts thus favor binyan morphology for marking reciprocity and inchoativeness. Reflectives alone alternate with the fully productive set of self-pronouns, specified by Condition A of government and binding theory (Chien & Waxler, 1989; Kave, 1990). In Hebrew, these reflexive pronouns apply across the board, beyond the restricted set of inchoative and of semantic bodily activities such as washing, dressing, or drying oneself. In expressing reciprocals and inchoatives, by contrast, children pпеtfer verb morphology by P4, both in normative and unconventional extensions.

An earlier study noted the importance of lexical mismatches in the form of 'pattern mixing' (Berman, 1980), as evidence that once children recognize that morphological changes are required—that is, they reach step (c)—they may select the wrong pattern for a given verb, but this will not cross the bounds of transitivity. Instead, P2 and P4 forms will be reserved for intransitive predicates, and P3 and P5 for transitive (section 2.1).

We recorded about 40 such P2/P4 intransitive switchings. For example, Daniel (3:5) uses P2 nitsahf for P4 hitalef 'poo off', and Ran (3:9) uses P3 walef for mitsahf 'change, switch places', whereas Nir (3:5) uses P4 mitsahf for P2 nitsahf = Intr. 'suffocate' and Sivul (4:1) uses P4 hitalef for P2 nitsahf = 'be offended'. As for the even commoner P3/P5 transitive, Assaf (3:10) says P3 shehit for P5 hehebit 'hit (something)', And (4:10) says P5 musakha 'at for P4 mesakha 'eat—fill up with food', Gitia (4:15) says P3 bigadif for P5 gadaf 'rise, grow', and Shelly (4:8) says P5 hehebit for P3 halef 'they crowed'. Similarly, the syntactically productive passive participle resultant endstate forms alternate between the P1-derived CaCaC pattern and the P3-derived meCaCaC pattern, for example, Nir (3:7) uses kamut for mekamut 'crushed', Ido (5:0) says metsah for becmah 'colored' (see, further, section 4.2). These errors manifest grammatical rule-bound knowledge, earlier defined as operating prior to command of lexical convention. And they support the claim that the factor of productivity precedes that of convention in the acquisition of word formation in general (Clark & Berman, 1984).

At this phase, a rather different strategy is revealed by semantic over-extension, in the form of intransitivization of P1: Children turn P1 intrasitives into nonoccurrent P2 forms to express inchoativity, or they turn P1 transitives into nonoccurrent P5 forms to express causativity. For example, the highly precocious 2-year-old Smadar describes entry into a state of pain by P2 nits-la 'got-hurt' (cf. P1 boen 'be-hurt'). Sivan (3:7) uses P2 mefeshoti for 'get-scared' (cf. P1 pa'adoti 'be-scared'), Rama (4:6) says that her act P2 ne'evar 'past, get-over' versus P1 nevar 'be-over'. These children clearly distinguish between entering into and being in state, and they use unconventional verb morphology to mark this. Other instances of innovative P2 forms where the only conventional intrasitive verb is in P1 show that children reject the basic P1 as a means of expressing inaccusative change-of-state predicates (noted as very rare in this form in Hebrew)—for example, Arik (5:2) uses P4 alakaf for P1 natsal 'faded, got-faded' (of a flower that had withered), Assaf (4:6) says the boy nitsadet 'got big for P1 gadaf 'grow', Ron (5:3) nefshu 'became frozen'; and the same child also innovated P3 mitsah 'got smaller, shrinkt, cf. natkan 'small'.

A similar pattern is revealed when children change P1 transitive verbs to P5 to express high transitivity, even though these forms are syntactically unmotivated, because they fail to alter the surface verb-argument configuration. Thus, a 4-year-old girl demonstrating how she is picking her cardboard crowns around to show the gold-painted side says tin et'en mabuxsa at ba-leker 'look how I am-making-lower' (P5) OM the-crown' (cf. conventional P1 ba-leker); a 3-year-old boy says he can paint his shoes by himself, saying an yavol loe be-te'axafet be-hanei'ayim 'I can alone make-take-off [P5] my shoes' rather than established P1 be-te'ixaf. When Hagar is 4:1, her mother tells her not to stifle her baby sister with P1 atteiman at ba-moroket, to which she replies an et mitamai ora 'I'm not stifling [P5] her' (cf. P1 smasking). There are other examples: Hagar (4:0) P5 me'mezula for P1 shofetz 'Trans spell', Assaf (3:7) manikh for mezei 'erase', Rama (3:5) me'assei for dizeh 'push', Yael (3:4) birmash for mezei 'smear, spread', Gita (4:5) mazaf for yoref Trans 'burn'.

In modifying the basic, high-frequency P1 pattern, children are guided by productivity in current-lexical usage and new word formation. P2 rather than intransitive P1 functions to express semantic change of state, and P5 rather than transitive P1 to mark an activity as highly agentive and causative in content. Children's construal of P5 as the means par
excellence for expressing causativity is supported in several ways. First, they are often used as P5 for lexically missing causatives and so fill accidental lexical gaps by spontaneous coinages, for example, meshum (normative meshes) from P1 Meshum 'sleep', meshur from P1 Meshur 'swim', meshur from P1 meshur 'creek'. Second, they almost never use available options for syntactic periphrases with verbs meaning make or cause. And, third, on the structurally elicited task described earlier, they did much better on coining novel causatives than in producing other innovative forms. Moreover, children's overextensions from P1 transitive to P5 causatives violate what was defined earlier as canonic, productive causative formation in current Hebrew, by P5 applied to P1 transitive activity verbs and stative adjectives. The fact that children go beyond this to causativize P1 transitive activity verbs could be symptomatic of a more general process of language change now under way in Hebrew: There is a tendency to extend P1 transitive verbs to P5 in colloquial usage (e.g., novel P5 le-baelit 'to make someone feel under pressure', put under pressure' versus P1 le-baelit 'to press [on], le-kaet 'cause to leave, fire from le-kat 'leave'), as well as in specialized contexts (e.g., le-baelit l'implant from dl-baelit l-'implant', le-baelit l-'launch' from P5 la-baelit 'send-off'). Moreover, colloquial usage avoids the classical morphological identification of P5 for both intransitive inactivates and transitive causatives akin to English daren, dacken, rikin (section 2.1). Although children's nonnormative usages will not cause change in language, more sophisticated, knowledge-based 'creative' errors are indicative of quite general directions of ongoing processes of change.

In sum, the nonfelicitous immature errors as well as more creative later errors reviewed here support the developmentally constructivist view underlying this study. In learning how transitivity distinctions are marked in Hebrew, as in acquiring other systems of the grammar, children do not proceed from zero to endstate knowledge, from entry to exit in one single jump. They acquire partial, piecemeal knowledge, extended through varied strategies. The errors they make are evidence of reorganizations and reconstructions on route from initial to full mastery.

4. DISCUSSION: IN DEFENSE OF DEVELOPMENT

An important criterion of language acquisition theory is how it explains the child's task in distinguishing between general and particular knowledge; general in the sense of common to all input languages compared with the particular native tongue, on the one hand, and of rule bound and regular compared with idiosyncratic, on the other. I suggest that from the phase of early grammar, children become increasingly sensitive to the typological bias of their particular native tongue, which pushes them to recognize that Hebrew verb morphology is relevant to verb-argument configurations. However, they do not acquire this system in toto, by a one-step jump into total, endstate knowledge. As in other areas of the grammar, no knowledge gives way to partial knowledge, which is then extended and reconceived to encompass major and minor regularities (e.g., particular directions of binyan changes), and these in turn are constrained by detailed knowledge of particular subsystems and idiosyncratic groups of items.

Certain assumptions about the development of linguistic knowledge guide the following discussion of continuity (section 4.1), speed (section 4.2), and order (section 4.3) of development in this analysis. The same "acquisition principles" and processing explanations (Slobin, 1985), the same "acquisitional principles" (Clark, 1983, in press), and the same developmental factors (section 3.2) impinge on how children move into new knowledge and how this knowledge changes and gets reorganized across time. However, such factors do not apply equally across the board by invariant, age-related stages, as within a Piagetian constructionist view; rather, they interact with developmental phases that occur at different periods of time in relation to different subdomains of linguistic (and other) knowledge (Karmiloff-Smith, 1985). Structurally equivalent linguistic subdomains do not emerge at the same time in all languages, as in a maturationist view of acquisition (Borer, 1991; Borer & Waxler, 1987); rather, acquisition of specific subdomains is affected by how these factors interact in the development of specific target languages (section 4.3).

4.1. Continuity in Development: Universal versus Particular

My analysis was based on the assumption that linguistic universals are accessible to children from the outset. Children do not need to learn that there are different semantic classes of predicates, that predicates can have one or more arguments, or that different types of propositions will entail different configurations of verb-argument relations. They do have to learn how these distinctions are specified in the surface morphosyntax of their native language. Such language-particular knowledge includes: (a) the subcategorization constraints that apply to specific verbs and verb classes; (b) an issue not considered in the present context; for instance, in Hebrew the verb lalu governs an instrumental case-marking preposition,

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10The phrase "in defense of development" is the title of my commentary to Crain's article "Language Acquisition in the Absence of Experience" (Berman, 1991).
and the verb want can take an infinitival and a that complementizer (for English, see Fisher, L. Gleitman, & H. Gleitman, 1991, and for Japanese, Nippoll, 1991); (b) the system of case marking, by bound inflections, ap-
positions, and so on, and how these markers are distributed in realizing predicate-argument relations; (c) possible correlates between predicate semantics, such as activity versus achievement and morphosyntactic real-
izations; and (d) the focus of this study: morphological correlates of differ-
ent values for syntactic transitivity.

An earlier finding for which new evidence was marshaled in this study
relates to this last issue, the occurrence of morphological “neutraliza-
tions” of the obligatory change in morphological form with a change in
transitivity (section 3.3.2). Any account of acquisition must contend with
children’s espousal of rules, or of constructions, not available in the in-
put (see, for examples, Borer’s, 1991, study of Italian children’s marking of
paratactic agreement on the object of verbs that take have as well as those
taking be). This issue can be accommodated within the general
model I have proposed for language development as proceeding from
programmatical to structure bound and on to conventions of language
use (section 3.1). Early verb use of Hebrew-speaking children is defini-
table as “programmatical”: it does not violate universal constraints, be-
cause there are languages in which syntactic configurations suffice to
indicate a change in transitivity values (e.g., the break, change, or open
class of verbs in English); it does, however, violate the grammar of the
input language, Hebrew. But this is exactly what one might predict, be-
cause the principle of binyan pattern alternation needs to be learned.
It is simply not available to children at the programmatical phase of ac-
quisition of language particular markings of transitivity distinctions.
This set of claims is consistent with what has been termed the “weak con-
stituent” hypothesis. Early Hebrew, like early Italian or English, con-
forms with universal constraints on possible form-meaning matchings in natural
languages, but not with the particular manifestations of these relations
in a given target language.

4.2. Rate of Acquisition: The Developmental Paradox

The developmental thrust of this discussion follows from the assump-
tion that in language as in other areas children do not proceed in a single
jump from initial to endstate knowledge. This is shown by the different
strategies and distinct types of unconventional, non-endstate usages of
children at different phases in the development of binyan transitivity
marking (section 3.3). The “developmental paradox” is that the rate of
this development is both very rapid and long drawnout. Rapidity is
demonstrated, for instance, by the brief duration of only a few months
characterizing the stepwise developments sketched for acquisition of the
grammatical relations of subject and object in examples (7) and (8) (sec-
tion 1.2). Yet elsewhere I argue that such knowledge, too, is only par-
tial, often confined to the domain of the simple clause. For instance, the
knowledge that null subjects in Hebrew can occur in the syntactically
inadmissible contexts of third person and present tense across strings of
classes, when discourse motivated by the need for topicalization, emerges
much later than age 3, and is not fully commanded even by school-age
children (Berman, 1990a).

Work in progress on the development of diverse structural domains
(e.g., tense-aspect systems, relative clauses, and clause linkage) in narra-
tive texts elicited from children at different ages in five different languages
reveals the selfsame paradox (Berman & Stubia, in press). Three-year-olds
may manifest near-complete mastery of the structural devices available to
their native tongue. But they use them in very restricted contexts, from
a syntactic and semantic as well as from a discourse point of view. For
example, English-ing participles are used first without and later with aux-
iliary be as a deictic present tense, only later with to as a relative tense
in past progressive or without to in complement constructions, even later
as a major means of expressing attendant circumstances through nonfinite
modifying clauses. That is, initial acquisition of this construction and errors
in its grammatical form are shadowed, yet its full developmental path
is staggered across different interrelated subsystems, across a long per-
iod of time. Acquiring command of Hebrew verb morphology, too, is both
an early and a lengthy process, dependent on a complex interaction of the
developmental factors delineated earlier.

4.3. Order of Emergence: Language Structure
and Language Use

I have suggested that a “typological imperative” motivates Hebrew-
acquiring children to recognize that they must mark the transitivity value
of predicates by means of binyan morphology. I also argued that this
knowledge emerges later than the highly pervasive or structurally
“weighty” inflectional markings of subject-verb agreement, and of
verb-tense inflections. The relatively later acquisition of binyan trans-
itivity was explained as due to the more central structural status of inflec-
tional compared with derivational morphology, of (simple-clause) gram-
mar compared with lexicon. This is confirmed by research based on
naturalistic data and structured elicitation showing that binyan verb
morphology emerges at much the same time as other processes of Hebrew
word formation. The age of 3 to 4 also proves to be critical for derive-
tion of: (a) innovative nouns from familiar verbs (Clark & Berman, 1984);
innovative denominal verbs from familiar nouns and adjectives (Berman, 1980); and (c) adjectival passives marking resultant entities from familiar verbs in different transitive binyan patterns (Berman & Clark, 1992). Two-year-olds typically make errors in these areas, or else they avoid such formations altogether; from around age 3, children apply appropriate morphological modifications much of the time; 4- to 5-year-olds show good command of the structural properties of such alternations; and by early school-age, children conform increasingly to conventions of the established lexicon.

In marked contrast to these processes of word formation, three other areas of Hebrew morphology constitute much later developments: (d) noun compounds derived from the combination of two simplex nouns; (e) abstract verb-derived nominals based on the binyan distinctions; and (f) syntactic passives, derived from the finite forms of the three transitive binyan patterns (sections 2.2, 2.2.3). The later emergence of these constructions is explained in large part by the factor of "rhetorical bias," in the sense of the structural options preferred by speakers out of those available in their language in order to express different form-meaning relations and discourse functions. The idea of "rhetorical bias" is closely allied to the factor of relative productivity in current usage, as defined for new verb formation (section 5.2.2). It explains why it takes longer for children to acquire certain constructions that appear equally available for expressing the same semantic content.

Consider first, the relatively late emergence of noun compounds in Hebrew. The morphological operations demanded by these constructions are in principle accessible to Hebrew-acquiring children from the rich bound morphology of the inflectional systems they master by age 3. And syntactically compounds are straightforward, because they follow the head-initial order of all noun-plus-modifier expressions in Hebrew (compare the compound noun-noun string *ṣewat tefon* 'conversation-telephone = phone conversation' with the noun-adjective *ṣewat talofon* 'telephonic conversation', or the noun-demonstrative *ṣewat sela* 'this conversation', *ṣewat sheli* 'my conversation'). Nonetheless, children avoid these constructions until well beyond age 4, in contrast to their English-speaking peers (Clark & Berman, 1984). The reason lies in language usage rather than linguistic form. Colloquial Hebrew, which forms the input and output for children's acquisition, possesses other, equally productive alternatives for expressing noun-noun relations, using the genitive particle *šel* for possession of other prepositions for relations of containment, partitive, and so on (Berman, 1987a). Compounding as a "productive" syntactic means for combining nouns is restricted to more normative literary usage and to formal expository style, of the kind largely irrelevant to children's constraints of the language. And as a means for new noun formation, children like adults consistently prefer the morphological device of *šivah* to a consonantal root or bound stem rather than by juxtaposing two nouns as is common in Germanic languages.

An even later acquisition are action nominals, which correspond to both gerundive *breaking* and derived *breakage*, both *arriving* and *arrival* in English. Children age 5 and 7 years often appeared to understand sentences with these constructions, but they produced them in fewer than one third of the elicitation contexts, compared with 5-year-olds and 11-year-old sixth-graders, who gave 70% and 93% correct responses (Maynoz, 1983). In terms of form, these nominals are constructed by a quite regular set of derivational processes relating to the binyan membership of their source verbs. Yet they are consistently avoided by children, who can and do use other devices to express the same ideas: finite clauses subordinated by the Hebrew *šivah* productive; nonfinite infinitivals; or prepositional phrases. These latter options are more analytically transparent than the corresponding nominalizations (compare *hu shemar 'he broke' vs. *shivrut 'breaking'; *hemen b'gal 'they arrived +PL vs. *bagan 'arrival-PL'); and they are typically preferred in everyday spoken Hebrew, the input language most relevant to children well on through school-age.

The third, most pertinent, example is the avoidance of verbal or syntactic passives by Hebrew-speaking children, in contrast to the early acquisition of corresponding constructions in Sesotho (Demuth, 1988a) or Quechua Mayan (Py & Poe, 1988). Hebrew passive formation is structurally almost entirely productive for verbs that are semantically active, and that syntactically govern accusative case. And it is morphologically productive through the binyan system. Pl verbs like those for *give, push, steal* change to *P2; P3 verbs change to the passive *pu'el* pattern (e.g., *tsikan 'was-mended', ye-bišan will-be buttoned*); and *P5 change to their passive *bol'el counterpart (e.g., *huram 'was lifted', yo-laš will-be-recorded*). But in current Hebrew, syntactic passives occur mainly in the expository style of academic discourse and more formal media usage. Not only are syntactic passives relatively rare in colloquial Hebrew, it is hard to elicit them from young children by experimental procedures. Sixth-graders, age 7 to 8, give passive-form responses to follow-up questions asking "What happened . . . ?" less than one third of the time, compared with around two thirds such answers from seventh-graders (age 13-to-14), and 75% from adults (Shani, 1990). And on a sentence-completion task, toward the end of first grade (age 6 to 7-6), children avoided using the *pu'el and bol'el passive binyan forms almost entirely, compared with extensive use of these forms by both 12-year-old sixth-graders and adults; focal passive forms provided in obligatory contexts came to 87% of the responses from older children and adults, as against only 14% from-
6-year-olds, and nearly all of the latter were in the inflected P2 form, and not in the two strictly passive binyanim (Kenan, Nirbaz & Dekel, 1988). This cannot be attributed to avoidance of binyan alternations, because on the same test, the 6-year-olds produced causative P5 binyan verbs as required in 65% of their responses (12-year-olds and adults provided causatives to the same high extent as passives, in almost all obligatory contexts). Nor is this avoidance due to formal difficulty of morphological patterns with the uniquely passive marking [it] element. As noted, children use passive [it]-marked participles (e.g., P1 absher 'broken', P2 metutan 'fixed', P5 nimmam 'raised, heightened') in adjectival or lexical passive forms, to express the notion of resultant endstate, from an early age (around half the required responses from 3-year-olds and nearly 70% from 5-year-olds; Berman & Clark, 1992). Rather, passives are marked constructions in Hebrew, not only in morphosyntactic terms, but also in terms of rhetorical bias and usage preferences. Again, Hebrew speakers have several alternative ways of achieving the pragmatic discourse functions typical of passives: downgrading of the agent and topicalization focusing on the patient-undergoer element. One such option, common in Hebrew 2-year-old input and output, are subjectless impersonal constructions with third-person plural verbs (e.g., impersonal nakkah or 'took + Pl me 'I got-taken' versus passive nikkah-in). Speakers can also useative-affective constructions for agency downgrading (section 1.2), and patient or undergoer thematic roles can be focused on by simple fronting operations or by use of middle-voice achievement predicates in P2 or P4. These options, favored in colloquial Hebrew, are accessible in both the input and output of 2- and 3-year-olds. It is not surprising, then, that they forego passive constructions well on through school-age.

The developmental route sketched here involves two complementary facets of the form/function relationship in language acquisition. Order of development across time (as with the English-ing forms in the preceding section) is determined by the development of more functions for a single form. Order of emergence (this section) is determined by the development of new forms for a particular function.

4.4. The Developmental Challenge: A Confluence of Cues

What emerges is that generalizations concerning order of acquisition will be typologically constrained by the particular target language from two points of view: structural and rhetorical. Certain construction types may emerge early or late in different languages depending on their typological "weight" in that language—for example, early emergence of lexicalized causatives and resultatives compared with verbal passives in Hebrew, and early emergence of passives in Sesotho and Quiche Mayan compared with English or Hebrew, perfect aspect in American versus British English (Slobin, 1987) and nominalizations or relative clauses in Turkish compared with European or Semitic languages (Slobin, 1988, 1991).

There is obviously a close correlation between frequency of input occurrence and both rate and order of language acquisition and language development. But input frequency alone does not explain children's selection. After all, young children do encounter instances of other usages, including Hebrew compound nouns, nominalized forms, and syntactic passives, as well as V3 word order. Children from middle-class backgrounds, like those who provided the database for our studies, have considerable exposure to the rather formal and archaic style of much children's literature from as early as age 2. Rather, as Slobin (1987) pointed out, "frequency reflects function," in the sense that children are sensitive to the preferred options for expressing particular semantic content and discourse functions from an early age. The fact that certain forms are favored in everyday usage defines the particular dialect to which children are initially peculiarly attuned, prior to the addition of more specialized varieties, such as narrative or academic discourse. The latter are critically affected by factors such as linguistic convention, literary, and formal study, and they are thus particularly suited to school-age acquisition and usage.

Finally, this chapter has noted several factors involved in the multiple bootstrapping at emergence, and confluence of cues in development of verb transitivity in Hebrew. The challenge for a theory of language development is to articulate precisely how these and other factors interact with one another, in relation to different subsystems of different target languages. This can be illustrated by a topic relevant to acquisition of transitivity distinctions, not as yet analyzed for Hebrew (or, as far as I know, for other languages): What constitutes a "basic form"? The question is still open as to which form of a given predicate children initially prefer, transitive or intransitive, activity or achievement. Nor is it clear what motivates the choice of early verbs from these points of view. Different explanations might be sought which, in keeping with the general thrust of this chapter, I would consider to be interactive rather than mutually exclusive. Relevant factors might include: (a) formal morphosyntactic simplicity, although this tends to account more for accuracy rather than extent of production (Clark & Berman, 1987); (b) input frequency, which, as noted is at best a partial explanation, because some motivation must exist for why some forms are more common in input than others, and adults probably use alternating forms of the same verbs from the time children are very young; (c) the pragmatics of "prototypical activity scenes" (Slobin, 1985), such that certain situations are basically viewed
and hence described in early child language input and output as change-
of-state events, and so would initially favor P2 or P4 intransitive predic-
ates, whereas others might be prototypically actor-activity-type events,
favoring P1 intransitive or P3 intransitive activity verbs with animate sub-
jects, whereas (d) the impact of discourse constraints, such as appropri-
ate alternating of perspectives on a given scene, may constitute a later
development in general (Berman, 1993a).

This chapter has aimed at pointing to some directions that might profi-
tably be pursued in the interests of formulating an integrative theory of
both the emergence and development of knowledge, of both linguistic
structure and language use, attempts to isolate one specific variable of
the many involved in such a task may provide strongly predictive the-
tories. But they run the risk of not accounting for many of the facts.

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APPENDIX

EXAMPLES OF "NEUTRALIZATION" = TRANSIVITY MISASSIGNMENTS

(1) STRUCTURED ELICITATION TEST (Slavin, 1993b)

P1 Intransitive [P1] [P2] in place of:

1. abo sam eto
   - Daddy swims him
   - Daddy does swim

2. mor aro
   - swim him
   - swim him

3. axat et hadam
   - swim the sea
   - swim the sea
   - swim the sea [Rott 2:7] – NOVEL

4. abo akeel eto
   - Daddy swims him
   - Daddy does swim
   - Daddy does swim [Guy 2:4] – NOVEL

5. abo akeel eto
   - Daddy does swim
   - Daddy does swim
   - Daddy does swim [Yasmin 3:6] – NOVEL

6. abo akeel eto
   - Daddy does swim
   - Daddy does swim
   - Daddy does swim [Lit 3:7] – NOVEL

7. akeel et beyaled
   - swim the boy
   - swim the boy
   - swim the boy [Lit 7:9] – NOVEL

8. apeet et beyaled
   - swim with him
   - swim with him
   - swim with him [Rott 3:7] – NOVEL

9. apeet et beyaled
   - swim with him
   - swim with him
   - swim with him [Lit 7:9] – NOVEL

10. yebbele et batum
     - sleep the baby
     - sleep the baby
     - sleep the baby [Lit 7:9] – NOVEL

P3 Intransitive [P3]

11. abo wewlo esto
    - swim on itself
    - swim on itself
    - swim on itself [Rilla 2:9] – NOVEL

12. abo wewlo esto
    - swim herself
    - swim herself
    - swim herself [Rilla 2:9] – NOVEL

13. abo wewlo esto
    - swim herself
    - swim herself
    - swim herself [Yasmin 3:0] – NOVEL

14. abo wewlo et beyaled
    - swim the balloon
    - swim the balloon
    - swim the balloon [Yasmin 3:0] – NOVEL

15. abo wewlo et beyaled
    - swim the balloon
    - swim the balloon
    - swim the balloon [Lit 2:6] – NOVEL

(Continued)

APPENDIX (Continued)

P3 Intransitive [P3]

16. abo wewlo esto
    - swim on itself
    - swim on itself
    - swim on itself [Rilla 2:9] – NOVEL

17. abo wewlo esto
    - swim the boy
    - swim the boy
    - swim the boy [Rilla 2:9] – NOVEL

18. abo wewlo esto
    - swim herself
    - swim herself
    - swim herself [Yasmin 3:0] – NOVEL

19. abo wewlo esto
    - swim the day
    - swim the day
    - swim the day [Yasmin 3:0] – NOVEL

(Continued)

(2) SPONTANEOUS SPEECH DATABASE—DIARY RECORDS AND LONGITUDINAL SCALES.

I. INTRANSITIVE FORMS [P] USED IN PLACE OF REQUIRED TRANSITIVE [P2]:

<table>
<thead>
<tr>
<th>P2 Intransitive P2</th>
<th>P3 Intransitive P3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <em>1</em> - mit arow eto (girl)</td>
<td><em>2</em> - mit arow eto (girl)</td>
</tr>
<tr>
<td>2. <em>3</em> - mit arow eto (girl)</td>
<td><em>4</em> - mit arow eto (girl)</td>
</tr>
<tr>
<td>3. <em>5</em> - mit arow eto (girl)</td>
<td><em>6</em> - mit arow eto (girl)</td>
</tr>
<tr>
<td>4. <em>7</em> - mit arow eto (girl)</td>
<td><em>8</em> - mit arow eto (girl)</td>
</tr>
<tr>
<td>5. <em>9</em> - mit arow eto (girl)</td>
<td><em>10</em> - mit arow eto (girl)</td>
</tr>
</tbody>
</table>

*Hagar 3:10–14: It gives no evidence of either this type of reanalysis or of productive existives, uses P5 verbs lehav ‘bring’, lehavith ‘light’, lehabar ‘show’, which have imperfect alternation, and lehabar ‘invite’; Hagar 3:13 has more P5 verbs, e.g., lehabar, lehabar, and very advanced syntax, but shows no evidence of productive existives.

1.6 F2 Intransactive Activity (P2) Intransitive:

<table>
<thead>
<tr>
<th>P2 Intransitive P2</th>
<th>P3 Intransitive P3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <em>1</em> - mit arow eto (girl)</td>
<td><em>2</em> - mit arow eto (girl)</td>
</tr>
<tr>
<td>2. <em>3</em> - mit arow eto (girl)</td>
<td><em>4</em> - mit arow eto (girl)</td>
</tr>
<tr>
<td>3. <em>5</em> - mit arow eto (girl)</td>
<td><em>6</em> - mit arow eto (girl)</td>
</tr>
<tr>
<td>4. <em>7</em> - mit arow eto (girl)</td>
<td><em>8</em> - mit arow eto (girl)</td>
</tr>
</tbody>
</table>

(Continued)
### APPENDIX
(Continued)

#### 1.3 P1 Inf. ipv P3 Causative - Transitive Activity:

1. *206 - erem légbi oui bosse.  
   - cf. *sepadel* [Brian 3:7]
2. *202 - mia, si yoddjel lafle laza?  
   - cf. *savannah* [Abed 4:2]

#### 1.4 P4 Inf. [Unaccusative or Reflexive] ipv P5 or P1 - P2 Transitive Activity:

1. *129 - laŤ hem holam kite na miteqath biqan?  
   - cf. *mirenas* [Sivan 3:7]
2. *209 - si la raoule la yitappu ouli  
   - cf. *yéppov* [Sivan 3:7]
3. *410 - biot biot mirenas da ahrav  
   - cf. *nésaren* [Kace 2:9]
4. *343 - biot bidemar ou  
   - cf. *éppov* [Nagar 2:5]
5. *410 - biot bidemar ou  
   - cf. *éppov* [Nagar 2:5]
6. *410 - biot bidemar ou  
   - cf. *nésaren* [Kace 2:9]
7. *410 - biot bidemar ou  
   - cf. *éppov* [Nagar 2:5]
8. *410 - biot bidemar ou  
   - cf. *éppov* [Nagar 2:5]
9. *410 - biot bidemar ou  
   - cf. *éppov* [Nagar 2:5]

#### 2. TRANSITIVE FORMS [P4] USED IN PLACE OF REQUIRED INTRANSITIVE [P7]

#### 2.1 P1 Transitive [Activity] ipv P2 Intransitive [Unaccusative, Perfective]

1. *163 - eri ex kol bender shapax  
   - cf. *shapax* [Sherry 2:11]
2. *163 - long hedefet la potam  
   - cf. *hedefet* [Ori Degan 2:1]
3. *167 - long garama ou hedefet potam  
   - cf. *hedefet* [Ori Degan 2:1]
4. *167 - eri ex kol bender shapax  
   - cf. *shapax* [Sherry 2:11]
5. *167 - long hedefet la potam  
   - cf. *hedefet* [Ori Degan 2:1]
6. *167 - long hedefet la potam  
   - cf. *hedefet* [Ori Degan 2:1]
7. *167 - long garama ou hedefet potam  
   - cf. *hedefet* [Ori Degan 2:1]
8. *167 - long garama ou hedefet potam  
   - cf. *hedefet* [Ori Degan 2:1]
9. *167 - long garama ou hedefet potam  
   - cf. *hedefet* [Ori Degan 2:1]
10. *167 - long garama ou hedefet potam  
    - cf. *hedefet* [Ori Degan 2:1]
11. *167 - long garama ou hedefet potam  
    - cf. *hedefet* [Ori Degan 2:1]

#### 2.2 P3 Intransitive Activity ipv P4 Intransitive [Unaccusative, Reflexive]

1. *168 - biot bidemar ou  
   - cf. *mirenas* [Sivan 3:7]
2. *168 - biot bidemar ou  
   - cf. *mirenas* [Sivan 3:7]
3. *168 - biot bidemar ou  
   - cf. *mirenas* [Sivan 3:7]
4. *168 - biot bidemar ou  
   - cf. *mirenas* [Sivan 3:7]
5. *168 - biot bidemar ou  
   - cf. *mirenas* [Sivan 3:7]

#### 2.3 P5 Intransitive [Excessive] ipv P2 Intransitive [Unaccusative]

1. *140 - ax lo manták łezak  
   - cf. *mantak* [Nouma 2:5]

### SUMMARY DATABASE NEUTRALIZATIONS

<table>
<thead>
<tr>
<th>Smad</th>
<th>Hаг</th>
<th>Leò</th>
<th>Ass</th>
<th>Stv</th>
<th>Shël</th>
<th>Gilm</th>
<th>Oth</th>
<th>Tot</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>ipv</td>
<td>P2</td>
<td></td>
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<td>9</td>
</tr>
<tr>
<td>P1</td>
<td>ipv</td>
<td>P5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>17</td>
</tr>
</tbody>
</table>

Out of total 256 unconventional lexical usages:

- \( Y > V \): NZ = "neutralization" \( 39 + 17 \) = 56
- \( EV = "pattern mixing" \) 33 [excluding 20 Resultatives] = 73
- \( GA = "gap filling" \) 33 [including OM, EX] = 56
- \( N > Y \): denom. = 17

Total innovative, unconventional verb forms = 253

NZ accounts for about one quarter of the unconventional verb forms recorded.

(Continued)