

Motion Verbs in the Developing Lexicon of Hebrew-speaking Children*

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Introduction

Children's acquisition of an early verb lexicon constituted a major area of research in the passing decade (Berman & Armon-Lotem 1996, Bowerman 1990, Brown 1998, Clark 1993, Ninio 1999, Tomasello 1992). Of major interest were questions like: What is the make up of children's verb lexicon? Do children initially acquire general or specific verbs? What motivates a particular make up of children's early verb lexicon, and to what extent is this make up shared across languages?

The present paper addresses these questions with data from the acquisition of motion verbs in child Hebrew. Why motion verbs? First, focusing on the acquisition of any family of semantically related verbs allows for a particularly reliable examination of developmental patterns. Second, motion verbs play a major role in the acquisition of children's early verb lexicon to the extent that children start talking about movement and motion in space rather early in their linguistic development (e.g., Clark 1993). Finally, motion verbs comprise an important semantic domain in all languages, and one that exhibits distinct types of lexicalization patterns crosslinguistically (Berman & Slobin 1994, Slobin (in press), Talmy 1985), and as such serve as a particularly interesting test case for comparison of early verb acquisition across languages.

Based on the Hebrew data, I argue that, initially, children seem to rely more heavily on general than on specific motion verbs, but this tendency changes across development. I argue further that the make up of children's motion verb lexicon is determined by a combination of factors (e.g., conceptual, universal, language particular, pragmatic/situational, and distributional = frequency in input) that must be considered simultaneously, rather than in competition with each other. The current proposal stands in marked contrast with previous work on acquisition of motion and space, which tended to account for this process from a single perspective. For example, early on Slobin (1985) used universal accounts of space, while Bowerman (1996) highlighted the importance of typological accounts. The multidimensional account proposed here offers a complex, yet a genuine way of looking at the development of children's early verb lexicon. It is in line with a more general view of acquisition as a process affected by a confluence of cues, and of the language learner as an active participant in this process, who is busy using and integrating different kinds of knowledge to learn more (Berman 1993a, Hirsh-Pasek & Golinkoff 1996, Shatz 1987, Uziel-Karl 2001).

Method

To examine these issues, I analyzed naturalistic longitudinal data from bi-weekly one-hour sessions with two Hebrew-speaking girls – Lior and Smadar. The corpus from which my data was extracted was recorded and transcribed as part of the

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Crosslinguistic Language Acquisition Project conducted by Berman and Weissenborn (1991).

The two girls were audio-recorded at home during interactions with their parents and siblings, for approximately one hour a week in a variety of situations, and in more than one session. Each girl was recorded by her mother, a linguistics student at Tel Aviv University during the period of data collection. Information about the girls and database is displayed in Table 1.

Table 1 Subjects and Database

Child	Age Range	MLU Range	Total No. of Motion Verb Tokens	Total No. of Motion Verb Types
Lior	1;5 – 2;9	1 – 3.5	275	43
Smadar	1;6 – 2;4	1.5 – 4.5	234	38

Out of a total of 3654 verb tokens in the entire database, I analyzed 509 motion verb tokens (approximately 14%). These were divided relatively evenly between the two girls.

To detect developmental trends, the girls' data were divided into four developmental periods by MLU-W. The girls overlap on two of the periods examined, as shown in Table 2.

Table 2 Developmental Periods by MLU-W

MLU-W	Lior	Smadar
1 – 1.5	1;5 – 1;7	–
1.51 – 2.5	1;8 – 2;4	1;6 – 1;7
2.51 – 3.5	2;5 – 2;9	1;8 – 2;0
3.51 – 4.5	–	2;1 – 2;4

The data were coded and analyzed using CHILDES (MacWhinney 1995) with adaptations to Hebrew. Each verb was coded for one of five motion categories: general motion, posture, direction of motion, manner of motion, and caused motion. Coding was based on prior work on motion verbs in Hebrew and in other languages (Berman and Armon-Lotem 1996, Clark 1993, Levin 1993, Slobin 1981, 1985, 1997, 2001, and Talmy 1985). Examples of verbs in each category are given in Table 3.

Table 3 Motion Categories

Motion Category	Example
General motion (MOG)	<i>lavo</i> 'come' <i>lalexet</i> 'go' <i>lazuz</i> 'move'
Posture (POS)	<i>la'amod</i> 'stand' <i>lashevet</i> 'sit' <i>lehisha'en</i> 'lean'
Direction of motion (MDI)	<i>laredet</i> 'get down' <i>laalot</i> 'get up' <i>lehikanes</i> 'go in'
Manner of motion (MMA)	<i>likpoc</i> 'jump' <i>lauf</i> 'fly'

	<i>lirkod</i> ‘dance’
Motion Category	Example
Caused motion (MCA)	<i>lehaziz</i> ‘move-TR’ <i>lehasia</i> ‘drive-TR’ <i>lesovev</i> ‘spin-TR’

A sixth category, *Other*, included cases of general verbs like *la’asot* ‘make/do’ in combination with particular noun complements used to indicate motion, e.g., *la’asot (gilgulim)* ‘do (somersaults)’, and motion verbs used to denote other semantic notions. For example, the verb *lavo* ‘come’ when used to denote hortative mood, e.g., *bo nesaxek* ‘come = let’s play’, or affective state, e.g., *loh ba li* ‘I don’t feel like it’, or the verb *lacet* ‘go out’ when used to denote achievement as in *loh yoce li* ‘I can’t manage it’.

Findings

Figure 1 shows the distribution of motion verb types for each girl across development (Lior, N = 43; Smadar, N = 38).

Figure 1 Distribution of verb types in Lior and Smadar’s data across development

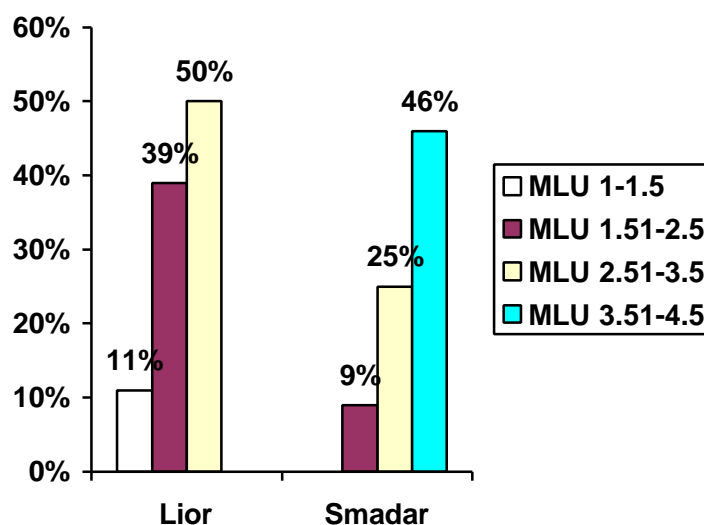


Figure 1 shows that both girls increase the number of motion verb types from one period to the next, despite individual differences between them in the number of different verb types used at each developmental period. This corroborates findings on the general development of children’s early verb lexicon in Hebrew (Berman & Armon-Lotem 1996, Dromi 1987), and in other languages (Brown 1998, Clark 1993, Tomasello 1992).

Figure 2 shows the distribution of shared and idiosyncratic verb types in the girls’ data by motion category out of the total number of motion verb types in each category. *Shared* refers here to verb-types that Lior and Smadar have in common, while *idiosyncratic* refers to verb-types used exclusively by one girl but not by the other. In the figure, the dark bars show the percentage of shared verb types, the white bars show the percentage of motion verb types used only by Lior, and the light bars show the percentage of verb types used only by Smadar.

Figure 2 Distribution of shared and idiosyncratic verb types in the girls' data by motion category

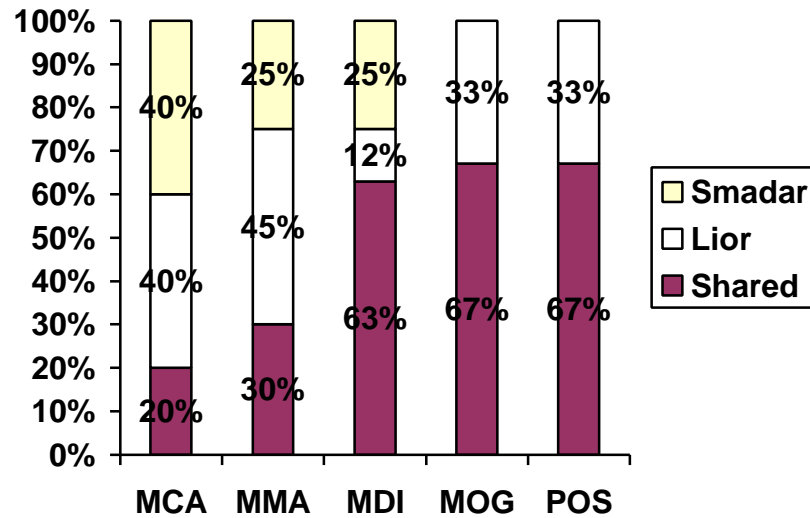


Figure 2 shows that Lior and Smadar share many general motion, posture, and direction of motion verb types. They do not share most manner of motion and caused motion verb types.

Consider next the distribution (in percentages) of verb tokens for each girl by motion category and developmental period. Figure 3 shows data from Lior, and Figure 4 data from Smadar.

Figure 3 Distribution of verb tokens by motion category in Lior's data across development

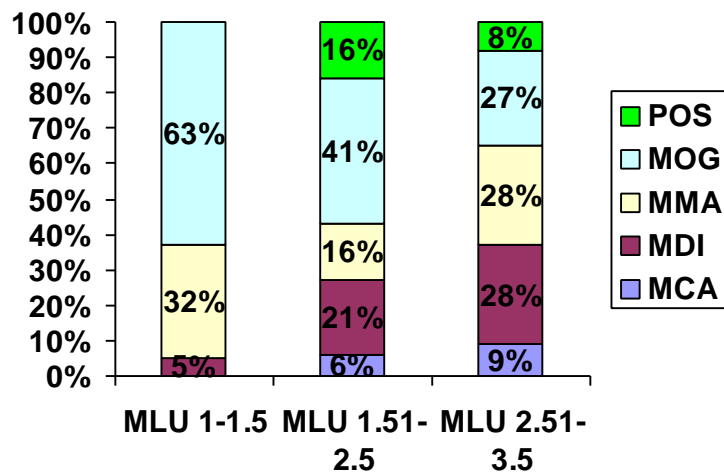
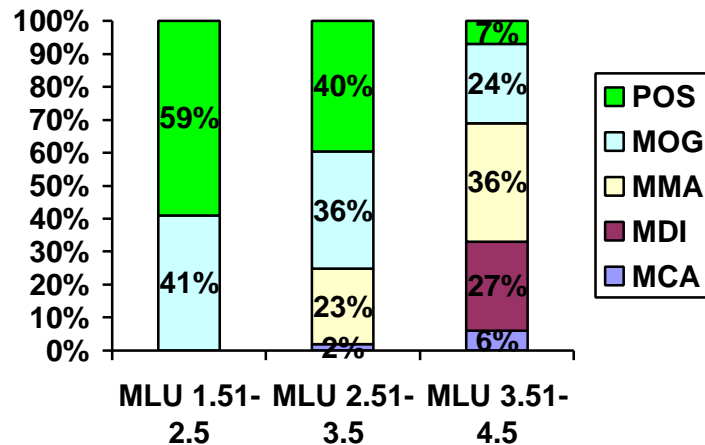


Figure 4 Distribution of verb tokens by motion category in Smadar’s data across development



Several findings emerge from Figures 3 and 4: (1) Initially, both girls rely heavily on general motion verbs; (2) Across development, the two girls increase the variety of motion categories in their lexicons; (3) Both girls start using caused motion verbs later on in development; And (4) there are individual variations between the two girls in the extent to which they use posture, manner of motion and direction of motion verbs.

Table 4 shows the distribution of verb tokens for three frequently used motion verbs, *hlk1* ‘go’, *yshb1* ‘sit’ and *zwz1* ‘move’, in input to the girls and in the girls’ production data.

Table 4 Distribution of motion verb tokens in input to the girls and in the girls production data

	<i>hlk1</i> ‘go’	<i>yshb1</i> ‘sit’	<i>zwz1</i> ‘move’
Mother	50	37	0
Smadar	39	30	0
Mother	145	21	14
Lior	30	27	5

The data reveal that the girls and caregivers make use of similar verbs. For example, Smadar uses the general motion verb *hlk1* ‘go’ 50 times in the examined period, but she does not use the verb *zwz1* ‘move’ at all. This corresponds to the frequency of these verbs in her mother’s recorded input – while Smadar’s mother uses the verb ‘go’ 39 times, she does not use the verb ‘move’ even once. Lior’s mother, on the other hand, uses the verb ‘move’ 14 times, and indeed, the verb occurs in Lior’s data 5 times during the examined period. This suggests that occurrence of particular verbs in the girls’ lexicons and the frequency with which they are used by the girls may be affected by their frequency in the input.

Discussion

The data reveal certain similarities in the acquisition of motion verbs by the two girls, but they also point to a number of individual differences between them. How can these findings be accounted for? I argue that a number of factors interact to determine the distribution of motion verbs in the girls' lexicons across development. These include: Conceptual, universal, language particular, pragmatic/situational, and distributional factors. **Conceptual** factors relate to the way young children conceive of the world around them; **universal** factors relate to the properties of particular verb groups that make them crosslinguistically favored for early acquisition; **language particular** factors relate to typological differences between languages that lead to crosslinguistic variation in the inventory of children's early verb lexicon, e.g., the distinction between verb-framed and satellite-framed languages (Talmy 1985); **pragmatic/situational** factors relate to the particular context or situation in which a given verb is introduced and/or used, and **distributional** factors relate to the frequency of occurrence of a particular verb in input to the child.

Consider the similarities first: (1) Initially, both girls relied heavily on general motion verbs, (2) both shared certain verb types, and (3) both started using caused motion verbs relatively late. Each of these findings is discussed in turn.

General motion verbs like 'come', 'go' and 'move' occurred early and were frequently used for three main reasons: First, they describe activities that are directly observable, and as such are conceptually easier for young children than, say, caused motion verbs which require making inferences about causes (Huttenlocher, Smiley & Charney 1983). Secondly, these verbs have particular semantic and syntactic characteristics that make them universally favored for early acquisition (Clark 1993, Hollebrandse & van Hoot 1995, 1996, Ninio 1999, Pinker 1989): (1) Their meanings are fairly nonspecific to the effect that they are determined in combination with their complement (e.g., *come home* vs. *come off*); (2) they are polysemous (e.g., *it goes well* [it's working] vs. *he goes to school* [he attends school]); (3) they are lexically underspecified (e.g., *come off* is not a *coming* activity); and (4) they are syntactically multifunctional, since they can function both as auxiliaries and as main verbs (e.g., *going to eat* vs. *going home*). Finally, the group of general motion verbs seems to constitute a kind of "closed class" in that it consists only of a small, limited number of verbs that cannot be added to. As a result, children might acquire these verbs more easily than specific motion verbs that constitute a kind of "open class", imposing no limitation on the girls' early lexicons.

The use of certain manner of motion verbs like *rwcl* 'run' and *glsh4* 'slide', and posture verbs like *yshbl* 'sit' and *imdl* 'stand' by the two girls can be accounted for pragmatically. These verbs constitute part of children's everyday life experience, and as such it is reasonable to assume that they will be shared by the two girls, and even across languages. The girls use other manner of motion verbs like *nsil* 'travel' or *qpcl* 'jump' as prototypes in that early on these verbs occur in place of more specific manner of motion verbs. For example, *nsil* 'travel' is used by Lior and Smadar instead of 'go somewhere' as in *anaxnu nos'im el Tal* 'we're going to Tal's'; 'ride' as in *ba-sof nasanu al ha-poni* 'eventually, we rode the poni', *nasati im ha-ofanaim* '(I) rode (my) bike'; 'drive' as in *nasa xatul ba-oto* 'the cat drove the car'; or 'fly' as in *ani po nosa'at al ha-koxav* 'I'm flying on the star'. As prototypical manner of motion verbs, the two girls are expected to share these verbs.

The shared use of certain direction of motion verb types like *yrdl* 'go down', *ilyl* 'go up', *ycal* 'go out' can be attributed to language typology, as follows. Talmy (1985) proposed two distinct ways in which languages allocate information between

the main verb and supporting elements (satellites) in a clause. A Germanic language like English uses verb particles (satellites) to specify direction of movement, e.g., walk **in**, get **down**, and as such it is characterized as a **satellite-framed** language. In contrast, a Romance language like Spanish, or a Semitic language like Hebrew, encode this information in the verb, e.g., *entrar* ‘enter’, *bajar* ‘descend’, and as such are characterized as **verb-framed** languages. In view of that, it is expected that Hebrew-speaking children will include direction of motion verbs like *ilyl* ‘go up’, *yrdl* ‘go down’, and *yca1* ‘go out’ in their early lexicon, and that these verbs will be shared across speakers of the language (Berman & Slobin 1994, Slobin 1997, (in press)). However, it is also expected that such direction of motion verbs will not occur in the early lexicons of children who speak Germanic languages like English, since they can use particles instead of full verbs to express the same notions (Clark 1993).

Anecdotal data from Berman’s bilingual daughter Shelli support these predictions. Berman (p.c.) reports that at the one word stage, Shelli used either the English particle *down* or the Hebrew verb form *laredet* ‘to get down’ when she wanted to get down from her high chair or out of bed.

Both girls start using caused motion verbs relatively late. This is due to a particular property of Hebrew as a Semitic language. In Hebrew, verbs are formed through integration of a consonantal root with an affixal pattern called *Binyan*. For example, the verb *tipes* ‘climb’ is made up of the consonantal root *t-p-s* and the *CiCCeC* (P3) pattern, and the verb *raqad* ‘dance’ is made up of the root *r-q-d* in the *CaCaC* (P1) pattern. *Binyan* patterns form the basis for morphological marking of predicate-argument relations like transitivity, causativity, passive vs. middle vs. active voice, reflexivity, reciprocity and incoativity. Thus, to form a causative verb, Hebrew-speaking children need to extract a consonantal root and insert it into the *binyan* pattern that characteristically bears the causative meaning, i.e., the *hiCCiC* (P5) pattern. For example, *r-q-d* ‘dance’ → *hiCCiC* → *hirqid* ‘make dance’. Hebrew speaking children recognize that the grammar of their language requires morphological marking of argument structure alternations typically from around age 3, after simple clause structure is established (Berman 1985, 1993b), which explains why early caused motion verbs are initially so scarce in the girls’ lexicons. Also, as noted, caused motion verbs are conceptually more difficult for children to talk about.

The data reveal that the girls differ from one another in the frequently with which they use particular motion verbs (measured by number of tokens), and in the inventory of specific motion verbs in their early lexicons. These differences may be attributed mainly to situational and distributional factors, as follows.

The data reveal that the girls and their mothers make use of similar verbs, and that when the mother uses a particular verb very often, her daughter seems to use that verb very frequently, too. This suggests that the occurrence of a particular verb in the girls’ lexicons may be determined by its frequency in the input.

Finally, particular situations or conversational contexts may elicit use of certain verbs in one child but not in the other. For example, Lior uses the verb *dhr1* ‘gallop’ only once when she tells her mother about some horses that she had seen. Similarly, she uses the verb *tws1* ‘fly-on-a-plane’ only once when she talks with her mother about a friend who went abroad. Smadar uses the verb *dlg3* ‘hop’ only once in response to a remark made by her mother using that verb. Similarly, she uses the verb *sxy1* ‘swim’ only twice – when she is asked what she did when visiting her grandma’s, and on a trip to the beach. Other specific verbs like *ndnd3* ‘swing-TR’ or *sbb1* ‘spin’ were introduced in nursery rhymes frequently recited by one of the girls but not the other.

In conclusion, in the present study, I proposed a multidimensional account of the early acquisition of motion verbs in child Hebrew. In the proposed account, multiple factors affect the make up of children's early motion verbs lexicon. Conceptual and universal factors seem to account for crosslinguistic similarities in acquisition of particular motion verbs. Typological factors account for similarities between speakers of a particular language on the one hand, and crosslinguistic variation on the other hand. Finally, pragmatic and distributional factors account for individual differences between learners. As for the development of children's motion verb lexicon, the Hebrew data suggest that acquisition of motion verbs proceeds from semantically general to semantically more specific verbs. This corroborates developmental patterns attested for other early verbs in the language as well as in other languages (Berman 1993b, Berman & Armon-Lotem 1996, Clark 1993, Uziel-Karl 1999). To fully establish these claims, additional research is required on topics like the effects of parental input on children's verb lexicon, and on the relative contribution of each factor to the make up of children's motion verb lexicon. It may also be worthwhile to test the proposed account on a larger database of Hebrew-speaking children, as well as on data from typologically different languages, and with experimental designs.

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