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CHILDREN'S DEVELOPING AWARENESS OF THE COMPLEX MEANINGS OF THE "SLEEP VERBS"[1]

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Abstract: This study aimed at examining the semantic acquisition of two sets of converse verbs associated with 'sleep': *sleep-get up, fall asleep-wake up* by Hebrew speaking children aged 2-12. It was hypothesized that the order of acquisition is as above, determined by the semantic features of markedness and positivity, and that the child has to be at an advanced stage of cognitive development in order to be able to fully understand the semantic features of these verbs. The results showed that the order of acquisition is different from the one predicted, since *wake up* (which is "negative") is evidently acquired before *fall asleep* (a "positive" action). Hence positivity does not play as great a role in the order of acquisition of those verbs as predicted. Instead, the frequency of the verb was found to have a larger role in acquisition. The order of acquisition of the various semantic features of the 'sleep' verbs was postulated as well, and explained by some semantic theories. The study revealed interesting findings about children's understanding of different concepts. It was found that young children do not understand the difference between ability and permission, place an important role on functionality, and do not fully understand sleep's essentiality to life. It was also shown that correct answers do not always reflect understanding, and that children tend to answer yes/no questions positively, even if they do not know the answer. Children's experience in life and their intellectual-cognitive maturity determine the rate of their acquisition of complex features. This conclusion, demonstrated by the feature acquisition of the 'sleep' verbs, coincides with the other hypothesis of the study.

Keywords: Hebrew, Child Language, First Language Acquisition, Order of Acquisition, Sleep Verbs

Özet: Bu çalışma, 'uyku' ile alakalı iki takım zıt fiillerin 2-12 yaşlarındaki İbranice konuşan çocuklar tarafından anlamsal edinimini incelemektedir*: uyumak-kalkmak*, *uykuya dalmak-uyanmak*. Belirtisellik ve olumluluk anlamsal özellikleri göz önünde bulundurularak karar verilen edinim sırasının yukarıdaki gibi olduğu ve çocuğun bu fiillerin anlamsal özelliklerini tam olarak anlayabilmesi için ileri seviyede bir bilişsel gelişim düzeyinde olması gerektiği varsayılmaktadır. Sonuçlar edinim sırasının öngörülenden farklı olduğunu göstermektedir, çünkü *uyanmak* (olumsuz bir anlama sahip) *uykuya dalmak*'tan (olumlu bir hareket) açık bir şekilde daha önce edinilmektedir. Bu yüzden, olumluluk bu fiillerin edinim sırasında öngörüldüğü gibi önemli bir rol oynamamaktadır. Onun yerine, fiilin sırasının edinimde daha önemli bir rol oynadığı bulunmuştur. 'Uyku' fiillerinin çeşitli anlamsal özelliklerinin edinim sırası doğru varsayılmıştır ve bu anlamsal teorilerle açıklanmıştır. Bu çalışma çocukların farklı kavramları anlamaları konusunda ilginç sonuçlar ortaya çıkarmıştır. Küçük çocukların yetenek ve izin arasındaki farkı anlamadıkları, ki bu durum işlevselliğin önemli rolüne işaret etmektedir, ve uykunun hayat için zorunluluğunu tam olarak kavramadıkları bulunmuştur. Benzer şekilde, doğru cevapların her zaman anlamayı yansıtmadığı ve cevapları bilmeseler bile çocukların evet/hayır sorularını olumlu cevaplama eğiliminde oldukları gösterilmektedir. Çocukların hayattaki tecrübeleri ve onların entelektüel-bilişsel olgunlukları onların karışık özellikleri edinim oranlarını belirlemektedir. 'Uyku' fiillerinin edinimi vasıtası ile kanıtlanan bu sonuç bu çalışmanın diğer varsayımıyla örtüşmektedir.

Anahtar sözcükler: İbranice, Çocuk Dili, Anadil Edinimi, Edinim Sırası, Uyku Fiilleri

Introduction

The study described below represents an attempt to provide further insight into child language acquisition from the point of view of what has come to be known as the "Semantic Feature Approach" (Clark 1973a, 1973b; McNeill 1970). This approach makes use of two sets of features: "positivity" and "markedness", as discussed in the works of Clark (1973a), Clark and Garnica (1974), Donaldson and Wales (1970) and Clark (1973). These features are the basis of our analysis of the acquisition of "sleep" verbs by Hebrew-speaking children aged 2-12. In

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Clark and Garnica's (1974) study of some deictic verbs (*come, go, bring* and *take*), it was found that *come* and *bring* are acquired before *go* and *take* – although it might be expected that *come* and *go* would be acquired before *bring* and *take*, since the former pair is semantically "simpler" than the latter. The reason the authors offer for this order of acquisition is that the two positive verbs (*come* and *bring*) are cognitively simpler for the young child, who uses the strategy of identifying the speaker and addressee of deictic verbs such as those with the goal of motion. According to these authors, positivity plays a major role in the order of acquisition of deictic verbs. *Come* and *bring* are positive since they refer to actions which occur at the speaker's side (the 'ego'). *Go* and *take* are negative since they refer to actions which occur at the goal (away from the 'ego'). Similarly, Internicola and Weist (2003) found that the deictic word *front* was produced by young children nearly a year before its counterpart *back*. These two words can also be regarded as a positive-negative pair because usually *front* is closer to the ego, easily seen, while *back* is far and hidden.

Following McNeill and Clark (1970), marked verbs are those that have a less general and/or more specific meaning than their unmarked counterparts, which are close to them in meaning. For example: *kill* is unmarked, whereas *strangle* is marked; *leave* is unmarked, whereas *dese*rt is marked. At an early stage the child, who knows only the unmarked verbs, those which are naturally acquired earlier (as shown later in this section), overextends their meaning to include that of the marked verbs. The findings of Clark and Garnica show that young children identify the addressee of *come* and *bring* more easily than that of *go* and *take*.

Table 1 summarizes the order of acquisition of the deictic verbs, according to Clark and Garnica. It shows that positivity overrides markedness in the acquisition of the deictic verbs.

Like the above deictic verbs, the class of 'sleep' verbs: *sleep*, *get up*, *fall asleep* and *wake up* are among the first verbs that children acquire, since they refer to everyday actions that a child is assumed to be aware of from a young age. *Sleep* and
get up are mentioned by Berman (1978) as "early verbs"; *fall asleep* and w*ak*e *up* are also assumed to be acquired quite early for the same reason. Like the deictic verbs, the four 'sleep' verbs also entail positive and negative features, though for different reasons. We suggest that the "positive" verbs are *sleep* and *fall asleep* – those that initiate an action. The negative verbs are *get up* and *wake up* – those that cause the (positive) actions to cease. Getting up cannot occur if sleep did not take place[2], just as waking up cannot occur if falling asleep did not take place.

Table 1: The Role of Markedness and Positivity in the Order of Acquisition of the Deictic Verbs

Verb	Positivity	Markedness	Order of Acquisition of pairs	Order of Acquisition within pairs
Come *Bring*	+ +	– +	1	*Come* is acquired before *bring*.
Go *Take*	– –	– +	2	*Go* is acquired before *take.*

We suggest that although the deictic verbs and the 'sleep' verbs each includes two pairs of opposites, consisting of a positive and a negative verb, positivity plays a greater role in the

order of acquisition of the deictic verbs, while markedness plays a greater role in the acquisition of the 'sleep' verbs.

In line with Clark (1973a), we assume that the first verb in each pair of the 'sleep' verbs is acquired before the second (by saying 'first' we mean the left-hand verb, the right-hand one being the 'second') since the first verb in each pair is positive. Therefore *sleep* is probably acquired before *get up* and *fall asleep* – before *wake up*[3]. Obviously a child who knows that he or she is getting up also knows that they have slept before, just as it is likely that if they understand the notion of waking up, they also understand the action of falling asleep.

Thus, the unmarked pair (*sleep-get up*) is probably acquired before the marked pair (*fall asleep-wake up*). Markedness, then, is assumed to override the property of positivity in the 'sleep' verbs, whereas in the deictic verbs, the property of positivity overrides that of markedness. The reason for this has to do with the fact that in the positive deictic verbs mentioned above, both the unmarked one (*come*) and the marked one (*bring*) are acquired before their negative counterparts (*go* and *take*) which are unmarked and marked respectively. The assumed order of acquisition of the 'sleep' verbs is presented in Table 2 below.

Table 2 shows that markedness (or in fact lack of it, i.e. "unmarkedness") overrides positivity in the acquisition of the 'sleep' verbs. In both pairs, the positive and the negative, the unmarked is acquired before the marked.

Table 2: The Role of Markedness and Positivity in the Assumed Order of Acquisition of the 'Sleep' Verbs

Verb	Positivity	Markedness	Assumed Order of Acquisition of pairs	Assumed Order of Acquisition within pairs
Sleep *Get up*	+ –	– –	1	*Sleep* is acquired before *get up*
Fall Alseep *Wake up*	+ –	+ +	2	*Fall asleep* is acquired before *wake up*.

Why is the property of being unmarked assumed to be more important in the acquisition of 'sleep' verbs than of deictic verbs? Firstly, markedness usually plays a significant role in the order of acquisition of any word. For example, *shut*, which is unmarked, is usually acquired before the more specific *lock, slam, block* etc., which are all marked. Likewise the unmarked *want* is usually acquired before the marked *wish, hope, desire* etc. The pair *fall asleep-wake up* denotes far more restricted actions than *sleep-get up*. Therefore the former pair is probably acquired later. Another property of markedness which is relevant to vocabulary acquisition is its frequency in adult speech: the unmarked words usually have a far wider distribution than the marked words. They appear more often and in more varied contexts, whereas the marked words are usually limited to fewer and far more restricted contexts. In the specific case of the 'sleep' verbs, the prior acquisition of *get up* to the marked pair *fall asleep* and *wake up* can probably be ascribed to the fact that *get up* is the opposite of several other common verbs in addition to *sleep: rest, lie (down), sit (down)* and *fall down*, whereas *fall asleep* is the converse term of *wake up* exclusively. The child thus hears the verb *get up* in several different contexts (as the opposite of many common actions), while *fall asleep* is heard in one context only.

Morphology and Phonology

It is interesting to note that, according to Berman (1978), in Hebrew each marked verb consists of twice as many syllables as the unmarked verbs in the infinitive form (which is usually used by children to express a wish). Thus *sleep* is [lishon לישון] and *get up* is [lakum לקום], two syllables each, while *fall asleep* is [leheradem להרדם] and *wake up* is [lehitorer להתעורר] (four syllables each). Yet, as Berman claims, morphological complexity is irrelevant in order of acquisition. The child simply utters fewer syllables when using the morphologically complex word.

Yet morphological similarities between words do have a role in the order of acquisition.[4] English morphology and phonology compared to that of Hebrew might be a factor in the order of acquisition of the 'sleep' verbs. It is possible that English speaking children acquire the verb *fall asleep* before Hebrew speaking children, since *fall asleep* and *sleep* are morphologically related in English simply because they both contain the same overt morpheme *sleep*, whereas the two Hebrew expressions are morphologically (hence, phonologically) unrelated. Therefore the same research in English speaking children might conceivably yield different results.

Motivation for Choice of Items

In attempting to analyze the semantic acquisition of a certain set of words with related semantic properties, the following four verbs all relating to the general activity of "sleeping" – *sleep, get up, fall asleep, wake up* – seem of particular interest, for the following reasons. While characterizable in terms of "positive-negative" and "marked-unmarked" referred to in the literature above, they furthermore represent semantically highly complex notions, which can be analyzed in terms of a wide range of different semantic features, as follows.

It appears that the 'sleep' verbs are much more complex semantically than the deictic verbs noted above, and contain far more abstract semantic features. A complete understanding of the four (i.e., their full dictionary entries) involves (1) knowledge of duration of time (*sleep* has the longest duration of the four; *get up* has some duration) as against (2) Instantaneity (*fall asleep* and *wake up* are usually instantaneous)[5]; (3) sequence of activities (*fall asleep-sleep-wake up-get up*); (4) association between the actions and their normal time (night) and (5) place (bed); (6) distinction between Volitional and Nonvolitional activities (*sleep* is nonvolitional once falling asleep has taken place; *wake up* is also nonvolitional; *fall asleep* can be regarded as both[6]; (7) distinction between Animate and Inanimate objects (all the 'sleep' verbs require animate subjects); (8) distinction between Conscious and Unconscious states (*sleep* and *fall asleep* are unconscious, whereas *get up* and *wake up* are conscious) and (9) at least a vague notion about life (*sleep* is essential to life, just like food, although the latter could be considered as "more important"). The verb *get up* also requires the notion (10) ability to move to Upright Position. The semantic properties of the 'sleep' verbs are displayed in Table 3 below, where + indicates that the verb is characterized by the feature and – that it is not.

Table 3: Semantic Properties of Four 'Sleep' Verbs

No.	Semantic Properties	*sleep*	*get up*	*fall asleep*	*wake up*
1	Duration	+	+	–	–
2	Instantaneity	–	–	+	+
3	Sequence of Actions	2	4	1	3

4	Dependence on Time	–	–	–	–
5	Dependence on Place	–	–	–	–
6	Volitional	–	+	±	–
7	Requires Animate Subject	+	+	+	+
8	Conscious	–	+	–	+
9	Necessity to Life	+	–	+	+
10	Ability to move to upright position		+		
11	Hypothesized Order of Acquisition	1	2	3	4

Aims of Study

This study aimed to test children's knowledge of semantic and other properties of the 'sleep' verbs. The questions given to the subjects checked the following:

1. Which pair is acquired first.
2. Which verb in each pair is acquired first.
3. Whether (and at what age) children know that,
   a. *Sleep* is the most continuous activity;
   b. *Fall asleep* and *wake up* are usually instantaneous;
   c. *Sleep* is nonvolitional once falling asleep has taken place;
   d. *Fall asleep* is volitional when one wants to avoid it and nonvolitional when wished to be done at a specific time;
   e. *Get up* is volitional;
   f. *Get up* requires the ability to move to upright position;
   g. *Sleep* does not depend on night time;
   h. *Sleep* does not depend on place (bed);
   i. Get up is also the opposite of other verbs (*Fall down, sit down* and *rest* were checked in this study);
   j. The 'sleep' verbs require [+Animate] subjects.
   k. *Sleep* and *fall asleep* are unconscious actions, whereas *wake up* and *get up* are conscious.
   l. *Sleep* is a necessity to life, like food; *get up* is not;
   m. The four verbs are consecutive: *fall asleep-sleep-wake up-get up* in this order.

The second aim of this study was to establish a hierarchy of semantic complexity of the 'sleep' verbs. It was desired to find which semantic features are more complex than others. This could be revealed through the order of acquisition of the features.

The third aim of this study was to see whether the findings of our modest study accord with the theories of semantic acquisition noted above as well as others to be considered later, or whether additional explanations are needed to account for children's semantic development of the 'sleep' verbs.

Hypotheses

The hypotheses were the following:

1. The features of positivity and markedness are relevant to the acquisition of the 'sleep' verbs, but markedness will override positivity. Therefore the verbs in question will be acquired in the following order, with the unmarked verbs first: (a) *sleep*; (b) *get up*; (c) *fall asleep*; (d) *wake up*.
2. As the 'sleep' verbs are so complex semantically, it was assumed that in order to acquire complete lexical entries, children are required to be highly developed cognitively (hence full acquisition would have to take place at a later stage in their childhood). Even the verb *sleep*, which is the most basic verb in the group and the earliest to be acquired, is not fully understood before a child has reached some maturity, because its understanding involves the knowledge of complicated features such as [+necessity to life], which is very difficult for young children. The full semantic entries are not acquired all at once, but rather gradually.
3. Partial entries are acquired to start with, rather than full semantic entries (Clark 1973b). The child acquires more semantic features as he or she matures, thereby gradually extending their meanings until they reach full understanding.
4. It was assumed that by the age of 11-12 children will have full meanings and complete lexical entries, because this age terminates the critical period of language acquisition, and is biologically the age of puberty (Lenneberg 1967). This age is widely recognized as the age which plays a role in language acquisition since around this age the individual undergoes major social, physical and psychological changes (Krashen 1975, Schumann 1975).
5. In accordance with the Full and Partial Semantic Feature Hypothesis of Clark (1973a, 1973b, 1975), and McNeill's Semantic Development Hypothesis, it is assumed that cognitive development correlates with the acquisition of the semantic features of the 'sleep' verbs. It is hard to guess which features are more difficult than others and are therefore acquired later, although it is likely that the sense of sequence of actions is acquired before duration or instantaneity. But we cannot postulate an assumed order of difficulty or hierarchy of features in terms of cognitive/perceptual complexity because of a) the lack of any attempt to establish such a hierarchy within general semantic theory and b) the lack of developmental studies of the hierarchical interrelations of such cognitive concepts in terms of different stages in the child's mental growth.
6. In fact, Clark suggests an approach for determining the complexity of features by claiming that

   > … it is not obvious how to measure the cognitive complexity of different linguistic forms. The child's reliance on non-linguistic strategies, though, suggests one possible approach. These non-linguistic strategies may provide the basis for the child's linguistic hypotheses about the meanings of words. (1973b:179)

Yet it is hard to determine the relative complexity of the semantic features of the 'sleep' verbs even if the child's non-linguistic strategies concerning the 'sleep' verbs could be ascertained. Perhaps Clark's suggestion is applicable to relational terms such as prepositions, which she investigated, but it is insufficient for the 'sleep' verbs.

Research Design

Subjects

The subjects of the research were 36 children, 18 boys and 18 girls, between the ages of 2-12, half preschool and half school children. All of them were native speakers of Hebrew. They

were divided into 6 age groups, 6 children in each (3 males and 3 females), as presented in Table 4 below:

Table 4: Division of Research Subjects According to Age

Group "name"	A	B	C	D	E	F (control)
Group Age	2-3	4-5	5-6	6.5-8	9-10	11-12
Mean Age	2;8	4;5	5;6	7;3	10;3	11;8

The study was conducted in Ramat Gan, a large town bordering Tel Aviv, at a day care center (groups A, B), a kindergarten next to it (group C), and an elementary school (groups D-F) in the same area. All subjects came from fairly well-established middle class families. The 'sleep' verbs had not been formally taught in the preschool institute.

Originally it was intended to have 5 groups, the last consisting of ages 10-12 and serving as a control, but after testing a few 10 year olds and seeing their relatively poor knowledge of certain features, it was decided to add a control group E, of 11-12 years old.

The Instruments

The instruments consisted of 30 sets of questions (Appendix A), some of which consisting of two or three items. Some questions were accompanied by pictures which show people sleeping, waking up or getting up. In addition, there were preparatory or "warm-up" questions (which appear in parentheses in Appendix A), whose answers were not recorded since they were irrelevant for the study but which served to prepare the child for the target questions. The questions were grouped according to the aspects tested. The answers are recorded according to the age-groups (Table 5 below). Validity and reliability were not calculated because of the relatively small sample.

Procedure

The procedure consisted of individual sessions with each child for 15-20 minutes in which the child was asked the 30 questions and 9 sub-questions, totaling 39 questions (plus preparatory questions). More questions were added in the course of the interview, whenever needed. For example, the first picture (a yawning man) was used as a stimulus for question 1, "This man is tired. What do you think he is going to do?" The expected answer was 'to sleep' or 'to fall asleep'. A preparatory question was: "Why is he yawning?" In some cases, when the subject gave the wrong answer, I tried to elicit the right one from him or her through further questioning. For instance, the most common answer to question 10, "If mother does not want to get up after she wakes up, can she?" was, "She has to get up". When I asked why, the usual answer was, "Because she has to go to work". Whenever this answer was given the subject was then asked, "And if she is sick or it is a holiday/Saturday?" and the answer to *this* question was recorded.

The most interesting interactions were with the preschool children because their responses were unpredictable. Most children knew that tables do not sleep (Question 25), but their (unrecorded) answer to the question that followed, why tables do not sleep, was "because they don't have beds". In these cases the subject was then asked "and if we put them on beds, will they sleep?" If the child said that in that case tables would sleep, this answer was recorded as wrong. In some cases the children said that the tables wouldn't sleep even if they were put on

beds because they don't have eyes. This answer was considered correct since it meant that tables were inanimate.

A particularly difficult question for the preschool children was Questions 15, which tested knowledge of instantaneity of *fall asleep*: "Is there one moment that one falls asleep or does it take a long time?" The children confused the question with the time it takes them until they fall asleep. In spite of further explanations of this question, the question (and the concept) was too difficult for the preschool children, so most of them did not really answer it.

Findings and Results

The following tables demonstrate the results according to the aims of testing. Table 5 shows the number of correct answers per age group. Each group, which consisted of 6 subjects, was supposed to answer 39 questions. This means that each group could score 6x39=234 points (correct answers). The total of all the groups would then be 234x6=1,404.

Table 5: No. of Correct Answers in Each Age Group (N=36)

No. of Items	Question	A	B	C	D	E	F	Total
1	1 production *sleep*	5	6	6	6	6	6	35
1	2 production *get up*	5	6	6	6	6	6	35
1	3 production *fall asleep*	0	4	3	5	5	6	23
1	4 profuction *wake up*	1	6	4	5	6	6	28
1	5 production *sequence*	2	5	4	5	6	6	28
1	6 production *sequence*	3	5	6	6	6	6	32
1	7 understand sequence	3	5	6	6	6	6	32
1	8 understand sequence	3	4	5	6	6	6	30
1	9 *sleep* nonvolitional	6	6	6	6	6	6	36
1	10 *get up* volitional	5	3	6	6	6	6	32
2	11 *fall asleep* unconscious	a0 b0	a0 b0	a0 b3	a4 b3	a3 b2	a6 b6	a13 b14
2	12 *wake up* unconscious	a6 b5	a6 b6	a5 b6	a5 b5	a5 b6	a6 b6	a33 b34
1	13 *sleep* durative	1	4	4	5	6	6	26
1	14 *get up* durative	0	4	4	3	5	5	21
1	15 *fall asleep* instantaneous	0	1	4	3	4	6	19
1	16 *wake up* instantaneous	0	4	3	1	5	6	19

1	17 *sleep* durative	2	4	4	6	6	6	28
1	18 *fall asleep* volitional	2	3	2	3	5	6	21
1	19 *wake up* nonvolitional	3	3	2	3	3	6	20
1	20 *fall asleep* nonvolitional	2	1	2	3	6	6	20
1	21 *sleep* time	3	3	4	5	6	6	27
1	22 *get up* time	3	3	2	3	6	6	23
2	23 *sleep* necessity	a0 b4	a3 b3	a5 b5	a6 b6	a0 b6	a6 b6	a26 b30
2	24 *get up* [–necessity]	a0 b1	a3 b2	a5 b3	a6 b5	a6 b4	a6 b6	a24 b21
1	25 *sleep* animate	2	3	6	5	5	6	27
1	26 *get up* move	0	3	3	4	4	5	19
2	27 *sleep* unconscious	a1 b2	a5 b4	a6 b5	a6 b4	a6 b4	a6 b6	a30 b26
3	28 *sleep* place	a0 b2 c2	a1 b1 c2	a2 b6 c6	a2 b5 c3	a4 b4 c5	a6 b6 c6	a15 b24 c24
1	29 sleep rest	3	3	5	4	6	6	27
3	30 *get up* 3 opposites	a2 b0 c1	a5 b5 c4	a6 b3 c5	a6 b5 c6	a6 b6 c6	a6 b6 c6	a31 b25 c28
39	Totals (out of 39x6=234)	80	139	169	182	205	232	Total: 1,007 (out of 1404)

Table 5 shows that altogether, the subjects of this research scored 1,007 correct answers out of 1404 questions. This means that their percentage of success in the production and comprehension of the 'sleep' verbs is 72%. However, if the results of group F, the control group, are removed, the percentage of success drops to 66% (775 correct answers of groups A-E out of 1,170).

Table 6 shows the average knowledge of semantic features of each one of the 'sleep' verbs by the majority of each group, where + means that most of the group (4-6 subjects) knew the answer; – means that most of the group did not know the answer, and ± means that half the group (3 subjects) knew the answer and half did not. The purpose of this Table is to give a general impression of feature acquisition for each verb by each group.

Table 6: Average Knowledge of Semantic Features of 'Sleep' Verbs by Age Groups (N=36)

A. The Verb *Sleep*

Feature	Based on Question	A	B	C	D	E	F
–Volitional	9	+	+	+	+	+	+
–Instantaneous	13	–	±	±	+	+	+
–Conscious	12,27	–	+	+	+	+	+
–Dependent on Time	21	±	±	+	+	+	+
–Dependent on Place	28	–	–	+	+	+	+
+Necessity to Life	23	–	±	+	+	+	+
Takes [+Animate] Subject	25	–	±	+	+	+	+

B. The Verb *Get Up*

Feature	Based on Question	A	B	C	D	E	F
+Volitional	10	+	±	+	+	+	+
–Instantaneous	14	+	+	–	–	+	+
–Dependent on Time	22	±	±	–	±	+	+
–Necessity to Life	24	–	–	+	+	+	+
+Ability of Moving to Vertical Position	26	–	±	±	+	+	+

C. The Verb *Fall Asleep*

Feature	Based on Question.	A	B	C	D	E	F
+Volitional	18	–	±	–	–	+	+
–Volitional	20	–	–	–	±	+	+
+Instantaneous	13	–	–	+	–	±	+
+Conscious	11	+	+	+	–	±	+

D. The Verb *Wake-Up*

Feature	Based on Question	A	B	C	D	E	F
–Volitional	19	±	±	–	±	±	+
+Instantaneous	14,16	–	±	–	–	+	+
+Conscious	12	+	+	+	+	+	+

Table 7 presents the production of the 'sleep' verbs by age groups A-E. The results of group F, the control group, were not included because they were 100% correct, and as such, cannot reflect development.

Table 7: Production of 'Sleep' Verbs by Age Groups A-E (N=30)

Verb	Based on Question	A	B	C	D	E	Total	% of Production
Sleep	1	5	6	6	6	6	29	97
Get-up	2	5	6	6	6	6	29	97
Fall asleep	3	0	4	3	5	5	17	57
Wake-up	4	1	6	4	5	6	22	73
Get up as opposite of 3 other verbs	30a,b,c	3	14	14	17	18	66 (out of 90)	73

The percentage of the production of the 'sleep' verbs by the first four groups is quite similar to that of other four groups of identical ages, consisting of four subjects per group, who were tested in a pilot study preceding this one. The subjects were children in the same institutions as those used in this study. Table 8 below presents their answers to the same questions.

Since it seems that there is a high correlation in production between groups A-D of the two studies, and since Table 7 shows that the results of group E were nearly as good as those of the control group F, it would be interesting to show the production of the 'sleep' verbs by the 40 subjects of groups A-D in both studies. Table 9 below presents the production of the 'sleep' verbs by groups A-D in the two studies.

Table 8: Production of 'Sleep' Verbs by the Same Age Groups from the Pilot Study (N=16: 4 per group)

Verb	Based on Question	A	B	C	D	Total out of 16	% of Production
Sleep	1	3	4	4	4	15	94
Get-up	2	1	4	4	4	13	81
Fall asleep	3	0	1	4	2	7	44
wake-up	4	0	4	4	3	11	69
Get up as opposite of 3 other verbs	30a,b,c	4	12	10	9	35 (out of 48)	73

Table 9: Production of 'Sleep' Verbs by Groups A-D in Both Studies (N=24+16=40; 10 per group)

Verb	Based on Question	A	B	C	D	Total	%
Sleep	1	8	10	10	10	38	95
Get-up	2	6	10	10	10	36	90
Fall asleep	3	0	5	7	7	19	48
wake-up	4	5	10	8	8	31	78
Get up as opposite of 3 other verbs	30a,b,c	7	26	24	26	83	69

Figure 1 below demonstrates the mean production of the 'sleep' verbs by groups A-D of both studies: the present one and the pilot study, as shown in Table 9 above.

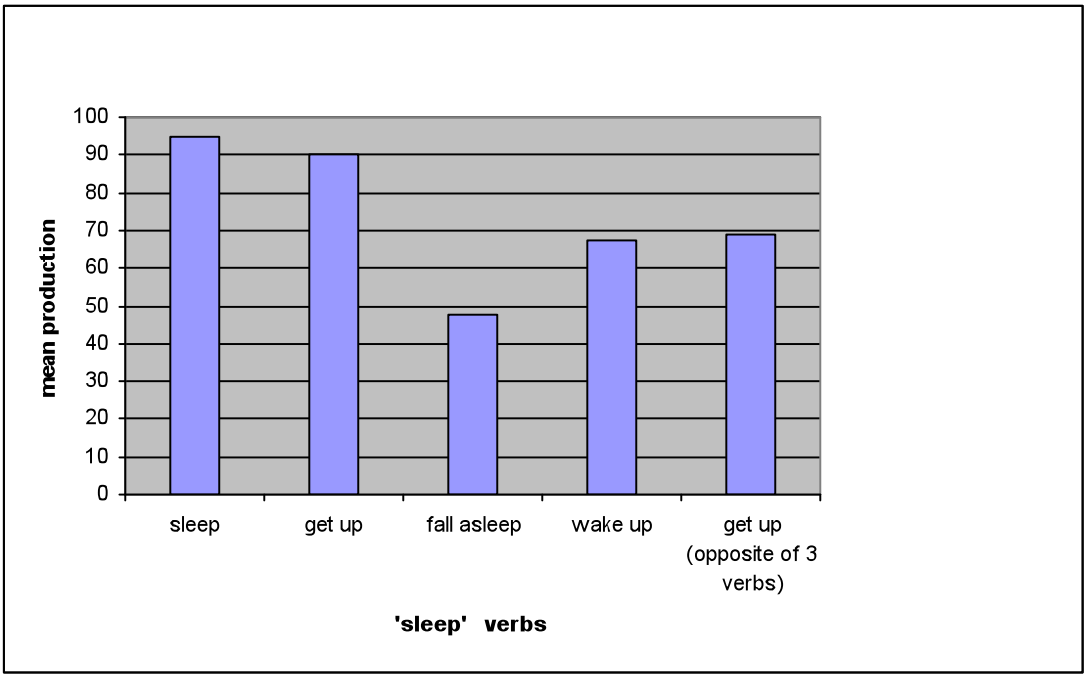

Figure 1: Production of the 'Sleep' Verbs by Age Groups A-D in Both Studies

Table 10 below demonstrates the knowledge of other properties of the 'sleep' verbs by the subjects of this study. The number in each box indicates number of correct answers.

Table 10: Understanding and Production of Other Features of the 'Sleep' Verbs by Each Age Group (N=36)

Properties	Based on Question	A	B	C	D	E	F	Total	% out of 36
Understanding of sequence *fall asleep-sleep*	7	3	5	6	6	6	6	32	89
Understanding of sequence *wake up-get up*	8	3	4	6	6	6	6	31	86
Production of sequence *fall asleep-sleep*	5	2	5	4	5	5	6	27	89
Production of sequence *wake up-get up*	6	3	5	6	6	6	6	32	89
Distinction between *sleep-rest*	29	3	3	5	4	6	6	27	75
Sleep = longer than *get up*	17	2	4	4	6	6	6	28	78

Since Table 10 too shows that groups E and F demonstrate nearly complete knowledge/production of the above properties, and since the subjects of the pilot study were asked exactly the same questions as those referred to in Table 10, it would be interesting to show the knowledge of the above properties by the 40 subjects of groups A-D in both studies. Table 11 presents the understanding and production of the same properties as Table 10 by the subjects of the two studies.

Table 11: Understanding and Production of Other Features of the 'Sleep' Verbs by Age Groups A-D in Both Studies (N=40)

Properties	A	B	C	D	Total out of 40	% of Knowledge
Understanding of sequence *fall asleep-sleep*	6	8	10	10	34	85
Understanding of sequence *wake up-get up*	6	8	10	10	34	85
Production of sequence *fall asleep-sleep*	2	7	8	9	26	63
Production of sequence *wake up-get up*	4	7	8	10	29	73

Distinction between *sleep-rest*	5	4	5	7	21	53
Sleep = longer than *get up*	3	6	8	10	27	68

Table 6C,D above shows that the subjects of the research understand the features of volitionality, instantaneity and consciousness for the verb *wake up* better than for *fall asleep*.

Table 6A,B shows that the subjects understand the features of volitionality and instantaneity for the verb *sleep* better than for *get up*. These two findings point to the greater difficulty of *fall asleep* and *get up* compared to their respective counterparts *wake up* and *sleep.* The differences of knowledge of the three features – volitionality, instantaneity and consciousness – can point to the order of acquisition, which seems to be *sleep-get up-wake up-fall asleep.*

Table 12 presents the knowledge of each feature by age groups A-E. Group F was excluded because, as a control group of older children, they knew all these features.

Table 12: The Knowledge of the Features Volitionality, Instantaneity & Consciousness and Production of the 'Sleep' Verbs by Groups A-E, Presented in % of Correct Answers

Feature	Based on Questions	*Sleep*	*Get up*	*Wake up*	*Fall asleep*
Volitionality	9,10,18,19,20	100	87	47	48
Instantaneity	13,14,15,16	67	53	43	43
Consciousness	11,12,27	72	100*	92	25
Production	1,2,3,4	97	97	73	57

*This answer is assumed. Consciousness was not tested for the verb *get up* because it was assumed that children are aware of the fact that they are conscious while they get up. Formulating such a question without it being too obvious would be very difficult. In addition, asking children more questions than the 39 they were asked seemed to tax their patience and cooperation too much.

Figure 2, which is based on Table 12, shows the results graphically.

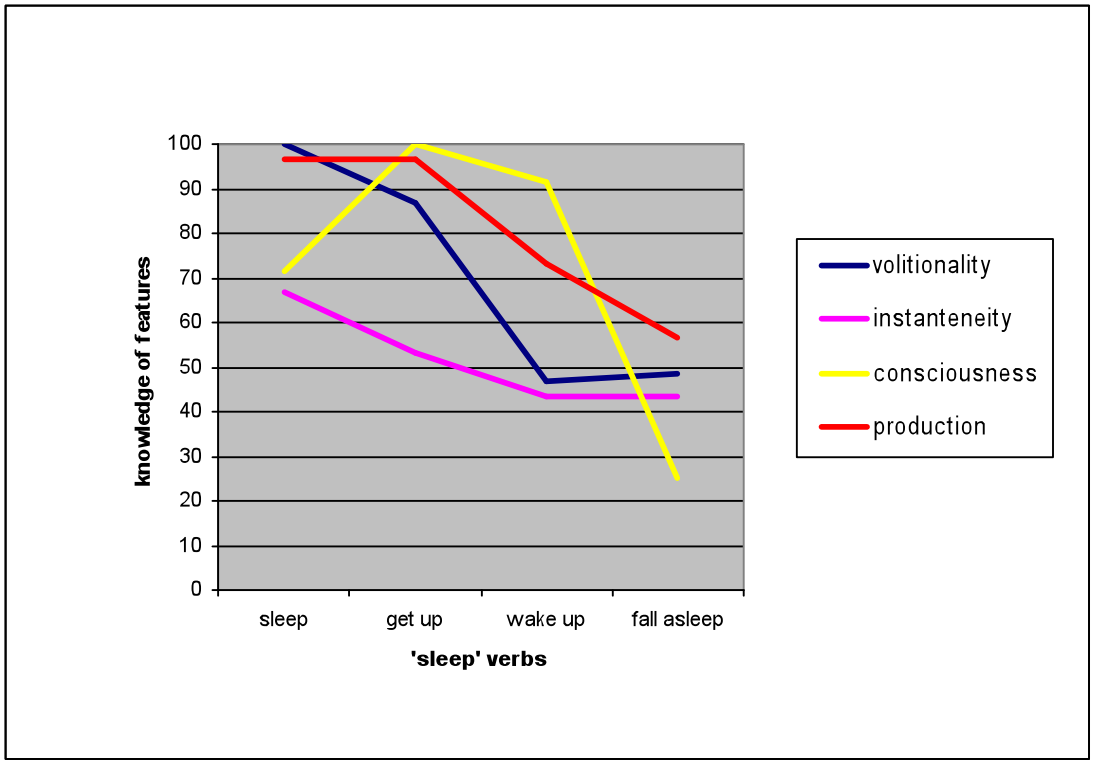

Figure 2: Knowledge of the Features Volitionality, Instantaneity & Consciousness and Production of the 'Sleep' Verbs by Groups A-E

Interpretation of Results

What can be learnt from the results of this study about the semantic acquisition of the 'sleep' verbs?

Order of Acquisition of the 'Sleep' Verbs

Table 9 and Figure 1 reveal that the order of production of the 'sleep' verbs is not as was assumed (*sleep-get up-fall asleep-wake up*), but rather *sleep-get up-wake up-fall asleep*. Only 48% of the children in groups A-D in both studies produced *fall asleep*, whereas 78% produced *wake up*. This finding is quite surprising. Tables 7 & 8 show that in both studies no subjects from group A and only 5 from group B managed to produce the verb *fall asleep*. Does this mean that *fall asleep* is acquired after *wake up*?

Table 11 shows that the production of the sequence *fall asleep-sleep* in both studies is slightly poorer than that of *wake up-get up*. Table 5 and Figure 1 also show better understanding of the features of *wake up* than those of *fall asleep*. Table 12 shows significant differences in the understanding of the features of consciousness of the two verbs – 25% understood the consciousness feature of *fall asleep* whereas 92% understood that of *wake up*. All this suggests that the verb *wake up* is probably acquired before *fall asleep*, contrary to our hypothesis. Therefore Table 1, which showed the assumed order of acquisition, needs to be remade. The result is Table 13 below.

Table 13: The Role of Markedness and Positivity in the Order of Acquisition of the 'Sleep' Verbs – Corrected Order

Verb	Positivity	Markedness	Order of Acquisition of Pairs	Order of Acquisition within Pairs
Sleep *Get up*	+ –	– –	1	*Sleep* is acquired before *get up*
Wake up *Fall Asleep*	– +	+ +	2	*Wake up* is acquired before *fall asleep*.

Now that all the findings reveal that *fall asleep* is acquired after *wake up*, it remains for us to explain this order of acquisition. Several reasons can be suggested. First, the frequency of *wake up* is far greater than that of *fall asleep*. The child hears adults telling him or her to "wake up" but never to "fall asleep", since in that sense it is nonvolitional. Instead, he or she is told to go to sleep or just to sleep. This analysis also highlights the causality of *wake up* contrary to *fall asleep*: In Hebrew, the verb *nirdam* (*fall asleep*) has a causative form *hirdim* (cause to fall asleep), which is used in medical contexts (anesthetics) as well as in the context of boredom (The lecturer *hirdim* – put to sleep – the listeners with his monotonous speech). The following sentences demonstrate this difference between the two verbs:

1. Wake me up at 3 o'clock.
2. I woke up at 3 o'clock.
3. *Fall me asleep at 3 o'clock.
4. I fell asleep at 3 o'clock.

In addition, *fall asleep* has only one opposite: *wake up*, but *wake up* can be said to have two converse terms: both *fall asleep* and *sleep*. Secondly, *wake up* and *get up* are much more distinct activities than are *sleep* and *fall asleep* and therefore they cause less confusion. This is why most of the subjects in group A in both studies failed to answer question 5, in which they were asked to say what the woman in the picture is doing now that she has fallen asleep. Instead of saying 'sleeping' – which is what the picture shows, they said: "She is getting up" – because they identified *fall asleep* with *sleep*. At quite an early age the child can distinguish between *wake up* and *get up* and know that the former does not necessarily entail the latter. Yet it is difficult to distinguish between *fall asleep* and *sleep* since these are not two separate, discrete actions (a fact that is reflected in the morphological and phonological similarity of the two verbs in English, but not in Hebrew: *leheradem* להרדם – *lishon* לישון). These two activities do not even really follow each other in temporal terms since when *fall asleep* occurs, *sleep* occurs at the same time but is [+ Durative]. Therefore it is very likely that a child will not be able to distinguish between the two.

It must however be noted that *wake up* and *get up* also caused confusion among the youngest subjects. When asked what they would do if they fell down, some of them answered that they would wake up. Yet the confusion of *sleep–fall asleep* was much greater, as can be seen in the findings.

The third possible reason for the later acquisition of *fall asleep* compared to *wake up* lies in the greater semantic complexity of the former. As presented before, the verb *fall asleep* can be [±Volitional] and [±Instantaneous], whereas *wake up* is

[–Volitional] and almost always [+Instantaneous]. In addition to this ambiguity of *fall asleep*, it is also [–Conscious], whereas *wake up* is [+Conscious], which adds to the complexity of *fall asleep*, since the feature [–Conscious] is more difficult for children than the feature [+Conscious]. A comparison between the features of the marked verbs is portrayed in Table 14 below.

Order of Acquisition of Semantic Features

The above findings (Tables 5-14) have shown that both understanding of the semantic features and production of the 'sleep' verbs increase with age. By comparing the correct answers of the groups, this increase can be demonstrated. Table 15 below presents a comparison of the knowledge of the 'sleep' verbs as reflected in this study, by the subjects of each group. This Table is an elaboration of the bottom of Table 5. The maximal possible number of correct answers per group is 234.

Table 14: Comparison between the Complexity of the Features of the Marked 'Sleep' Verbs

Feature	*fall asleep*	*wake up*
Volitional	±	–
Instantaneous	±	+
Conscious	–	+

Table 15: Comparison of the Correct Answers of Each Group (N=36)

Group:	A	B	C	D	E	F
No. of Given Answers	80	139	169	182	205	232
% of Correct Answers	34	59	72	78	88	99

The percentage of correct answers by each group shown in Table 15 can clearly be taken to represent increased knowledge of 'sleep' verbs with age, as portrayed graphically in Figure 3 below.

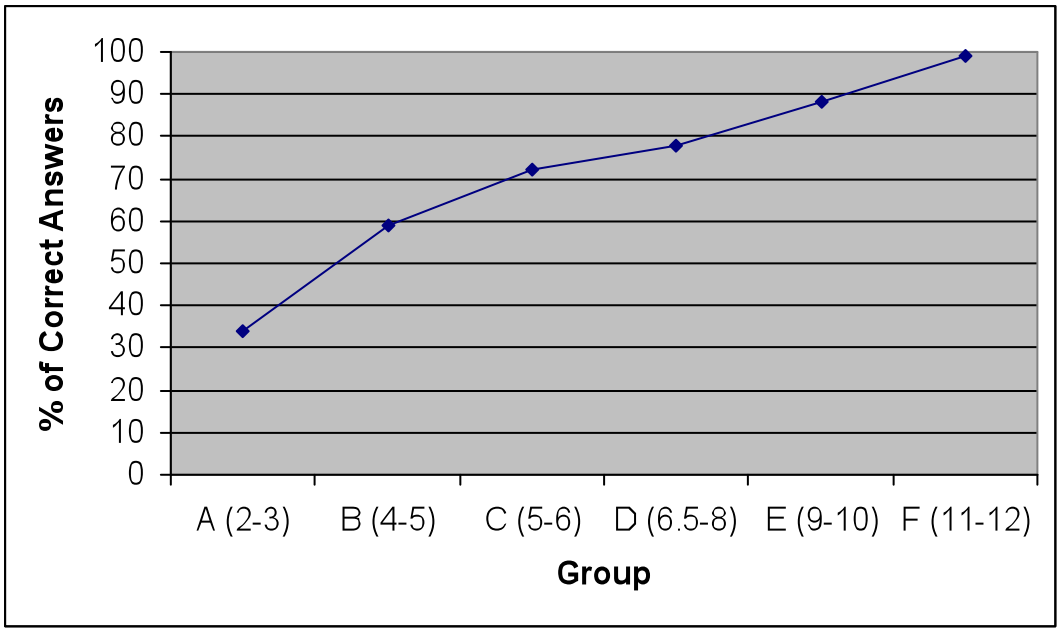

Figure 3: Increase of Knowledge of 'Sleep' Verbs with Age As Demonstrated by the Subjects of This Study

The increase of knowledge of semantic features with age is in fact predictable since it is natural for a child to develop his or her cognitive knowledge and acquire more semantic features while growing up. Yet it would be more interesting to show which features of the 'sleep' verbs are acquired first, and which last. The order of acquisition of the semantic features is based on the average percentage of correct answers given by the subjects of groups A-E. Group F (the control group) was excluded since its members knew almost all the answers to the questions which test each of these features. Table 16 below shows the order of acquisition of the semantic features of the 'sleep' verbs.

Table 16: The Knowledge of Each Semantic Feature of the 'Sleep' Verbs by Groups A-E (N=30)

Feature	based on questions	No. of Correct Answers	No. of Possible Correct Answers	% of Knowledge
1. Sequence *wake up-get up*	6,8	50	60	83
2. Sequence *fall asleep-sleep*	5,7	48	60	80
3. Animacy	25	21	30	70
4. Volitionality	9,10,18,19, 20	99	150	66
5 .Necessity to Life	23a,b, 24a.b	77	120	64
6. Dependence on Time	21,22	38	60	63
7. Consciousness	11a,b,12a,b 27a,b	114	180	63

8. Instantaneity & Duration	13-17	84	150	56
9. Dependence on Place (bed)	28a,b,c	45	90	50
10. *Get up* requires upright position	26	14	30	47

Figure 4 below shows the order of acquisition of the semantic features graphically. The feature numbers in Figure 4 are the same as those in Table 16.

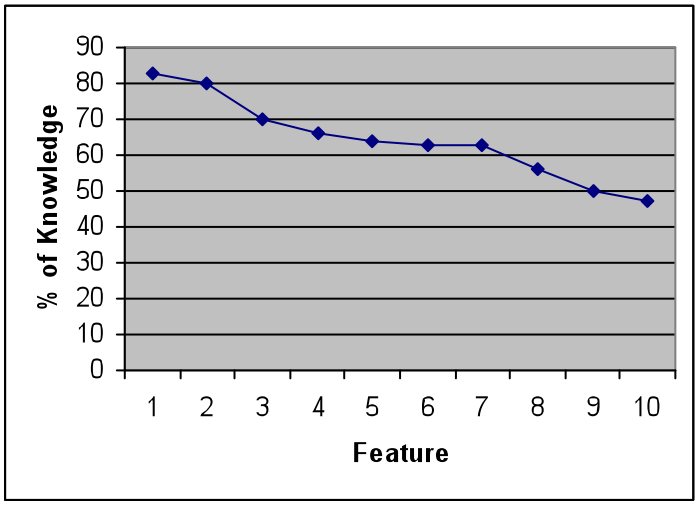

Figure 4: The Order of Acquisition of the Semantic Features of 'Sleep' Verbs by Children in Groups A-E (N=30)

Both Table 16 and Figure 4 clearly show which semantic features of the 'sleep' verbs were easier and which were more difficult for the subjects of this research.

What makes each feature in the above list more difficult than the one preceding it? The answer to this question is given in the Discussion, following a brief examination of certain relevant semantic theories.

Discussion

Findings about Children's Behavior

Children's Functional Approach

Although this study is restricted to a small, homogenous population, it can serve as a basis for revealing certain important facts about children's semantic acquisition and their attitude to questions. Thus, for instance, it was found in the course of this study, that children tend to identify the possibility of doing things with necessity. Most of the youngest children said that they, or their parents, could not avoid getting up after waking up because they had to go to work or to kindergarten (i.e., to function socially). This means that they do not understand the concept of *can* (as it appears in question 10: If mother does not want to get up after she wakes up, can she?) as pure, objective possibility, independent of social conventions or requirements, but rather as permission (which is why they said that mother cannot stay in bed, meaning that she may not). Functionality of people or situations, which was reflected in the answers to many questions, determines actions in children's mind. For example, going to bed leads to

falling asleep independent of one's will; waking up is volitional on holidays; sleep is impossible in the day time because people work, and getting up and staying awake are unthinkable at night time because it is dark; sleeping on the floor is impossible because one might catch a cold, etc. This view of life, which a child has until around the age of 11-12, as shown in the interpretation of the results, interferes with a child's understanding of questions. This child's view was observed by Piaget (1926), who noted that *why* questions yield no relevant answers from young children. This instrumental view also interferes with the child's understanding of semantic properties (hence, also acquisition) of words, as was seen in this study. The older children were able to modify their answer after a question was further explained to them and possibility vs. permission was suggested more explicitly. Young children usually did not understand this type of question even after receiving such an explanation, and stuck to their functional approach.

This approach was manifested very interestingly in question 28a, "Is it possible to sleep on a chair?", which was answered negatively by most of the youngest children. When a negative answer was supplied, the child was immediately shown a picture of a girl sleeping on a chair, and asked what the girl was doing. Most of the children did not see that the girl was sleeping and gave answers such as: "Putting on her shoes", "sitting", etc. When told that the girl was actually sleeping and asked whether they thought now that it as possible to sleep on a chair, at least half of them stuck to their negative answer! This behavior will serve, in the course of the discussion, as evidence for our semantic hypothesis.

The Problem of Correct Answers

Problems arise not only in interpreting wrong answers, but also in accepting correct ones. When correct answers were given, we could not always rely on them as evidence for children's understanding of the feature tested or the question asked because in some cases the children in the youngest age group gave more correct answers than those in the older age groups, a fact that is counter-logical and obviously hard to understand. A normal child of two cannot have a higher cognitive development than that of a normal five year old child. The better results of the young age groups in these questions (see Table 5, question 10, groups A,B fox example) can be attributed to casual yes/no answers which do not reflect understanding. Another possibility is that both these questions consist of a conditional clause (if) and a main clause, and as such were too difficult for the youngest children, who did not really understand them and gave arbitrary answers. As Clark (1975) notes, "Correct responses may mislead us into thinking he [the child – S.K.] knows more about meanings than he does." Her advice is to identify the strategies implemented by the child in different contexts. This will enable us to distinguish between responses based on full, and those based on partial, semantic knowledge.

Clark's advice was applied in this study by posing several overlapping questions. For instance, although it was found that most of the children in all age groups distinguish between the action of waking up and getting up since they produce both terms in their correct contexts (Tables 7,8), still, in some deeper sense they do not distinguish between the two concepts. This can be seen in their answer to the introductory part of question 26, "Do flowers sleep sometimes?" and then in the answer to the target question 26 (which was asked only if the answer to the introductory question was positive), "Do they get up after they sleep?" which was positive (and mistaken). Many children in groups A-D confirmed that flowers get up after they sleep. These children were hardly aware of the feature [+Changing position to vertical] which is one of the most important features of *get up* (and is also a very difficult feature, as can be inferred from the fact that it was the last to be acquired – see Table 6). They did not

know that flowers cannot get up because they are anyway in a vertical position and cannot move. In a larger scale research, with more subjects, the relative weight of accidentally correct answers would be counterbalanced by the number of subjects. Ideally, more overlapping questions would counterbalance such answers, but then each interview would be so long that it would tire the children out completely. This is a methodological consideration that cannot be separated from any research, particularly on children.

The Problem of Sleep's Essentiality to Life

Another interesting finding in this study is the fact that none of the children knew to what extent sleep is essential to life. When asked in question 23a "What will happen to you if I don't let you sleep at all (for many days)?" they usually gave four types of answers, according to their level of maturity, as is shown in Table 17.

Table 17 shows that ten children gave irrelevant answers or simply said they did not know. These answers were given by the youngest children, probably because a hypothetical situation of this nature was too complicated for them to understand. The

Table 17: Answers to Question 23a about Lack of Sleep

Mainly Groups	Ages	Answers	No. of Children
A,B	2-5	Irrelevant answers	10
B,C	4-6	I will be tired	7
C,D	5-8	I will fall asleep anyway	13
E,F	9-12	I will feel sick/weak	6
Total			36

three types of relevant answers reflect three stages of cognitive development. The answer "I will be tired", which was given mainly by the youngest children, reflects their consideration of immediate results, since at a young age they cannot conceive of far reaching, remote consequences. The answer "I will fall asleep anyway" reflects an attempt to give a more precise answer, based on past experience – they always fall asleep at night somehow – even if there is noise or some other interfering factor (like pain or some excitement). The answer "I will feel weak/sick" reflects a higher stage of cognitive development, since it is an attempt to answer the question not based on past experience but on analogy with other lacks or situations, probably hunger or sickness, which also cause people to feel sick or weak.

According to information given to us by a physician, a person can stay awake up to 10-11 days, gradually passing stages of extreme nervousness, lack of self control, double vision, terrible headaches, dizziness, inability to stay in vertical position, inability to distinguish visual, vocal and tactile information, loss of consciousness, irreversible madness and even death. It must be admitted, though, that not only children are not aware of the above consequences of complete lack of sleep, but also adults, who hardly ever experience such dreadful situations. For obvious reasons, no experiment of lack of sleep has ever been conducted for longer than 8-9 days. But there was no point in expecting to receive this answer from the subjects of this research, nor from older subjects for this matter. In fact, it was very difficult to decide which answer should be considered as correct, since, in a sense, all the

answers given were correct, considering the ages of the children. Eventually it was decided to accept all the relevant answers as correct, since all of them reflect the subject's understanding of the importance of sleep, and the level of understanding was perfect for their ages.

The Role of Positivity

Another finding of this study was the unpredictable (counter-intuitive) fact that positivity does not play any major role in the order of acquisition of the 'sleep' verbs (see Table 17). The factor that does play a major role is markedness, which is determined mainly by frequency. A child acquires the word he or she hears earlier than other words. Therefore *wake up* is acquired before *fall asleep*, although this is a negative-positive order. Perhaps another factor for this order is the fact that *fall asleep* is in a more complex morphological pattern (*Binyan* in Hebrew) than *sleep*, as was mentioned before, and has other morphologically related verbs, such as *hirdim* (cause to sleep), which was mentioned before and *hurdam* (was made asleep by someone – passive for *hirdim*). Still, although morphological complexity does not really play a role in the order of acquisition (Berman), there is some correlation between the semantic and morphological properties of this verb.

Children do not only acquire unmarked words first, they also tend to overextend those words to include marked words from the same family (Ingram 1989). Thus, a child overextends *car* to a wide range of vehicles such as *motorcycle, bike, truck, plane* and *helicopter.* Clark (2003) also claims that "children under two-and-half or so may overextend words and rely heavily on deictic terms to identify target referents for their addressee." (p. 299) This means that, for young children, the meanings of *sleep* and *get up* include those of *fall asleep* and *wake up*. This quality of children is well-recorded in the literature and is manifested in different ways, such as over-inclusion of names of similar animals or objects (Bloomquist 2007).

Factors in Order of Acquisition

One factor in the order of vocabulary acquisition is definitely that of input, that is, children will acquire first the words they hear around them, words which are addressed to them by their parents, etc. Other factors that determine which words children acquire earlier or later may depend on more internal, psycholinguistic factors of semantic acquisition.

Below we consider some theories of semantic acquisition and try to show whether, and how, they account for the acquisition of the 'sleep' verbs.

Clark (1973a) postulates her Semantic Feature Hypothesis, in which she claims that the child acquires overall features of a word gradually, overextending them to include other meanings, as was noted in this study: *sleep* and *get up* are overextended to include *fall asleep* and *wake up*. *Sleep* is overextended to *rest* and *lie down* as well. The whole set of questions in this study followed the Semantic Feature Hypothesis since it tested how the features of the 'sleep' verbs are acquired and at what age.

Clark (1973b) presents a Partial Semantic Feature approach, which was in fact noted in the course of this study. According to this hypothesis, the child uses both linguistic and nonlinguistic strategies when having to determine on meaning. When the subjects of this study were asked questions starting with the words "Do you know" (Do you know when you fall asleep/when you wake up/when your brother falls asleep/wakes up?) the youngest subjects always tended to answer positively, perhaps because children in general are reluctant to admit that they do not know the answer to a question, especially one about themselves. None of the children in groups A-C answered correctly question 11a – "Do you know when

your brother falls asleep?" None of the children in groups A-B knew the correct answer to question 11b ("Do you know when you fall asleep?"), probably not because they thought they knew the time of falling asleep, but because they felt better expressing knowledge concerning themselves. This is definitely a non-linguistic strategy.

Clark and Garnica's (1974) theory of Semantic Complexity as one of the major determiners of the order of acquisition is also relevant for our study since the more complex the word, the later it is fully acquired. This study showed why each 'sleep' verb acquired after the verb *sleep* is more complex than the one acquired previously. *Get up* is more complex than *sleep*, and *fall asleep* is more complex than *wake up*. Therefore the order of acquisition is *sleep-get up-wake up-fall asleep.*

McNeill's Horizontal Development Hypothesis fits the acquisition of the 'sleep' verbs because the child's "different semantic properties from the same word… of… an adult" can be paraphrased as 'lack of features". If, for example, *sleep* applies to both + and – [Animate] things in the child's vocabulary, then *sleep* has different properties in the child's vocabulary from that of the adult. But at the same time it is the result of the lack of features. In the course of time the child acquires more and more features, to adapt his or her vocabulary to that of the adult.

Menyuk's conclusion about semantic acquisition is that

> …"children assign a unique and limited set of properties to the lexical items they use. As they mature this set of properties is modified and expanded." (1971:196)

This approach, which seems self-evident, is very relevant for the 'sleep' verbs. Obviously children, who lack the knowledge of complex features of words, make use of those features they understand. As they mature, they acquire more features and change their own. At first *sleep* for them means an activity that takes place only at night and only in bed. Later they acquire the properties [+Independent of time] and +Independent of place of occurrence], just as they acquire [±Volitional]. Thus their set of properties is expanded and modified.

So far we have examined hypotheses which treat semantic acquisition from a linguistic and general cognitive point of view, but which do not regard the child's psychological development as a major factor in the acquisition of the semantic features. The essence of the semantic hypotheses which we found relevant for the 'sleep' verbs is that the meaning of words consists of features, and the order of acquisition of these features is determined by their complexity. The question which these theories leave unanswered is – which factor determines the complexity of each feature? What is the child's "filter" – processing device – that causes him or her to acquire simple features at an early stage, and blocks the acquisition of complex features?

Cognitive maturity may be the beginning of the answer, and as such should perhaps be combined with pragmatic experience. The older the child grows, the more capable he or she is of understanding new concepts, based on their experience with similar concepts or situations. A child may not acquire an entirely new concept if it does not remind him or her of a situation which they have experienced before. For example, a child cannot say that it is possible to sleep during the day unless he or she has encountered once or even several times some person or animal sleeping in daytime so that they can make the generalization that it is possible. The inability of the youngest children to grasp that it is possible to sleep on a chair even after

seeing such a situation in a picture can be regarded as evidence for this claim. The conclusion drawn by the child that a certain situation is possible, or in other words, the understanding of the situation, is intellectual maturity. Cognitive maturity and pragmatic experience enable the child to understand the new features – that sleep is independent of time and place. When the child realizes that it is possible to rest without sleeping, he or she has learnt more about the verb *sleep*. The semantic complexity of the features gradually acquired by the child is determined by his or her growing experience and ability to understand his or her experience, which is in fact their intellectual-cognitive maturity.

The order of acquisition of the semantic features of the 'sleep' verbs, which is attributed to the complexity of the features, can be reinterpreted now as determined by the child's life experience, which becomes more varied and complex with age.

The child's functional approach to life is also a result of his or her limited life experience and cognitive maturity. These two do not yet enable him or her to understand how situations can be separated from the actions they are connected to. Thus, for example, going to bed at night time means for the child that one has to fall asleep, while the adult knows that it is not necessarily so.

Thus the acquisition of semantic features depends on the child's psychological experience in life and intellectual-cognitive development, namely maturation, which determine the child's order of acquisition of semantic features. The two factors are equally important at a young age, because if the child has experience but not intellectual maturity, he or she will not be able to understand the experience (and the semantic features which represent it). On the other hand, if the child has the intellectual-cognitive maturity but not the experience, he or she will not be able to understand the utmost result of lack of sleep, as was the case with all the subjects. They are (some of them, at least) mature enough to understand the feature [+Essential to life], but they do not have experience with any fatal lack of sleep. The two factors are inseparable, and as we have seen, if one of them is missing, the semantic acquisition is slowed or prevented.

Obviously semantic acquisition has to be tied with general theories of word acquisition or word meaning acquisition. Bloom (2000) claims that children do 'fast mapping': they figure out a good deal of the meaning of new words quickly and accurately. They read other people's intentions across a wide variety of situations. In fact, they read other people's nonlinguistic intentions in a similar way. Children's approach to guessing meanings of new words could be called "problem solving". Bloom claims that children are good readers of other people's intentions and good problem solvers – at least in vocabulary acquisition. Bloom also mentions the function of syntax as an aid to the acquisition of word meanings. This role of syntax is also extensively discussed by Gropen, Pinker, Hollander and Goldberg (1991), who emphasize the connection between syntax and semantics in the acquisition of locative verbs by young children. The study could also be tied to Stolt, Haataja, Lapinleimu and Lehtonen's (2008) study on lexical development, which compared the rate of acquisition of receptive versus expressive lexicon. This ties in with a comparison of the production and comprehension of the 'sleep' verbs, and the understanding that comprehension precedes production. But comparison of production to comprehension of the semantic features of the 'sleep' verbs was not included in the aims of this research.

Summary and Conclusions

This study aimed at examining the semantic acquisition of two sets of converse verbs associated with 'sleep': *sleep-get up, fall asleep-wake up* by Hebrew speaking children aged 2-12. It was hypothesized that the order of acquisition is *sleep-get up, fall asleep-wake up*, determined by the semantic features of markedness and positivity, and that the child has to be at an advanced stage of cognitive development in order to be able to fully understand the semantic features of these verbs.

The results showed that the order of acquisition is different from the one predicted, since *wake up* (which is "negative") is evidently acquired before *fall asleep* (which is positive). Hence positivity does not play as great a role in the order of acquisition of those items as it had been predicted. Instead, the frequency of the verb was found to have a larger role. Positivity plays, perhaps, a great role in the acquisition of relational terms. The order of acquisition of the semantic features of the 'sleep' verbs was postulated as well, and explained by some semantic theories: Clark's (1973a) Semantic Features Hypothesis and (1975) Partial Semantic Feature Hypothesis; McNeill's (1970) Horizontal Development and Menuk's (1971) conclusion about the properties of lexical items. An additional theory was our development of Piaget's theory of child egocentrism, as outlined by Beard (1969) and of McNeill's (1970) explanation of the rate of feature acquisition. The child's experience in life and his or her intellectual-cognitive maturity determine the rate of his or her acquisition of complex features. This conclusion, demonstrated by the feature acquisition of the 'sleep' verbs, coincides with our hypothesis which says that the child needs to have reached a high cognitive development in order to be able to understand the complex features of the 'sleep' verbs. There is a possibility for some pedagogical implications, such as raising the awareness of lower grade teachers as for the complexity of vocabulary acquisition and enabling them to have the tools to analyze new words and concepts that their pupils are trying to cope with.

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Appendix A – Questions

a. Production of *sleep–get up* (with a picture of a tired man)
1. This man is tired. What do you think he is going to do?
2. And after he sleeps all night, what will he do?

b. Production of *fall asleep–wake up*
3. As you see, I am very tired. What will happen to me in a while? (self-demonstration)
4. This woman is sleeping. If somebody enters the room suddenly and makes a noise, what will she do? (with the help of a picture)

c. Production of the sequence *fall asleep–sleep*; *wake up–get up* (with 2 pictures)
5. Mother has fallen asleep. What is she doing now?
6. In the morning mother wakes up. What does she do then?

d. Understanding of the above sequences (with 2 pictures)
7. Mother has been sleeping for a long time, but father has just got into bed. Who fell asleep first?
8. Father got up and went to work very early, and mother has just got up. Who woke up first?

e. Knowledge that *sleep* is [-volitional] once falling asleep has taken place whereas *get up* is [+volitional] (with 2 pictures)
9. If mother does not want to sleep after she fell asleep, can she?
10. If mother does not want to get up after she wakes up, can she?

f. Knowledge that *fall asleep* is unconscious whereas *wake up* is conscious
11. Do you have a sibling? Do you sleep with your brother/sister in one room?
    a. When you look at him/her, can you know exactly when they fell asleep?
    b. When you go to sleep, do you know/feel exactly when you fall asleep?
12. a. If you look at your brother/sister in the morning while they are asleep, can you see them waking up?
    b. When you wake up in the morning, do you know exactly when you wake up?

g. Knowledge that *sleep* and *get up* are [+durative]
13. What takes more time, to sleep or to fall asleep?
14. What takes more time, to get up or to wake up?

h. Knowledge that *fall asleep* and *wake up* are usually [+instantaneous]
15. Is there one moment that one falls asleep or does it take a long time (usually)?
16. Is there one moment that one wakes up or does it take a long time (usually)?

i Knowledge that *sleep* is the longest action
17. What takes more time, to sleep or to get up?

j. Knowledge that *fall asleep* is [+volitional] whereas *wake up* is not.
18. If father goes to bed at night but does not want to fall asleep, can he? (or does he fall asleep anyway)
19. If father does not want to wake up in the morning at all, can he? (or does he wake up anyway?)

k. Knowledge that *fall asleep* is also [-volitional]
20. If I decide to fall asleep right now, here, can I (Is it possible?)?

l. Knowledge that *sleep* and *get up* do not depend on night time
21. Is it possible to sleep in day time?
22. Is it possible to sleep during the day and get up at night?

m. Knowledge that *sleep* is a necessity for life
23.a. What will happen to you if I don't let you sleep at all?
b. What is more important, to sleep or to eat?

n. Knowledge that *get up* is not a necessity to life
24. a. Will anything bad happen to a person if he or she does not get up at all?
b. What is more important, to get up or to sleep?

o. Knowledge that *sleep* requires [+Animate] subject
25. (Do all children sleep at night?
(Do animals sleep at night?)
Do tables sleep at night?

p. Knowledge that *get up* requires the feature of [+ability to move to vertical position]
26. (Do flowers sleep sometimes?)
Do they get up after they sleep?

q. Knowledge that *sleep* is unconscious
27. a. Do you do other (more) things when you are asleep?
b. Do you want to eat when you are asleep?

r. Distinction between *sleep* and place of occurrence (bed)
28. (Does one sleep only in bed?)
a. Is it possible to sleep on a chair? (If not, then what is the girl in the picture doing? – showing a picture of a girl sleeping on a chair)
b. Is it possible to sleep on the floor?
c. Is it possible to sleep of the lawn?

s. Distinction between *sleep* and *rest*
29. (Does your mother rest in the afternoon?)
(Can she sleep while resting?)
Can she rest without sleeping?

t. Knowledge that *get up* is also the opposite of *fall down, rest* and *sit down*
30. a. What does mother do after she rests?
b. If you fall down on the floor and I give you my hand, what will you do?
c. If you sit down and you want to take sweets which are on the table at the other side of the room, what will you do?

Notes

[1] A much shorter version of this article was published as a chapter titled: "How do children acquire the 'sleep' verbs: sleep, get up, fall asleep and wake up in their native language?" in *How Do Children Learn Best?* Edited by Derya Sahhuseyinoglu and Dzintra Ilisko, Children's Research Center, Turkey, 2010.

[2] This refers to the context of sleeping. We are aware of the fact that the verb *get up* is used after resting/lying down or sitting – in Hebrew. This will be discussed later on in this section.

[3]In fact this statement is the first hypothesis for the present study and is mentioned here since it is relevant to the definition of the problem.

[4]The 'cost' of learning new words is a lot smaller when they are not entirely new but contain morphemes similar to those in words already known, according to Jackendoff (1974). In my opinion, this applies both to first and foreign or second language learning.

[5] The act of falling asleep is usually instantaneous; however, there are sometimes interim situations – a gradual passing from a conscious to unconscious state. In this study I regarded this act of falling asleep as instantaneous, and when asking a relevant question I always emphasized the word *usually* (Does it usually take a long time to fall asleep or is it done in a moment?). *Wake up* can also be
[- Instanteneous], but since this does not happen frequently, I preferred to ignore this possibility in this study.

[6] *Fall asleep* is regarded as [+Volitional] when a person does not want to fall asleep, since he or she can try to avoid it. Yet it is considered [-Volitional] in case a person does want to fall asleep because (a) one cannot determine the exact time of one's falling asleep and (b) sometimes one wants to fall asleep but cannot. Thus, when there is a will, the verb is [-Volitional] and when there is not, it is [+Volitional]. This interesting property of *fall asleep* is portrayed schematically below:

Fall asleep

Will	+	–
Volitionality	–	+

Both + and – aspects of Volitionality concerning the verb *fall asleep* were checked in the present study, in questions 18-20 (See Appendix A). The + and – Volitionality of the verb *fall asleep* can be semantically/distributionally characterized in terms of possible linguistic contexts: e.g.,
*I decided to fall asleep at 11:48.
I decided not to fall asleep till morning.