A Tenseless System in Search of Tense-oriented Constructions: The Case of Spoken Israeli Hebrew

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A wide range of literature has dealt with the verb system of Hebrew over the years, yet, most of these are either diachronic descriptions or textbooks which present a more traditional view. The descriptions of Hebrew in the literature comprise of all Hebrew layers. Those which claim to deal with Modern Hebrew suggest that the Hebrew verb system is a tense-based system, which consists of seven verb patterns.

The current study was performed on a mini-corpus of Spoken Israeli Hebrew, which consisted of recorded spontaneous conversations of fifteen Israeli Hebrew speakers in different occasions. The results show some outstanding findings regarding the means, which Israeli speakers use to express tense, mood and aspect (TMA) in Hebrew, and suggest that Modern Hebrew is an aspect-based system rather than a tense-based one, which consists of only five verb patterns.

1 Introduction

Hebrew is mostly a derivational morphology language, characterized by synthetic structures. Verbs in the language are always constructed by a combination of a root and a pattern, whereas nominals can be constructed by inflectional means as well. The root is always consonantal, whereas the pattern contains vowels, and optionally also consonants. The pattern has reserved locations in-between the vowels (and consonants, if exist), where the consonants of the root should be integrated. Examples of a combination of a root and a pattern in Hebrew are presented in section 3 below.

TMA studies in Hebrew are very few, and were mainly performed on random written texts or questionnaires, as such texts are available and easy to get (Muchnik 1989, Ambar 1989, Tsivoni 1991, Bar 1999, 2001, Schwarzwald 2001, Tsarfaty 2004). Such texts, taken from different layers of literary Hebrew, do not reflect the spoken variation of Hebrew.

The current study is a subset of a pilot study, which was held on 22 informants, and was performed in order to design a broader TMA research in Hebrew. It was aimed at the investigation of tense, mood and aspect in the verb system of Spoken Israeli Hebrew (SIH), trying to ignore the traditional division of verb tenses. The study included both native and non-native speakers of Hebrew, living in Israel. The non-native speakers were living in Israel for over

five years at the time of the recordings. The study was meant to investigate, which verbal means are used by Israeli Hebrew speakers, native and non-native, to express TMA categories.

The findings show that in addition to the differences between native and non-native speakers in the use of TMA categories, the usage of verb patterns in both groups was different from the traditional Hebrew verb system described in the literature.

2 TMA Definitions

Tense, mood and aspect are semantic categories, expressed by various linguistic means (Dahl 1985:1). The following definitions of tense, mood and aspect were used for the analyses in this study.

2.1 Tense

Time in language is a grammatical way to express or describe a situation in a specific time point. The described time point can be either speech time, then referred to as absolute tense, or another time point, then referred to as relative tense (Comrie 1976:2, 6, 1985:9). Time reference in the language is usually carried by the verb (Crystal 1997:438).

2.2 Aspect

Aspect is a grammatical way to describe the internal temporal structure of events, states or actions in a specific situation. These events can be either independent or related to each other (Comrie 1976:2, 3, 6; Dahl 1985:24; Crystal 1997:421). Aspect deals with the temporal **structure** of situations, whereas tense deals with their temporal **location** (Bhat 1999:43).

2.3 Mood

Mood is a grammatical way to describe the speaker's attitude towards a situation or his/her opinion about this situation (Palmer 1986:2, 16), i.e. attitudes, wishes or feelings, expressed by a grammatical structure (Crystal 1997: 432).

3 Overview of Hebrew verb morphology

The basic forms in the verb system of Hebrew are purely synthetic, i.e. verbs are always constructed by a combination of a consonantal root and a pattern. The obtained forms constitute a stem, to which affixes are attached to obtain more specific details, such as gender, number and person, as well as aspect and mood.

The agglutination of these affixes can sometimes entail phonological changes in the stem, but these are out of the scope of this study, and hence are not discussed here.

In order to form a Hebrew verb, two components are needed: A consonantal root and a pattern. The consonantal root is a building block of the verb and noun systems in Hebrew. It usually consists of three radicals, but in other cases can also consist of four, five or even six radicals. Five or six radicals in a root are rare, but a four radical root is quite widespread in Hebrew. Some roots may seem to have only two radicals, but this mainly happens when one of the three radicals is a weak consonant, such as a semi-vowel or a glottal consonant, which tends to be dropped in most of the locations where it appears. The radicals usually represent a general meaning. The radicals themselves are not independent, and cannot stand alone without being integrated into a pattern, which assigns their specific meaning. A pattern in the Hebrew verb system is called *Binyan* (plural: *Binyanim*). Patterns are claimed to have constant meanings. Yet, patterns can carry a dominant meaning, as well as many other recessive ones. A pattern can also entail a duplication of one of the radicals, and/or the insertion of a consonant in addition to the vowels. Duplication of any consonant in Hebrew is anchored in the Hebrew vowelized orthography only, and is never pronounced in speech. The patterns, which contain the duplication, are usually the ones which are used for inserting new verbs into the language, and new quadri-consonantal roots into the verb system, since they consist of an additional consonant in their deep structure. Most of the roots cannot integrate with all patterns, i.e. most of the roots can appear in only some of the patterns, but not in others. Roots, which integrate with all patterns, are rare.

Examples of verb construction in Hebrew are presented below. The examples show the root X•S•b, having the basic meaning of 'think', in different verb patterns. The presented forms are basic stems, to which affixes can be added in order to obtain extra-information, such as gender, person and number. The basic stems always refer to third person, masculine, singular. Transcription is given in Sampa.

(1)	Root:	X		S		b	
	+	⇩		⇩		⇩	
	Pattern:	C_1	a	C_2	a	C_3	(basic neutral meaning)
	=	⇩	⇩	⇩	⇩	⇩	
	Word:	X	a	S	a	v	'think'

(2)	Root:			X	S		b	
	+			⇩	⇩		⇩	
	Pattern:	h	i	C_1	C_2	i	C_3	(basic causative meaning)
	=	⇩	⇩	⇩	⇩	⇩	⇩	
	Word:	h	e	X	S	i	v	'consider'

(3)	Root:	X		S			b	
	+			⇙	⇘		⇩	
	Pattern:	C_1	i	C_2	C_2	e	C_3	(basic agentive meaning)
	=	⇩	⇩	⇘	⇙	⇩	⇩	
	Word:	X	i	S		e	v	'calculate'

(4)	Root:				X		S			b	
	+						⇙	⇘		⇩	
	Pattern:	h	i	t	C_1	a	C_2	C_2	e	C_3	(basic reflexive / reciprocal meaning)
	=				⇩	⇩	⇘	⇙	⇩	⇩	
	Word:	h	i	t	X	a	S		e	v	'take into account'

4 Study design

4.1 Corpus

The study presented here was held on a sample of 15 Israeli Hebrew speakers, males and females, ages 20 and up, from different origins and education levels. Out of these, four were non-native from different origins: two from Russia, one from Hungary and one from France, living in Israel for at least five years.

Ordinary, spontaneous, conversations on various subjects were recorded on a digital recording device. These conversations were used as a mini-corpus, in order to characterize preliminary trends of TMA categories in Hebrew.

The recordings had different durations. The total duration of the recordings was about 240 minutes. Counting words in representative chunks and calculation of the average number of words per discourse minute revealed that a continuous conversation of 4 minutes usually contained over 500 words, and thus the average number of words per discourse minute was about 132. Truncated words, unclear speech sequences and laughter were not taken into account when counting. Thus, continuous chunks of at least 4 minutes were used in the study. This way, a mini-corpus of about 7500 words was obtained (15 informants, 500 words per informant). Previous studies define that a corpus which is suitable for linguistic analyses should contain between 1000 to 20000

words, depending on the research type (Oostdijk 1988:20, Biber 1990:258, Miller and Weinert 1998:10). These corpora represent much larger populations than that of Hebrew speakers, and are divided to many more cross-sections. Also, many of these corpora were established for European languages. Hebrew words, having a more synthetic character, contain much more information each, than their counterparts in European languages, so that each Hebrew word is parallel to more than one word in European languages, see for example the following speech units in Hebrew and English, respectively:

aXalti	kSehu	ba	(3 words in Hebrew)
?•K•l-Qal-PFTV-1-SG	when-he	b•w•?-Qal-PFTV-3-M-SG	
I was eating	when he	came	(6 words in English).

The recorded chunks were transcribed to include basic discourse characteristics. Transcription was based on conventional discourse division into prosodic speech units, and included notations of pauses, final tones, and other discourse characteristics, see 4.2 below.

4.2 Organization of the data

4.2.1 Transcription

In order to analyze spontaneous speech, it is necessary to transcribe the recordings. The transcription is a written representation of the recorded speech, which can be used for linguistic analyses. Yet, it cannot stand alone without simultaneously listening to the parallel spoken text while analyzing, especially because it consists of prosodic features, which can never be well-enough transcribed so that the listener can imagine the conversation exactly as it was originally uttered.

The division of the spoken text to units for analysis is different from standard, written texts. Written texts have sentences, which are independent, written syntactic units with independent meanings, regardless of their context. Their borders are determined by punctuation marks, and their structures reflect their writers' decisions (Miller and Weinert 1998:12, 30). Spoken texts have no punctuation marks and are context-dependent, and thus sentences cannot be used as analysis units in spoken texts (Miller and Weinert 1998:30). Therefore, the transcribed discourse is divided into prosodic speech units.

Until lately, discourse units were referred to as intonation units (IU), and were defined as a sequence of speech produced under one coherent contour (Du Bois et al 1992:17, Du Bois et al 1993:47). Intonation units contain a combination of basic speech segments, which include consonants and vowels,

which are the building blocks of words, and of prosodic elements such as rhythm, pitch, accents, stress and more (Crystal 1997:171). The unit borders are determined according to prosodic criteria, such as intonation, rhythm and length, and not only according to its intonation. Thus, newer researches have preferred the term prosodic units (PU) as the basic analysis unit of spontaneous speech in several languages (Lee and Lee 1996, Quazza and Garrido 1998, Portes et al 2002, Elordieta and Romera 2002, Tseng 2003). To avoid confusion, intonation / prosodic units are referred to as speech units (SUs) in this paper. Transcription conventions followed Du Bois et al 1992:17, Du Bois et al 1993:47, and were adjusted to Hebrew according to Izre'el 2004.

4.2.2 Isolation of TMA-bearing verbs and verb constructions

First, verb forms were isolated from the conversations. These forms included all combinations of roots and verb patterns, infinitive forms, participles with verbal meanings and complex verbal structures, containing a combination of two verbs or more, in a predicative use. Infinitive and participle forms with nominal meanings were excluded.

Then, verbs were classified according to their form, inflection or complex structure, and were analyzed for their root, pattern, person and number. Also, semantic classification was done to TMA categories, according to the context, and the speaker type (native vs. non-native), and age and education were noted therein. The root *HYY* 'be', having verb-like inflections, was treated in the frame of the verbal forms, although it usually appears in nominal units. This way, the verbal forms were sorted according to the two main linguistic sections treated in this study: Verbal inflection forms and TMA categories. Organized this way, the data could be sorted into sub-categories if needed. In addition, classification according to cross-sections was obtained this way: Native vs. non-native speakers, males vs. females, young vs. old and low vs. high education levels.

5 Research process

5.1 Research methods

After all the conversations were transcribed and divided into speech units, the texts were analyzed as follows:

Step1*: Highlighting relevant speech units*

First, all speech units, denoting tense, aspect or mood, were highlighted in the transcribed speech text, by being marked differently than the rest of the text.

Step2*: Determination of the part which expresses tense, aspect or mood*
Evaluation of the part which expressed TMA within the highlighted speech unit was carried out. This was done to exclude cases where tense, aspect or mood, were expressed by lexical items and not by a pattern or a structure. In order to verify that, words and structures were omitted from the text, one at a time, to ensure that the TMA meaning was preserved, although one form / structure or another were eliminated. If the meaning was not preserved, then the TMA meaning was carried by the omitted word or structure. This way, the word / structure which carried the TMA meaning in the tested speech unit was isolated.

Step3*: Form / structure isolation*
Out of the highlighted speech units, which were filtered as bearing TMA meanings on a form or a structure in the previous step, all verb forms and structures were isolated and classified to groups, where each group contained data with the same structure.

Step4*: Semantic classification of forms and structures*
After all data were classified to groups, each occurrence of each form/structure was checked separately. In speech units with TMA-bearing forms/structures it was necessary to determine what semantic component in the form/structure was responsible for its meaning: The form/structure itself, or some other element. This is because Hebrew forms/structures are synthetic, and may contain a few elements. To determine that, contrastive analysis was performed. The checked form/structure was compared to other forms from the sample, if possible from the same text and same speaker, which were apparently identical to the checked form, but different from it in only one element. This element could be the root, a synthetic, form-contained pronoun or similar. Also, the form was compared to other forms having the same root. This was done to verify that the semantic category was indeed carried by the form, and not by some other element such as the root, which might contain modality, for instance, as part of its basic semantics. Structures having two parts were compared to other identical structures, where the content of only one part of the structure was substituted. Speech units, where TMA categories were not carried by the checked structure, were excluded.

Step5*: Listing of linguistic means used to express TMA*
Listing of the means which were used to express TMA in SIH was now prepared. This listing enabled to evaluate the quantitative relationships between various linguistic ways to express TMA and their distribution.

5.2 Statistical analyses

First, structures with a low number of repetitions were excluded from the research, because too few repetitions cannot be statistically calculated. Thus, structures with less than ten repetitions were excluded. Statistical calculations on too few occurrences are not representative, since their error rate is too high, and they are negligible in relation to the general statistical calculations because of their number.

After the exclusion of rare structures, the remaining data actually constituted the findings. In these data, quantitative distribution and distribution in percentages were calculated for each semantic category and each structure in each population group.

6 Results

After classification of all structures, the percentages of each major TMA category were calculated for each structure/form. The distribution in percentage of the main verbal structures found in the study according to major semantic categories among Hebrew speakers is presented in Table 1 below. For a summary and figures showing the findings, see thereafter.

Table 1: Distribution in percentage of verb forms/structures according to semantic categories in the pilot study among Hebrew speakers

	Tense	**Mood**	**Aspect**
HYY (‘be’) + participle *		37.8	62.2
carix ‘need’ + infinitive		100.0	
jaxol ‘can’ + infinitive		100.0	
verb + infinitive		85.0	15.0
verb (prefix)		100.0	
verb (suffix)	0.6	5.2	94.2
participle	3.2	30.8	66.0
infinitive	2.4	97.6	
imperative		100.0	
HYY ‘be’ root	63.3	18.0	18.7

* *HYY* ‘be’ root in these structures appeared in suffixed patterns only

6.1 Forms and structures

The results of the distribution of forms and structures are presented in Figure 1 below, and they show the four most widespread structures used to express TMA

in Spoken Israeli Hebrew. Each of these structures has two presentations, one for native speakers, the other for non-native speakers.

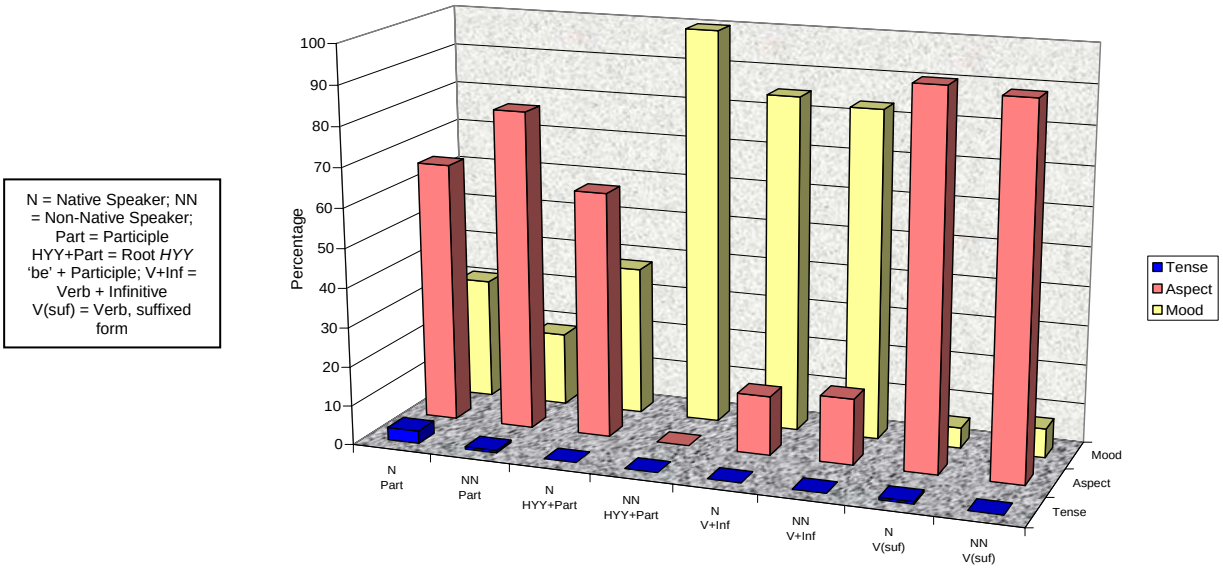

Figure 1: Distribution in percentage of major verbal structures used to express major semantic categories

The most outstanding finding was the very poor existence of tense in Hebrew verb forms, as opposed to traditional views, conceiving Hebrew verb system as tense-oriented (Rosen 1977: 99, 193, Berman 1978, Gordon 1982). In the verb system of Hebrew, mood seemed to be the dominant semantic category in the TMA class, constituting 54% of all TMA-expressing verbal speech units, whereas aspect appeared in 42% of these units. The remaining speech units (4%) expressed tense (numbers are rounded). The findings show that tense had very few occurrences, when being expressed by a structure or a form. In the vast majority of structures expressing tense, the root *HYY* 'be' was used, either independently or with a participle. *HYY* 'be' in Hebrew is an auxiliary verb. This shows a trend of using an auxiliary verb for expressing tense in Hebrew, and goes hand in hand with Bhat's claim (1999) that languages tend to use verb affixes to express their most prominent TMA category, and auxiliary verbs to express the others.

Another outstanding finding is the use of the structure *HYY* ('be')+participle to express aspect and mood among native speakers of Hebrew, as opposed to non-native speakers. Non-native speakers did not use this structure at all to express aspect, but only to express mood, whereas native speakers used it to express both aspect and mood, where aspect was the most dominant. For a graphic illustration of this finding see Figure 2 below.

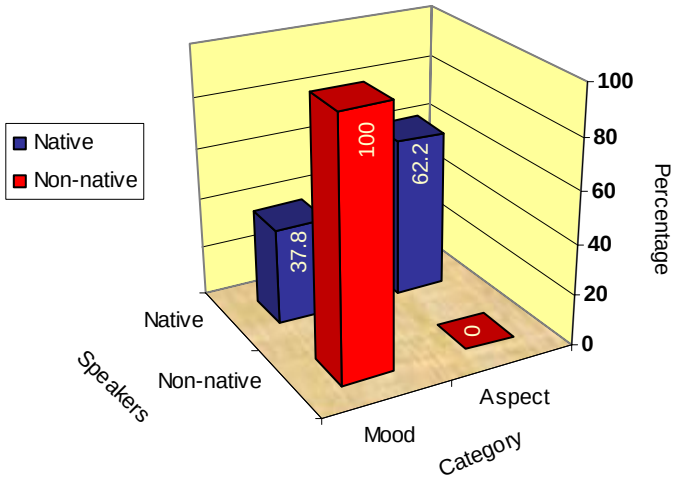

Figure 2: Distribution in percentage of *HYY* 'be' + Participle structures used to express aspect and mood among native and non-native speakers

The use of suffixed forms was also different between native and non-native speakers, although the differences were not as extreme as in the *HYY* ('be') + participle structures. Non-native speakers of Hebrew, did not use suffixed forms at all to express tense, whereas native speakers used suffixed forms as tense, although rarely. Both native and non-native speakers used suffixed forms to express aspect and mood, but the ratio between using suffixed forms to express aspect and using them to express mood was different between native and non-native speakers, as can be seen in Figure 3 below.

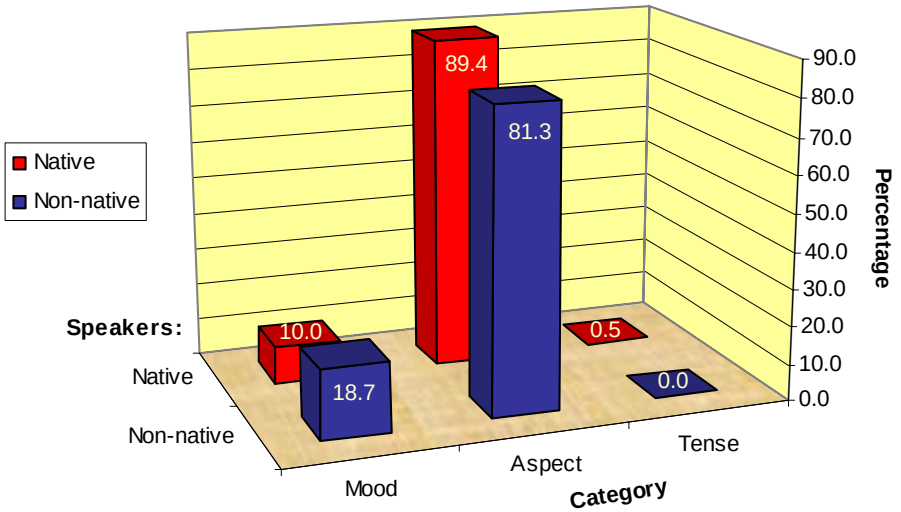

Figure 3: Distribution in percentage of suffixed forms used to express TMA among native and non-native speakers

6.2 Semantic categories

Each semantic category (tense, aspect and mood) was expressed using several structures. A graphic illustration of the formal means used by native and non-native speakers of Hebrew to express each semantic category is presented in Figures 4 to 9 below. Each figure shows the distribution of verbal forms used to express one specific semantic category among one of the population groups (native vs. non-native).

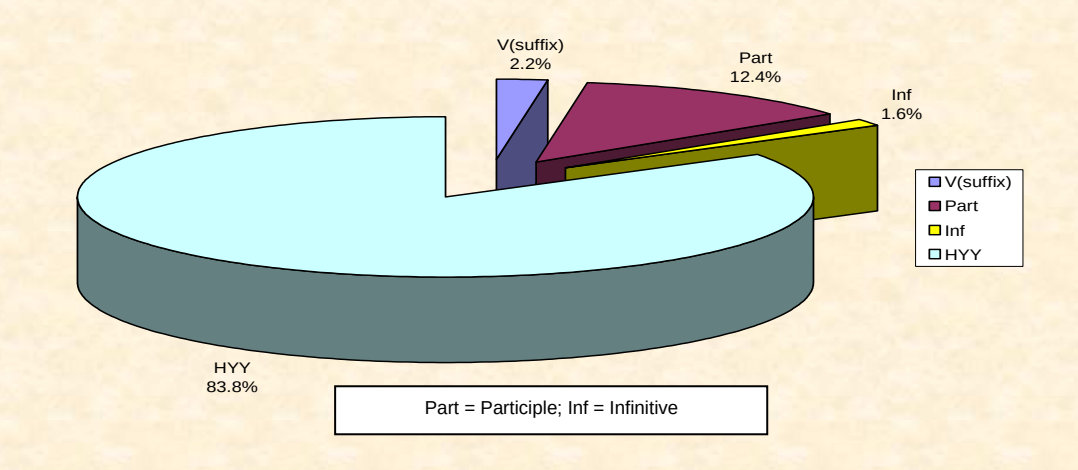

Figure 4: Distribution in percentage of verbal structures expressing tense among Hebrew native speakers

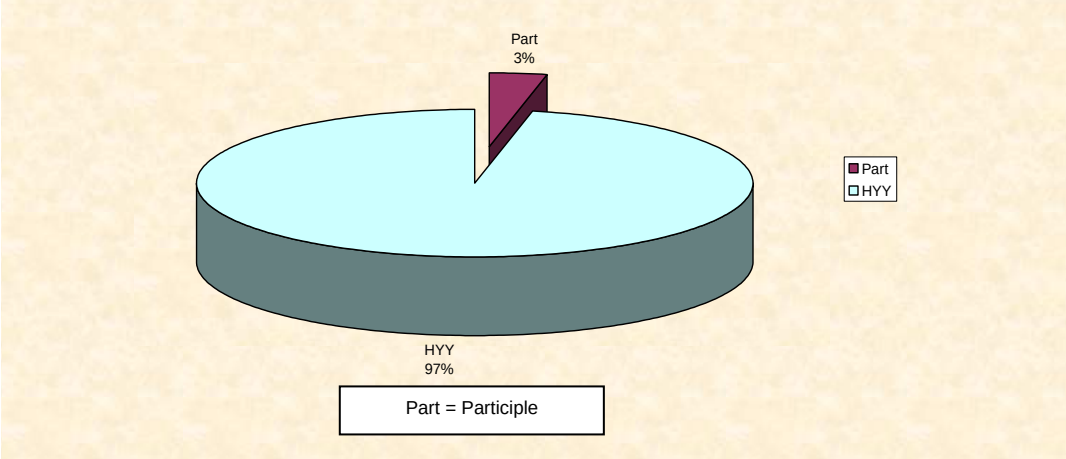

Figure 5: Distribution in percentage of verbal structures expressing tense among Hebrew non-native speakers

We can see that two of the forms used by native speakers to express tense, were absent from the non-native speakers' speech. The other two forms had a completely different distribution among native speakers as opposed to non-native speakers. The only correlation between forms expressing tense among

native and non-native speakers was the root *HYY* 'be', which constituted the majority of the tense category, and was also different in distribution between native and non-native speakers. The other form, which appeared in both groups, was the group of participles. Suffixed forms, which according to traditional views are considered the past tense expressing category, were used in a very low distribution to express tense among native speakers, and were absent from the group of non-native speakers. These findings, together with the 4% distribution of the tense category, demonstrate that the tense category in SIH is very weak if expressed by a form or a structure, and that SIH verb system is probably not tense-oriented, as most of the traditional views claim.

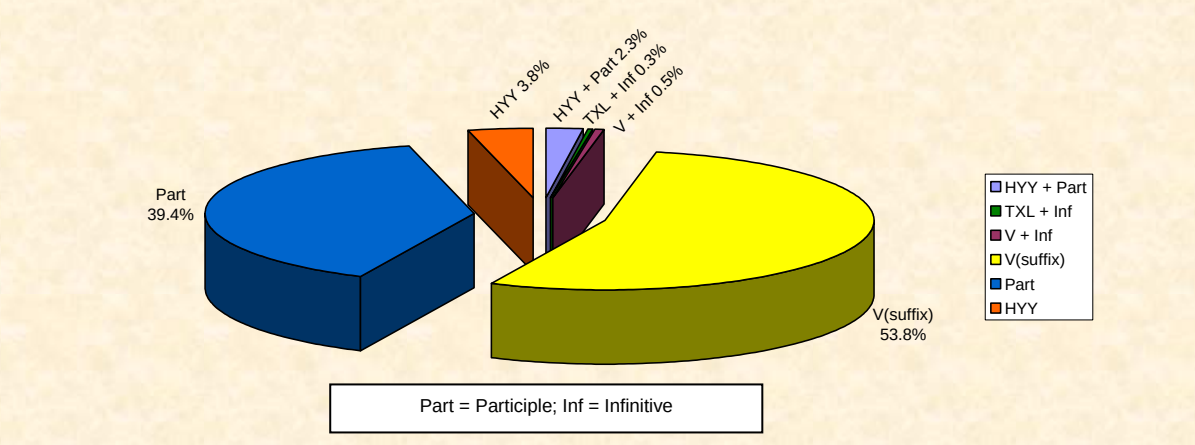

Figure 6: Distribution in percentage of verbal structures expressing aspect among Hebrew native speakers

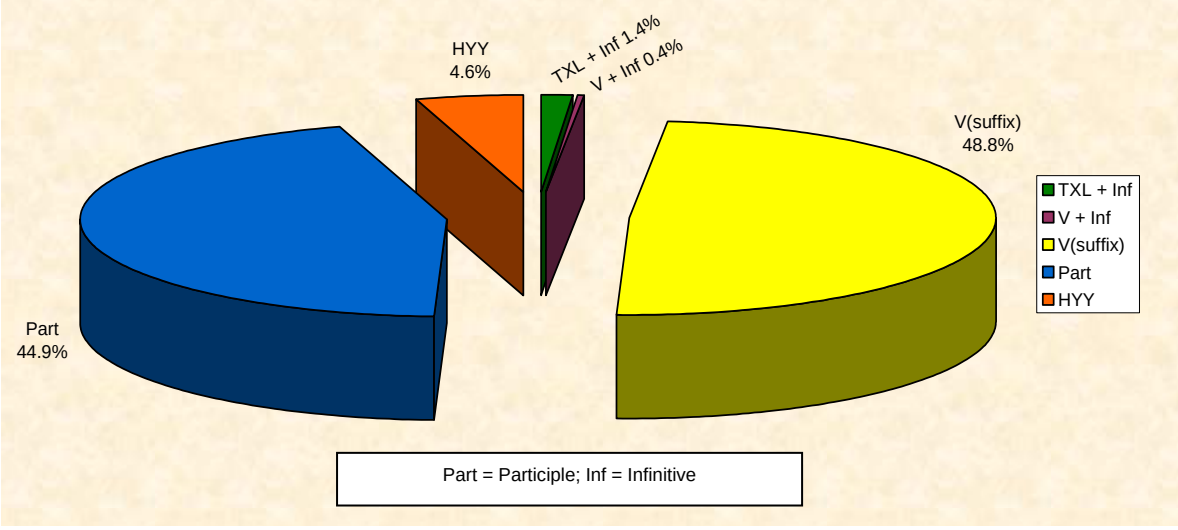

Figure 7: Distribution in percentage of verbal structures expressing aspect among Hebrew non-native speakers

The main finding in the aspect category is the absence of *HYY* 'be' + Participle structures from the group of non-native speakers. As mentioned before, this structure was used to express mood among non-native speakers, whereas among native speakers it functioned as both aspect and mood.

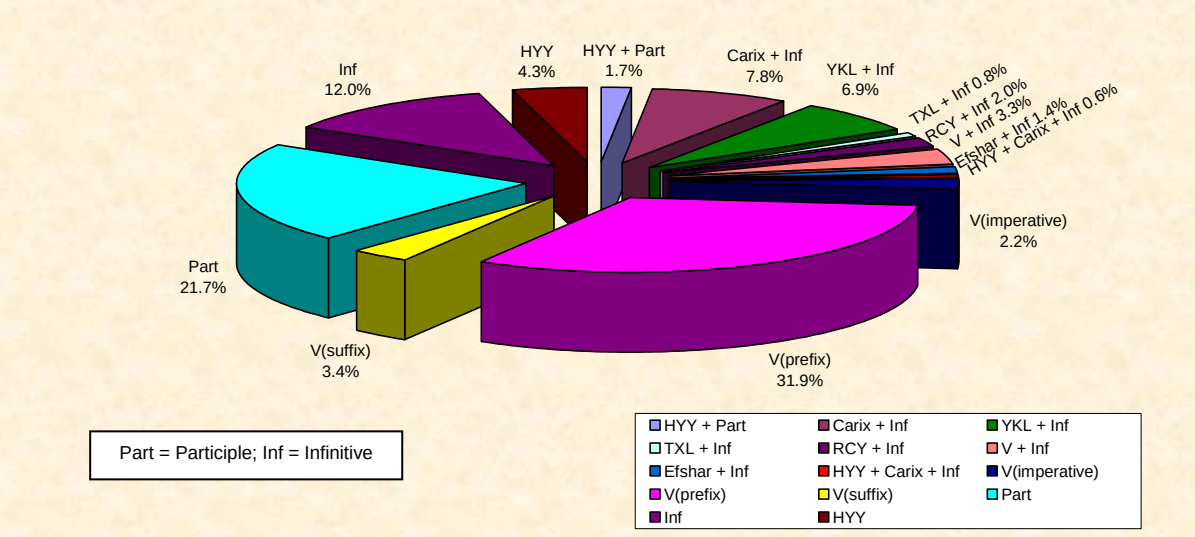

Figure 8: Distribution in percentage of verbal structures expressing mood among Hebrew native speakers

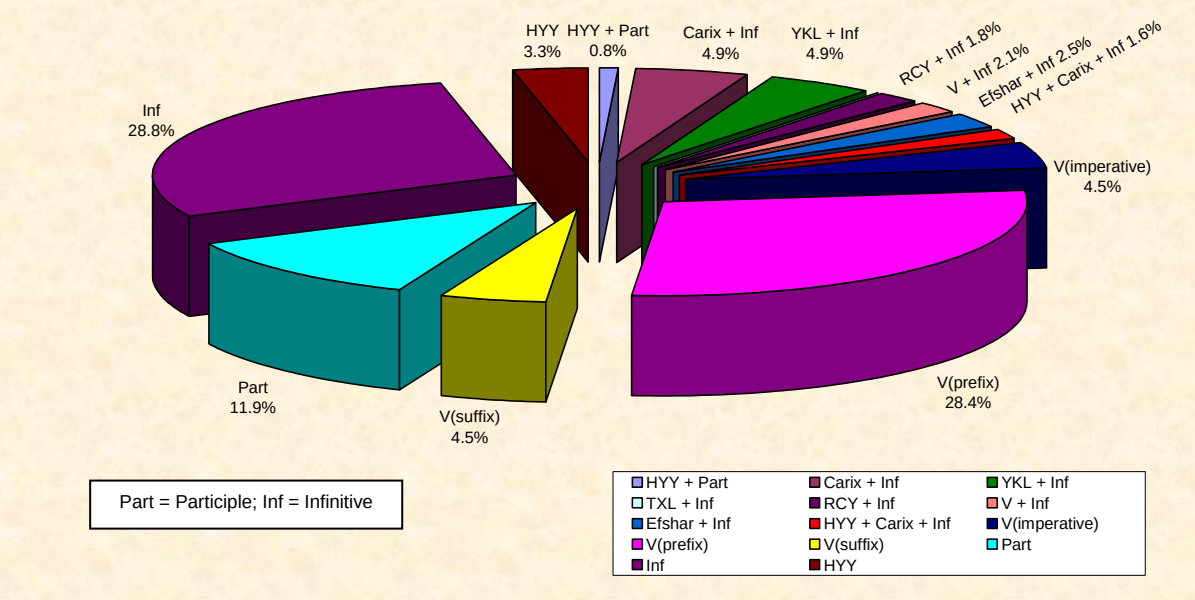

Figure 9: Distribution in percentage of verbal structures expressing mood among Hebrew non-native speakers

In general, a large variety of forms was used to express mood in both groups. Both native and non-native speakers used prefixed forms rather widely for this goal. In both groups some of the forms were modal in nature, due to their roots. Yet, there are significant differences in the distribution of some of the forms

among the groups. Native speakers used participles to express mood in over 21% of the cases, whereas non-native speakers used participles in less than 12% of the cases. The situation is similar in the infinitive forms, which were used in 12% of the cases to express mood among native speakers, but in almost 29% of the cases to express mood among non-native speakers.

6.3 Summary of findings

The most outstanding piece of data in the above figures is the use of only a few verbal structures to express tense. This is in contradiction to traditional views, which treat Hebrew verb system as a tense-expressing system.

A wide range of verbal structures denoting mood was found, which is also in contradiction to traditional views, which tend to classify only the imperative forms as a mood-expressing category.

The aspect-expressing forms were mostly the suffixed forms and participles, which are perceived in traditional views as expressing past tense and present tense, respectively.

The findings also show that prefixed forms, which are traditionally perceived as expressing future tense, actually express mood, and are mainly used in an imperative function, instead of the classical imperative forms. The use of classical imperative forms is limited to roots with at least one weak consonant. The imperative forms of roots with strong radicals have disappeared, and their parallel prefixed forms are used.

The participle forms are widely used in various TMA meanings. The most widespread ones were aspectual and modal. Participles in SIH are used to describe narrative situations in the past, and also intentions for the future, which allow their aspectual and modal use, respectively.

7 Conclusions

During the analysis of TMA functions in SIH verbs, I tried to ignore the traditional attitude towards the verb system of Hebrew as expressing tense.

Apparently, the overall findings suggest that SIH is an aspect-oriented language, rather than a tense-oriented one. Except for prefixed forms, which are modal, most of the other affixed forms were used to express aspect, whereas forms with the auxiliary verb *HYY* ‘be’ were the only ones, which were explicitly used to express tense.

The findings show that in spite of the differences between native and non-native speakers in the use of TMA categories, both groups used the verb system in a different way than the one described in the literature. Forms, which were

considered in the literature as denoting one category, express, in fact, completely different categories, and vice versa. For example, it is common to think that participles denote present tense (Berman 1978: 142, Gordon 1982). This is also what Israeli students are taught in Hebrew language classes (Blau 1975). In fact, participles in this study were used to express almost every other TMA category rather than tense. Prefixed forms, which are believed to express future tense, and are also taught this way in Israeli schools (Blau 1975), actually denote mood in all their occurrences, and in most of the cases eliminate their parallel imperative form, being used as the imperative.

It seems that both the literature and the teaching methods of the Hebrew verb system rely on a traditional approach. It looks as if this approach, and as a result, also the teaching methods, 'forced' a tense system on the modern variation, while in fact, they do not match.

The results in this study suggest that both the traditional approach and the teaching methods should be re-considered, as teaching a system, which does not match the language, is more similar to a second language teaching rather than to real learning of one's language systems.

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9 List of abbreviations and short terms

i List of abbreviations

Abbreviation	**Full form**
SIH	Spoken Israeli Hebrew
SU	Speech unit
TMA	Tense, mood and Aspect

ii List of Hebrew verbal patterns

Abbreviation	**Full form**
Qal, Paal	Pa'al
Nifal	Nif'al
Piel	Pi''el
Hifil	Hif'il
Hitpael	Hitpa''el
Pual	Pu''al (*)
Hufal	Huf'al (*)

(*)Pual and Hufal are not productive in the spontaneous spoken language