

Habituality and the Habitual Aspect

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Abstract

The paper examines the linguistic expression of habituality showing that two concepts must be distinguished: gnomic habituality and actualized habituality. It is claimed, on the basis of Modern Hebrew, that the two concepts are derived from non-quantificational habitual operators – Hab which is modal and yields gnomic habituality, and Φ_{Hab} which is aspectual and yields actualized habituality. The core meaning of both operators is iteration over a contextually long interval. Syntactically, the operators differ with respect to their position: Hab is argued to be a VP-level adverb and Φ_{Hab} – an aspectual head. This is correlated with the fact that gnomic habituality is expressed via the simple form of the verb while the expression of actualized habituality involves periphrasis. The paper ends with a diachronic consideration of the Hebrew periphrastic form suggesting that its habitual use can already be detected in Biblical Hebrew.

1. Preliminaries

1.1 Introduction

The term *habituality* appears in the literature with a variety of different meanings (cf. Comrie 1976, Xrakovskij 1997, Langacker 1997, Dahl 1985, Verkuyl 1995 among others). Habituals are often taken to be a subtype of genericity. As such, they create intensional contexts, and are interpreted as gnomic and rule-like (Carlson 1977, Krifka et al. 1995). However there are languages (Bittner this volume) where expressions referred to as habitual simply describe the sequence of actual episodes, often conceived as the instantiation of a habit, and do not give rise to intensionality.¹ In this paper, we discuss a language which distinguishes in form between these two meanings, and show how such a language can shed light on the semantics of habituality.

Modern Hebrew has two separate habitual forms. One is the simple form of the verb, which expresses habituality in addition to its familiar episodic reading, as exemplified in (1a) below. The other is periphrastic, and, at least in the indicative mood, does not have an episodic reading, but is only habitual. The periphrastic form is constructed from the tensed form of the auxiliary verb derived from the root *hyy* ‘be’ in conjunction with the main

verb in its participial form, see (1b). We translate the simple forms in Hebrew into simple verb forms of English, and the periphrastic Hebrew forms into the English periphrastic forms with the auxiliary *used to* or *would*. Like the English *would*, the periphrastic form has another, subjunctive, reading:

- (1) a. *Simple form:*
 ya'el **nas'-a** la-'avoda ba-'otobus.
 Yael go.PAST-3SF to-work by-bus
 'Yael went to work by bus.' (episodic/habitual)
- b. *Periphrastic form:*
 ya'el **hayt-a** **nosa'-at** la-'avoda ba-'otobus.
 Yael HYY.PAST-3SF go-SF to-work by-bus
 'Yael used to/would go to work by bus.' (habitual/subjunctive)²

The paper is structured as follows. In section 1.2, we offer some background on the Hebrew aspectual system in general, prior to any discussion of habituality. In section 2, we argue for a crucial structural distinction between the two kinds of habitual sentences, the ones with simple forms, and those with periphrastic forms. Whereas the former involve adverbial modification, the latter involve a habitual aspectual functional category. In section 3, we elaborate on the aspectual difference in interpretation between the simple and periphrastic forms, and argue that these differences are not expressions of the perfective/imperfective contrast, since, as explained in section 1.2, this contrast is absent in Modern Hebrew. We also show how our proposal accounts for the interaction of the two habitual forms with temporal adverbial modification. In section 4, we elaborate the semantics of habituality and habitual aspect. Section 5 provides a diachronic perspective on the Hebrew periphrastic form. Finally, section 6 offers some concluding remarks.

1.2 Viewpoint aspect in Modern Hebrew

In Modern Hebrew, verbs are not inflected with aspectual affixes. In particular, there is no marking of the perfective/imperfective distinction. We therefore assume a default viewpoint aspect, which we refer to as *neutral aspect*. The definition of neutral aspect depends on lexical aspect. It specifies that Reference time includes Event time in the case of dynamic events, but overlaps it (and may even be included in it) in the case of states. In other words, the default aspectual value for eventive VPs is perfective, and for stative VPs – imperfective.³

In Modern Hebrew, it is also possible to coerce an eventive VP into the imperfective viewpoint. It is nevertheless clear that the basic value for dynamic events is perfective rather than imperfective. Whereas the perfective viewpoint is always possible for eventive verbs, imperfective

aspect is possible for these verbs only under special discourse conditions, such as backgrounding. In the following example, if the discourse consists of (2a) alone, default aspect takes the perfective value. When followed by (2b), the viewpoint aspect in (2a) takes the imperfective value:

- (2) a. *dani xaca et ha-kviš.*
 Dani cross.PAST-3SM ACC the-street
 b. *pit'om hegixa masa'it me-'ever la-pina*
 suddenly appeared truck from-around the-corner
ve-pag'a b-o.
 and-hit at-him
 'Dani crossed/was crossing the street. Suddenly a truck appeared from around the corner and hit him.'

Modification by *when*-clauses is an additional context which indicates that events can be coerced into the imperfective viewpoint. Whether the main clause advances the narrative or not depends on whether it is interpreted perfectly or imperfectly. Accordingly, in the following examples we get indeterminacy between an overlapping interpretation and a consecutive (not necessarily causative) one.

- (3) a. *kše-nixnas-ti l-a-xeder, ya'el katv-a*
 when-enter.PAST-1S to-the-room, Yael write.PAST-3SF
et ha-mixtav.
 ACC the-letter
 'When I entered the room, Yael was writing the letter.'
 'When I entered the room, Yael wrote the letter.'
 b. *kše-nixnas-ti l-a-xeder, ya'el hištadl-a*
 when-enter.PAST-1S to-the-room, Yael try.PAST-3SF
le-vader et ha-'orxim.
 to-entertain ACC the-guests
 'When I entered the room, Yael was trying to entertain the guests.'
 'When I entered the room, Yael tried to entertain the guests.'
 c. *kše-nixnasti l-a-xeder, ya'el ka'as-a.*
 when-enter.PAST-1S to-the-room, Yael angry.PAST-3SF
 'When I entered the room, Yael was angry.' (overlapping or consecutive)

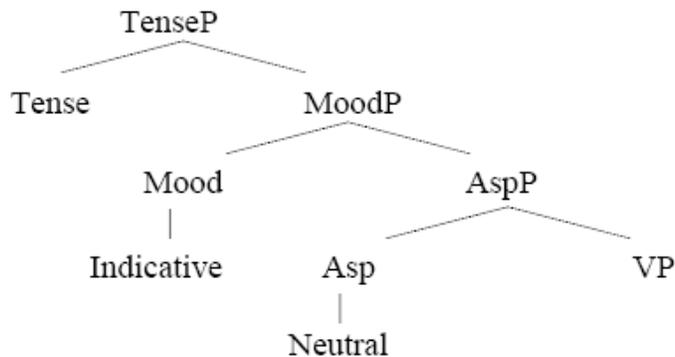
In all three examples, the verb in the matrix clause may be interpreted as already holding at the time of the punctual eventuality of the *when*-clause, or as immediately following it.⁴ Hebrew thus differs from English, where the overlapping reading is only available for stative predicates, and rather patterns with Dutch (cf. Landman (this volume)).⁵

We conclude that the default neutral aspect depends on the lexical aspectual class of the verb and on additional considerations such as discourse for/backgrounding. Crucially, it is not the case that "anything goes" in the system, leading us to reject the possibility that Modern Hebrew is a language lacking the viewpoint aspect category altogether.

2. The syntax of habituality

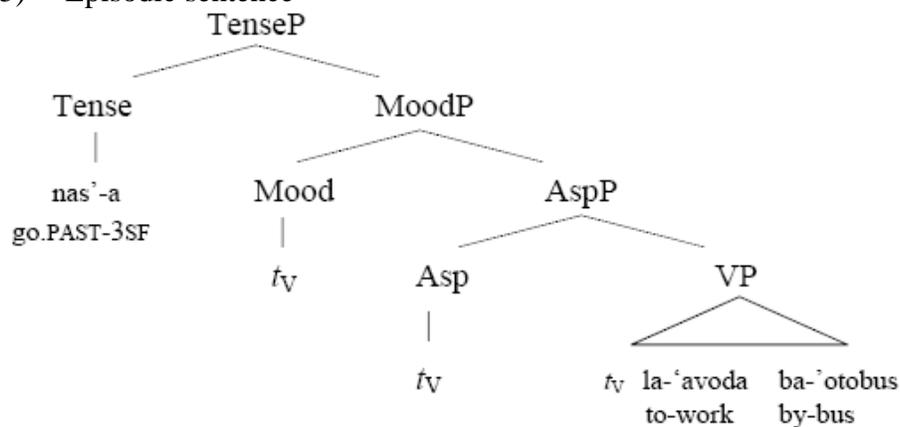
We assume a sentence structure which includes sentential functional heads of tense, mood and aspect. The default mood is indicative, and the default aspect in Hebrew, as explained in section 1.2 above, is neutral:

(4) Sentence structure (default values)



In a structure such as (4) with default mood and aspect, the verb raises from the VP and gets (covertly) inflected for aspect and mood,⁶ and (overtly) for tense (and subject-verb agreement features). This is the case, for example, in the episodic reading of sentence (1a):

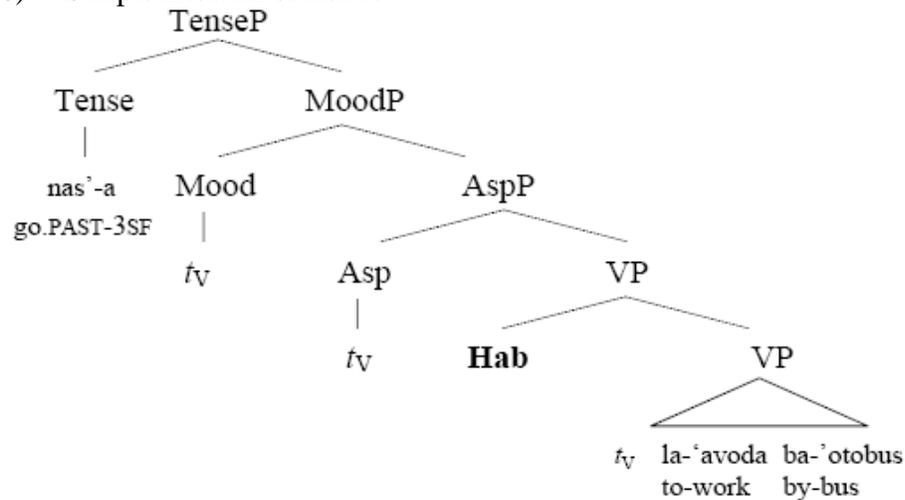
(5) Episodic sentence



‘(Yael) went to work by bus.’ (episodic reading of (1a))

Moving on to habitual sentences, we assume a null habitual operator, *Hab*, often postulated in the analysis of e.g. the simple present in English (Carlson 1977, Lenci 1995, Scheiner 2002, Rimmell 2005 and many others). We take the fact that the inflection of the verb in simple habitual sentences is identical to that of episodic sentences to indicate that the functional heads in the two cases are identical. The habitual operator *Hab* is therefore not encoded by the functional heads, but adverbially. We analyze the adverb *Hab* as applying to its sister VP and deriving a stative VP. This derived state falls under the scope of the sentence's (neutral) aspectual head:

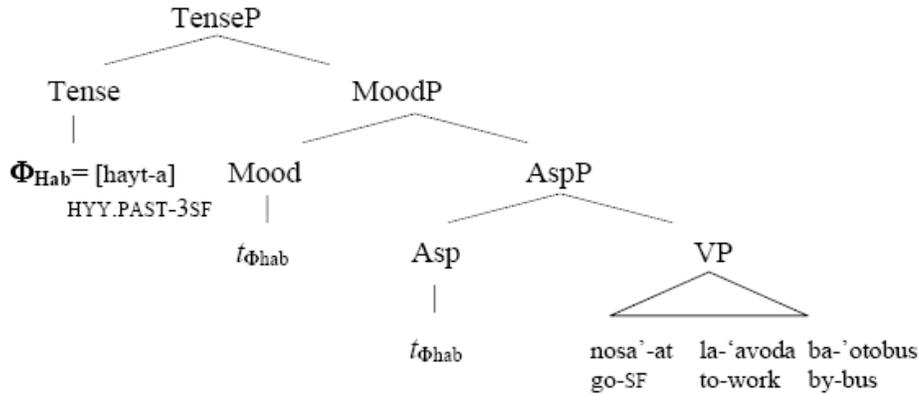
(6) Simple habitual sentence



‘(Yael) went to work by bus.’ (habitual reading of (1a))

In sentences with the periphrastic form, tense morphology does not inflect the verb but the auxiliary *hyy* ‘be’. We take this to indicate that the habitual operator Φ_{Hab} in these sentences fills a functional head position, i.e. the aspectual head. As a consequence, the verb is prevented from raising out of VP, and cannot be tensed. Rather, it is Φ_{Hab} which raises to the tense node, and is inflected by tense morphology, spelled-out as the auxiliary *hyy* ‘be’. Thus we do not consider the auxiliary *hyy* to be the operator itself, which is null, but rather the morphological realization of tense and agreement.

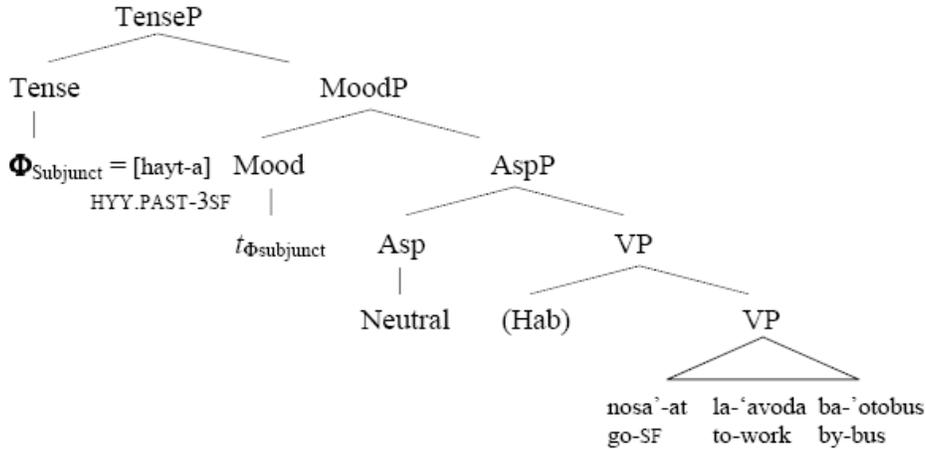
(7) Periphrastic habitual sentence



‘(Yael) used to go to work by bus.’ (habitual reading of (1b))

For the sake of completeness, we also present the structure of the subjunctive reading of the periphrastic form. Similarly to the habitual reading, it is also possible to deduce the existence of a covert subjunctive mood operator Φ_{Subjunct} on the basis of the realization of inflectional morphology by the auxiliary *hyy* ‘be’ rather than directly on the verb:

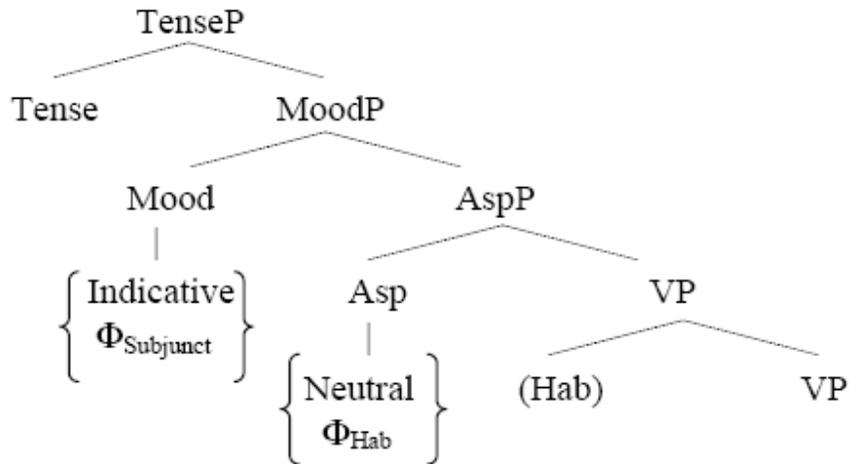
(8) Periphrastic subjunctive sentence⁷



‘(Yael) would go to work by bus.’ (subjunctive reading of (1b))

To sum up, in addition to the default values of Mood and Aspect shown in structure (4) above, there is indication for the marked values Φ_{Subjunct} , Φ_{Hab} respectively, realized as periphrastic forms. Structure (9) below summarizes the different values of the functional heads which play a role in simple and in periphrastic forms in Hebrew:

(9) Simple/periphrastic sentence



In this section, we have argued that whereas the default mood/aspect values allow the verb to raise to the functional heads, the presence of the operators Φ_{Subjunct} , Φ_{Hab} prevents the verb from raising. Accordingly, sentences with the default mood/aspect values, whether or not modified by the adverb Hab, show tense morphology on the verb, without the mediation of an auxiliary, whereas sentences with the covert operators Φ_{Hab} , Φ_{Subjunct} realize tense morphology with the use of the auxiliary *hyy* ‘be’ rather than directly on the verb. The fact that *hyy* realizes tense and agreement inflection in sentences where no verb raises to these functional heads has also been shown for sentences with non-verbal predicates (Doron 1983, 1986).

3. Temporal properties of habituais

We will now describe and illustrate the major differences in the interpretation of the two habitual forms in Hebrew. Though both denote habits, they present differences in temporality.

3.1 Restrictions on tense

The simple forms are attested in different tenses. In all tenses, past, present and future, the simple forms denote habituality alongside episodic events:

- (10) a. *dan ‘išen mikteret.*
 Dan smoke.PAST-3SM pipe
 ‘Dan smoked a pipe.’ (episodic/habitual)
 b. *dan me’ašen mikteret.*

- Dan smoke-SM pipe
 ‘Dan is smoking/smokes a pipe.’ (episodic/habitual)
- c. *dan ye’ašen mikteret.*
 Dan smoke.FUT-3SM pipe
 ‘Dan will smoke a pipe.’ (episodic/habitual)

On the other hand, both in Hebrew and English, the periphrastic forms are only attested with past tense inflection (cf. Glinert 1989 for Hebrew, Quirk et al. 1985, Tagliamonte & Lawrence 2000 for English):

- (11) *dan haya / *yihye me’ašen mikteret.*
 Dan HYY.PAST-3SM / *HYY.FUT-3SM smoke-SM pipe
 ‘Dan used / *will use to smoke a pipe.’

This difference is expected within the framework proposed in section 2 above. The simple forms involve an adverbial, Hab, which does not restrict the values of the tense head. The periphrastic forms involve a non-default value of the aspectual head, Φ_{Hab} . This imposes constraints on the compatibility with tense values. It is well known that non-past tenses select the default aspectual value, and similarly, dedicated habitual forms in many languages are restricted to the past tense (Comrie 1976, Xrakovskij 1997). Under our account, these two facts are correlated. Dedicated habitual forms involve a marked habitual aspectual value, whereas simple forms, which can be interpreted either as habitual or as non-habitual, have default aspect.

3.2 Restrictions on aspect

3.2.1 Overlap with speech time

Simple past forms on their habitual reading describe habits which may still hold at speech time. Periphrastic forms, on the other hand, describe habits which no longer hold. We now discuss this distinction for Hebrew (cf. Tagliamonte & Lawrence (2000) for English). The following passage, from the daily newspaper *Haaretz*, illustrates this contrast:

- (12) *hitgorarti b-a-me'onot šel ha-nezirot ha-katolijot leyad ha-knesiya. kol yom hayiti mit'oreret el ha-avir ha-mevusam ve-el arugot ha-praxim ha-civ'oniyot. be-xadar ha-oxel higišu lexem tari ve-xam, mirkaxot ve-gvinot mi-toceret ha-makom. hakol dibru be-laxaš u-ve-naxat...*

I stayed in the quarters of the catholic nuns near the church. Every day **I would wake up** to the perfumed air and to the colorful flowerbeds. In the dining room they **served** fresh hot bread, jams and local cheeses. Everyone **spoke** softly and calmly... (*Haaretz* 15.6.05, Tamar Golan, *musaf sfarim* 84)

The author describes her memories from a stay in a monastery. Mostly, this is the description of recurrent events which repeat themselves all along her stay. Interestingly, the events whose recurrence is confined to the period of her stay in the monastery (her waking up to the perfumed air) are described with the use of the periphrastic form, whereas the events which constitute customs of monastery life (serving fresh bread and talking softly), which held then and might still hold now, are conveyed with the use of the simple past.

The following examples further illustrate this distinction.

- (13) a. *bi-šnot ha-šmonim ya'el nas'-a la-'avoda ba-'otobus.*
 in-years the-eighties Yael go.PAST-3SF to-work by-bus
 'In the 80s, Yael went to work by bus.'
- b. *bi-šnot ha-šmonim ya'el hayt-a nosa'-at la-'avoda*
 in-years the-eighties Yael HYY.PAST-3SF go-SF to-work
ba-'otobus.
 by-bus
 'In the 80s, Yael used to/would go to work by bus.'

In (13a) containing the simple form, the described habit may still hold at speech time. In (13b), with the periphrastic form, the habit is understood to be over before speech time.

This property can be further illustrated by noting the incompatibility of left boundary *from/since* adverbials with the periphrastic form. These adverbials denote intervals which continue up to the present, and are incompatible with the periphrastic form. They contrast with right boundary adverbials such as *until/till*, which are compatible with the periphrastic form:

- (14) a. **mi-šnat 1981, hu haya me'ašen golwaz.*
 since-year 1981, he HYY.PAST-3SM smoke-SM Gauloises
 '*Since 1981, he used to smoke Gauloises.'
- b. *'ad šnat 1987, hu haya me'ašen golwaz.*
 till year 1987, he HYY.PAST-3SM smoke-SM Gauloises
 'Until 1987, he used to smoke Gauloises.'

This property has further repercussions which effect the salient temporal anchoring of functional noun phrases. In example (15), the difference in the reference of the noun phrase *the prime minister* between (15a) and (15b) stems from the choice of the simple vs. periphrastic form of the verb:

- (15) a. *bi-šnot ha-šmonim, dani hitlava*
 in-years the-eighties, Dani accompany.PAST-3SM
el roš-hamemšala le-nesi'ot lexul
 to prime-minister to-trips abroad

‘In the 80s, Dani accompanied the prime minister to trips abroad.’

- b. *bi-šnot ha-šmonim, dani haya mitlave*
 in-years the-eighties, Dani HYY.PAST-3SM accompany-SM
el roš-hamemšala le-nesi’ot lexul
 to prime-minister to-trips abroad
 ‘In the 80s, Dani used to accompany the prime minister to trips abroad.’

According to the preferred reading for (15a), the noun phrase *the prime minister* refers to the current prime minister at the time of speech, whereas in (15b), to the prime minister who was in office at the time of each episode, though it is possible to get both readings for each sentence. In (15a), where the simple form of the verb is used, accompanying the prime-minister may still hold in the present, which is why the prime minister referred to is probably the current prime minister. In (15b), with the periphrastic form, the habit has terminated. The current prime minister is therefore less salient, and it is more plausible that reference is to prime ministers of the eighties.

3.2.2 *The relation between reference time and habit time*

We showed in section 3.2.1 that habits denoted by periphrastic forms terminate before speech time, unlike habits denoted by simple past forms, which may still hold at speech time. This is an aspectual difference, yet it cannot be reduced to the perfective/imperfective distinction. In other words, it would be incorrect to view the periphrastic form as perfective, and the simple form as imperfective. First, in a language like Modern Hebrew, the perfective/imperfective distinction is not morphologically marked (cf. the discussion in section 1.2 above). Second, from a typological perspective, a perfective/imperfective distinction for habitual forms is not a common phenomenon. Many languages are known to use imperfective forms to express habituality (Comrie 1976). Indeed, we find that both habitual forms in Modern Hebrew pattern with imperfective verbs, in that both allow the described habit to overlap in time with *when*-clauses:

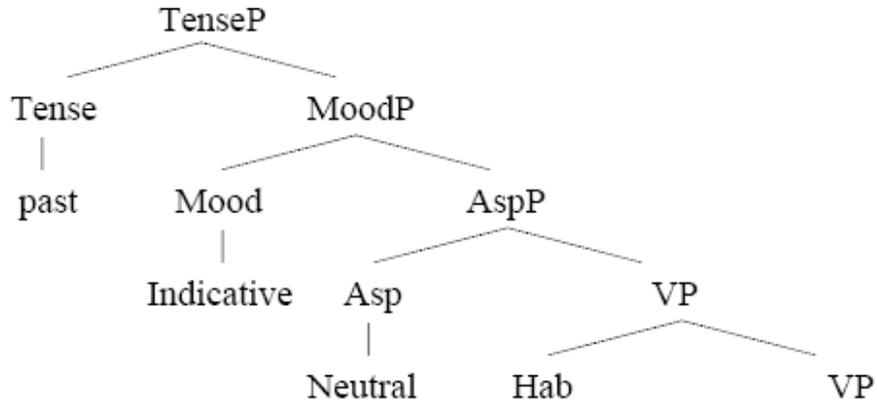
- (16) a. *kše-higa’ti l-a-’arec, ya’el nas’-a*
 when-arrive.PAST-1S to-the-country, Yael go.PAST-3SF
la-’avoda ba-’otobus.
 to-work by-bus
 ‘When I arrived in the country, Yael went to work by bus.’
 (overlapping/consecutive)
- b. *kše-higa’ti l-a-’arec, ya’el*
 when-arrive.PAST-1S to-the-country, Yael
hayt-a nosa’-at la-’avoda ba-’otobus.
 HYY.PAST-3SF go-SF to-work by-bus
 ‘When I arrived in the country, Yael used to go to work by bus.’

(overlapping)

In (16a), the habit may be understood either as overlapping the time of arrival or as starting immediately after it. This patterns with the episodic readings of the simple form (cf. example (3) in section 1.2). The habit described by the periphrastic form in (16b) can only be understood as overlapping the time of arrival, no consecutive reading is available. Thus, the periphrastic form actually patterns even more clearly with imperfective verbs than the simple form.

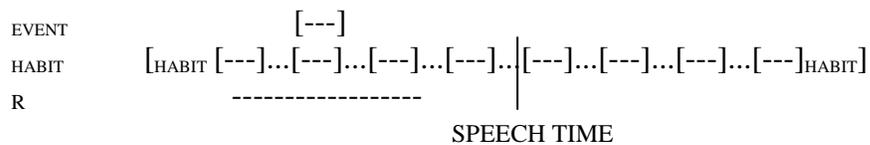
In our analysis, as presented in section 2 above, the aspectual distinction between the two forms stems from the neutral aspect of the simple forms vs. the marked habitual aspect of the periphrastic form. The two distinct structures are given in (17) and (19):

(17) Habitual sentence with the simple past tense form



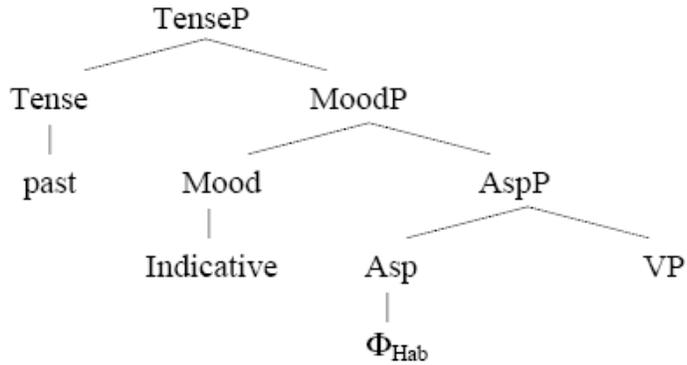
According to structure (17), the habitual reading of the simple form derives from a covert habitual adverbial operator Hab. The default neutral aspect value of this structure provides a Reference time (R) which overlaps the habit. R is ordered before speech time by past tense, yet it is possible for the habit to still hold at speech time, as shown in the following diagram.

(18)



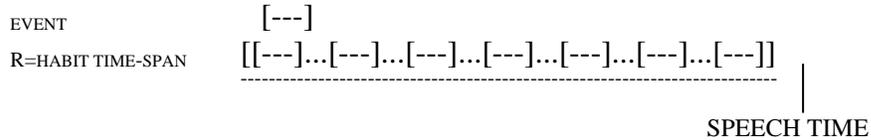
In structure (19), the habitual reading derives from a habitual operator which replaces the default neutral aspect:

(19) Habitual sentence with the periphrastic form



R introduced by the habitual aspectual head Φ_{Hab} is the time of the habit (*habit time-span*). R is ordered by past tense before speech time, and accordingly the time of the habit precedes speech time, and does not overlap it.

(20)

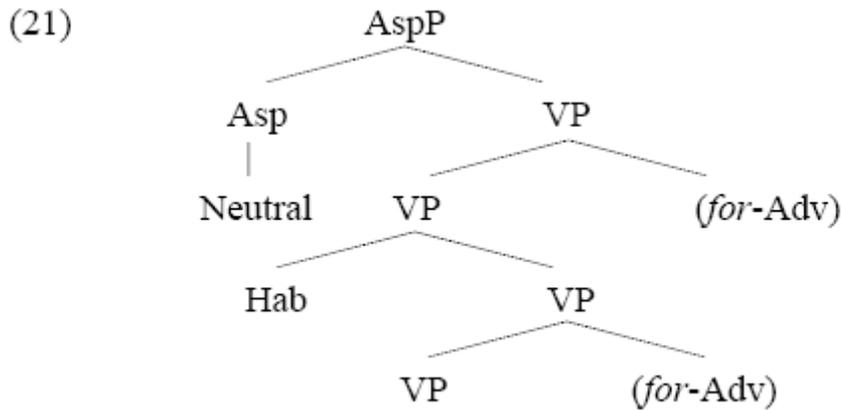


If our account of the interaction between habitual readings and viewpoint aspect in Hebrew is correct, it seems to indicate that the habitual is not a subtype of the imperfective as claimed by some scholars (cf. Comrie 1976, Lenci & Bertinetto 2000), but an independent aspectual value.

3.3 Interaction with temporal adverbials⁸

The difference between the structures with Hab and those with Φ_{Hab} has implications for their scope relative to overt VP adverbials. Since Hab is a VP-adjunct, it scopally interacts with other VP-adjuncts. Φ_{Hab} , on the other hand, is an aspectual head above VP, and therefore only scopes above VP-adjuncts.

Consider for example durative adverbials measuring the extent of the temporal trace of the event (cf. Csirmaz 2006). In a structure with Hab, these adverbials may be merged either lower or higher than Hab:

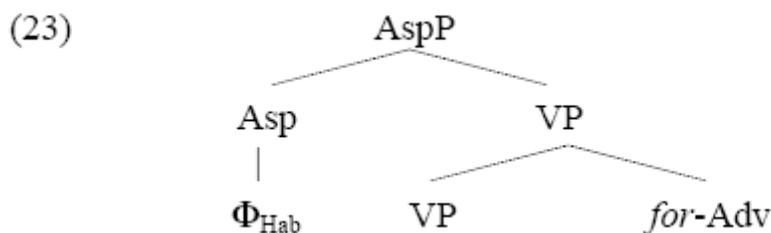


Depending on its syntactic position, the durative adverbial either measures the temporal extent of episodes, or that of the habit as a whole. The felicity of an adverbial in each of the two positions varies with the length of the interval it specifies. Contextually short intervals are only felicitous as measuring episodes, whereas contextually long intervals are appropriate mostly for the habit as a whole:

- (22) a. *bi-ne'ur-av dani 'avad b-a-gina*
 in-youth-his Dani work.PAST-3SM in-the-garden
be-mešex šaloš ša'ot.
 in-duration three hours
 'In his youth, Dani worked in the garden for three hours.'
- b. *bi-ne'ur-av dani 'avad b-a-gina*
 in-youth-his Dani work.PAST-3SM in-the-garden
be-mešex šaloš šanim.
 in-duration three years
 'In his youth, Dani worked in the garden for three years.'

When the sentences in (22) are understood habitually, then if the durative adverbial is short, as in (22a), it can only be understood under the scope of Hab, whereas if it is long, as in (22b), it is most natural to understand it as having scope over Hab, i.e. as measuring the time of the habit.

In contrast, in a clause with Φ_{Hab} , durative adverbials adjoining to VP only scope below the habitual operator:



It follows that a durative adverbial can measure the temporal extent of each episode, as in (24a) below, but not that of the habit as a whole, as seen from the ungrammaticality of (24b), when intended as reporting the time of the habit:

- (24) a. *bi-ne'ur-av dani haya 'oved b-a-gina*
 in-youth-his Dani HYY.PAST-3SM work-SM in-the-garden
be-mešex šaloš ša'ot.
 in-duration three hours
 'In his youth, Dani used to work in the garden for three hours.'
- b. #*bi-ne'ur-av dani haya 'oved b-a-gina*
 in-youth-his Dani HYY.PAST-3SM work-SM in-the-garden
be-mešex šaloš šanim.
 in-duration three years
 '#In his youth, Dani used to work in the garden for three years.'

In a similar fashion, iterative adverbials, like durative adverbials, only scope under Φ_{Hab} :

- (25) *bi-ne'ur-av dani haya xogeg*
 in-youth-his Dani HYY.PAST-3SM celebrate-SM
et yom.huladet-o pa'amayim.
 ACC birthday-his twice
 'In his youth, Dani used to celebrate his birthday twice.'

But in relation to Hab, iterative adverbials, unlike durative adverbials, do not have two scope relations, but only scope below Hab. Thus in the habitual interpretation of (26), the iterative adverb *twice* can only be understood as reporting iteration within each episode:

- (26) *bi-ne'ur-av dani xagag et yom-huladet-o*
 in-youth-his Dani celebrate.PAST-3SM ACC birthday-his
pa'amayim.
 twice
 'In his youth, Dani celebrated his birthday twice.'

The missing of the *twice* > *Hab* scope is a particular case of the well known fact that iterative adverbs do not modify habituais (cf. Lenci & Bertinetto 2000 a.o.), which, in turn, follows from the stativity of the habitual predicate, and from the fact that iterative adverbs do not apply to individual-level predicates (Landman (this volume), Rothstein (2004)). We account for the stativity of the habitual predicate, and for its being individual-level, in the next section.

4. The semantics of habituality

So far, we have motivated the existence of two distinct habitual operators: a covert adverbial operator *Hab* and a covert aspectual operator Φ_{Hab} .

The two habitual operators share a common core meaning. Both involve a particularly long temporal interval, which is the duration of the habit. Since duration is only defined for cumulative predicates, it has been repeatedly emphasized by Dowty (1979), Vlach & Nef (1981), Vlach (1993), van Geenhoven (2001, 2004), that a duration interval requires iteration. The definition of both habitual predicates therefore also involves an iterative operator.

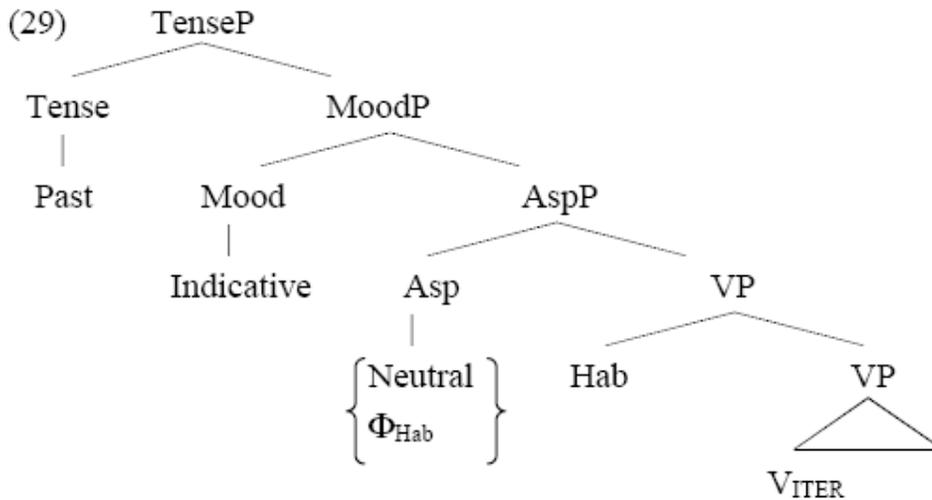
The two habitual operators share yet another characteristic: neither is quantificational. This accords with the ample literature (Carlson 1977, Lenci 1995, Zucchi & White 2001, Scheiner 2002, van Geenhoven 2004, Kratzer 2005, Rimmell 2005 and others) which has demonstrated that habituality *per se* does not give rise to quantifier scope ambiguities. Thus, in example (27) below, when understood habitually, the indefinite *a student* takes wide scope over the habitual operator in (27a). This is unlike the case with an overt quantifier, as in (27b), where *a student* can vary in the different episodes of student testing:

- (27) a. *kše-hi* 'avda *b-a-universita*, *ruti baxan-a*
 when-she worked at-the-university, Ruti test.PAST-3SF
student.
 student
 'When she worked at the university, Ruti tested a student.'
- b. *kše-hi* 'avda *b-a-universita*, *ruti baxan-a*
 when-she worked at-the-university, Ruti test.PAST-3SF
student kol šana.
 student every year
 'When she worked at the university, Ruti tested a student every year.'

The same is true for sentences in the periphrastic form, with Φ_{Hab} . It too, does not give rise to scope ambiguities, unlike overt quantifiers:

- (28) a. *ruti hayt-a boxen-et student.*
 Ruti HYY.PAST-3SF test-SF student
 ‘Ruti used to test a student.’
- b. *ruti hayt-a boxen-et student kol šana.*
 Ruti HYY.PAST-3SF test-SF student every year
 ‘Ruti used to test a student every year.’

In order to capture this common characteristic of both habitual operators, namely that they introduce iterativity which does not by itself interact scopally with other quantifiers, we adopt Kratzer’s (2005) proposal that iterativity is (or at least can be) a property of V, not of the VP. If the verb itself is marked as iterative, this ensures that iterativity is under the scope of quantifiers introduced by the verb’s arguments. We will therefore assume that under agreement with the habitual operator, either Hab or Φ_{Hab} , the verb is marked as iterative (V_{ITER}):



We now develop the semantic analysis. First, we assume that a verb V denotes a property P of events:

$$(30) \quad V \sim \lambda e \lambda w P(e, w)$$

We adopt the assumption (defended in Krifka 1992, Landman 1996, Kratzer 2005) that dynamic predicates P in their episodic reading are properties of plural events. Plurality is understood in a weak sense which includes singularity as a special case.

In the proposed semantics for habituality, the notion of plurality is replaced by a stronger notion of iterativity, which excludes singularity. We assume that the lexical feature ITER is interpreted as the operator ITER which

derives from P an iterative process ITER(P) (through the use of Link's (1983) sum-operator (σ)):

$$(31) \text{ ITER } \sim \lambda P \lambda e \lambda w [P(e, w) \ \& \ e = \sigma e' [P(e', w) \ \& \ e' \subseteq e]]$$

The definition requires of each event e which satisfies ITER(P), first, that it satisfies P, and second, that it consists of a sum of proper subevents which satisfy P. As a consequence, events satisfying ITER(P) are plural in a strong sense, i.e. they consist of sums of more than one event satisfying P. Since iteration involves sums of *proper* subevents, it is not a trivial notion: for example, telic predicates are not normally iterative.

Next, we explicitly define the operator FOR which applies to predicates P and selects intervals i which span ITER(P). However, it is not necessarily the case that the temporal trace $\tau(e)$ of an event e which satisfies ITER(P) is an interval (since there often are interruptions between the iterated subevents), rather, it is a set of intervals. We therefore define the *convex closure* of a set I of intervals (${}^{CC}I$) to be the interval that starts at the infimum of the left bounds of the intervals i of I and ends at the supremum of their right bounds (i.e. it starts where the earliest interval in I starts, and ends where the latest interval in I ends). FOR(P) is true of all intervals which are the convex closure of iterations of P:

$$(32) \text{ FOR } \sim \lambda P \lambda i \lambda w \exists e [\text{ITER}(P, e, w) \ \& \ i = {}^{CC} \{ \tau(e') : P(e', w) \ \& \ e' \subseteq e \}]$$

Notice that unlike Stump (1981), Lasersohn (1995) and van Geenhoven (2001, 2004), our notion of iteration does not *require* breaks between the episodes, since it is perfectly possible for each episode to always start before the end of the previous one, both with the simple and the periphrastic forms. The examples in (33) are true even in case Dani was repeatedly producing the play without any pauses:

- (33) a. *bi-šnot-ha-tiš'im dani hefiq hacaga šel lorca.*
 in-the-90s Dani produce.PAST-3SM play of Lorca
 'In the 90s, Dani produced a play by Lorca.'
- b. *bi-šnot-ha-tiš'im dani haya mefiq*
 in-the-90s Dani HYYPAST-3SM produce-SM
hacaga šel lorca.
 play of Lorca
 'In the 90s, Dani would / used to produce a play by Lorca.'

Nevertheless, predicates which by virtue of their lexical meaning rule out pauses for arbitrarily long intervals, such as individual-level verbs, should be excluded from the domain of ITER, since the application of ITER to such predicates is vacuous. Indeed, it is known that individual-level verbs do not

lend themselves to serving as a base for a habit (cf. Krifka et al. 1995). In the case of the simple form, the only interpretation is that of a state holding during some time in the past, with no additional habitual interpretation:

- (34) a. *be-yaldu-ti, hora-y yad'-u carfatit.*
 in-childhood-my, parents-my know.PAST-3P French
 'In my childhood, my parents knew French.'
 b. *dan xašav še-ha-'olam šatuax.*
 Dan think.PAST-3SM that-the-world flat
 'Dan thought that the world is flat.'

As for the periphrastic form, since it only has habitual readings, sentences with individual-level verbs (and individual-denoting subjects) are ungrammatical:⁹

- (35) a. **be-yaldut-i, hor-ay hay-u yod'-im carfatit.*
 in-childhood-my, parents-my HYY.PAST-3P know-PM French
 '*In my childhood, my parents would know French.'
 b. **dan haya xošev še-ha-'olam šatuax.*
 dan HYY.PAST-3SM think-SM that-the-world flat
 '*Dan would think that the world is flat.'

In the next section, we articulate the semantic interpretations of the two habitual operators, and discuss further differences between them.

4.1 The adverb *Hab*

We propose that *Hab* is a modal operator which applies to a predicate *P* of events and yields a predicate *Hab(P)* of states. *Hab(P)* is always stative, irrespective of *P*, due to its modality. For a state *s* to count as satisfying the predicate *Hab(P)*, its temporal trace $\tau(s)$ must be a contextually long interval, which is the convex closure of all intervals *i* satisfying *FOR(P,i)*, at least in prototypical worlds of the modal base $MB_{c,\leq}$:

- (36) $Hab \sim \lambda P \lambda s \lambda w [|\tau(s)| > L_{c,P} \ \& \ \tau(s) = {}^{CC}\{i : \forall w' \in MB_{c,\leq}(\tau(s),w) \text{ FOR}(P,i,w') \}]$

We use the notation $|\tau(s)|$ for the length of the interval $\tau(s)$, and $L_{c,P}$ for the length of an interval given in the context *c* which is long for events satisfying *P*. $MB_{c,\leq}$ is a contextually determined modal base together with an ordering source (Kratzer (1981, 1991)), which consists of gnomic alternatives to the real world and an ideal world where all dispositions are realized as iterations of events.¹⁰

In the next subsections we consider the components of the definition of Hab.

4.1.1 Length of the habit

The requirement $|\tau(s)| > L_{c,P}$ in the definition of Hab expresses the fact that the time of a habit derived from P must be substantial in the given context c , and also that it depends on P. Habituals are characterized by iterativity over a relatively long duration. Intuitively, a long period is needed in order to construe an iterated event as a regular pattern that may count as a habit. As argued by van Geenhoven (2001), the interval must be long enough so as to be in principle unbounded, such that any event satisfying P could be followed by yet another event satisfying P. Accordingly, adverbials denoting short time spans can only be understood as providing a short reference time which is a portion of the habit, but not as providing the duration of the habit:

- (37) *ba-rišon le-yanuar 1970, dan 'išen mixuc*
on-first of-January 1970, Dan smoke.PAST-3SM outside
l-a-binyan.
to-the-building
'On the first of January 1970, Dan smoked outside the building.'

(37) clearly has an episodic reading, but it also has a habitual reading, yet this is not a one-day-long habit, and the adverbial simply characterizes the Reference time.

4.1.2 Modality of Hab

The definition of Hab contains quantification over worlds in a modal base.¹¹ The notion of modal base $MB_{c,\leq}(i,w)$ is defined in Kratzer (1981, 1991) as determined contextually for each interval and world, and shaped by a contextually determined stereotypical ordering source \leq . In the present case, the modal base consists of gnomic alternatives to the real world. The ordering source requires us to assume the existence of concepts which are habits (see note 1), and enables us to characterize prototypical worlds as closest to the ideal world where accidents do not occur which prevent the realization of habits (in the ideal world, all dispositions are realized by iterated events). The definition of Hab states that in such a prototypical world, there is iteration of events P within the (contextually long) interval $\tau(s)$.

In case the real world is not prototypical, a habit may hold in it, but be rarely instantiated, or even wholly uninstantiated. This is so since accidental facts about the real world may interfere with the realization of some habits. Accordingly, the truth of a habitual sentence is not dependent on the

actualization of any particular event characterized by the habit. This may be the case in the example below:

- (38) *bi-ne'urey-ha ya'el hicbi'-a merec.*
 in-youth-her Yael vote.PAST-3SF Meretz
 'In her youth, Yael voted for the Meretz party.'

All that (38) asserts is that Yael was a Meretz voter. Therefore (38) is true, even if she mostly, or even always, happened to be out of the country on election day, and hardly, or even never, cast actual votes for Meretz. Another example is Krifka et al.'s (1995: ex. 22a) by now famous example, translated and adapted to the past tense:

- (39) *meri tipl-a ba-do'ar mi-'antarktika.*
 Mary handle.PAST-3SF the-mail from-Antarctica
 'Mary handled the mail from Antarctica.'

Even if there is no mail from Antarctica, the sentence might be true, simply by virtue of Mary having been appointed to handle it.

It may also happen that there are habits which are instantiated in the real world by a singular event. A husband who had just once refused to take out the garbage might be accused by his wife years later with the use of the habitual sentence *In those days, you refused to take out the garbage*. This is so since the wife conceptualized the single refusal as the realization of a habit.

4.2 The habitual aspect Φ_{Hab}

The aspectual operator Φ_{Hab} provides the sentence with a Reference time which is the convex closure of all intervals FOR(P) of iteration of P. Unlike Hab, Φ_{Hab} is not a modal operator:

- (40) $\Phi_{Hab} \sim \lambda P \lambda i \lambda w [|i| > L_{c,P} \ \& \ i = {}^{CC}\{ i' : FOR(P, i', w) \}]$

Since Φ_{Hab} is an alternative aspect to neutral aspect, it is directly embedded under (mood and) tense. Accordingly, as was shown in section 3, we do not get the potential continuation of the habit from the past to speech time.

As we saw above, the habitual aspect Φ_{Hab} does not apply to individual-level stative verbs, from which we infer that Φ_{Hab} does not co-occur with Hab, since Hab(P) is itself stative.

In a parallel way to the discussion of the semantics of Hab in section 4.1 above, we now turn to discuss the different components of the semantics of Φ_{Hab} .

4.2.1 Length of the habit

The periphrastic form, just as the simple one, requires a long duration; therefore frame adverbials denoting short periods are excluded as denoting the time of the habit. Unlike the case of the simple form where such adverbials could denote a short Reference time, here the habit time span is itself Reference time, and therefore cannot be contextually short:

- (41) **ba-rišon le-yanuar 1970, dan haya me'ašen*
on-first of-January 1970, Dan HYY.PAST-3SM smoke-SM
mixuc l-a-binyan.
outside to-the-build.
'*On the first of January 1970, Dan used to smoke outside of the building.'

In particular, the adverb *etmol* 'yesterday' cannot modify the periphrastic form. Here there is also interaction with the constraint of excluding speech time from the interval of the habit:

- (42) **etmol, dan haya me'ašen mixuc*
yesterday Dan HYY.PAST-3SM smoke-SM outside
l-a-binyan.
to-the-building
'*Yesterday Dan used to smoke outside of the building.'

The periphrastic examples improve as the length of the described intervals increases:

- (43) ??*ba-šavua / ba-xodeš še-avar, hu haya me'ašen*
in-week / in-month that-past, he HYY.PAST-3SM smoke-SM
mi-xuc l-a-binyan.
out-side to-the-build.
'Last week/month he used to smoke outside of the building.'

4.2.2 Actualization of the habit

A crucial difference between the simple and the periphrastic form relates to whether the habituality expressed is actualized or not. Whereas the simple form denotes a potential sequence of events, the periphrastic form denotes actual events (and is thus only found in the past tense). This can be exemplified as follows. In (44), the simple form is used to denote professional activities (in particular with unspecified objects, cf. Mittwoch 2005), whereas the periphrastic form – only actual events:

- (44) a. *dan limed b-a- 'universita.*
Dan teach.PAST-3SM in-the-university

- ‘Dan taught at the university.’
 b. *dan haya melamed b-a-‘universita.*
 Dan HYY.PAST-3SM teach-SM in-the-university
 ‘Dan used to teach at the university.’

(44a) states that Dan was a professor, even if in no semester were there ever enough registered students for him to teach, while (44b) states that Dan was regularly engaged in actual teaching.

In the simple form, the truth of a habitual sentence is not dependent on the actualization of any particular event characterized by the habit. This is not the case with the periphrastic form.

- (45) a. *bi-ne’urey-ha ya’el hicbi’-a merec.*
 in-youth-her Yael vote.PAST-3SF Meretz
 ‘In her youth, Yael voted for the Meretz party.’
 b. *bi-ne’urey-ha ya’el hayt-a macbi’-a merec.*
 in-youth-her Yael HYY.PAST-3SF vote-SF Meretz
 ‘In her youth, Yael used to vote for the Meretz party.’

The truth of (45b) requires actual episodes described by the VP, and hence elections when Yael actually voted for Meretz. This is not the case for (45a), as was shown in section 4.1.2. What is asserted in (45a) is that Yael was a Meretz voter.

An additional contrast is provided in (46):

- (46) a. *meri tipl-a ba-do’ar mi-‘antarktika.*
 Mary handle.PAST-3SF the-mail from-Antarctica
 ‘Mary handled the mail from Antarctica.’
 b. # *meri hayt-a metapel-et ba-do’ar mi-*
 Mary HYY.PAST-3SF handle-SF the-mail from-
 ‘antarktika.
 Antarctica
 ‘Mary used to handle the mail from Antarctica.’

(46b) is infelicitous since its truth depends on actual episodes described by the VP, and hence it presupposes the existence of mail from Antarctica. This is not the case in (46a), where what is asserted is that Mary was given a task, without any commitment as to its execution.

5. Diachronic discussion of the periphrastic form

In the previous section, we proposed that the periphrastic form is the realization of a particular aspectual value. Before concluding this paper, we present a diachronic overview of the Hebrew periphrastic form.

Rosén (1977) traces the periphrastic past historically to an *imperfective* form. Indeed, in Mishnaic Hebrew, the periphrastic form is used not only as habitual, as it is in Modern Hebrew, but also as a continuous form of the verb. The following are Mishnaic examples:

Habitual

- (47) *ma'ase be-'exad še-nata' et karm-o*
 story of-one that-planted-3SM ACC vineyard-his
 'al šeš 'esre 'ama. **haya** **hofex**
 on sixteen ama. HYY.PAST-3SM switch-SM...
 'The case of a man who planted his vineyard on a surface of
 sixteen ama [ama ≈2ft]. He used to switch...' (Kil'ayim 4.9)

Continuous

- (48) a. 'amar rabi tarfon, 'ani **hayit-i** **ba**
 said Rabi Tarfon, I HYY.PAST-1S come-SM
b-a-dereš ve-hitit-i
 in-the-road and-turned-1S
 'Rabi Tarfon said, I was coming along the road and I
 turned...' (Beraxot 1.3)
- b. *ma'as be-boyetas ben zinon še-haya mev*
 story of-Boyetas Ben Zinon that-HYY.PAST-3SM bring-SM
grogarot be-sfina ve-nišber-u xaviyot šel yayin
 dry-figs in-ship and-broke-3PL barrels of wine
 'al gabey-hem.
 on over-3PL
 'The case of Boyetas Ben Zinon who was bringing dry figs
 in a ship, and barrels of wine broke over them.' (Avoda Zara
 5.2)

The periphrastic form is thus assimilated to well known examples of imperfective forms in aspect languages such as Arabic, French, Italian, Russian etc., which function both as habitual and as continuous. The following example is from Arabic:

- (49) **kaana sami ya-ktubu.**
 BE.PAST-3SM Sami 3SM-write.IMPERF
 'Sami was writing.'/ 'Sami used to write.'

Rosén faces the following puzzle: if indeed the periphrastic form is originally an imperfective form, how did it eventually lose its continuous reading, and retain, in Modern Hebrew, solely its habitual reading? Rosén (1985) offers a sophisticated solution to the puzzle. He starts his account of the Hebrew verb system by considering the ancient Semitic languages, where the tense/aspect system included the grammaticalization of lexical

yisra: ʔel məqattri:m lo:
 Israel burn-PM to-3SM
 ‘For until those days the children of Israel used to burn incense to it.’ (2Kings 18:4)

In addition, future periphrastic forms are rare in the Bible.¹² We would therefore like to argue that not only is the periphrastic form an original Biblical Hebrew form, but that it preserves its original interpretation (habitual) to the present day. Mishnaic Hebrew reinterpreted this form under Aramaic influence, but this was idiosyncratic to that particular dialect, and died with it (see also Doron 2006).

Moreover, we would like to argue that the contrast between the two habitual interpretations also originates in Biblical Hebrew. The only difference is that the simple form associated with the gnomic habitual is not the past form, which at that time was strictly perfective, but the future form, which at the time was the imperfective form (cf. Hataav 1997):

- (51) a. *ʔal ken lo yidrəkū: koh^ane da:go:n wəkol*
 therefore not step.IMPERF-3PM priests Dagon and-all
habba: ʔi:m beʔ da:go:n ʔal miptan da:go:n
 that-come-3PM house Dagon on threshold Dagon
bə ʔašdo:d ʔad hayyo:m hazzε
 in-Ashdod until the-day the-this
 ‘Therefore neither the priests of Dagon, nor any that come into Dagon’s house, step on the threshold of Dagon in Ashdod until this day.’ (1Samuel 5:5)
- b. *ki: lanna:bi: hayyo:m yiqqa:re:*
 for to-the-prophet the-day call.PASSIVE.IMPERF-3SM
ləpa:ni:m ha:ro: ʔε
 before the-seer
 ‘For he that is now called a Prophet was in the past called a Seer.’ (1Samuel 9:9)

We therefore suggest that the two habitual operators Φ_{Hab} and Hab were already in place in Biblical Hebrew, and that they gave rise to the same interpretive differences that we find in Modern Hebrew. Thus, we conjecture that whereas sentences such as (50a-b), with Φ_{Hab} , were interpreted as prolonged iterations, sentences such as (51a-b), with Hab, were interpreted as gnomic habituais.

6. Conclusion

In the literature on habituality, the issue of the difference between separate linguistic notions of habituality has not been explicitly debated. In this paper we have shown that Modern Hebrew is a language that encodes such a difference in its grammatical system. Specifically, we argued that Modern Hebrew uses two habitual operators: Hab and Φ_{Hab} , the former yielding gnomic habituals and the latter – actualized ones. Both these operators were defined as sharing a core habitual meaning while being non-quantificational. The difference between them has been traced to an interchange between a modal component in one which is replaced by an aspectual component in the other. Syntactically, the operators were argued to differ as to the position in which they merge: Hab was argued to be a VP-level adverb, and Φ_{Hab} – an aspectual head. We took the fact that the inflection of the verb in simple habitual sentences is identical to that of episodic sentences as indicating that the habitual operator Hab is not encoded by functional heads, but adverbially. As for Φ_{Hab} , we suggested that, as an aspectual head, it is non-modal.

It was also suggested that Φ_{Hab} has a modal counterpart – Φ_{Subjunct} – present in counterfactual constructions. This last suggestion is based on an apparent complementary distribution between these two operators. The morphological similarity between habitual constructions and counterfactual ones is not a rare phenomenon, as the English translations of the Hebrew examples attest; Romance languages constitute an additional example (Ippolito 2004, for Italian). A full investigation of the semantic and syntactic connection between these constructions is left for future research (cf. Iatridou 2000).

Finally, the analysis in this paper indirectly tackles a question concerning the conditions for the emergence of periphrastic constructions in a given temporal system. Here it was suggested that the presence of Φ_{Hab} (or Φ_{Subjunct}) prevents the verb from raising to the functional projections thus forcing the insertion of an auxiliary.

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Notes

¹ We use the term *habit* for the denotation of *habituals*, though these are not necessarily habits in the every-day sense of the word. Habituals can be predicated of inanimate objects, e.g. *The sun rises in the east*, yet only animate beings are normally said to have habits. But even in the case of animates, the habitual *Mary answers her phone* is natural, yet answering your phone is not a felicitous example of a habit in the every-day sense, as can be seen from the oddity of *Mary has the habit of answering her phone*.

² The subjunctive reading is typically found in the consequent of a conditional:

- i. 'ilu laqaxta l-a et-ha-'oto, ya'el **hayt-a nosa'-at**
 if(irr.) take.PAST-2SM to-her ACC-the-car, Yael HYY.PAST-3SF go-SF
 la-'avoda ba-'otobus
 to-work by-bus
 'If you took her car, Yael would go to work by bus.'

³ Our concept is distinct from the neutral aspect of Smith 1991, which provides the sentence with a Reference time that overlaps the initial part of Event time. However, the difference between the two notions is not crucial for the analysis of habituality.

⁴ Many statives tend to be interpreted only as overlapping the event of the *when*-clause:

- i. kše-nixnas-ti l-a-xeder, **sarar** šam šeket
 when-enter.PAST-1S to-the-room, prevail.PAST-3SM there silence
 'When I entered the room, silence prevailed.'

⁵ A reading where the matrix eventuality totally precedes the *when*-clause eventuality is not available in (3). In order to enable such a reading, the adverb *kvar* 'already' has to be used.

⁶ Mood and aspect are not indicated in the gloss of the verb when they have default values.

⁷ The structure does not allow the simultaneous realization of both operators Φ_{Hab} and Φ_{Subjunct} . This prediction seems to be correct, but discussing it in detail is beyond the scope of the present paper.

⁸ The classification of adverbials in this section is due to Bennett & Partee (1978), de Swart (1993), Vlach (1993).

⁹ Like the Hebrew periphrastic form, the English habitual *would* is not possible with individual-level predicates. However, the English *used to* is possible with such predicates:

- i. My parents used to know French.
- ii. Dan used to think that the world is flat.

¹⁰ Our modal notion of habituality is based on universal quantification over possible worlds, and as such it differs from the notion of *dispositionality* (cf. Schubert and Pelletier 1989, Green 2000 among others) which, according to Menéndez-Benito (2005), is based on existential quantification.

¹¹ Notice that the modal quantifier does not interact scopally with other quantifiers that may be part of the event description (on this issue see Kratzer 2005).

¹² But note that Tsivoni (1993) has collected some archaic examples of future periphrastic forms which have found their way into Modern Hebrew.