

# The psychological reality of the telic/atelic distinction: Evidence from adult and child Hebrew\*

**Aviya Hacohen**

Ben-Gurion University of the Negev

## **1. Introduction**

The linguistic importance of the notion of telicity is evident from the large amount of theoretical literature dealing with the phenomenon. This study is motivated by the discrepancy between the abundance of theoretical literature on the telic/atelic distinction and the (near) lack of psycholinguistic research which clearly establishes the psychological reality of this distinction in adult language. The contribution of this study is in the introduction of the psycholinguistic perspective to the discussion of telicity. With psycholinguistic data, from both adult and child language, I hope to add valuable information and detail which will promote further development of the theoretical accounts.

This paper reports the results of an experiment on the telic/atelic distinction in Hebrew transitive constructions. Results unambiguously show that there is a clear distinction between telic and atelic predicates in adult Hebrew: adult speakers have a very strong tendency to reject telic predicates such as *lecayer et hapraxim* ('draw the flowers') as true descriptions of incompleting events, while freely accepting atelic predicates, such as *lecayer praxim* ('draw flowers'), as true descriptions of the same incompleting events. Furthermore, it was found that seven year old typically developing Hebrew speaking children, behave very differently from adults: they reject both telic and atelic predicates as true descriptions of incompleting events. I suggest that this behavior is the result of overgeneration of the definite determiner.

The paper is structured as follows: in the next section I provide the theoretical background of (compositional) telicity. Section (3) describes two of the most relevant acquisition studies which tested knowledge of compositional telicity in Dutch and in German. This is followed by section (4) in which I formulate the hypotheses and predictions for adult and child Hebrew. Section (5) is the methodology section, and in section (6) I present the results obtained in the experiment as well as a discussion of these results. I conclude this paper with a brief summary and suggestions for further research.

---

\* This research was supported by grant No. 4-2004 from The National Institute for Psychobiology in Israel.

## 2. Theoretical background

### 2.1 The telic/atelic distinction

Across languages, verbal predicates may be characterized as having two main properties: tense and aspect. Tense is used in linguistic analysis in order to determine the position of an event on a time-line. Aspect, on the other hand, is concerned with the internal contour of the event itself, how it unfolds over time, regardless of where it occurred with respect to the time-line. The linguistic category of Aspect has two levels: the grammatical aspect and the lexical aspect. The former is carried by the tense morphemes on the verb itself and is concerned with whether the event depicted is viewed as a whole ('perfective aspect') whose beginning and end are defined, or whether it is to be viewed from within, as it is progressing (Comrie, 1976). Lexical aspect, and telicity in particular, which is the focus of this investigation, refers to the internal temporal contour of the depicted event. Telicity is defined by two properties: endpoint and homogeneity. Telic predicates are those that involve an inherent, natural endpoint, or culmination. They are also non-homogeneous, or non-cumulative in Krifka's (1992, 1998) terms, in the sense that one part of the event is not the same as the whole event. I will return to the question of definition in the following sections, but first I want to present some evidence that the telic/atelic distinction is indeed a real linguistic phenomenon, in the sense that telic and atelic predicates behave differently in different linguistic contexts.

One of the most common diagnostics for telicity in English, is the test of adverbial modification (e.g. Dowty, 1979). As can be seen in (1), telic predicates may only be modified by so-called 'frame' adverbials, such as *in an hour*, while atelic predicates are only grammatical in the context of durational adverbs, such as *for an hour*:

- (1) a. Sara ran a mile in an hour/\*for an hour (telic)  
b. Sara ran \*in an hour/for an hour (atelic)

Applying this test in Hebrew, however, gives us very different results:

- (2) a. *Sara raca kilometer tox sha'albemeshex sha'a*  
Sara ran-sgf (a) kilometer in an hour/ for an hour  
Sara ran a kilometer in an hour/ for an hour  
b. *Sara raca tox sha'albemeshex sha'a*  
sara ran-sgf in an hour/ for an hour  
Sara ran in an hour/ for an hour

As shown by the examples above, both the telic and the atelic predicates are equally grammatical when modified by either the 'frame' adverbial or the durational adverbial. Thus, this very common test is not a good diagnostic for telicity in Hebrew. This of course does not mean that the distinction does not exist in Hebrew, but rather, that these adverbials are somehow different in Hebrew, and can therefore not be used as tests for (a)telicity.<sup>1</sup> Instead, one of the contexts that do distinguish telic and atelic predicates in Hebrew is the modifier *kim'at* ('almost') (Smith, 1991):

- (3) a.     *Sara kima't axla       orez.*  
           Sara almost ate-3sgf   rice  
       b.     *Sara kim'at axla       sendvich.*  
           Sara almost ate-3sgf   (a) sandwich

What the examples above show is that while the (a) sentence has only one reading, namely, that Sara did not eat rice at all, the (b) sentence is ambiguous: one reading says that Sara did not eat at all (the same reading as the previous sentence), but there is an additional reading in which Sara did start eating the sandwich but did not finish it. This ambiguity is the result of the heterogeneous nature of telic predicates as opposed to the homogeneity that characterizes atelic predicates (cf. the next section): telic predicates involve both a process and a result (Smith, 1991). Since *kim'at* may modify either the process or the result, the two possible readings above emerge. What the *kim'at* test shows is that the telic/atelic distinction does in fact exist in Hebrew.

Another diagnostic of telicity has been termed 'the imperfective paradox' (Dowty, 1979). The examples in (4) show that telic and atelic predicates have different entailments when they are generated in the progressive:

- (4) a.     John was eating rice  $\Rightarrow$  John ate rice  
       b.     John was eating a sandwich  $\nRightarrow$  John ate a sandwich

What these examples show is that the atelic predicate in a) entails the perfective. Conversely, the telic predicate in b) does not license the perfective reading. This is a good test for telicity in English, but, again, it cannot be used in Hebrew since Hebrew does not have progressive morphology. Nevertheless, the same principle applies in Hebrew by creating a structure (rather than using verbal morphology) that denotes an imperfective reading. This structure is created by the use of the inflected preposition *beod* (=while) (Yitzhaki, 2003):

---

<sup>1</sup> The reasons for the "failure" of this test may also be due to other properties of the Hebrew predicates, but investigation of the issue is beyond the scope of this paper, and in any case, the point I am making here is merely that this classic test does not yield the desired distinction for Hebrew.

- (5) a. *Be'odo melatef xatul, hashemesh shak'a.*  
 While-he stroking-3sgm cat, the-sun set-3sgf
- b. *Be'oda mecayeret igul, haiparon nishbar.*  
 While-she drawing-3sgf circle, the-pencil broke-3sgm

Note that in this construction the verb is always in the present, and this, together with the preposition, gives rise to the reading in which the event depicted in the adjunct is ongoing. Thus, when generated in this structure, the telic and the atelic predicates exhibit different behaviors: while the sentence in (a), with an atelic predicate, entails that the cat was stroked, the sentence in (b), with the telic predicate, does not entail that a circle was drawn.

The distributional evidence from the *kim'at* test and the *beod* test, then, show that (A)telicity is a real linguistic phenomenon in Hebrew. Having shown this, I now turn to a brief survey of the crosslinguistic theoretical literature on compositional telicity.

## 2.2 Defining (compositional) telicity

(A)telic predicates may be defined in terms of two properties, namely *endpoint* and *homogeneity*. As mentioned above, the claim is that telic predicates, but not atelic ones, have a natural point at which the event comes to an end, a culmination point. A telic predicate such as *eat the sandwich* is only true when the event it describes reaches its endpoint, the point at which the sandwich is consumed and the eating cannot go on. In other words, telic predicates have an entailment of completion.

The idea of the end-point as the defining element of telicity is adopted, either explicitly or implicitly and under various titles, in a wide range of theoretical literature (e.g. Verkuyl, 1972, 1993; Comrie, 1976; Dowty, 1979; Tenny, 1994; Depraetere, 1995; Krifka, 1998; Rothstein, 2004).

In terms of the homogeneity criterion, it is claimed that atelic predicates are homogeneous while telic ones are non-homogeneous (e.g. Vendler, 1967; Dowty, 1979; ter Meulen, 1984; Krifka, 1998). In what follows, I explain what is meant by homogeneity and how it is used to define telicity.

In his seminal work on verb classes, Vendler (1967) distinguishes four basic verb classes in terms of their aspectual denotation: states, activities, achievements, and accomplishments. His classification was done according to two basic criteria, punctuality/continuity and homogeneity/heterogeneity. The actual classification and its consequences are not at all relevant for my study, but the homogeneity criterion is. In

Vendler's terms, what distinguishes between verbs such as *eat* or *draw* on the one hand and predicates such as *eat a sandwich* and *draw a circle* on the other is that while a verb of the *eat/drink* type "goes on in time in a homogeneous way; [such that] any part of the process is of the same nature as the whole" (Vendler, 1967:101), the *eat a sandwich/draw a circle* type predicates "proceed to a terminus which is logically necessary to their being what they are" (ibid).<sup>2</sup>

In Krifka (1998), homogeneity is related to the *subinterval* property of (a)telic predicates. Atelic predicates, such as *eat rice*, have this property: whenever they are true at a given time interval, they are also true at any part (or subinterval) of that interval. This is not the case for telic predicates such as *eat a sandwich*. A formal definition of the subinterval property is found in Bennet & Partee (1972/78:14):

"Subinterval verb phrases have the property that if they are the main verb phrase of a sentence which is true at some interval of time *I*, then the sentence is true at every subinterval of *I* including every moment of time in *I*"

Based on this, Borik (2002:34) formulates a definition of homogeneity:

(6) P is homogeneous iff  $\forall x, \forall y(P(x) \ \& \ (y \subset x) \rightarrow P(Y))$

Crucially, the notion of homogeneity refers to both the verbal and the nominal part of the predicate. That is, the 'homogeneity value', and consequently the telicity value of the predicate is the result of the combination of the properties of the verb and those of the NP. This compositional process naturally brings us to Verkuyl's account of how telicity is compositionally derived.

### 2.3 Deriving compositional telicity

One of the most influential theories of compositional telicity has been developed by Verkuyl (1972, 1993). According to this account, the derivation starts with a dynamic verb, such as *eat*. This type of verbs have the feature [+ADD TO], which expresses dynamic progress and distinguishes them from stative verbs. A [+ADD TO] verb provides a path along which the event unfolds over time, but crucially that is all it does. In other words, the verb itself is never solely responsible for the telicity value of the predicate; it merely provides the possibility for the predicate to be telic. Ultimately, it is the direct object argument that determines the telicity value of the predicate. A direct object with the feature [+SQA]—which stands for 'specific quantity of A' and means that the NP refers to a specified, discernible quantity of the object denoted by it—

---

<sup>2</sup> Note that Vendler also uses the notion of endpoint, or terminus.

provides a boundary for the path created by the [+ADD TO] verb, thus determining the value of the predicate as [+telic].

There is a problem with this approach in that it seems to wrongly predict the telicity value of such predicates as *push the cart*. Since *push* is dynamic, and therefore [+ADD TO], and *the cart* is quantized and therefore [+SQA], the predicted derivation should be telic, which of course is false. Verkuyl (1989) proposes a possible solution, which I find unsatisfactory, at best. Instead I propose to informally incorporate a restriction on the [+ADD TO] feature. This is done by introducing the idea of 'incrementality' (Dowty, 1991) or 'measuring out' (in the sense of Tenny, 1987; 1994). Thus, in order for a derivation to be telic, it is not enough that the verb is [+ADD TO]; it must also be the type of [+ADD TO] verb that takes an incremental theme as its direct object.

The main reason for adopting Verkuyl's account (with the slight adjustments from Dowty and Tenny suggested above), rather than using Dowty's or Tenny's hypotheses, is that the latter two approaches draw on the notion of result state as a defining property of telic predicates.<sup>3</sup> According to Dowty (1979) and as adopted in Tenny (1987), accomplishments (i.e. telic predicates) are analyzed as having a complex structure comprised of two atomic clauses: CAUSE and BECOME. Thus, such predicates crucially involve a result state, namely, the BECOME part of the predicate. In other words, it seems that for Dowty and Tenny telicity is tied together with a result state. This assumption turns out to be problematic in light of Hebrew data brought up by Doron (2000), who shows, using evidence from the behavior of the nominal passive that, at least in Hebrew, telicity and result state do not necessarily go hand in hand.

Hebrew has two types of passive forms, a verbal passive and a nominal passive. It is the nominal forms that are of interest here. This form is derived from a verb and describes the result state of the event denoted by the verb (Doron, 2000). Doron shows that telic verbs in Hebrew differ in their licensing of nominal passives.<sup>4</sup> For example, while the verb *bišel* ('cooked') licenses the nominal passive *mevušal* ('is cooked'), the verb *kara* ('read<sub>past</sub>') does not license a nominal passive form. Thus, although both verbs are taken to be telic, only *bišel* ('cooked') licenses the nominal passive. Furthermore, some clearly atelic verbs actually license a nominal passive. For example, the verbs

---

<sup>3</sup> The authors specifically refer to the aspectual class of *accomplishment* (a distinction which is immaterial for this paper), but it is reasonable to assume that this applies to telic predicates in general.

<sup>4</sup> Note that, contra to the approach adopted in this paper, Doron assumes that the lexical verb itself, rather than whole predicate, is either telic or atelic. Nevertheless, this does not take away from the evidence and the argument that follows.

*la'as* ('chewed') and *šifšef* ('rubbed') licenses the nominal passives *laus* and *mešušaf* respectively. These data quite clearly show that, at least in Hebrew, telicity and result state are independent of each other.

In the next section I describe the distribution of compositional (a) telicity in Hebrew.

## 2.4 Hebrew compositional telicity

Empirically, compositional telicity in Hebrew is quite similar to English. Table 1 demonstrates the distribution of compositionally (a)telic predicates. Telic predicates are in the shaded cells.

(7) Table 1

	<b>+ Definite</b>	<b>- Definite</b>
<b>Singular count</b>	<b>le'exol et hasendvich</b> eat-inf 'et' the-sandwich	<b>le'exol sendvich</b> eat-inf (a) sandwich
<b>Plural count</b>	<b>le'exol et hasendvichim</b> eat-inf 'et' the-sandwiches	<b>le'exol sendvichim</b> eat-inf sandwiches
<b>Mass</b>	<b>le'exol et haorez</b> eat-inf 'et' the-rice	<b>le'exol orez</b> eat-inf rice

As can be seen from the table, similarly to English, it is ultimately the nature of the NP which determines the telicity value of the predicate. Specifically, a quantized NP combined with an incremental dynamic verb derives a telic predicate. Quantization in Hebrew is the result of the interaction between definiteness and noun type. Thus, the telic predicates are those with definite NP's as well as an indefinite singular count NP. Having laid out the theoretical background, I now turn to psycholinguistic data.

## 3. Previous acquisition studies

### 3.1 van Hout (1998)

Van Hout (1998) conducted a comprehension experiment, using the Truth Value Judgment task (Crain & McKee, 1985; Crain & Thornton, 1998), to test typically developing (TD) Dutch and English speaking children's knowledge of compositional telicity. The relevant situation type in this context is the incompleting one since it depicts a situation where judgments are predicted to differ depending on the telicity value of the predicate. That is, when presented with the incomplete event, subjects are predicted to judge telic predicates to be false descriptions of the event and atelic predicates to be true

descriptions of the same event. Excerpts from the Dutch and English protocols are presented below:

(8) [Dutch incomplete event]

*EXP:* Hier is een witte muis. Hij heeft een net stuk kaas gevonden. Kijk, hier is hij aan het eten. Hij knabbelt er een beetje af, maar dit stuk is veel te groot voor hem. Hij laat nog wat over voor later.

[English incomplete event]

*EXP:* Here's a white mouse. He just found a piece of cheese. Look, here he's eating. He takes a couple of bites, but his cheese is too big for him for now. He leaves a piece for later.

The story was accompanied by three pictures depicting the beginning of the event, the event in progress, and the final result.

Having heard the story above, the subject was asked a *yes/no* question about the character. In the original experiment van Hout tested four different question structures: intransitives, transitives with a bare object, transitive particle verbs, and transitives with an object preceded by a possessive pronoun. The latter condition is the most interesting one for my purposes since it involves a transitive verb + full DP structure, a similar structure to the one I will be testing in Hebrew. An example of such a question is given in (9):

(9) Dutch: Heeft de witte muis zijn kaasje gegeten? Heeft de rode muis zijn kaasje gegeten?

English: Did the white mouse eat his cheese? Did the red mouse eat his cheese?

Each subject was only presented with one such item. That is, a presentation of the **incomplete event** followed by a question such as the one above (i.e. a transitive verb with an object preceded by a possessive pronoun) was only tested once on each subject.

Three groups of 15 Dutch speaking children (3- 4- and 5-year olds) and one group of 15 adults participated in the Dutch experiment. In the English experiment there were 19 3-year-olds, 17 4-year-olds, 11 5-year-olds, and 16 adults, all of whom were speakers of American-English.

Van Hout found that Dutch speaking adults rejected the predicate 80% of the time, which strongly indicates that this predicate has a completion entailment in adult Dutch.<sup>5</sup> Performance of 4- and 5-year-olds was at chance, and rejection rate of the

---

<sup>5</sup> But note that this is only one predicate, which does not necessarily generalize over to other telic predicates. Furthermore, van Hout (p.c.) reports that when she (and others) tried to replicate this result,



youngest children was 20%. Rejection rate of English speaking adults was only 25% and three child groups behaved at chance.

Thus, results from the English experiment show a very weak completion entailment for the predicate, failing to demonstrate the psychological reality of the telic/atelic distinction in adult English. The adult Dutch result seems to be more promising; however, taking into account the fact that this result was never replicated (cf. footnote 3) and that only one predicate was tested, these data remain vague. Given that *adult* performance in English and Dutch is not conclusive, it follows that it is impossible to say anything meaningful about the *acquisition* of compositional telicity in those languages. This is true in general: description and analysis of child language must always be conducted vis-à-vis adult language.

### 3.2 Schulz & Penner (2002)

Based on van Hout's (1998) experiments, Schulz & Penner (2002) tested the acquisition of compositional telicity in German. Materials used in this experiment were very similar to the ones used by van Hout: three picture-sequences depicting an eating/drinking event accompanied by a story. Following this presentation, the subject was asked two *yes/no* questions about the event, one intransitive question and one question using a particle verb or a transitive verb frame. The latter being the relevant one for my purposes. An example of a transitive question is given below:

- (10) Hat das Mädchen den Apfel gegessen?  
has the girl the apple eaten  
'Did the girl eat the apple?'

Each subject was asked to answer two such questions in the incompleteness condition. One group of 24 German speaking adults and a group of 24 German speaking children aged 4;1-6;4 (mean 5;4) were tested. Results show that behavior of both groups was very near chance (56% 'yes' response for adults and 52% for children).

Thus, data from the German experiment does not provide evidence for the psychological reality of the telic/atelic distinction in adult German.

Given these results and van Hout's (1998), it is clear that before examining the acquisition of compositional telicity, the first task is to show that the telic/atelic distinction is psychologically real in adult language.

---

with similar versions of the experiment, rejection rates were much lower, suggesting that the completion entailment was not nearly as strong as the original experiment suggests.

#### **4. Hypotheses and predictions**

Based on the theoretical literature on compositional telicity as laid out above, I hypothesize that in adult language

**Hypothesis 1** Telic predicates (=incremental dynamic verb + quantized object) are only true as descriptions of completed events

This hypothesis renders the prediction that

**Prediction 1** Hebrew speaking adults will reject telic predicates as descriptions of incompleting events

I further hypothesize that

**Hypothesis 2** Atelic predicates (=incremental dynamic verb + non-quantized object) are true as descriptions of completed and incompleting events

This renders the prediction that

**Prediction 2** Hebrew speaking adults will accept atelic predicates as descriptions of incompleting events

As for child language, recall that results from van Hout (1998) and Schulz et al (2002) showed that even at age 6, TD English, Dutch and German speaking children do not distinguish compositionally telic and atelic predicates. If I were to base my hypotheses and predictions for TD Hebrew speaking children on these results, I would hypothesize that TD Hebrew speaking children younger than 6 have non-adultlike knowledge of compositional telicity, and consequently that they accept telic predicates as descriptions of incompleting events (similarly to the children in van Hout, 1998 and Schulz et al, 2002). However, recall also that, crucially, the child results of those experiments are not very different from the adult data obtained. This being the case, and taken together with the possible methodological flaws of the experimental design, I think that it would be wrong to base my hypotheses and predictions for TD Hebrew speaking children on those experiments. Instead, based on the Aspect First Hypothesis, according to which the lexical-semantic notion of telicity is present cross-linguistically from the initial emergence of verbal forms (Bloom, Lifter & Hafitz, 1980; Shirai & Andersen, 1995 for English; Bronckart & Sinclair, 1973 for French; Stephany, 1981 for Greek; Antinucci & Miller 1976 for Italian; Aksu-Koç, 1988 for Turkish; Berman, 1983 for Hebrew), I hypothesize that

**Hypothesis 3** Typically developing preschoolers have adultlike knowledge of compositional (a)telicity

This hypothesis renders the following predictions:

**Prediction 3** Hebrew speaking preschoolers will reject telic predicates as descriptions of incompleted events

**Prediction 4** Hebrew speaking preschoolers will accept atelic predicates as descriptions of incompleted events

## 5. Methods

The main goal of this study was to determine the psychological reality of the telic/atelic distinction in adult language. In other words, to show that adult Hebrew speakers clearly distinguish between telic and atelic predicates: when presented with an incompleted event, speakers will reject telic predicates and accept atelic predicates as true descriptions of these events. Previous acquisition studies in other languages (van Hout, 1998 for Dutch and English; Schulz & Penner, 2002 for German) have all failed to show that (cf. section 3). I strongly argue that it is pointless to test children's knowledge of a linguistic phenomenon before testing adult behavior and without showing a clear pattern in adult language. Therefore, the first, and perhaps the most important aim of my study, was to show that adult speakers distinguish between compositionally telic and atelic predicates.

### 5.1 Design and procedure

In order to test the predictions above, I designed the following experiment (inspired by van Hout, 1998), which is a variant of the Truth Value Judgment task (Crain & McKee, 1985; Crain & Thornton, 1998). The following table presents the experimental design:

(11) Table 2

		NP type		
		Singular count	Plural count	Mass
Definiteness	+	<i>le'exol et hatapuz</i> eat-inf 'et' the-orange	<i>le'exol et hatapuzim</i> eat-inf 'et' the-oranges	<i>le'exol et haorez</i> eat-inf 'et' the-rice
	-	<i>le'exol tapuz</i> eat-inf (an) orange	<i>le'exol tapuzim</i> eat-inf oranges	<i>le'exol orez</i> eat-inf rice

As illustrated in the table, this is a 2x3 design, which renders the following experimental conditions: 1) indefinite singular count, 2) definite singular count, 3) indefinite plural, 4) definite plural, 5) indefinite mass, and 6) definite mass. With 10 experimental items per condition and 30 unrelated filler items, the experiment consists of 90 items. The purpose of including this many items is to allow a relatively wide

variety of verbs. Furthermore, the verbs and the direct objects were kept as constant as possible across conditions, so that the different responses for each condition can not be accounted for by purely lexical-semantic differences between the verbs.<sup>6</sup>

The English translation of the procedure is presented below:

- (12) *EXP*: Hello [subject], first of all, I'd like you to meet my friends. (to the puppets:) you can introduce yourselves now.  
*Crab*: hi, I'm Sartan ('crab').  
*Frog*: hello, I'm Cfardea ('frog').  
*EXP*: Yesterday, Sartan and Cfardea had a video camera and they told their friends to do all sorts of things for the camera. But after they'd watched their movies, they can't stop arguing about whether their friends did what they were told or not. They were driving me crazy with all their arguing! So I suggested that maybe I should look at what they'd filmed and tell them what I thought, but they didn't even agree on that! So then I suggested that you will help them decide. And they actually agreed to that. And they promised that what you say is what counts. Do you want to help them?  
*Subject*: Yes.  
*EXP*: Good, so before each clip I will tell you what Cfardea and Sartan told their friend to do, then we will watch the video and then you will say what you think. I will write that down so that we don't forget and so whenever they start arguing again I can tell them that they agreed that what you [subject] said is what counts.

The reason I decided to use two puppets instead of—the more "traditional"—one puppet, is that this way I provide a pragmatic context in which rejection and acceptance are equally plausible.<sup>7</sup> Furthermore, it is important to note that the puppets did not comment on each individual clip, saying whether they thought the friend did what she was told or not. The reason for this is that I wanted to avoid a situation in which the subject takes a fancy to one of the puppets, and makes judgments based on that puppet's judgment, rather than on her own intuitions.

## 5.2 Subjects

Two groups of monolingual Hebrew speakers were tested: 14 undergraduates aged 20-30 and 7 typically developing children aged 5;7-6;4 (mean 6;0). Note that 2 of the children did not complete the task; however, I decided to include their results since given that the items were fully randomized across conditions, incompleteness of the task should not affect the results.

---

<sup>6</sup> Though, naturally, it was not possible to have a perfect correlation, since not many verbs allow all three NP types as the direct object argument. Specifically, the mass condition seems to be the most restricted one in this context, and thus, the verbs in the two mass conditions are quite different to those in the other four conditions.

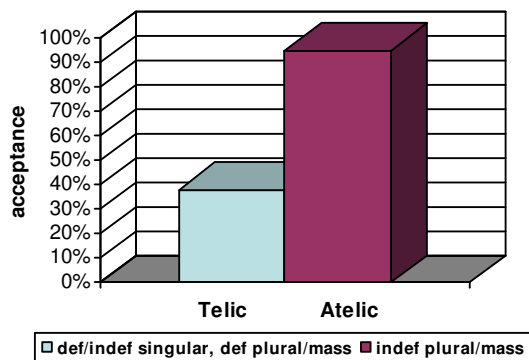
<sup>7</sup> I wish to thank Leah Paltiel-Gedalyovich for the idea.

## 6. Results and discussion

Recall that the hypothesis was that telic predicates are not true as descriptions of incompleting events, and thus the prediction for adult Hebrew was that when presented with the visual stimuli (i.e. video clips of incompleting events), speakers will **reject** the telic predicates (namely, the three definite conditions as well as the indefinite singular condition) and **accept** the atelic ones (i.e. the indefinite plural and mass conditions). Adult data are presented in the graph below:

(13) Figure 2

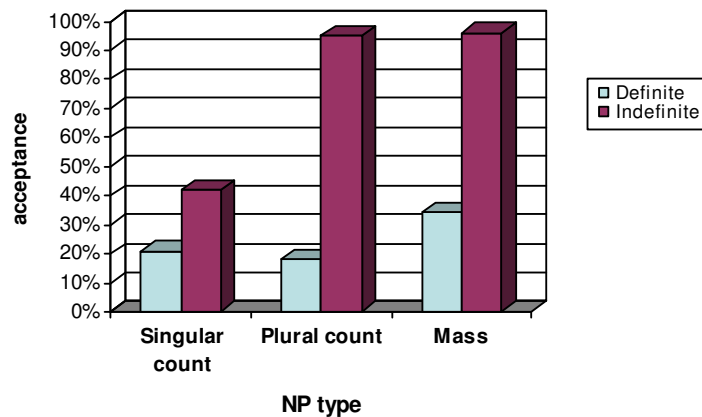
Average acceptance rate of telic vs. atelic predicates as true descriptions of incompleting event (adults)



From the graph it is indeed clear that there is a distinction between acceptance rate of compositionally telic vs. atelic predicate, which is the desired result. The next graph illustrates the distribution of acceptance per condition:

(14) Figure 3

Acceptance rate of (a)telic predicates as descriptions of incompleting events (adults)



A significant interaction effect of definiteness and NP type was found. From this graph we see that definiteness has a stronger effect on telicity than NP type does. This is evident from the fact that the difference between the acceptance rate of definite

predicates vs. indefinite predicates is much bigger than the difference between the acceptance rate of count predicates vs. mass predicates. Nonetheless, NP type does play an important role, hence the significant difference between acceptance of definite count predicates vs. that of the definite mass. This difference may be accounted for by the idea that in terms of visual representation (and presumably the real world), mass objects are 'less bounded' than plural objects. Being less bounded, it follows that it is harder to determine what constitutes event completion in the mass nouns condition. Interestingly, and perhaps independently of the explanation I propose here, this result clearly suggests that perceptual differences between mass and plural play an important role in the interpretation of the linguistic stimulus.<sup>8</sup>

Finally, a relatively high acceptance rate (40%) was found in the indefinite singular count condition. In light of the theoretical literature, this is a completely unexpected result, which will have to be addressed if, after testing a larger population, it proves to be a real phenomenon. At this point, all I can say is that perhaps this has to do with the fact that an indefinite determiner (corresponding to the English *a*) does not exist in Hebrew, a fact that may lead to the possible interpretation of various indefinite count nouns as mass. Alternatively, it is also possible that this result is simply the consequence of the relatively small sample size and/or some problems in the materials, both of which will be addressed in further research.

To summarize the adult results, it is clear that adult Hebrew speakers distinguish between compositionally telic and atelic predicates. It is also clear, however, that more work needs to be done on the materials, since, though clearly in contrast with acceptance on the atelic predicates, acceptance of telic predicates as true descriptions of incompleting events is still too high, namely, 38%.

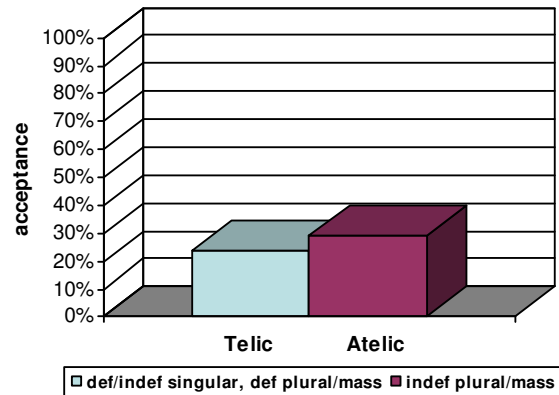
Having established a clear pattern for adult Hebrew it is now time to turn to the child data. These results are presented in the graph below:

---

<sup>8</sup> And see Chierchia (1995) for a discussion on the role of real world knowledge and perception of objects on linguistic categorization of nouns.

(15) Figure 4

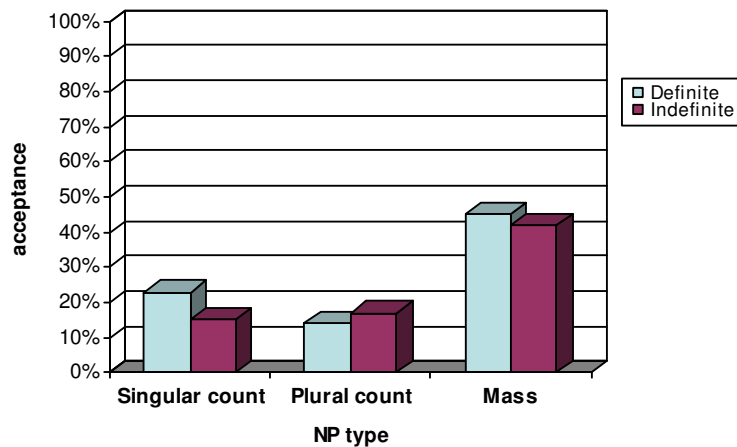
Average acceptance rate of telic vs. atelic predicates as true descriptions of incompleting event (children)



What this graph shows is that the average acceptance rate of telic and atelic predicates are virtually identical. Thus, it is quite clear from this graph that the group of children in this experiment does not distinguish compositionally telic and atelic predicates. Furthermore, what we see for the children is dramatically different from the adult data, and quite unlike what was found for other languages (see section 3). This is more clearly illustrated in the graph below, which provides a break down of the data according to each condition:

(16) Figure 5

Acceptance rate of (a)telic predicates as descriptions of incompleting events (children)



What we see in the graph is that these children treat the definite and the indefinite predicates in exactly the same way, with a high rejection rate on the four singular/plural count conditions that is similar to that of the adults on the definite conditions. In other words, the children seem to treat the indefinite conditions as if they were definite. As

for the mass conditions, behavior is pretty much at chance, both group and individual behavior, and it too is very different from the adult behavior. Furthermore, no interaction effect of definiteness and NP type was found in the child data.

In summary, the results of this study show that while adult speakers of Hebrew clearly accept atelic predicates as true descriptions of incompleting events, acceptance rate of telic predicates as description of such events is on average quite low, providing strong evidence for the psychological reality of the telic/atelic distinction in Hebrew. As for the child data, these unambiguously show that even at 6 years of age, typically developing Hebrew speaking children's knowledge of compositional (a)telicity is non-adultlike. It is important to note here, that only a relatively small group of children was tested, and it would therefore be unwarranted to draw very strong general conclusions with respect to the acquisition of compositional telicity based on these data at this point. Nonetheless, a clear pattern does emerge in terms of the use of the definite article (and/or lack thereof) by these children

### **6.1 Accounting for the child data**

The child results were highly surprising, as they are so unlike what was found for other languages (van Hout, 1998 for Dutch and English and Schulz et al, 2002 for German) in which atelicity seemed to be some sort of default (for both adults and children) and was acquired much earlier.

The most striking result of this experiment is that Hebrew speaking children treated definite and indefinite NP's in exactly the same way, namely, the way adults treat definite NPs. What immediately springs to mind is that this is a case of overgeneration of the definite determiner, a phenomenon in which the definite determiner is used in contexts which require the use of the indefinite. Preliminary support for this idea comes from spontaneous production of the children during the experiment. An example of such a response is given in (17):

- (17) *EXP*: lavideo        aba        amru    leTara leroken    kosot.  
          for-the-video next        told-3pl to-Tara empty-inf glasses  
          for the next video they told Tara to empty glasses.  
(video is shown)  
*EXP*: i    asta        ma    sheamru    la?  
          she did-3sgf what that-told-3pl to-her  
          did she do what she was told?  
*Subject*: lo.  
          no



(after short pause)

*EXP:* rega, shaxaxti, ma amru la la'asot?  
minute forgot-1sg what told-3pl to-her do-inf  
wait, I forgot, what did they tell her to do?

*Subject:* leroke**n** **et** akosot.  
empty-inf 'et' the-glasses

From this example it really looks as if the child simply ignores the fact that the actual stimulus was indefinite. Such responses were elicited repeatedly from all subjects and in all indefinite conditions. No responses in the opposite direction were found. That is, it was never the case that when a child was asked (using a similar procedure) to repeat a definite stimulus, she produced the indefinite counterpart of the item.

Further, independent, support for the phenomenon of overgeneration comes from elicited production experiments conducted by Karmiloff-Smith (1979) in French and, more recently, by Schaeffer (1997; 2000) in Dutch. Karmiloff-Smith shows that French speaking children overgenerate the definite determiner to indefinite contexts up until the age of 9. Similarly, even the oldest subjects in Schaeffer's experiment (6 year olds) produced the definite determiner in contexts where adults would use the indefinite 35% of the time.

Note, however, that these results all come from production experiments. Given the clear distinction between production and comprehension in child language, the overgeneration account proposed here must therefore be further investigated using a comprehension task.

## **7. Summary**

In summary, results of this study show that the telic/atelic distinction is psychologically real in adult Hebrew, thus providing support for theoretical literature on telicity.

However, it is clear that a refinement of the methodology, specifically the items in the indefinite singular count condition, is required in order to achieve a higher rejection rate for these items. As for the child data, further research is needed in order to independently test the overgeneration account and its interaction with the telicity data found here. In addition, a larger group of children from a wider age range should be tested in order to establish the acquisitional pattern of compositional telicity in Hebrew. It is precisely these issues that are currently being addressed.

## Bibliography

- Aksu-Koç, A. (1988). *The Acquisition of Aspect and modality: The Case of Past Reference in Turkish*. Cambridge, UK: Cambridge University Press.
- Antinucci, F. & Miller, R. (1976). How children talk about what happened. *Journal of Child Language* **3**, 169-189.
- Bennett, M & Partee, B. (1972/78). *Toward the logic of Tense and Aspect in English*. Distributed by Indiana University Linguistics Club.
- Berman, R. (1983). Establishing Schema: Children's Construals of Verb-Tense Marking. *Language Sciences* **5**, 61-78.
- Bloom, L., Lifter, K. & Hafitz, J. (1980). Semantics of verbs and development of verb inflection in child language. *Language* **56**, 386-412.
- Borik, O. (2002). *Aspect and Reference time*. Doctoral dissertation, Utrecht University.
- Bronckart, J. & Sinclair, H. (1973). Time, tense and aspect. *Cognition* **2**, 107-130.
- Chierchia, G. (1995). Syntactic Bootstrapping and the Acquisition of Noun Meanings: the Mass/Count Issue. In B. Lust (ed.), *Syntactic Theory and Language Acquisition*. Princeton, NJ: Erlbaum Associates.
- Comrie, B. (1976) *Aspect: An Introduction to the Study of Verbal Aspect and Related Problems*. Cambridge: Cambridge University Press.
- Crain, S. & McKee, C. (1985). The acquisition of structural restrictions on anaphora. In S. Berman, J-W Choe, & J. McDonough, (eds.), *Proceedings of NELS 15*. Amherst: University of Massachusetts, GLSA.
- Crain, S. & Thornton, R. (1998). *Investigations in Universal Grammar: A Guide to Experiments in the Acquisition of Syntax and Semantics*. Cambridge: MIT Press.
- Depraetere, I. (1995). On the Necessity of Distinguishing between (Un)boundedness and (A)telicity. *Linguistics and Philosophy* **18**, 1-19.
- Dowty, D.R. (1979). *Word Meaning and Montague Grammar*. Dordrecht: Reidel.
- Dowty, D.R. (1991). Thematic Proto-Roles and Argument Selection. *Languages*, **67**(3), 547-619.
- Karmiloff-Smith, A. (1979) *A functional approach to child language: a study of determiners and reference*. Cambridge: Cambridge University Press.
- Krifka, M. (1992). Thematic relations as links between nominal reference and temporal constitution. In I. Sag & A. Szabolcsi (eds.), *Lexical matters*. Stanford: CSLI Publications.
- Krifka, M. (1998). The origins of telicity. In S. Rothstein (ed.), *Events and Grammar*. Boston: Kluwer Academic Publishers.
- Rothstein, S. (2004). *Structuring events : a study in the semantics of lexical aspect*. Oxford: Blackwell Publishing.
- Schaeffer, J. (1997). *Direct object scrambling in Dutch and Italian child language*. Ph.D. Dissertation, UCLA.
- Schaeffer, J. (2000). *The acquisition of direct object scrambling and clitic placement: Syntax and pragmatics*. Amsterdam: John Benjamins.
- Schulz, P. & Penner, Z. (2002). How you can eat the apple and have it too: Evidence from the acquisition of telicity in German. In J. Costa & M.J. Freitas (eds.), *Proceedings of the GALA 2001 Conference on Language Acquisition*.
- Shirai, Y. & Andersen, R.W. (1995). The Acquisition of Tense-Aspect Morphology: A Prototype Account. *Language* **71**, 743-62.
- Smith, C. (1991). *The Parameter of Aspect*. Dordrecht: Kluwer.
- Stephany, U. (1981). Verbal grammar in Modern Greek early child language. In P. S. Dale & D. Ingram (eds.), *Child language: An international Perspective*. Baltimore, MD: University Park Press.

- Tenny, C. (1987). *Grammaticalizing aspect and affectedness*. Unpublished doctoral dissertation, MIT.
- Tenny, C. (1994). *Aspectual roles and the syntax-semantics interface*. Dordrecht: Kluwer.
- ter Meulen, A. (1984). Events, quantities and individuals. In F. Landman and F. Veltman (eds.), *Varieties of formal semantics*. Dordrecht: Foris.
- van Hout, A. (1998). On the role of direct objects and particles in learning telicity in Dutch and English. In A. Greenhill, M. Hughes, H. Littlefield and H. Walsh (eds.), *Proceedings of 22th Boston University Conference on Language Development*. Somerville, MA: Cascadilla Press.
- Vendler, Z. (1967). *Linguistics in Philosophy*. Ithaca, New York: Cornell University Press.
- Verkuyl, H.J. (1972). *On the Compositional Nature of the Aspects*. Dordrecht: D. Reidel.
- Verkuyl, H.J. (1989). Aspectual classes and aspectual composition. *Linguistics and Philosophy*, **12**, 39-94.
- Verkuyl, H.J. (1993). *A theory of aspectuality: the interaction between temporal and atemporal structure*. Cambridge: Cambridge University Press.
- Yitzhaki, D. (2003). *The Semantics of Lexical Aspect in Modern Hebrew*. Unpublished MA thesis, Bar-Ilan University.

דורון, ע. (2000). הבינוני הסביל. *בלשנות עברית* **47**, 62-39.