

# Adjectival Passives and Adjectival Decausatives in Hebrew\*

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## 1. Introduction

There is, in generative studies, a well-known distinction between adjectival and verbal passives (see, for example, Wasow 1977). Many studies have tried to define the operations that form the two types of passives; but while verbal passive formation seems to be quite understood, there is still debate on the nature of the operation that forms adjectival passives (for a very influential analysis see Levin and Rappaport 1986). In addition, recent studies have revealed that the class of adjectival passives in certain languages is not homogenous, and can be divided into sub-groups with different syntactic and semantic properties (see Kratzer 2000 on German, Anagnostopoulou 2003 on Greek and Embick 2004 on English).

In this paper I will try to define the operation that forms adjectival passives in Hebrew. I will first show that there are two classes of adjectival passives in Hebrew; one class behaves on a par with verbal passives, while the other behaves on a par with unaccusative verbs. I will therefore label the two types of adjectives ('true') **adjectival passives** and **adjectival decausatives**. I will then argue that the derivation of the two types of adjectives involves the same operations that derive the corresponding types of verbs.

The paper is organized as follows: in section 2, I will present the main empirical facts concerning the morphology of adjectival passives in Hebrew. In section 3, I will show some evidence that there are, in Hebrew, two different types of adjectival passives. Section 4 discusses the parallelism which I believe exists between the adjective system and the verb system, and argues that the two classes of adjectival passives correspond to two types of verbs - passives and unaccusatives - and are derived by the same operations which form these two types of verbs. This chapter also contains a small digression to discuss the verbal system; in particular, the operations that generate passive and unaccusative verbs. In section 5, I will present some data that reinforces the proposal that adjectival passives and adjectival decausatives are derived by the same operations which derive verbs. The reinforcement comes from the sets of adjectival passives and adjectival decausatives, which parallel the sets of passive and unaccusative verbs. In section 6 I will discuss apparent counter-examples to my analysis. Section 7 presents a cross-linguistic discussion regarding the phenomenon of adjectival passives and adjectival decausatives.

## 2. Morphological background

Most Hebrew adjectives are built using root-and-template morphology. Adjectival passives in appear in one of four templates, presented in (1)-(4):

- (1) **muCCaC**. This template is related to the active template hiCCiC. Some examples are: *mumca* ('invented'), *munax* ('placed, laid'), *mud'ag* ('worried'), *mugaz* ('carbonated'), *muxan* ('prepared, ready'), *mukpa* ('frozen').
- (2) **meCuCaC**. This template is related to the active template CiCeC. Some examples

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\* This research was supported by THE ISRAEL SCIENCE FOUNDATION (grant No. 44/05).

are: *megulgal* ('rolled'), *mevulbal* ('confused'), *mesulsal* ('curly'), *meluxlax* ('dirty'), *megulaf* ('engraved, carved'), *mecuyar* ('drawn, sketched, illustrated').

- (3) **niCCaC**. This template is related to the active template CaCaC, and is comparatively rare for adjectives. Some examples are: *nistar* ('hidden, concealed, invisible'), *nirgaz* ('annoyed, angry, furious').
- (4) **CaCuC**. This template is also related to the active template CaCaC. Some examples are: *hafux* ('reversed, inverted, upside down'), *kafu* ('frozen'), *sagur* ('closed'), *katuv* ('written'), *patu'ax* ('open'), *kavuy* ('extinguished'), *afuy* ('baked').

The first three templates above are also used to derive verbal passives in the present tense. Thus, most of the forms in (1)-(3) are ambiguous, though their adjectival reading is more accessible. The fourth template, on the other hand, creates only adjectives. This can be seen when inserting the various forms into contexts that clearly demand a verb or an adjective: such contexts can serve as tests to determine whether a given form is a verb or an adjective (some of these contexts in Hebrew are given in the appendix).

### 3. Two types of adjectival passives in Hebrew

It is a well-known fact that verbal passives have an implicit external argument: the external argument of the corresponding active verb is inferred in passive sentences even when it is not realized syntactically. On the other hand, it is quite widely assumed (Levin and Rappaport 1986, Dubinsky and Simango 1996, Kratzer 2000, among others) that adjectival passives lack such an implicit argument. This was often shown using various tests which detect the existence of an implicit Agent.

A close examination of Hebrew data, however, reveals a more complex situation: while some adjectival passives indeed fail tests detecting an external argument, others pass such tests, and therefore seem to have an implicit external argument in their semantics after all.

In the following subsections I will discuss four diagnostics for the presence of an implicit Agent, and show that Hebrew adjectival passives behave non-uniformly with regard to them.

#### 3.1 realization of an instrument

The first test that detects the existence of an implicit Agent is suggested by the Instrument Generalization, presented in Reinhart and Siloni (2005). This generalization states that an instrument phrase can only be realized in a sentence when an Agent is present in the sentence explicitly (mapped to the syntax) or implicitly (inferred).

As expected, verbal passives consistently allow the realization of an instrument (5):

- (5)a. The soup was eaten with a spoon.  
b. The window was broken with a stone.

Adjectival passives, on the other hand, behave non-uniformly with respect to this test. Some of them allow the realization of an instrument (6), while others disallow it (7):

- (6)a. *ha-mixtav katuv be-et.*  
the-letter written in-pen  
'The letter is written with a pen.' (adjectival reading)

- b. *ha-kelev kašur be-recu'a.*  
 the-dog tied in-leash  
 'The dog is tied with a leash.' (adjectival reading)
- c. *ha-bayit na'ul be-mafte'ax.*  
 the-house locked in-key  
 'The house is locked with a key.' (adjectival reading)
- d. *maks natan li kufsa mudbeket be-devek plasti.*<sup>1</sup>  
 Max gave to+me box glued in-glug plastic  
 'Max gave me a box which is glued with plastic glue.'
- (7)a. *\*ha-kise šavur be-patiš.*  
 the-chair broken in-hammer
- b. *\*ha-bayit patuax be-mafteax.*  
 the-house open in-key
- c. *\*ha-yeled xavut be-maklot.*  
 the-child beaten in-sticks
- d. *\*ha-kufsa dvuka be-devek plasti.*  
 the-box glued in-glug plastic

### 3.2 Use of Agent-oriented adverbs

The second test that detects an implicit Agent has to do with the use of Agent-oriented adverbs: only an Agent, explicit or implicit, can license an Agent-oriented adverb. As with the previous test, verbal passives consistently behave as if an Agent is present in their interpretation:

- (8)a. The soup was eaten hungrily.  
 b. The window was broken on purpose.

But in this case as well, adjectival passives behave non-uniformly. Some license an Agent-oriented adverb (9), other do not (10):

- (9)a. *ha-sefer katuv be-kišaron.*  
 the-book written in-talent  
 'The book is written with talent.'
- b. *ha-xulca ha-zot tfura be-xoser mikco'iyut.*  
 the-shirt the-this sewn in-lack (of) professionalism  
 'This shirt is sewn unprofessionally.'
- c. *maks avar leyad poster mudbak be-rašlanut.*  
 Max passed by poster stuck in-carelessness  
 'There was on the wall a poster which was glued carelessly.'
- (10)a. *\*ha-bakbuk sagur be-zadon.*  
 the-bottle closed maliciously
- b. *\*ha-poster davuk be-rašlanut.*  
 the-poster glued in-carelessness

### 3.3 Adjunction of a by-phrase

A third test for the detection of an Agent is offered by the *by*-phrase: a *by*-phrase can realize an implicit Agent, when there is one; a *by*-phrase is impossible when no

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<sup>1</sup> As explained in section 2, the form *mudbak* ('stuck') is ambiguous between a verb and an adjective. However, the post-nominal position is exclusively adjectival, and therefore the form has only an adjectival reading here.

implicit external argument is present.

Again, all verbal passives pass the test, suggesting that they have an implicit external argument, as seen in (11):

- (11)a. The soup was eaten by Max.  
b. The window was broken by Lucy.

And yet again, adjectival passives behave non-uniformly with regard to the test. Some pass it (12), while others fail it (13):

- (12)a. *ha-sefer arux al-yedey orex mecuyan.*  
the-book edited by editor excellent  
'The book is edited by an excellent editor.'  
b. *ha-ictadion šamur al-yedey šotrim xamušim.*  
the-stadium guarded by policemen armed  
'The stadium is guarded by armed policemen.'  
(13)a. \**ha-kise šavur al-yedey maks.*  
the-chair broken by Max  
b. \**ha-rikma kfu'a al-yedey mad'anim.*  
the-tissue frozen by scientists

### 3.4 Cancellation of the Agent entailment

The last diagnostics for the existence of an Agent is semantic: if an implicit Agent is inferred from the sentence, than canceling its existence should create a contradiction. This is indeed the case with verbal passives, as can be seen in (14):

- (14)a. *ha-mixtav nixtav, lamrot še-af exad lo katav oto.* (contradiction)  
the-letter was+written, though that-no one wrote it  
b. *ha-mayim hukpe'u, lamrot še-af exad lo hikpi otam.* (contradiction)  
the-water frozen, though that-no one froze it

Here as well, adjectival passives behave non-uniformly. The cancellation of the Agent inference sometimes renders the sentence contradictory (15), while in other cases it does not (16):

- (15) *ha-sefer katuv / karux, lamrot še-af exad lo katav / karax oto.* (contradiction)  
the-book written / bound, though that-no one wrote / bound it  
(16) *ha-kufsa ptuxa / sgura, lamrot še-af exad lo patax / sagar ota.*  
the-box open / closed, though that-no one opened / closed it

One could conceivably argue that the difference between (15) and (16) has to do with our world knowledge: perhaps we know that things are not "created" written or bound, while they might be "created" open or closed. But, as shown by the contrast in (17), this cannot be a sufficient account. Both adjectives in (17) are related to the same verb and both are translated to English as *frozen*. Regardless of what we know about whether things are created frozen or not, (17a) is contradictory, while (17b) is not. The contrast is therefore a grammatical one.

- (17)a. *ha-ma'im mukpa'im, lamrot še-af exad lo hikpi otam.* (contradiction)  
the-water frozen, though that-no one froze it

b. *ha-ma'im kfu'im, lamrot še-afexad lo hikpi otam.*

the-water frozen, though that-no one froze it

To summarize this section, it was shown that the group of adjectival passives in Hebrew is not homogenous with regard to the existence of an external argument in their interpretation. Some adjectival passives pass tests detecting an implicit Agent, while others fail them.

It is worth noting here that there is a strong, though not perfect, correlation between the adjectives that pass the different tests for existence of an implicit Agent. Generally, an adjective that passes one test will pass all of them. I will deal with exceptions to this correlation in section 6.

#### 4. Analysis of the two types of adjectival passives

The behavior of the two classes of adjectival passives in Hebrew presented above parallels exactly the behavior of two well-known types of verbs: passives and unaccusatives.

Both passive and unaccusative verbs do not realize an external argument syntactically. The difference between the two types of verbs lies in the status of this unrealized external argument. **Passive verbs have an accessible external argument present in their interpretation, unaccusatives lack an external argument altogether.** Consequently, it is not surprising that passive verbs allow the addition of instruments, Agent-oriented adverbs and *by*-phrases (18a), while unaccusatives ban these additions (18b).

(18)a. The window was broken with a stone / on purpose / by Max.

b.\*The window broke with a stone / on purpose / by Max.

The situation in (18) is exactly the one we saw in section 3 with regard to the two types of adjectival passives. In the case of adjectives, though, the distinction between the two types is blurred, because both may bear the same morphology.

However, it is well-known that in the Hebrew verbal system, the correlation between the morphology of a verb and its type (passive, unaccusative, reflexive, etc.) is not completely systematic either. For example, the *niXXaX* template is used to derive passive (*nixtav* 'was written'), unaccusative (*ne'elam* 'disappeared'), reflexive (*niršam* 'register oneself') and reciprocal (*nilxam* 'fight') verbs. Therefore, in order to decide whether a verb is passive or unaccusative, we cannot rely on its morphology alone. Rather, we have to determine if it has an external argument in its interpretation or not. If the external argument is present in the interpretation, the verb is passive; if it is missing altogether, the verb is unaccusative.

**I suggest that the same holds for adjectives:** what has been taken to be typical passive morphology for adjectives are in fact morphological forms that are not exclusive to passive. The fact that an adjective bears such morphology cannot on its own indicate that it is passive. The decision whether an adjective is passive or not should be based on whether or not it has an external argument in its interpretation.

- Adjectives that pass tests for the accessibility of an external argument are "true" **adjectival passives**.

- Adjectives that do not pass these tests - meaning, do not have an external argument at all - I label **adjectival decausatives**.<sup>2</sup>

Based on this parallelism with the verbal system, I suggest that the two types of adjectives are derived by the same operations that derive passive and unaccusative verbs. Section 4.1 discusses the relevant operations in the verbal system, and section 4.2 extends the discussion to the adjectival system.

#### 4.1 Operations in the verbal system

This subsection discusses the operations that form passive and unaccusative verbs. The discussion is based on Reinhart (2000, 2002) and Reinhart and Siloni (2005). These authors claim that not all word formation is syntactic. Rather, new words can be derived in the lexicon, via lexical operations manipulating thematic grids. Following Horvath and Siloni (2003), the external argument of a verb is taken to be an argument of the lexical verb itself, and not of an additional functional head (“little-*v*”). Thus, each verb is lexically specified for its external  $\theta$ -role, which in most cases is either Agent or Cause. An Agent role can be realized only by DPs whose head noun is animate (19a). A cause role, on the other hand, can be realized both by DPs whose head noun is animate, in which case it will be interpreted as Agent (19b), or by DPs whose head noun is inanimate, in which case it will be interpreted as cause (19c) or instrument (19d).

(19)a. Max / \*the situation / \*the pen wrote a letter.

- b. Max opened the door.
- c. The wind opened the door.
- d. The key opened the door.

##### 4.1.1 Verbal passive formation: Saturation

As mentioned above, verbal passive formation was studied extensively, and though some debates regarding its nature still exist, there are some properties of the operation that are agreed upon. It is clear that syntactically, verbal passivization prevents the external argument of the active verb from being mapped to the subject position, and cancels the verb's ability to assign accusative Case. It is also known that semantically, the operation performs existential closure on the external argument (Chierchia 1995, Reinhart 2000, 2002, among others). I will refer to this operation as Saturation: the external argument is saturated.

(20)a. The gangster was murdered.

- b. interpretation:  $\exists e \exists x (\text{Murder}(e) \wedge \text{Agent}(e, x) \wedge \text{Theme}(e, \text{the gangster}))$

As can be seen in (20), the external argument is present in the interpretation of a passive sentence. Therefore, passive verbs allow the realization of an instrument, the addition of Agent-oriented adverbs etc.<sup>3</sup>

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<sup>2</sup> From this point forward, I use the term **adjectival passives** in its narrow sense, that is – adjectives which have an implicit external argument, and not just any adjective that has the so-called passive morphology.

<sup>3</sup> Judgments seem to show that in Hebrew, when a verb whose external  $\theta$ -role is Cause (a role that can be realized either as an Agent or as an inanimate cause) undergoes passivization, the saturated argument is interpreted as Agent. consider (i):

In Meltzer (2005), I claim that verbal passivization in Hebrew takes as input transitive verbs that assign accusative Case, and whose external  $\theta$ -role can be interpreted as Agent. These include of course verbs whose external  $\theta$ -role *is* Agent, and verbs whose external  $\theta$ -role is Cause, which can be realized either as an Agent, or as an inanimate cause (verbs like *patax* 'open tr.' *gilgel* 'roll tr.') etc.

#### 4.1.2 Unaccusative verb formation: Decausativization

I assume that unaccusative verbs, like passive verbs, are derived from their transitive alternates (Chierchia 1989, Levin & Rappaport-Hovav 1995, Reinhart 2000, 2002). Specifically, I will assume here the operation presented in Reinhart (2000, 2002), which I will refer to as Decausativization.

Reinhart states that Decausativization takes as input transitive verbs whose external  $\theta$ -role is Cause; Meaning, verbs whose external  $\theta$ -role can be realized either as an Agent, or as an inanimate cause. The operation **reduces** the Cause role of the verb, as shown in (21), and cancels the verb's ability to check accusative Case:

- (21)  $V(\theta_1(\text{cause}), \theta_2) \rightarrow V(\theta_2)$   
 e.g. *open(tr.)*  $\rightarrow$  *open (intr.)*

Here, the external  $\theta$ -role is not merely saturated, but totally reduced. Therefore, such verbs will not allow the realization of an Instrument, etc.

#### 4.2 Operations in the adjectival system

As noted above, my suggestion is that adjectival passives and adjectival decausatives are derived by the same operations which derive passive and unaccusative verbs, respectively. Horvath and Siloni (2005) present convincing evidence that both types of adjectives are derived lexically, showing that several differences between adjectival and verbal passives can be accounted for by assuming that the former are derived in the lexicon, and the latter – in syntax. Based on this, the adjective-forming operations that I present here are both lexical.

I assume that the input for both operations is concepts, unspecified for category, with their thematic grid.

In addition to Saturation and Decausativization, the adjective-forming operations necessarily involve Adjectivization. Adjectivization sets the category of the concept to A. Notice also, that adjectives always have (at least) one  $\theta$ -role less than their verbal alternates. One role is not realized in its canonical position; it is 'abstracted over' in order to create predication (Rothstein 2001). This role is often referred to as 'externalized' (Levin & Rappaport 1986 and others). An immediate question that arises is: which argument should be externalized? It is clear that in both the creation of adjectival passives and adjectival decausatives this cannot be the external argument, since it is this argument which is manipulated by Saturation and

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- (i)a. *lucy /ha-ru'ax gilgela et ha-kadur.*  
 Lucy / the-wind rolled the-ball  
 b. *ha-kadur gulgal*  
 the-ball was rolled  
 c.  $*\exists e\exists x (\text{Roll}(e) \wedge \text{Cause}(e, x) \wedge \text{Theme}(e, \text{the ball}))$   
 d.  $\exists e\exists x (\text{Roll}(e) \wedge \text{Agent}(e, x) \wedge \text{Theme}(e, \text{the ball}))$

The claim that the saturated argument in Hebrew passives must be interpreted as Agent was already made in Doron (2003).

Decausativization. Levin and Rappaport (1986) argue convincingly that Case considerations force the direct object to be the one externalized.

I follow the null hypothesis in assuming that Adjectivization and Saturation or Decausativization are not ordered with respect to each other.

Sample derivations of an adjectival passives and an adjectival decausative are given in (22):

(22)a. Adjectival passive formation:

input – two place relation  $R(\theta_1, \theta_2)$  e.g. *katav* 'write'

Adjectivization

- category setting – A
- abstracting over the direct object

Saturation

- Case reduction – vacuous<sup>4</sup>
- marking of the external  $\theta$ -role to be assigned in the semantics (existential closure)

output - predicate  $A, \lambda x. R'(\theta_1!, x)$ <sup>5</sup> *katuv* 'written'

b. Adjectival decausative formation:

input – two place relation  $R(\theta_1, \theta_2)$  e.g. *hikpi* 'freeze'

Adjectivization

- category setting – A
- abstracting over the direct object

Decausativization

- Case reduction – vacuous
- deletion of the external  $\theta$ -role

output - predicate  $A, \lambda x. R'(x)$  *kafu* 'frozen'

Notice, that in (22a) the output contains the original external  $\theta$ -role. This accounts for the compatibility of adjectival passives with instruments, etc. One might wonder what it means for an adjective to have an Agent  $\theta$ -role: adjectives refer to states, and it seems that Agents cannot participate in states. I suggest that in these cases an event must be inferred, or reconstructed, in order to accommodate for this otherwise unassigned  $\theta$ -role. Indeed, when we interpret a sentence containing an adjectival passive, such as *ha-bayit banuy* ('the house is built(adj.)') we automatically infer an event of building.

### 5. Reinforcement of the analysis

In section 4, I suggested that adjectival passives and adjectival decausatives are derived by the same operations that derive the corresponding verbs, namely, Saturation and Decausativization, respectively. This analysis has a strong prediction regarding the existence/non-existence of certain adjectival forms, which is borne out. This fact reinforces the analysis suggested here.

Taking into consideration the inputs that Saturation and Decausativization take as defined in section 4.1 above, it is obvious that verbs whose external  $\theta$ -role is Agent

<sup>4</sup> Case reduction here is vacuous since neither concepts, nor Hebrew adjectives, check accusative Case.

<sup>5</sup> The sign ! in this case means that the thematic role is saturated – marked to be assigned in the semantics.



will undergo Saturation, but will not undergo Decausativization, and therefore will have a verbal passive alternate, but not an unaccusative one. Verbs whose external  $\theta$ -role is Cause will undergo both operations and have both corresponding verb types. This is indeed the case in the verbal system, as shown in (23) and (24):

(23)a. Max/ \*The paint painted the picture.

b. The picture was painted.

c. \*The picture painted.

(24)a. Max / the wind opened the door.

b. The door was opened.

c. The door opened.

If indeed adjectival passives and adjectival decausatives are derived by the same operations, the prediction is that the situation should be the same in the adjectival system:

- Transitive verbs whose external  $\theta$ -role is Agent are predicted to have adjectival passive alternates, but no adjectival decausative alternates.

- Transitive verbs whose external  $\theta$ -role is Cause are predicted to have both adjectival passive and adjectival decausative alternates.

I will now show that this prediction is borne out.

### 5.1 Adjectival forms of transitive verbs whose external $\theta$ -role is Agent

Verbs like *katav* ('write'), *kašar* ('tie'), *šamar* ('guard'), *nigev* ('wipe dry'), *hidpis* ('type'), *talaš* ('tear off, tear out'), *cilem* ('photograph') etc., whose external  $\theta$ -role is Agent, are predicted to undergo Saturation and have an adjectival passive alternate, but to not have an adjectival decausative alternate.

The prediction is borne out: the adjectives derived from these verbs show the existence of an implicit Agent (with some exceptions that will be dealt with in section 6):

(25)a. *hamixtav katuv be-et / be-kišaron.*

the-letter written in-pen / in-talent

b. *ha-kelev kašur be-recu'a.*

the-dog tied in-leash

c. *ha-ictadion šamur bi-kfida.*

the-stadium guarded impeccably

d. *Max natan li daf mudpas be-rašlanut / be-mexonat ktiva.*

Max gave to+me paper typed in-carelessness / in-typewriter

e. *ha-mixtav katuv, lamrot še-af exad lo katav oto.* (contradiction)

the-letter written, though that-no one wrote it

Therefore, the adjectival forms of such verbs are passive. It is important to note that these verbs do not have another adjectival counterpart (which might have been decausative).

### 5.2 Adjectival forms of transitive verbs whose external $\theta$ -role is Cause

Verbs like *hikpi* ('freeze'), *nipe'ax* ('inflate, blow up'), *sibex* ('complicate'), *pizer* ('scatter'), *kicer* ('shorten'), *ximem* ('heat'), *saraf* ('burn'), *šavar* ('break'), etc., whose external  $\theta$ -role is Cause, are predicted to undergo both Saturation and

Decausativization, and have both an adjectival passive and an adjectival decausative alternate.<sup>6</sup>

This prediction is borne out as well. The existence of two adjectival alternates for these verbs can manifest itself in one of four ways, discussed in the following subsections.

### 5.2.1 The 'well-behaved' group

Some verbs whose external  $\theta$ -role is Cause have two morphologically distinct adjectival alternates – one passive, the other decausative. Examples are given in (26):

(26)

transitive verb	adjectival passive	adjectival decausative
<i>hikpi</i> 'freeze'	<i>mukpa</i> 'frozen'	<i>kafu</i> 'frozen'
<i>nipe'ax</i> 'inflate'	<i>menupax</i> 'inflated'	<i>nafu'ax</i> 'swollen, inflated'
<i>pina</i> 'clear off, vacate'	<i>mefune</i> 'vacated'	<i>panuy</i> 'vacant, empty'
<i>hidbik</i> 'glue, attach'	<i>mudbak</i> 'stuck, attached'	<i>davuk</i> 'stuck, attached'
<i>hevix</i> 'embarrass'	<i>muvox</i> 'embarrassed'	<i>navox</i> 'embarrassed'

The adjectives in the second column show accessibility of the external argument. The ones in the third one do not:

(27)a. *maks natan li kufsa mudbeket be-devek plasti / be-rašlanut.*

Max gave to+me box glued in-glug plastic in-carelessness  
'Max gave me a box which is glued with plastic glue / carelessly.'

b. \**ha-kufsa dvuka be-devek plasti / be-rašlanut.*  
the-box glued in-glug plastic / in-carelessness

(28)a. *bet ha-xolim kibel mišlo'ax šel rekamot mukpa'ot be-xankan nozli.*  
the hospital received shipment of tissues frozen in-nitrogen liquid

b. \**ha-rikma kfu'a be-xankan nozli.*  
the-tissue frozen in-nitrogen liquid

(29)a. ?*macati kadur menupax be-maš'evat gumi.*  
I-found ball inflated in-pump rubber

'I received a ball which was inflated with a rubber pump.'

b. \**kibalti kadur nafu'ax be-maš'evat gumi.*  
I-received ball inflated in-pump rubber

(30)a. *ha-giv'a ha-zo mefuna, lamrot še-af exad lo pina ota.* (contradiction)  
the-hill the-this vacated, though that-no one evacuated it

<sup>6</sup> Object-Experiencer verbs such as *hifxid* 'scare, frighten' *hevix* 'embarrass' *hifiti'a* 'surprise' etc. are usually classified as having an external Cause role as well. However, this class of verbs is not homogenous (Landau 2002), and in Meltzer (2005) I show that only some of them can realize their external  $\theta$ -role as an Agent (compare (ia), where the addition of an Agent-oriented adverb is grammatical, to (ib), where it is not):

(i)a. *lucy he'eliva / hišpila / hevixa / zi'aze'a et max be-xavana.*

Lucy insulted / humiliated / embarrassed / shocked Max on purpose.

b. *lucy \*hitmiha / \*hidhima / ?hirgi'a / ?simxa / \*inyena et maks bexavana.*

Lucy puzzled / amazed / calmed / delighted / interested Max on purpose.

If we accept the claim that only verbs whose external  $\theta$ -role can be interpreted as an Agent undergo Saturation, then only the verbs in (ia) are predicted to have both an adjectival passive and an adjectival decausative alternate.

- b. *ha-giv'a ha-zo pnuya, lamrot še-af exad lo pina ota.*  
 the-hill the-this vacant, though that-no one evacuated it
- (31)a. *Max muvax, lamrot še-af exad lo hevix oto.* (contradiction)  
 Max embarrassed, though that-no one embarrassed him
- b. *Max navox, lamrot še-af exad lo hevix oto.*  
 Max embarrassed, though that-no one embarrassed him

The facts in (27)-(31) show that the adjectives in the second column are passive, the ones in the third column are decausative.

### 5.2.2 Ambiguity in the adjectival passive form

Some verbs whose external  $\theta$ -role is Cause have two adjectival alternates - one decausative, and the other ambiguous between passive and decausative. Some examples are given in (32):

(32)

transitive verb	ambiguous form	adjectival decausative
<i>sibex</i> 'complicate'	<i>mesubax</i> 'complicated'	<i>savux</i> 'complicated'
<i>pizer</i> 'scatter'	<i>mefuzar</i> 'scattered'	<i>pazur</i> 'scattered'
<i>ikem</i> 'bend, twist'	<i>me'ukam</i> 'bent, twisted'	<i>akum</i> 'crooked, twisted, bent'

The adjectives in the second column show accessibility of the external argument, while those in the third do not:

- (33)a. *?ha-sukar al ha-uga yihiye mefuzar be-nedivut.*  
 the-sugar on the-cake will+be scattered(adj.) in-generosity
- b. *\*ha-sukar al ha-uga yihiye pazur be-nedivut.*  
 the-sugar on the-cake will+be scattered(adj.) in-generosity
- (34)a. *mot ha-barzel nir'e me'ukam be-ko'ax.*  
 pole the-iron seems bent(adj.) in-power  
 'The iron pole seems forcefully bent.'
- b. *\*mot ha-barzel nir'e akum be-ko'ax.*  
 pole the-iron seems bent(adj.) in-power

But, both forms do not entail the existence of an Agent:

- (35) *ha-alim mefuzarim / pzurim po, lamrot še-af exad lo pizer otam.*  
 the-leaves scattered here, although that-no one scattered them
- (36) *ha-anaf ha-ze me'ukam / akum, lamrot še-af exad lo ikem oto.*  
 the-branch the-this bent, although that-no one bent it

So, the forms of the second column can behave either as passives (showing accessibility of an implicit Agent) or as decausatives (not entailing the existence of an Agent). Therefore I suggest that they are ambiguous. The forms in the third column are unambiguously decausative.

### 5.2.3 Adjectival decausatives without passive morphology

Some verbs whose external  $\theta$ -role is Cause have two adjectival alternates - one passive, with so-called passive morphology, the other decausative, without such morphology. Some examples are given in (37):

(37)

<b>transitive verb</b>	<b>adjectival passive</b>	<b>adjectival decausative</b>
<i>kicer</i> 'shorten'	<i>mekucar</i> 'shortened'	<i>kacar</i> 'short'
<i>ximem</i> 'heat'	<i>mexumam</i> 'heated'	<i>xam</i> 'hot'
<i>kerer</i> 'cool'	<i>mekurar</i> 'cooled'	<i>kar</i> 'cold'

The adjectives in the second column are passive – they have an implicit Agent in their semantics (38a). The adjectives in the third column, though not bearing the so-called passive morphology, share the other properties with the adjectival decausatives discussed so far: they have a transitive alternate whose external  $\theta$ -role is Cause, and this role seems to have been totally eliminated during the derivation (38b).

(38)a. *maks sone oxel mexumam be-mikro.*

Max hates food heated in-microwave

b. *\*maks sone oxel xam be-mikro.*

Max hates food hot in-microwave

#### 5.2.4 One ambiguous alternate

The last group of verbs whose external  $\theta$ -role is Cause consists of verbs like *saraf* ('burn'), *šavar* ('break'), *sagar* ('close'), *patax* ('open'), *gilgel* ('roll'), *lixlex* ('dirty, sully'), *kilkel* ('damage, spoil'), *nipec* ('smash'), which have only one corresponding adjectival form. This form seems at first sight to behave like a decausative: in its most natural interpretation it does not entail the existence of an Agent (39), and it does not readily allow the realization of an instrument, Agent-oriented adverb or *by*-phrase (40):

(39)a. *ha-kufsa sgura, lamrot še-afexad lo sagar ota.* (not contradictory)

the-box closed, though no one closed it

b. *ha-tanur mekulkal, lamrot afexad lo kilkel oto.* (not contradictory)

the-oven broken (out of order), though no one damaged it

(40)a. *?ha-delet sgura be-mafte'ax.*

the-door closed in-key

b. *\*ha-kise šavur be-ko'ax / al-yedey maks.*

the-chair broken in-strength / by Max

But there are some examples which seem to show that even in this case, the external argument can be traced:

(41)a. *ha-xalonot sgurim be-rašlanut.*

the-windows closed in-carelessness

b. *maks me'ašen sigaria megulgelet be-meyumanut.*

max is smoking a cigarette rolled in-skill

Theoretically, there are two possible ways to analyze this case: either, for some reason, these verbs only have an adjectival decausative alternate, and not a passive

one; or - these adjectival forms are ambiguous between a passive and a decausative reading, and for some reason do not pass the tests detecting the existence of an external argument.

The second analysis is much more appealing, since it maintains uniformity in the group of verbs whose external  $\theta$ -role is Cause (namely, that all of them can undergo both Saturation and Decausativization). Notice that in the verbal system as well some of the very same verbs have one morphological form which is ambiguous between a passive and an unaccusative reading (*nišbar* – 'was broken, broke', *nisgar* – 'was closed, closed'). This analysis is also tenable because there is indeed an independent explanation for the ungrammaticality of many of the sentences such as (40), in which these adjectives seem not to allow the addition of an Instrument etc. (see section 6).

A very good argument in favor of these forms being ambiguous would be if there was no other option - if there were morphological reasons why there cannot be two different forms. I believe that this is the case here. From the last sub-sections we can draw some conclusions about the morphology of the adjectives under consideration: an adjectival passive of a verb is in the passive template related to the active verb's template. An adjectival decausative is generally in the *CaCuC* template (or in non-passive morphology). Now let us look at the verbs listed in the beginning of this sub-section. Some of them are in the *CaCaC* template. There are two passive templates that correlate to this template: *niCCaC* and *CaCuC*. It was mentioned already in section 2 that for some reason, the *niCCaC* template is in general very rare for adjectives. Therefore, verbs in the *CaCaC* template are predicted to have an adjectival passive alternate in the remaining related template: *CaCuC*. But since this is also the general template for adjectival decausatives, such forms will be ambiguous between passive and decausative.

The rest of the verbs mentioned in the beginning of the section (with one exception – *nipec* 'smash') are verbs with four root consonants. Their verbal passive alternate will be in the predicted form - in the passive template related to the template in which they appear (*CiCeC*). But their decausative alternate cannot be in the predicted *CaCuC* template, because the paradigm of this template cannot "host" quadriconsonantal roots. So, the passive form is used to express the decausative meaning as well.

To conclude this section, verbs whose external  $\theta$ -role is Agent were shown to have only an adjectival passive alternate, while verbs whose external  $\theta$ -role is Cause were shown to have two adjectival alternates: one passive and one decausative. These facts show that the adjectival system parallels the verbal system with regard to the sets of the different types of adjectives and verb, and therefore they strongly reinforce the analysis that the two types of adjectives are derived by the same operations that derive verbs.

## 6. Accounting for the counter-examples

One prediction of the analysis presented here that seems to have many counter-examples is that every verb whose external  $\theta$ -role is Agent or Cause will be able to undergo Saturation, and therefore that the resulting adjective will behave as if it has an implicit Agent in its interpretation. Consider for example (42):

- (42)a. \**ha-kise šavur be-patiš / be-ko'ax.*  
the-chair broken in-hammer / in-force  
b. \**ha-yeled yihiye muke be-maklot.*

the-child will+be beaten in-sticks  
 c. \**ha-delet sgura be-zadon / al-yedey maks.*  
 the-door closed in-evil / by Max

If, as I argue, the adjectives in (42) are (at least on one of their readings) true adjectival passives, with an implicit Agent, why are the sentences ungrammatical?

When we modify a verb with an instrument phrase, or with an adverb, we modify the event. Likewise, a *by*-phrase introduces a participant in an event. But adjectives do not describe events, they describe states, and lack an event variable of the kind that verbs have (Rothstein 2001). Therefore, an instrument, an adverb or a *by*-phrase that we add to the sentence must relate to the state, and not only to the event that led to it. The instrument, the adverbial description or the Agent realized in the *by*-phrase must still be relevant, 'visible' in the state. Consider (43) and (44):

(43) *ha-kelev kašur be-recu'a.*

the-dog tied in-leash

(44)\**ha-yeled muke be-maklot.*

The-child bitten in-sticks

When we see a tied dog, we also see what it is tied with. On the other hand, if we see a boy which was hit, we can perhaps only guess what he was hit with, but the Instrument is no longer 'visible' and it is not a part of the state. Consider next (45) and (46):

(45)\* *ha-mixtav katuv be-et yafa.*

the-letter written in-pen beautiful

'The letter is written with a beautiful pen.'

(46) *ha-mixtav katuv be-et šxora.*

the-letter written in-pen black

'The letter is written with a black pen.'

(Julia Horvath p.c.)

(45) is ungrammatical because the pen being beautiful cannot be detected from looking at the written letter. (46), on the other hand, is grammatical, but we interpret it in a very specific way: the sentence claims that the ink in the pen is black, not that the pen itself is black. The reason is the same as in the previous examples: the pen itself being black is not detectable from the resulting state. But, the ink in the pen being black is detectable from the written letter, and therefore the addition of an Instrument is grammatical, and this is the interpretation that we assign to the sentence. The same is true for Agent-oriented adverbs:

(47) *ha-poster mudbak be-rašlanut.*

the-poster glued in-carelessness

(48) \**ha-delet sgura be-zadon.*

the-door closed in-evil

(47) is fine, because the adverb is still relevant to the state. By looking at a glued poster we can tell if it has been glued carelessly, maybe because it is glued unevenly, has loose ends, etc. On the other hand, when we look at a closed door, we cannot tell if it was closed with good or bad intentions.

Consider next (49) and (50):

(49) *ha-ictadion šamur al-yedey šotrim xamušim.*

the-stadium guarded by policemen armed  
'the stadium is guarded by armed policemen' (adjectival reading).

(50) \**ha-kise šavur al-yedey maks.*

the-chair broken by Max.

The state of a guarded stadium includes in it a guarding participant. In contrast, the state of a broken chair does not include the breaking participant, which is no longer visible.

To conclude this section, the principles governing the grammaticality of instruments, Agent-oriented adverbs and *by*-phrases, which were proposed in section 3, are in fact correct. There is simply an additional condition involved – that of 'detectability'.<sup>7</sup>

### 7. Adjectival passives and adjectival decausatives – a cross-linguistic perspective

Having established the fact that there are two distinct types of adjectival passives in Hebrew, a natural question arises: is this phenomenon unique to Hebrew, or does it exist in other languages? Theoretically, there is no a priori reason why the two types of adjectives should not exist in other languages. Given the analysis presented here, the two types of adjectives are derived by Saturation and Decausativization: the operations that form passive and unaccusative verbs. Passive and unaccusative verbs exist in many languages, meaning that these two operations are operative in the verbal system of many languages. Unless there is some feature of the adjectival system which prevents these operations (or one of them) from applying in it, the prediction is that in these languages Saturation and Decausativization will derive adjectives as well.

In this section I will discuss data suggesting that the two types of adjectives exist in Hungarian and English as well. Kratzer (2000) and Anagnostopoulou (2003) present evidence for two types of adjectival passives in German and Greek, respectively. However, it is not at all clear that the split they argue for is the same as the one in Hebrew. Particularly, it does not seem to be the case that the two groups consist of the same adjectives in the three languages, nor that the interpretation of the two classes is identical in them. Therefore, German and Greek will not be discussed further here.

#### 7.1 Hungarian

As was shown in section 5, there are some cases in which the distinction between adjectival passives and adjectival decausatives in Hebrew is very clear, since they are realized in two morphologically distinct forms. Another language which marks morphologically the two types of adjectives is Hungarian. Some examples, taken from Horvath and Siloni (2005), are given in (51):

(51)

transitive verb	adjectival passive	adjectival decausative
<i>olvaszt</i> 'melt'	<i>olvaszt-ott</i> 'melted'	<i>olvad-t</i> 'melted'

<sup>7</sup> At this point, this condition of 'detectability' is rather intuitive, since I have not defined precisely what 'detectable' means. In the case of instruments and participant introduced by *by*-phrases, 'detectability' can simply mean plain, literal visibility. For an adverbial description the formalization of 'detectability' is harder, and warrants further research.

<i>kinyit</i> 'open up'	<i>kinyit-ott</i> 'opened up'	<i>kinyíl-t</i> 'opened up'
<i>fagyaszt</i> 'freeze'	<i>fagyasztott-ott</i> 'frozen'	<i>fagy-ott</i> 'frozen'
<i>megrongál</i> 'damage'	<i>megrongál-t</i> 'damaged'	<i>megrongálód-ott</i> 'damaged'

As can be seen from the noun phrases in (52)-(53), the forms of the second column allow addition of Agent-oriented adverbs and Instruments, while those in the third do not:

- (52)a. *a szándékosan befagyasztott tó*  
the intentionally in-freeze-caus.-adj.part. pond  
'the intentionally frozen pond'  
b. a (\**szándékosan*) *befagyott tó*  
the intentionally in-freeze-adj.part. pond
- (53)a. *a késsel megrongált asztal*  
the knife-with perf.-damage.trans.-adj.part. table  
'the damaged with a knife table'  
b. a (\**késsel*) *megrongálódott asztal*  
the knife-with perf.-damage-unacc.-adj.part

The Hungarian data is easily predicted and explained by the analysis presented here. Notice that all the verbs in (51) have as their external  $\theta$ -role the Cause role, and are therefore predicted to have two corresponding adjectival forms. The data in fact reinforces the proposed analysis: the forms which I labeled adjectival decausatives are very similar to the forms of the corresponding unaccusative verbs, both containing identical morphemes; for example, compare the forms *olvad* 'melt (unaccusative)', and *olvadt* 'melted (adjectival decausative)'. The shared morpheme (-*d*) may indicate that the forms shared some operation in their derivation, namely Decausativization. Hungarian, then, systematically derives both adjectival passives and adjectival decausatives using different morphology. I have shown that in Hebrew the situation is more complex: sometimes there are indeed two different forms for the two types of adjectives, and sometimes one form is ambiguous between the two readings. This indicates a theoretical option for morphologically poor languages: both adjectival passives and adjectival decausatives exist in such languages, but the two types have an identical form. I believe that this is the case with English.

## 7.2 English

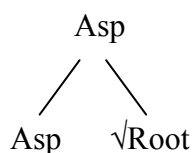
Embick (2004) presents evidence that in English there are two types of adjectival passives, which he labels 'statives' and 'resultatives'. In many cases, the two types are identical in form; this is the case with *closed*, *broken* and *bent*, for example. In other cases, the two types have different forms; examples are *open* (stative) – *opened* (resultative), *rotten* – *rotted*, *shaven* – *shaved* and more. Embick uses several tests to distinguish between the two types of adjectives. The one relevant to the current discussion has to do with adverbial modification – according to Embick, resultatives, but not statives, allow modification by manner (and other) adverbials (example from Embick 2004):

- (54)a. The package remained carefully opened.  
b. \*The package remained carefully open.

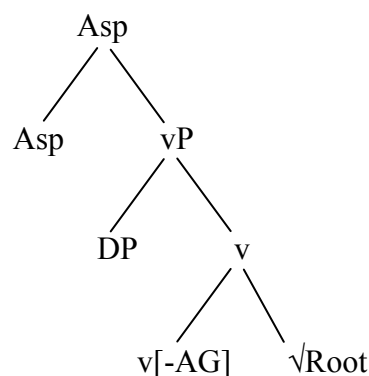


Notice that in both cases the form in question appears as a complement of *remained*, which is a context that allows only adjectives. Therefore, both forms are adjectival. My suggestion is that the adjectives which Embick labels statives are adjectival decausatives, and those he labels resultatives are adjectival passives. This is a natural conclusion based on the diagnostics presented in (54), which is identical to the test presented in section 3 for detecting the presence of an implicit Agent. Also, Embick notes that resultatives are interpreted as resulting from a prior event. As explained in section 4.2, I suggest that ‘true’ adjectival passives include in their interpretation an event which is reconstructed in order to accommodate the unassigned Agent role. Embick proposes an analysis for the derivation of the two types of adjectives, in which both are created syntactically using different functional heads, in the spirit of *Distributed Morphology* (Marantz 1993, 1997, 2000). According to this analysis, the two types of adjectives involve different Aspect heads (heads which are the locus of participial morphology). Embick claims that statives lack eventivity altogether and are therefore derived by the merge of the Aspect head to the root itself, without any verbal head (55a). Resultatives, on the other hand, denote a state that results from a prior event, and therefore their structure must include a verbal head. But, according to Embick, resultatives are not agentive, and therefore the verbal head involved in their derivation cannot have the feature AG (agentivity) (55b).

(55)a. statives:



b. resultatives:



Embick's analysis is problematic in several respects. First, there are good arguments in favor of placing the derivation of both types of adjectival passives in the lexicon, rather than in the syntax (Horvath and Siloni 2005, among many others).

Even if we adopt the idea of syntactic derivation, Embick's analysis is inadequate. Embick states that resultatives do not allow an Agentive reading. He claims that this is visible, for example, in the fact that *by*-phrases denoting the Agent are not licensed with them. The example he gives is the following:

(56) The metal is hammered by John.

Embick claims that (56) has only a verbal reading, and not an adjectival resultative one. First, the test can become more decisive if we force an adjectival reading by an appropriate context, as in (57):

(57) \*The metal remained / seemed hammered by John.

While it is true that (57) is ungrammatical, suggesting that resultatives do not have an implicit Agent, parallel examples are perfectly fine:

(58)a. The stadium remained guarded by armed guards.

b. The book seems edited by an experienced editor.

Examples like those in (58) suggest that an Agent is present in the interpretation of resultatives, and therefore Embick's decision not to include a verbal head with an agentivity feature in their derivation is misled. Considering now my analysis, the presence of an implicit Agent in 'true' adjectival passives is acknowledged, and formally represented by the fact that they include an Agent role in their thematic grid. Example (57) is ruled out for other reasons, as explained in section 6; the participant introduced by the *by*-phrase must be detectable from the state that the adjective denotes, and it is clear that by looking at a metal we cannot tell who hammered it.

Second, Embick claims that statives lack a verbal head altogether, and this, according to him, accounts for their incompatibility with adverbial modification, as exemplified in (59):

(59) \*The door remained carefully open.

It seems, then, that Embick ties the possibility or impossibility of adverbial modification with the presence or absence of a verbalizing head. But this is clearly wrong. Adverbial modification is not automatically licensed by a verbal head. Consider (60):

(60) \*The door carefully opened.

(60) clearly contains a verbal head, since it describes an event. Still, adverbial modification is impossible here. This is because the adverb here is Agent-oriented, but there is no Agent in the sentence. The possibility of Agentive adverbial modification seems to be tied not only to the presence of a verbal head, but to the presence of an Agent as well. According to my analysis, the impossibility of (59), just like the impossibility of (60), is accounted for by the fact that in both sentences an Agent is neither realized, nor inferred. The difference between statives and resultatives (or decausatives and passives, in my terminology) is not rooted in the presence or absence of a verbal head (or an event variable), but in the presence or absence of the Agent  $\theta$ -role.

Finally, I believe that the weakest point in Embick's analysis is that it does not predict the set of statives. Embick notes (p. 361) that 'it seems that not all Roots form pure statives. It does not seem possible to form statives on  $\sqrt{\text{DESTROY}}$ ,  $\sqrt{\text{KICK}}$ , and certain other Roots'; but nothing in his analysis accounts for this fact. Under the current analysis, on the other hand, this fact is straightforwardly predicted. Only verbs which can undergo Decausativization have adjectival decausative (stative) alternates. Regarding *kick*, since its external thematic role is Agent, and not Cause, it is not predicted to undergo Decausativization. The case of *destroy* is somewhat different: the external thematic role of *destroy* is Cause, so we would predict it to have an adjectival decausative alternate. But, as shown in (61), *destroy* does not have a verbal unaccusative alternate as well:

(61)a. The army / the storm destroyed the house.

b. \*The house destroyed.

It seems that something blocks the application of Decausativization to *destroy*. Whatever that thing might be, it is also the reason for this verb not having an adjectival decausative alternate, since the derivation of adjectival decausatives involves the application of Decausativization as well. Hence, my analysis straightforwardly predicts which verbs will have a stative (adjectival decausative) alternate and which will not.

The data therefore suggest that in English as well there are two types of adjectival passives: 'true' adjectival passives and adjectival decausatives. The fact that the two types of adjectives often have the same morphology can obscure the distinction, but a close look at the behavior and interpretation of these adjectives reveals it.

Research of more languages with respect to the two types of adjectives is of course necessary.

## 8. Conclusion

This paper explored the formation of adjectival passives in Hebrew. I began by showing that the group of Hebrew adjectives which is usually referred to as 'adjectival passives' actually consists of two groups: one type of adjectives behaves as if they lack an external argument altogether, while the other type behaves as if an external argument is present in their interpretation. Based on a comparison with the verbal system, I called the first type **adjectival decausatives**, and the second one – **adjectival passives**. I have shown that analyzing the two types of adjectives on a par with the corresponding types of verbs not only accounts for their interpretation and behavior, but also predicts which verbs will have which adjectival alternate.

I believe that this analysis is preferable to former attempts of defining adjectival passive formation for two reasons: first, it explains and predicts more empirical data, especially concerning the non-uniform behavior of these adjectives with regard to the presence of an external argument. Second, it makes use of known and established operations to explain a new set of data, without stipulating new processes. In fact, given that we accept the difference between passive and unaccusative verbs, and the need for two distinct operations to derive these two types of verbs, an additional stipulation would be required to prevent both operations from operating in the adjectival system as well.

## Appendix – The distinction between verbal and adjectival passives in Hebrew

(1) Contexts which allow verbs and do not allow adjectives:

- a. Simple inversion (predicate - subject order: possible with some verbs, not possible at all with adjectives).
- b. Modification by an event modifier.

(2) Contexts which allow adjectives and do not allow verbs:

- a. Post nominal position.
- b. Following the copula in the future tense.

Sentences (3)-(4) show that the form *mumca* ('invented') is ambiguous between a verb and an adjective – it can appear in both types of contexts:

- (3)a. *mumca'im xamiša patentin be-yom ba-maxon ha-ze.*  
 (are) invented five patents in-day in-the-institution the-this  
 'Five patents are invented each day in this institution.'
- b. *sisma'ot xadašot mumca'ot pa'amayim be-šavu'a.*  
 passwords new (are) invented twice in-week  
 'New passwords are invented twice a week.'
- (4)a. *ha-iton ha-ze lo mefarsem uvdot mumca'ot.*  
 the-paper the-this not publish facts invented  
 'This paper doesn't publish invented (made-up) facts.'
- b. *yeš li hargaša še-hateruc šelo yihye mumca.*  
 there is to+me feeling that-the-excuse his will+be invented  
 'I have a feeling that his excuse will be a fabrication.'

The sentences in (5) show that *hafux* ('inside-out, inverted') is an adjective:

- (5)a. *\*hafuxot xameš xulcot ba-megera ha-zot.*  
 inverted (inside-out) five shirts in-the-drawer the-this
- b. *\*ha-xulcot ha-ele hafuxot pa'amayim be-šavu'a.*  
 the-shirts the-these inverted (inside-out) twice in-week
- c. *maks tamid hoxel im xulca hafuxa.*  
 Max always walks with shirt inside-out
- d. *maxar ha-xulca šel maks tihye hafuxa.*  
 tomorrow the+shirt of Max will+be inside-out

Additional diagnostics are given in Doron (2000).

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