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Alternating Perception Verbs in Modern Hebrew

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Abstract

“...seemingly different semantics of verbs of perception is a corollary of their transitivity [voice] patterns... It would be a worthwhile task to provide a cross-linguistic investigation of transitivity of verbs of perception...”.

(Aikhenvald and Storch 2013, p. 20)

This work wishes to participate in the typological project put forward by Aikhenvald and Storch, by exploring the contribution of diathesis within the domain of alternating perception verbs in Modern Hebrew (MH): לראות ‘to see’, לשמוע ‘to hear’, להרגיש ‘to feel’ and להריח ‘to smell’. When the complement of these verbs is a clause, they undergo alternation in voice, active and middle diathesis, which reveals alternation in the semantic properties of the verbs. Factivity is a salient semantic property which is sensitive to the alternation. The active diathesis, where the experiencer is expressed in the nominative case, contrasts with the middle diathesis, which lacks a nominative experiencer. Concomitantly, the active diathesis is interpreted as factive, while the middle diathesis is non-factive.

An additional dimension which classifies MH perception verbs is the syntactic category of the clause embedded by the verb. This parameter introduces a second significant semantic property - the distinction between sensory direct perception, and belief formation integrated with indirect perception.

This work also discusses three more properties in addition to factivity and belief formation, which are: lower interpretation of negation (LIN), types of embedded predicates and imaginative meaning.

Together, the two dimensions discussed in the present work yield four constructions, different in their semantic properties, in which the four alternating perception verbs in MH participate. The syntactic and semantic properties of the diathesis dimension are orthogonal to those of the second dimension, the embedded clause category.

Nevertheless, it is discovered in the current work that general principles of sentence structure in natural language give rise to a priority of the diathesis over the second dimension. This is revealed by the property of belief formation (and the imaginative meaning). In the active diathesis, the category of the embedded clause determines the distinction between direct perception and belief formation (with the availability of the imaginative meaning). But in the middle diathesis, which is marked morphologically in MH in the verbal form, the meaning of belief formation and indirect perception obtains obligatorily, independently of the clausal complement, and an imaginative reading does not arise. The conclusion to be drawn is that the diathesis bleeds clausal category with respect to the property of indirect perception and the availability of the imaginative reading.

Revealing a systematic alternation in diathesis and clausal category, the class of perception verbs in MH sheds light on the interaction between these two parameters, through their effects on the semantic properties of those perception verbs and their complements.

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*Oh Lord my god please teach me how to bless and pray
The truth of falling leaves and fruits of summers day
The freedom that it brings - to see to feel to breath
To know, to yearn, and even fail*

*Teach my lips a song that tells us how to praise
The morning and the nights the secrets of your ways
Guide my mind to find the truth, see through the haze
'cause I don't want no ordinary days*

(‘Teach me my God’, Leah Goldberg, English version: Shimon Smith & Nir Cohen)

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1. Introduction

This work discusses a particular class of perception verbs in Modern Hebrew, namely לראות 'to see', לשמוע 'to hear', להרגיש 'to feel', and להריח 'to smell'. These particular verbs reveal an intricate array of alternations: morphological, syntactic, and semantic. Morpho-syntactically speaking, the experiencer argument of *see*, *hear*, *feel* and *smell* alternates between nominative and dative marking. This alternation is accompanied by a voice alternation between active and middle voice, which is morphologically marked by the verbal form. In addition, all these verbs can embed two types of clauses, a small clause and a finite clause. Together, the alternation yields four different constructions, which might seem redundant. Semantically, however, each construction shows different properties, arising systematically for all the verbs in the class. The properties of this class of perception verbs in Modern Hebrew call for an explanation, shedding light on the interrelations between morphology, syntax and semantics.

The literature on perception verbs typically divides these verbs into two subclasses and describes them separately. The terminology of Levin (1993) distinguishes between *see*-verbs and stimulus-subject-perception-verbs. The two subclasses differ in whether the experiencer is expressed as the nominative subject or a dative object of the verb. The two subclasses contain different lexical verbs for the same sensory perception, e.g. English *see* vs. *look to*, *hear* vs. *sound to*, or homonymous verbs which differ in their syntax: *smell* vs. *smell to*, *feel* vs. *feel to*, *taste* vs. *taste to*. Most theoretical work only analyzes one of the two classes, either those perception verbs which take a nominative experiencer (Moulton 2009 a.o.), or those perception verbs which take a dative experiencer (Matushansky 2002, Kastner 2015). Yet the two

classes of verbs have important characteristics in common. Semantically, both are perception verbs. Syntactically, both classes allow both finite clausal complements and non-finite clausal complements, which differ in their semantic properties, as Dretske (1969) was the first to distinguish for *see*. These facts call for a unified analysis.

In Modern Hebrew, the verbs of the two classes are voice alternants of each other, i.e. they actually constitute a single class of verbs alternating in voice. This class consists of the verbs 'see', 'hear', 'feel', and 'smell'. In addition to the morphological alternation in voice, the duality found in these verbs has an important semantic dimension. As has already been shown for other languages, when perception verbs take a non-finite small clause complement (see Barwise 1981, Higginbotham 1983 for the semantics of non-finite complement of *see*, and Clark & Jäger 2000, Declerck 1983 for their syntax), they denote a sensory experience not necessarily connected to any mental apprehension. When they take finite complements, they denote a sensory experience that gives rise to mental apprehension.

The goal of the present work is to present an analysis of alternating perception verbs in (1).^{1,2,3}

¹ All examples in this work are attested, and all judgments here are mine, as a native speaker of Modern Hebrew. I am grateful to Prof. Edit Doron and Dr. Aynat Rubinstein for vital examples. The examples which are taken from the World Wide Web are given with the URL. All other examples are utterances which I was exposed to in naturally occurring conversations, or my own.

² Hebrew verbal morphology marks tense, gender (feminine/masculine), person and number (singular/plural) (but only gender and number in present tense), pronominal morphology marks person, gender and number, and nominal and adjectival morphology marks gender and number.

³ The spirantized allophones of the phonemes /b/ (ב), /k/ (כ) and /p/ (פ) in Hebrew will be transcribed here as [b], [k] and [p] respectively, to distinguish them from the phonemes /v/ (ו) and /x/ (ח). The non-spirantizable /k/ (ק) will be transcribed as [q]. The transcription ['] stands for the common variants of the glottal stops /ʔ/ and /ʕ/ in fluent speech.

In my glosses, ACC = accusative, GEN = genitive, MID = middle voice, NEG = negation. When the subject is null, the verb is glossed here for person, gender and number (or only gender and number for

(1) a. לראות *li-r'ot* 'to-see'

(i) active voice: אבנר ראה את הספרים נמכרים

abner ra'a et ha-s̄parim nimkarim

Avner **see** ACC the-books sold

'Avner saw the books being sold.'

(ii) middle voice: הספרים נראו לאבנר מעניינים

ha-s̄parim nir'u le-abner me'anyanim

the-books **see.MID** to-Avner interesting

'The books seemed to Avner interesting.'

b. לשמוע *li-šmo'a* 'to-hear'

(i) active voice: דפני שמעה שהילדים משחקים

daḇni šam'a še-ha-yeladim mesaxqim

Dafny **hear** that-the-children play

'Dafny heard that the children were playing.'

(ii) middle voice: נשמע לדפני שהילדים משחקים

nišma le-daḇni še-ha-yelad mesaxqim

hear.MID to-Dafny that-the-child play

'It sounded to Dafny that the children were playing.'

c. להרגיש *le-hargiš* 'to-feel'

(i) active voice: רבקה הרגישה את הבית מתחמם

riḇqa hirgiša et ha-bayit mitxamem

Rivka **feel** ACC the-house get.warm

'Rivka felt the house get warm.'

(ii) middle voice: הבית הרגיש לרבקה חם

adjectives), i.e. 1/ 2/ 3 = 1/ 2/ 3 person, M = masculine, F = feminine, S = singular, P = plural. The glosses for the perception verbs will not show tense.

*ha-bayit **hirgiš** le-riḇqa xam*
the-house **feel** to-Rivka warm
‘The house felt to Rivka warm.’

d. להריח *le-hari'ax* ‘to-smell’

(i) active voice: נעם הריח שהאוכל מוכן
*no'am **heri'ax** še-ha-oḵel muḵan*
Noam **smell** that-the-food ready
‘Noam smelled that the food was ready.’

(ii) middle voice: הריח לנעם שהאוכל מוכן
***heri'ax** le-no'am še-ha-oḵel muḵan*
smell le-Noam that-the-food ready
‘It smelled to Noam that the food was ready.’

I will name this unified class *alternating perception verbs*. Other perception verbs in MH, some of which will be listed below in section 2, do not systematically alternate in the same way. For example, the verb להקשיב ‘to listen’ (23) cannot appear in middle voice, and does not take a clausal complement. The verbs in (23) will not be part of the present discussion. In the case of alternating perception verbs, the voice alternation correlates systematically with contrasts between nominative experiencers and dative experiencers (henceforth NomExp and DatExp respectively) – NomExp appear only with active voice and DatExp only with the middle voice, hence this alternation will be viewed here as secondary to the alternation in voice. The voice alternation (and the concomitant experiencer alternation) is orthogonal to the second alternation, the alternation of the category of the embedded clause. The embedded clause may be a finite clause headed by a complementizer, i.e. a CP, or a non-finite

small clause, a SC. These two parameters, voice and the category of the embedded clause, yield four constructions for each of the alternating perception verbs, illustrated in list items I-IV below: active voice and a non-finite small clause (active-SC), active voice and a finite clause (active-CP), middle voice and a finite clause (middle-CP), and middle voice and a non-finite small clause (middle-SC). All the alternating perception verbs are attested in each construction, and I will use all the verbs from this class in order to illustrate them.

I. Active voice and a non-finite small clause (active-SC)

⁴רק פעם אחת ראיתי אותה מבשלת, אולי פעמיים, כשרק הכרנו (2)

raq pa'am axat ra'iti [ota meḥašelet], ulay pa'ama'im,
 only time one saw.1S [her cook], maybe twice,
kše-raq hikarnu
 when-just met.1P

‘I saw her cook only once, maybe twice, when we just met.’

⁵שמעתי במו אוזני את פקידת הרישום אומרת בהקלטה נסתרת למועמד ערבי שלא קשור לשום (3)

מכללה שנסגרה "אתה לא תלמד באונו"

Šamati be-mo oznay [et pqidat ha-rišum
Hear.1S with-own ears.my [ACC secretary.GEN the-registration
omeret be-haqlata nisteretle-mo'amad 'arabi še-lo qašur
 say in-recording hidden to-candidate Arab that-NEG related
le-šum miḵlala še-nisgera: “‘ata lo tilmad be-ono”]

⁴https://books.google.co.il/books?id=YW0fCgAAQBAJ&pg=PT16&lpg=PT16&dq=%D7%A8%D7%90%D7%99%D7%AA%D7%99+%D7%90%D7%95%D7%AA%D7%94&source=bl&ots=NEOR99wMVi&sig=IQZlv1h21DIS-8bDCje889w8N_Q&hl=iw&sa=X&ved=0ahUKEwi6h6_EnMjXAhUPZ1AKHfLHCG4Q6AEISjAJ#v=onepage&q=%D7%A8%D7%90%D7%99%D7%AA%D7%99%20%D7%90%D7%95%D7%AA%D7%94&f=false

⁵ <http://www.haaretz.co.il/magazine/tozeret/.premium-1.4213064?=&ts=1499007574575>

to-any college that-closed: “you NEG will.study in-Ono”]

‘I heard with my own ears the registration secretary say in a hidden recording
to an Arab candidate: “you won't study in Ono (Academic College)”.’

(4) לילך אמנם מרגישה את הדמעות יורדות על לחייה, אבל מחאתה די מנומסת⁶

lilaḵ omnam margiša [et ha-dma'ot yordot

Lilach surely **feel** [ACC the-tears fall

'al lexayeha], 'aḅal mexa'a-ta dey menumeset]

on cheeks.her], but protest-her quite polite

‘Lilach surely feels the tears fall on her cheeks, but her protest is quite polite.’

(5) מולי הריחה את הביסקוויטים של שוקולד על הרצפה לידה⁷

moli herixa [et ha-bisqvitim šel šoqolad al ha-ricpa

Molly **smell** [ACC the-biscuits of Chocolate on the-floor

le-yad-a]

to-side-her]

‘Molly smelled Chocolate's biscuits on the floor beside her.’

In different languages, active voice perception verbs may appear with different types of non-finite complements. Moulton (2009, p. 2, example (1)) presents an inventory for English of meanings for *see*, and the different non-finite clausal complements it appears with:⁸

⁶ <https://www.haaretz.co.il/literature/youngsters/.premium-1.4376993>

⁷ <https://books.google.co.il/books?id=iXGDrvkphZMC&pg=PA54&lpg=PA54&dq=%D7%94%D7%99%D7%90+%D7%94%D7%A8%D7%99%D7%97%D7%94+%D7%A9&source=bl&ots=IW13MfsK62&sig=b8PCqQZpV69pRa9X4APFs2wKb8E&hl=iw&sa=X&ved=0ahUKEwiwlfryiMTXAhUSpKQKHdC4AU0Q6AEIKTAC#v=onepage&q=%D7%94%D7%99%D7%90%20%D7%94%D7%A8%D7%99%D7%97%D7%94%20%D7%A9&f=false>

⁸ Moulton (2009) introduces five different clausal complements, the fifth being a finite clause:

(i) finite clause: John saw that Fred left early. factive (p. 2, ex. (1e))

- | | | | |
|-----|---------------------|-------------------------------------|-------------------|
| (6) | a. bare infinitive: | John saw Fred leave early. | direct perception |
| | b. gerundive: | John saw Fred leaving early. | direct perception |
| | c. gerundive: | John saw Fred owning a house. | imaginative |
| | d. infinitive: | John saw Fred to be a party-pooper. | belief |

All these constructions exhibit ‘exceptional case marking’ (ECM) of the embedded subject, and an infinitive/gerundive form of the embedded verb. In Modern Hebrew, the non-finite complement clause of perception verbs is not infinitival, but is headed by a participle (as in (2)-(5)). The participle in Hebrew is marked for number and gender, but bears no inflection for tense. This non-finite clause will be referred to as Small Clause (SC) (Chomsky 1981). As in English, the embedded subject is marked for accusative case, which, in Hebrew, is overtly marked by the morpheme *et* when the direct object is definite NP. In Hebrew, nominative is not marked morphologically, hence a NomExp subject is not marked for case. Voice (active, middle and passive) is morphologically marked in the verbal form.

II. Active voice and a finite clause (active-CP)

A second construction involves a perception verb in the active voice, complemented by a CP. The following sentences exemplify this construction for the verbs under discussion.

- (7) כשלקחו מחוגה (הם) ראו שזה מעגל מושלם⁹

kše-laqxu

mexoga,

ra'u

še-ze ma'agal

⁹https://books.google.co.il/books?id=YiRCLRBVdLMC&pg=PA123&lpg=PA123&dq=%D7%A8%D7%90%D7%95+%D7%A9%D7%96%D7%94&source=bl&ots=8_hrLlza4V&sig=xYhiAj-IRq4hPbaVsG01IX5S2-4&hl=iw&sa=X&ved=0ahUKEwiWqee6jcTXAhWDDuwKHWZCDHg4ChDoAQgsMAM#v=onepage&q=%D7%A8%D7%90%D7%95%20%D7%A9%D7%96%D7%94&f=false

when-took.3MPL pair.of.compasses, **see.3MP** that-it circle
mušlam
 perfect

‘When they took a pair of compasses, they saw that it was a perfect circle.’

(8) אני שומע בקולך שאין לך שום אי נוחות מפרסום הסרטון¹⁰

ani šome'a be-qol-ka [še-eyn le-ka šum
 I **hear** in-voice-yours [that-NEG.exist to-you any
'i-noxut mi-pirsum ha-sirton]
 NEG-comfort from-publishing the-video]

‘I hear in your voice that you feel no discomfort from publishing the video.’

(9) כשאנחנו לא מבינים בדיחה, אנחנו מרגישים שהשאירו אותנו בחוץ¹¹

kše-anaxnu lo maḥinim bdixa, anaxnu margišim
 when-we NEG understand joke, we **feel**
[še-hiš'iru otanu baxuc]
 [that-left.3MP outside].

‘When we don't understand a joke, we feel left outside.’

(10) כאשר עייש ביקש העלאה של 50 אחוז מחוזהו הנוכחי הם הריחו שזה הולך לכיוון של עזיבה, ושמ למעשה הבינו שהוא כבר מחויב לקבוצה אחרת¹²

ka'ašer ayaš biqueš ha'ala'a šel 50 axuz me-xoze-hu
 when Ayash asked raise of 50 percent of-contract-his
ha-noḡexi hem herixu [še-ze holeḡ le-kivun šel aziba],
 the-current they **smell** [that-it goes to-a direction of leaving],
ve-šam lema'ase hibinu še-hu kḅar mexuyab
 and-there in.fact understood.3MP that-he already committed

¹⁰ <http://www.haaretz.co.il/magazine/tozeret/premium-1.4073313>

¹¹ <https://www.haaretz.co.il/gallery/television/premium-1.4382304>

¹² <http://ashdodnet.com/article/65322>

le-q̣buca axeret.

to-group different

‘When Ayash asked for a raise of 50% of his current contract, they smelled that it was going towards leaving, and there, in fact, they understood that he had already committed to a different group.’

III. Middle voice and finite clause (middle-CP)

The DatExp in the middle voice is marked by the preposition *le* ‘to’. To express a pronominal experiencer, the dative preposition is inflected for person and number. The DatExp is optional rather than obligatorily overtly expressed (13). When unpronounced, the experiencer is interpreted deictically (or even universally). The verbal form of the perception verb in both III (middle-CP) and IV (middle-SC) is the middle voice. The main-clause subject, then, is assumed to be non-thematic. The main-clause subject of the middle-CP construction can be either null, as in (11)-(12), (14), or overtly expressed by the expletive pronoun *ze* ‘it’ (13).

(11) אשתי כועסת, נראה לי שאני ישן על הספה היום

'išti ko'eset, nir'e l-i [še-ani yašen 'al ha-sapa hayom]

wife.my angry, **see.MID** to-me [that-I sleep on the-couch today].

‘My wife is angry, it seems to me that I am sleeping on the couch today.’

(12) ¹³נשמע לי שאתה לא הולך לנתק לי, וזה מראש ייאמר לזכותך

nišma l-i [še-ata lo holek le-nateq l-i],

hear.MID to-me [that-you NEG going to-hang.up on-me],

ve-ze meroš ye'amer li-zkut-ka

¹³ <http://www.haaretz.co.il/magazine/tozeret/premium-1.4101539>

and-it already will.be.said to-right-yours

‘It sounds to me that you are not going to hang up on me, and that already speaks in your favor.’

(13) לא נוח לנו עם הסיטואציה, זה מרגיש (לי) שבין כל כיסא לכיסא יש בלוק קרח

lo no'ax l-anu im ha-situacia, ze margiš

NEG comfortable to-us with the-situation, it **feel**

(l-i) [še-beyn kol kise ve-kise yeš bloq qerax]

to-me [that-between every chair and-chair exists block ice]

‘We don't feel comfortable with the situation, it feels (to me) as if between each and every chair there is a block of ice.’

(14) מכל הפרסומים, הריח לי שיש לו עניין אישי בגבייה, ולא רק ייצוג רגיל של לקוח¹⁴

mi-kol ha-pirsumim, heri'ax l-i [še-yeš

from-all the-publications, **smell** to-me [that-exist

l-o in'yan iši ba-gbi'ya], ve-lo raq

to-him interestpersonal in.the-collection], and-NEG just

icug ragil šel laqo'ax

representation standard of client

‘From all the publications, it smelled to me that he had a personal interest in the collection, and not just standard representation of a client.’

IV. Middle voice and non-finite small clause (middle-SC)

As already stated, the main-clause subject position in the middle-CP and middle-SC constructions is assumed to be non-thematic. The subject of the non-finite small clause (SC) must raise to the nominative subject position of the main clause, since the

¹⁴ al-pachad.blogspot.com/2014/04/blog-post_25.html

middle verb cannot assign it accusative case. Hence, the argument we find in the highest subject position is thematically the subject of the embedded clause.

(15) ¹⁵ זאת נראית לי הרפתקה מפרכת ועסק לא זול בכלל

zot nir'et l-i [harpatqa meṗareket ve-eseq
 it **see.MID** to-me [adventure exhausting and-deal
lo zol biklal]
 NEG cheap at all]

‘It seems to me like an exhausting adventure and not at all a cheap deal.’

(16) לי זה נשמע טיפה בים

l-i ze nišma [tipa ba-yam]
 to-me it **hear.MID** [drop in.the-sea]

‘It sounds to me like a drop in the ocean.’

(17) זה הרגיש לי מכה קלה

ze hirgiš l-i [maka qala]
 it **feel** to-me [blow light]

‘It felt to me like a light blow.’

(18) זה מריח (לי) דיאט

ze meri'ax (l-i) [dayet]
 it **smell** (to-me)[diet]

‘It smells (to me) like diet [Coke].’

Note that in (15)-(18), the pronoun *ze* ‘it’ is the referential demonstrative pronoun, which is homonymous to the expletive *ze*, which we saw above in the middle-CP

¹⁵ http://www.markivsodi.co.il/2012/12/blog-post_15.html

construction. In middle-CP, *ze* is obligatorily expletive and cannot be replaced by an argument, while in middle-SC construction, it is necessarily referential, and has undergone raising from the subject position of the embedded clause. To support the difference between the demonstratives in each construction, I first note that the expletive demonstrative has a single form *ze*, whereas the referential demonstrative has a gender contrast: *ze/ zot* ‘it.MS/ it.FS’. Second, I consider the contrast in (19).

(19) a. דני סיפר לי שהיא חזרה אתמול לפנות בוקר,

ו(זה)¹⁶ נשמע לי שהוא מודאג

dani siper l-i še-hi xazra etmol

Danny told to-me that-she returned yesterday

lifnot boqer,

before morning,

ve-(ze) nišma l-i še-hu mud'ag

and-(it) hear.MID to-me that-he worried

‘Danny told me that she returned yesterday before sunrise, and it sounds to me that he is worried.’

b. דני סיפר לי שהיא חזרה אתמול לפנות בוקר, ו*(זה) נשמע לי משונה

dani siper l-i še-hi xazra etmol

Danny told to-me that-she returned yesterday

lifnot boqer,

before morning,

ve-(ze) nišma l-i mušune*

¹⁶ It is not completely clear whether *ze* ‘it’ in Hebrew is purely expletive even when it occurs in the non-thematic subject position of (19a). It seems to be felicitous in (19a), but not in a clause where there is no extraposed clause, as in (זה*) נשמע הצליל (*ze) *nišma ha-cilcul* ‘(*it) is heard the-bell’. This will be left here as an open issue.

and-*(it) hear.MID to-me peculiar

‘Danny told me that she returned yesterday before sunrise, and it sounds peculiar to me.’

In (19a), *ze* is expletive and does not co-refer to the first conjunct. In (19b), *ze* obligatorily co-refers to the first conjunct. The expletive *ze* can be null in (19a), but the raised referential *ze* in (19b) is obligatorily overt. Thus, *ze* in the main-clause subject position can only be referential when raised from the non-finite clause.¹⁷

These four constructions in Modern Hebrew are summarized as the *paradigm of alternating perception verbs*, shown in Table 1. The contrasts that will be pointed out between the four constructions concern the following features: the interpretation of the embedded clause as true in the actual world; lower interpretation of negation; the type of the embedded predicate; epistemic non-neutral reading; and availability of an imaginative reading. These contrasts will be presented in section 3, with an attempt to account for the central three in section 4.

¹⁷ This generalization, however, does not necessarily exclude cases in which the raised subject of the SC is both null and, so it seems, expletive, as in the following examples from naturally occurring discourse:

- (i) מרגיש לי לא נעים
margiš l-i lo na'im
 feel to-me NEG pleasant
 'It feels unpleasant to me.'
- (ii) מרגיש לי בול הזמן למבזק טקטי
margiš l-i bul ha-zman le-mibzaq taqti
 feel to-me spot on the-time to-news flash tactic
 'It feels to me exactly the right time for a tactic news flash.'

Table 1: The alternating perception verbs constructions

Construction	Case of the Experiencer Argument	Diathesis	Category of the Embedded Clause
1. active-CP	nominative (NomExp)	active voice	finite (CP)
2. active-SC	nominative (NomExp)	active voice	non-finite (SC)
3. middle-CP	dative (DatExp)	middle voice	finite (CP)
4. middle-SC	dative (DatExp)	middle voice	non-finite (SC)

The current work can hopefully be a modest contribution to a comprehensive typological study of semantic and syntactic perception verbs with respect to their voice alternation, prompted by Aikhenvald and Storch (2013, p. 20):

“...seemingly different semantics of verbs of perception is a corollary of their transitivity [voice] patterns... It would be a worthwhile task to provide a cross-linguistic investigation of transitivity of verbs of perception...”

2. The paradigm of alternating perception verbs

Conceptually speaking, perceptual experience involves a relation to perceived objects (Crane & Craig 2017). The group of alternating perception verbs expresses a perceptual experience of an event, state or an object in the world by means of one of the senses. In (20), for example, Lavy perceives the rain through a sensory experience – seeing, hearing, feeling or smelling.

(20) לביא ראה/ שמע/ הרגיש/ הריח את הגשם

laḇi ra'a/ šama/ hirgiš/ heri'ax et ha-gešem

Lavy see/ hear/ feel/ smell ACC the-rain

‘Lavy saw/ heard/ felt/ smelled the rain.’

As introduced in section 1, alternating perception verbs in Modern Hebrew appear in two constructions, which distinguish the case of the experiencer: NomExp and DatExp. The forms of the different perception verbs correlate with the case of the experiencer, as listed again in (21).¹⁸

(21) a. NomExp: ראה *ra'a* ‘see’; שמע *šama* ‘hear’; הרגיש *hirgiš* ‘feel’;

הריח *heri'ax* ‘smell’.

b. DatExp: נראה *nir'a* see.MID ‘seem’;¹⁹ נשמע *nišma* hear.MID ‘sound’;

הרגיש *hirgiš* ‘feel’; הריח *heri'ax* ‘smell’.

In Hebrew, a Semitic language, all verb stems, and also many noun and adjective stems are derived from (tri-)consonantal roots by different intercalations, called

¹⁸ All forms in (21) are marked for past tense, third person masculine singular.

¹⁹ I will disregard here possible semantic and syntactic similarities and differences between *seem* and *look* in English.

templates, of CV skeleta, vowel sequences and affixes (Doron 2003, p. 10). Voice is morphologically marked by the choice of template (Doron 2003, 2008): the active voice is expressed by the simple active *kal*, the intensive active *pi'el* and the causative active *hif'il*, whereas the middle voice (MID) is expressed by the simple middle *nif'al* and the intensive middle *hitpa'el*. All NomExp verbal forms are in the active voice, and all DatExp are in the middle voice, though the morphology does not always reflect this. The voice alternants are derived from the same consonantal root, i.e. *r.ʔ.y* ‘see’, *š.m.ʕ* ‘hear’, *r.g.š* ‘feel’ and *r.y.x* ‘smell’.²⁰ The alternating perception verbs *see* and *hear* are derived by the simple active template in the active voice, and in the simple middle template in the middle voice: *ראה-ראה ra'a-nir'a*; *שמע-שמע šama-nišma*. The verbs *feel* and *smell* in Hebrew are both derived in the causative template *hif'il*, a template which does not mark morphologically the middle voice. Rather, its active form also serves for the derivation of unaccusative verbs denoting internal causation. For the sake of simplicity, let us call the active forms of *feel* and *smell* with a DatExp also middle.²¹

In Hebrew, the passive voice has verbal patterns: *huf'al* and *pu'al*. According to Doron (2008, p. 26-27), both middle and passive voices lack an external argument. However, for the passive, the thematic role of the external argument is optionally realized and marked as oblique, for example by the preposition *על-ידי al-yedey* ‘by’. Middle voice verbs disallow the realization of the original external argument. The verbs *feel* and *smell* have a morphologically marked passive voice, *hurgaš* ‘was

²⁰ The consonantal root realization is subjected to morpho-phonological constraints (McCarthy 1981, Bat-El 1994 and Ussishkin 2000 a.o).

²¹ It might be worth mentioning that these two patterns for the middle forms correlate with the divergence of these sense-perception verbs in English: While *see* and *hear* have different forms as unaccusatives (*seem* and *sound*), *feel* and *smell* have the same forms. A possible path to explain this might be that only feelings and smells can emerge from within the experiencer, somewhat like *להבשיל le-haḇšil* ‘to-ripen’ and *להאדים le-ha'adim* ‘to-redden’.

sensed' and *hurax* 'was smelled'. In the case of *see* and *hear*, the middle voice forms 'seem' and 'sound' can function as passive ('seen', 'heard'), as do many simple middle verbs. But when interpreted as passive, they are ungrammatical with DatExp, either with a SC complement (22a) or an object complement (22b):

(22) a. נראתה (*לי) אשה הולכת ברחוב

nir'ata (**l-i*) *i'ša* *holket* *ba-rexov*

seen (*to-me) womanwalk in.the-street

'A woman was seen (to me) walking in the street.'

b. נשמעה (*לי) צעקה מרחוק²²

nišme'a (**l-i*) *ce'aqa* *me-raxoq*

heard (*to-me) shout from-distance

'A shout was heard (to me) from a distance.'

I propose that alternating perception verbs form a sub-group of a larger class of perception verbs. The class of perception verbs in Modern Hebrew includes the following (non-exhaustive) list of verbs:

(23) להקשיב *le-haqšib* 'to-listen', להאזין *le-ha'azin* 'to-listen.in', לצותת *le-cotet* 'to-

eavesdrop', להתבונן *le-hitbonen* 'to-look.at', להבחין *le-habxin* 'to-observe', לבחון

li-bxon 'to-examine', לבהות *li-bhot* 'to-stare', להביט *le-habit* 'to-glance', להסתכל

le-histakel 'to-watch', להציץ *le-hacic* 'to-peek', לצפות *li-cpot* 'to-view', לשים לב

la-sim leb 'to-notice', לחוש *la-xuš* 'to-sense', לנגוע *li-ngo'a* 'to-touch', למשש *le-*

²² The form *nišma* also has the non-perceptual meaning 'obey'.

mašeš ‘to-grope’, לרחרה *le-raxre'ax* ‘to-sniff.out’, להסניף *le-hasnip̄* ‘to-sniff’,
 לזהות *le-zahot* ‘to-recognize’, למצוא *li-mco* ‘to-find’.

It should be noted that some of these verbs can embed both finite and non-finite clauses, for example:

(24) a. הוא חש שליבה פועם.

hu xaš [še-lib-a po'em]

He **sense** [that-heart-her beat].

‘He sensed that her heart beats.’

b. הוא חש את ליבה פועם.

hu xaš [et lib-a po'em]

He **sense** [ACC heart-her beat].

‘He sensed her heart beat.’

However, there is neither voice nor nominative-dative experiencer alternation for these verbs.

Among the perception verbs, there are (at least) three more verbs which show the nominative-dative experiencer and some voice alternation, namely:

(25) NomExp: תפס *tapās* ‘perceived’ (active); דימה *dima* ‘visualize’ (active);
 זכר *zakar* ‘remember’ (active).

DatExp: נתפס *nitpas* ‘perceived’ (middle); נדמה *nidme* ‘resembles’
 (middle); זכור *za'kur* ‘remembered’ (adjectival passive).

These verbs will not be discussed here. First, the DatExp form of *remember* is an adjectival passive rather than middle. Second, these verbs are not directly related to sensory perceptions, and thus could be expected to show some different semantic and morpho-syntactic properties. The current discussion will be dedicated to the sensory perception verbs only.

To recapitulate, the alternating perception verbs in MH show a systematic morpho-syntactic alternation in the case-marking of the experiencer and in voice.

In addition, there is variation in the syntactic makeup of the embedded clauses, specifically – the nature of the complementizer. I illustrate this again with schematic constructed examples in (26)-(29), where both NomExp in the active voice (a and b examples) and DatExp in the middle voice (c and d examples) accordingly, embed two types of clauses: a finite clause - CP (a and b examples), headed by a complementizer (*še/ ke'ilu*), and a non-finite small clause - SC (c and d examples).

- (26)
- a. sc[את רונן עושה כביסה] היא ראתה
hi ra'ata sc[et ronən ose kbisa]
 she see sc[ACC Ronen do laundry]
 'She saw Ronen do the laundry.'
- b. CP[את רונן עשה כביסה] היא ראתה
hi ra'ata CP[še-ronen asa kbisa]
 she see CP[that-Ronen did laundry]
 'She saw that Ronen did the laundry.'
- c. CP[כאילו רונן עשה כביסה] נראה לה
nir'a l-a CP[še/ke'ilu-ronen asa kbisa]

see.MID to-her CP[that/like-Ronen did laundry]

‘It seemed to her that/like Ronen did the laundry.’

d. sc[נקייה לה הכביסה נראתה] *ha-kḥisa nirata l-a sc[_ neqiya]*

the-laundry see.MID to-her sc[_ clean]

the-laundry see.MID to-her sc[_ clean]

‘The laundry seemed to her clean.’

(27) a. sc[הוא שמע את רקפת מתאמנת על נגינה בצ'לו] *hu šama sc[et raqep̄et mitamenet al negina be-čelo]*

he hear sc[ACC Rakefet practice on playing in-cello]

he hear sc[ACC Rakefet practice on playing in-cello]

‘He heard Rakefet practice the cello.’

b. CP[הוא שמע שרקפת התאמנה על נגינה בחלילית] *hu šama CP[še-raqep̄et hitamna al negina be-xalilit]*

he hear CP[that-Rakefet practiced on playing in-recorder]

he hear CP[that-Rakefet practiced on playing in-recorder]

‘He heard that Rakefet practiced the recorder.’

c. CP[נשמע לו ש/כאילו רקפת התאמנה על נגינה בחלילית] *nišma l-o CP[še/ke'ilu raqep̄et hitamna al negina]*

hear.MID to-him CP[that/like Rakefet practiced on playing]

hear.MID to-him CP[that/like Rakefet practiced on playing]

be-xalilit]

in-recorder]

‘It sounded to him that/like Rakefet practiced the recorder.’

d. sc[רקפת נשמעה לו (כמו) צ'לנית טובה] *raqep̄et nišme'a l-o (kmo) sc[_ čelanit tova]*

Rakefet hear.MID to-him (like) sc[_ cellist good]

Rakefet hear.MID to-him (like) sc[_ cellist good]

‘Rakefet sounded to him like a good cellist.’

(28) a. sc[הוא הרגיש את הימים מתקצרים] *hu hargiš et ha-yamim meḥqצרim]*

hu hirgiš sc[et ha-yamim mitqacrim]

he feel sc[ACC the-days shorten]

‘He felt the days shorten.’

b. CP[הוא הרגיש ש/כאילו הימים מתקצרים]

hu hirgiš CP[še/ke'ilu ha-yamim mitqacrim]

he feel CP[that/like the-days shorten]

‘He felt like the days are getting shorter.’

c. CP[הרגיש לו ש/כאילו הימים מתקצרים]

hirgiš l-o CP[še/ke'ilu ha-yamim mitqacrim]

feel to-him CP[that/like the-days shorten]

‘It felt to him like the days are getting shorter.’

d. sc[הימים הרגישו לו _ קצרים]

ha-yamim hirgišu l-o sc[_ qcarim]

the-days feel to-him sc[_ short]

‘The days felt short to him.’

(29) a. sc[הם הריחו את העוגה נאפית בתנור]

hem herixu sc[et ha-uğa ne'eṗet ba-tanur]

they smell sc[ACC the-cake cook in.the-oven]

‘They smelled the cake cook in the oven.’

b. CP[הם הריחו שהמאפייה נפתחה]

hem herixu CP[še-ha-ma'aṗiya niṗtexa]

they smell CP[that-the-bakery opened]

‘They smelled that the bakery opened.’

c. CP[הריח להם ש/כאילו המאפייה נפתחה]

heri'ax la-hem CP[še/ke'ilu ha-ma'aṗiya niṗtexa]

smell to-them CP[like/that the bakery opened]

‘It smelled to them like the bakery opened.’

d. sc[אפוייה] הָעוּגָה הָרִיחָה לָהֶם

ha-uga herixa la-hem sc[_ aḫuya]

the-cake smell to-them sc[_ baked]

‘The cake smelled baked to them.’

The bracketing in all d examples assumes a raising construction. The complementizer in the c examples is optionally ‘like’;²³ it is also acceptable with active voice of *margiš* ‘feel’ (28a). In the d examples, ‘like’ is optional for middle voice with NP embedded predicates, as in (27d). ‘Like’ as a complementizer in Hebrew - in particular in the case of perception verbs - requires comprehensive research in order to reveal the systematic nature of its distribution. Therefore, this work will abstract away from the contribution of ‘like’ and its optionality, and leave its status in Hebrew for further research.^{24,25}

In addition to joint morpho-syntactic properties, the alternating perception verbs share the lexical semantic property of stativity. Perception verbs as mental verbs are treated as statives in the literature (Vendler 1957 a.o.), having a non-agentive external

²³Elements in this position that mean ‘like’ include *kmo* (or the clitic *ke*) with NPs and *ke’ilu* with IPs.

²⁴Lasersohn (1995), for example, proposes that ‘like’ in the ‘sound like’ construction in English is an empty operator that only shifts IPs and NPs into APs. Brook (2014) conducted a corpus study in Canadian English on the DatExp perception verbs *seem*, *appear*, *look*, *sound*, and *feel* she calls Ostensibility Verbs, which can be linked to the lower clause by one of five complementizers: *as if*, *as though*, *like*, *that*, and null. Her research shows that “although *like* is the newest of these variants it is overwhelmingly the predominant one in vernacular Canadian English and *as if* and *as though* have become negligible” (*ibid.*). Further research is required in order to determine the properties of ‘like’ as a complementizer in Hebrew.

²⁵Another possible complementizer, which I will not discuss here, is *am* ‘whether’, mostly in questions, as in:

(i) רֹאית אַם דָּנִי רָץ?
ra’ita ’im dani rac?
 see.2MS whether Danny ran?
 ‘Did you see whether Danny ran?’

argument. All alternating perception verbs are not eventive. This can be shown by the “did so too” test (Ross 1972).

- (30) a. משי ראתה/ שמעה/ הרגישה/ הריחה את החצר נקיה, * וגם כלנית עשתה זאת.
meši ra'ata/ šam'a/ hirgiša/ herixa et ha-xacer neqiya,
 Meshy see/ hear/ feel/ smell ACC the-yard clean,
**ve-gam kalanit asta zot*
 and-also Kalanitdid it
 ‘Meshy saw/ heard/ felt/ smelled the yard clean, and Kalanit did so too.’
- b. משי ראתה/ שמעה/ הרגישה/ הריחה שהחצר נקיה, * וגם כלנית עשתה זאת.
meši ra'ata/ šam'a/ hirgiša/ herixa še-ha-xacer neqiya,
 Meshy see/ hear/ feel/ smell that-the-yard clean,
**ve-gam kalanit asta zot*
 and-also Kalanitdid it
 ‘Meshy saw/ heard/ felt/ smelled that the yard was clean, and Kalanit did so too.’
- c. נראה/ נשמע/ הרגיש/ הריח למשי שהחצר נקיה, * וכך גם עשה לכלנית.
nir'a/nišma/hirgiš/herix le-meši še-ha-xacer neqiya,
 see.MID/ hear.MID/ feel /smell to-Meshy that-the-yard clean,
**ve-kaḡ gam asa le-kalanit*
 and-so also did to-Kalanit
 ‘It seemed/sounded/felt/smelled to Meshy that the yard was clean, and so did to Kalanit.’
- d. החצר נראתה/ נשמעה/ הרגישה/ הריחה למשי נקיה, * וכך גם עשתה לכלנית.

ha-xacer nir'ata/nišmea/hirgiša/herixa le-meši neqiya,

the-yard see.MID /hear.MID/ feel/ smell to-Meshy clean,

**ve-kak gam asta le-kalanit*

and-so also did to-Kalanit

‘The yard seemed/sounded/felt/smelled to Meshy clean, and so did to Kalanit.’

The “did so too” conjunct, meaning “saw/ heard/ felt/ smelled the yard clean”, is ungrammatical, so we can conclude that alternating perception verbs are stative.

However, as statives, both the active and the middle voice verbs seem to also to get an inchoative reading, of a starting point of the perception event (Doron 2013). Consider a context in which Danny and Moshe are roommates.

(31) a. בחצות, דני שמע את משה מנהל שיחה בצרפתית.

be-xacot, dani šama et moše menahel

at-midnight, Danny hear ACC Moshe conduct

sixa be-carpatit

conversation in-French

‘At midnight, Danny heard Moshe converse in French.’

b. בחצות, דני שמע שמשה מנהל שיחה בצרפתית.

be-xacot, dani šama še-moše menahel

at-midnight, Danny hear that-Moshe conduct

sixa be-carpatit

conversation in-French

‘At midnight, Danny heard that Moshe conversed in French.’

c. בחצות, נשמע לדני שמושה מנהל שיחה בצרפתית.

be-xacot, nišma le-dani še-moše menahel
 at-midnight, hear.MID to-Danny that-Moshe conduct
sixa be-carpatit
 conversation in-French

‘At midnight, it sounded to Danny that Moshe conversed in French.’

d. ²⁶ בחצות, משה נשמע לדני מנהל שיחה בצרפתית?

?*be-xacot, moše nišma le-dani menahel*
 ?at-midnight, Moshe hear.MID to-Danny conduct
sixa be-carpatit
 conversation in-French

‘At midnight, Moshe sounded to Danny converse in French.’

In all these examples, there is a point in time, namely midnight, where Danny is either in the midst of hearing the conversation in French, or actually just starts hearing the conversation. In addition, in (31c)-(31d), midnight is the starting point of Danny perceiving Moshe speaking French, but it is not at all necessary for it to be a point in time of actually hearing Moshe talking.²⁷ Consider, for example, a context in which Moshe is conducting a perfectly fluent and coherent conversation in Hebrew around midnight, and at the same time Danny's sleeping pill effects kick in. At midnight, blurred from the pill, Danny starts perceiving Moshe as talking French, even though it is not the case in reality. Thus, both active and middle verbs are non-eventive, and both can get an inchoative reading, but only the former is an inchoative reading of an actual event.

²⁶ The partial acceptability of this example will be discussed in more detail in section 3.3.

²⁷ This property is addressed in section 3.1 in terms of factivity.

One might wonder why ‘taste’, which *is* a sense verb, is absent from the alternation exemplified in (26)-(29). In Hebrew, the consonantal root *t.ʕ.m* ‘taste’ co-occurs with a DatExp only with the adjective טעים *ta'im* ‘tasty’ (32) derived from that root, both with CP (32a) and SC (32b). The middle voice verbal form with the DatExp is ungrammatical, neither with CP (33a), nor with SC (33b), in accordance with the c-d examples of (26)-(29) above, since it is only interpreted as passive.

- (32) a. טעים לו שהמילקשייק חמוץ
ta'im l-o še-ha-milqšeq xamuc
 tasty to-him that-the-milkshake sour
 ‘It is tasty to him that the milkshake is sour.’

- b. המילקשייק טעים לו חמוץ
ha-milqšeq ta'im l-o xamuc
 the-milkshake tasty to-him sour
 ‘The milkshake is tasty to him sour.’

- (33) a. *נטעם לו שהמילקשייק חמוץ
**nit'am l-o še-ha-milqšeq xamuc*
 tasted.MID to-him that-the-milkshake sour
 ‘It tasted to him that the milkshake was sour.’

- b. *המילקשייק נטעם לו חמוץ
**ha-milqšeq nit'am l-o xamuc*
 the-milkshake tasted.MID to-him sour
 ‘The milkshake tasted sour to him.’

In addition, it seems that the NomExp active verb expresses more of a physical action, somewhat like ‘sample’, rather than a more perceptual one. This difference can be supported by the grammaticality of active voice ‘taste’ in the “did so too” test (34), contrasted with ungrammatical sentences in (30). Moreover, the verbal ‘taste’ with a NomExp cannot embed a clausal complement, CP (35a) or SC (35b).

- (34) דודו טעם את הסופגניה, וגם רותי עשתה זאת
dudu ta'am et ha-suṗganiya, ve-gam ruti
 Dudu tasted ACC the-sufganiyah, and-also Ruti
asta zot
 did so

‘Dudu tasted the sufganiyah, and Ruti did so too.’

- (35) a. הוא הריח/ *טעם שהשוקולד נמס
*hu heri'ax/ *ta'am še-ha-šoqolad names*
 he smelled/ tasted that-the-chocolate melt

‘He smelled/ tasted that the chocolate melted.’

- b. הוא הריח/ *טעם את השוקולד נמס
*hu heri'ax/ *ta'am et ha-šoqolad names*
 he smelled/ tasted ACC the-chocolate melt

‘He smelled/ tasted the chocolate melt.’

The adjectival ‘taste’ with a DatExp can embed a clausal complement, CP (36a) and SC (36b). This contrasts with ‘smell’, as shown by the following examples.

(36) a. מריח/ טעים לו שהשוקולד נמס
meri'ax/ ta'im l-o še-ha-šqolad names
 smell/ tasty to-him that-the-chocolate melting
 'It smells/ is tasty to him that the chocolate melted.'

b. השוקולד מריח/ טעים לו נמס
ha-šqolad meri'ax/ ta'im l-o names
 the-chocolate smelled/ tasty to-him melting
 'The chocolate smells/ is tasty to him melting.'

Unlike the alternating perception verbs, the adjective 'tasty' with a DatExp expresses a general preference, or a personal taste (Lasersohn 2005, Stephenson 2007, Kennedy & Willer 2016, a.o.). The plain, general complementizer *še* 'that' can be replaced by the temporal complementizer *kše* 'when', yielding the meaning of a dispositional stance of the experiencer towards the complement. Thus, for example, (37a) is understood as "He (generally) likes the taste of melted chocolate". In addition, it does not necessarily get an evaluative meaning of a specific state. Consider again the contrast with 'smell', in a context where Danny eats chocolate cake.

(37) a. טעים לדני (כ)שהשוקולד נמס, אבל הוא לא חושב שהשוקולד בעוגה נמס
ta'im le-dani (k)še-ha-šqolad names,
 tasty to-him (when/)that-the-chocolate melting,
aḅal hu lo xošeḅ še-ha-šqolad ba-uga names
 but he NEG think that-the-chocolate in.the-cake melt
 'It is tasty to him when/that the chocolate melts, but he doesn't think
 that the chocolate in the cake melts.'

b. מריח לדני (*כ) שהשוקולד נמס, # אבל הוא לא חושב שהשוקולד הזה נמס

*meri'ax le-dani (*k)še-ha-šoqolad names,*
 smell to-Danny (when/)that-the-chocolate melting,
#aḅal hu lo xošeb še-ha-šoqolad ba-uga names
 #but he not think that-the-chocolate in.the-cake melt
 'It smells to him when/that the chocolate melts, but he doesn't think
 that the chocolate in the cake melts.'

The sentence in (37a) can mean that Danny generally finds melting chocolate to be tasty, but it is not necessarily the case that he finds the specific chocolate portion that he is having to be melting. The (37b) sentence does not imply any preference Danny has about chocolate, and necessarily evaluates the chocolate portion he is having as melting. I return to the incongruity of 'taste' with the paradigm of the sensory-perception verbs presented here in the discussion in section 5. It remains, however, an issue for further investigation.

It is worth mentioning two more verbs, related to sound perception, which can appear with DatExp and SC. These are 'ring', 'play' and 'echo':²⁸

- (38) a. ²⁹ הניק שלך מצלצל לי מוכר, אבל לא מעלה לי שום אסוציאציה
- | | | | | |
|---------------|---------------|-----------------|------------|-----------------------|
| <i>ha-niq</i> | <i>šel-ka</i> | <i>mecalcel</i> | <i>l-i</i> | <i>mukar,</i> |
| the-nick | of-yours | ring | to-me | familiar |
| <i>aḅal</i> | <i>lo</i> | <i>ma'ale</i> | <i>l-i</i> | <i>šum asoci'acya</i> |
| but | not | raises | to-me | any association |

²⁸ The verbal forms in (38a) and (38c) are not middle forms.

²⁹ <http://fullgaz.co.il/forums/archive/index.php/t-5653.html>

‘Your nick (= nickname) rings a bell to me, but it doesn't have any association for me.’

b. המושג פמיניזם התנגן לי שלילי

<i>ha-musag</i>	<i>p̄eminizem</i>	<i>hitnagen</i>	<i>l-i</i>	<i>šlili</i>
the-term	feminism	play.MID	to-me	negative

‘The term “feminism” sounded negative to me.’

c. ³⁰ מהדהד לי כל מיני דברים

<i>mehadhed</i>	<i>l-i</i>	<i>kol</i>	<i>miney</i>	<i>d̄barim</i>
echo	to-me	all	sorts.GEN	stuff

‘It echoes to me all sorts of stuff.’

These verbs behave similarly to the perception verb *nišma* ‘hear.MID’, with SC complements (although only (38b) has middle morphology).

To sum up the discussion of the paradigm, this work focuses on four sensory perception verbs in Modern Hebrew, namely ‘see’, ‘hear’, ‘feel’ and ‘smell’, which all share the following semantic properties and morpho-syntactic variation:

- i. Stative verbs with an experiencer argument.
- ii. A diathesis alternation between an active verbal form and a middle verbal form, which correlates with an alternation between a nominative and dative experiencer argument (NomExp and DatExp, respectively).
- iii. A clausal complement, alternating between CP and SC.

³⁰ <https://www.haaretz.co.il/magazine/ayelet-shani/.premium-1.4647969>

The combination of the diathesis alternation and the category of embedded clauses yields four constructions: active-CP, active-SC, middle-CP, and middle-SC. Each one of the constructions has distinct semantic properties, consistent for all four verbs ‘see’, ‘hear’, ‘feel’ and ‘smell’. The contrasts between the constructions are presented in the following section.

3. Alternating constructions and their semantic properties

As laid out in the previous section, the Hebrew alternating perception verbs ‘see’, ‘hear’, ‘feel’ and ‘smell’ appear in four constructions when embedding a clausal complement. I have introduced the terms *active voice verbs* and *middle voice verbs* to refer to constructions 1-2 (NomExp) and 3-4 (DatExp) in Table 1 respectively. In the present section, five phenomena that distinguish between the four constructions in Table 1 will be presented and discussed: 1. factivity, 2. lower interpretation of negation, 3. embedded predicates, 4. mental apprehension, 5. imaginative reading. For the sake of simplicity, the properties will be exemplified in some cases by just one of the alternating perception verbs, implying that the other alternating perception verbs behave similarly, unless mentioned otherwise.

3.1 Factivity

Within the class of attitude verbs, *factivity* is the property of a predicate which entails the truth of its complement (Karttunen 1971).³¹ The attitude verbs in (39a) are factive, entailing the truth of the complement “Ben is a dancer”, while (39b) predicates are non-factive.

(39) a. Dan {knows, realizes, is aware} that Ben is a dancer.

=> Ben is a dancer.

b. Dan {thinks, believes, is certain} that Ben is a dancer.

³¹ Karttunen's (1971) definition crucially talks about entailments for factive predicates in terms of presupposition. The truth of the complement of factive verbs (e.g. *know*) 'survives' under negation, questions, possibility modals such as *may* and in antecedents of conditionals. Consider:

(i) Dan didn't know that Ben was a dancer/ Did Dan know that Ben was a dancer?/ Dan may know that Ben was a dancer/ If Dan knew that Ben was a dancer, he should have tried to learn some steps. => Ben was a dancer.

Karttunen distinguishes factive predicates from ‘implicative’ ones, for which factivity is not similarly presupposed. In what follows, I will abstract away from the nature of the presupposition, and its survival in the abovementioned environments.

=/> Ben is a dancer.

Among the alternating perception verbs, active voice verbs are factive, whereas middle voice verbs are non-factive. Consider the following sentence:

(40) $_{CP}$ גל ראה [שאמא בבית]

gal ra'a [še-'ima ba-bayit] $_{CP}$

Gal see [that-mom at-home] $_{CP}$

‘Gal saw that mom is home.’

Let us assume that Gal knows that when the car is parked in the driveway, his mother is at home. In a context where Gal comes home and sees his mother's car in the driveway, (40) entails that the complement ‘mother is at home’ is true. This judgment can be tested by the contradiction test in (41) (Moulton 2009, p. 128).

(41) גל ראה שאמא בבית, # אך למעשה היא בכלל בעבודה

gal ra'a še-'ima ba-bayit, #ak lema'ase hi

Gal see that-mom at-home, #but in.fact she

biklal ba-aḥoda

at.all at-work

‘Gal saw that mom is home, but in fact she is at work.’

Factivity holds for the active voice verbs, with both categories of clauses, CP and SC. In a context in which Ronen comes to perceive Danny as drunk by means of one of his senses - for example, seeing an empty bottle of wine, or smelling Danny's breath –

the truth of the complement in the first sentence in (42a)-(42b) follows from factivity, hence the contradiction resulting from the second sentence:

(42) a. רונן ראה/ שמע/ הרגיש/ הריח שדני שיכור, # אך למעשה דני כלל לא שתה.

ronen ra'a/ šama/ hirgiš/ heri'ax še-dani šikor,

Ronen see/ hear/ feel/ smell that-Danny drunk,

#ak lema'ase dani biqlal lo šata

#but in.fact Danny at all NEG drank

‘Ronen saw/ heard/ felt/ smelled that Danny is drunk, but in fact Danny didn't drink at all.’

b. רונן ראה/ שמע/ הרגיש/ הריח את דני שיכור, # אך למעשה דני כלל לא שתה.

ronen ra'a/ šama/ hirgiš/ heri'ax et dani šikor,

Ronen see/ hear/ feel/ smell ACC Danny drunk,

#ak lema'ase dani biqlal lo šata

#but in.fact Danny at.all NEG drank

‘Ronen saw/ heard/ felt/ smelled Danny drunk, but in fact Danny didn't drink at all.’

It is important to note, though, that under some circumstances, ‘hear’ and ‘feel’ are non-factive with the active-CP construction. With ‘hear’, factivity arises only when the experiencer heard (some concrete evidence for) the event described in the embedded clause, but not if it is the content of a hearsay or a report (as was claimed for English by Moulton (2009, p. 145-147)). For example, (43a) is factive when Ronen hears Danny singing loud and tipsily, but non-factive if he heard about Danny being drunk from his parents (43b).

- (43) a. רונן שמע (מהשירה שלו) שדני שיכור, # אך למעשה דני כלל לא שתה
ronen šama (me-ha-šira šel-o) še-dani
 Ronen hear (from-the-singing of-him) that-Danny
šikor, #a_k lema'ase dani bi_klal lo šata
 drunk, #but in.fact Danny at.all NEG drank
 'Ronen heard (from his singing) that Danny is drunk, but in fact Danny didn't drink at all.'
- b. רונן שמע (מההורים שלו) שדני שיכור, אך למעשה דני כלל לא שתה
ronen šama (me-ha-horim šel-o) še-dani
 Ronen hear (from-the-parents of-him) that-Danny
šikor, #a_k lema'ase dani bi_klal lo šata
 drunk, #but in.fact Danny at.all NEG drank
 'Ronen heard (from his parents) that Danny is drunk, but in fact Danny didn't drink at all.'

With 'feel', the source of the perception might be an unreal impression rather than perceived evidence (44a), or may report an internal unverifiable sensation (44b). In such cases, 'feel' is non-factive, and the sentence describes a feeling that is not necessarily real.

- (44) a. היא אמרה לי קודם שהשמלה נורא יפה, אבל שהיא מרגישה שזה לא הסגנון שלה
hi amra l-i qodem še-ha-simla nora yaḫa, aḫal
 she said to-me earlier that-the-dress very pretty, but
še-hi margiša še-ze lo ha-signon šel-a
 that-she feel that-it NEG the-style of-her

‘She told me earlier that the dress was very pretty, but that she felt it wasn't her style.’ (Saydon 2009, p. 391)

b. אני מרגישה שהוא מתרחק.³²

ani margiša še-hu mitraxeq
 I feel that-he is.distancing
 ‘I feel that he is becoming distant.’

Therefore, in some cases NomExp alternating perception verbs can be non-factive.³³ But crucially, active voice ‘feel’ **can** be factive with CP, and is obligatorily factive with SC. Consider the following contrast between active voice ‘feel’ embedding CP (45a) and SC (45b).

- (45) a. דני מרגיש שדנית מרוחקת, אבל היא סתם טרודה במחשבות.
dani margiš še-danit meruxeqet, aḅal hi stam
 Danny feel that-Danit estranged, but she just
truda be-maxšəḅot
 occupied in-thoughts
 ‘Danny feels that Danit is estranged, but she is just preoccupied.’
- b. דני מרגיש את דנית מרוחקת, ? אבל היא סתם טרודה במחשבות.
dani margiš et danit meruxeqet, ?aḅal hi stam
 Danny feel ACC Danit estranged, but she just
truda be-maxšəḅot

³² www.ynet.co.il/articles/0,7340,L-4677708,00.html

³³ I will not attempt to explain these exceptions for factivity with ‘hear’ and ‘feel’ here. The non-factive active voice ‘hear’ might be explained through the distinction presented in the evidentiality literature (Willet 1988, cited by Krawczyk 2012, 63) between different types of evidence: **Direct** – *attested* (visual, auditory, other sensory), and **indirect** – either *reported* (second or third hand, such as hearsay), and *inferring* (based on results or reasoning). I leave this possibility as an open issue.

occupied in-thoughts

‘Danny feels Danit being estranged, but she is just preoccupied.’

For me, (45a) could be said about Danny having the impression that Danit is estranged, yet it is not really the case, while in (45b), his feeling corresponds to Danit's actual state, that is, that she is estranged.

While the clausal complements of active voice verbs, both CP and SC, are interpreted as true when the sentence is true, with middle voice verbs they are both interpreted as a probable or an evaluated statement, but not necessarily true. In (46a), Danny can evaluate Danit as drunk based on some sensory impression, even if she is perfectly sober. Sentence (46b), then, is not a contradiction.

(46) a. נראה/ נשמע/ הרגיש/ הריח לדני שדנית שיכורה,

אך למעשה היא כלל לא שתתה אלכוהול.

nir'a/ nišma/ hirgiš/ heri'ax le-dani

see.MID/ hear.MID /feel /smell to-Danny

še-danit šikora, aḵ lema'ase hi klal lo

that-Danit drunk, but in.fact she at.all NEG

šateta alcohol

drank alcohol

‘It seemed/ sounded/ felt/ smelled to Danny that Danit is drunk, but in fact she didn't drink alcohol at all.’

b. דנית נראתה/ נשמעה/ הרגישה/ הריחה לדני שיכורה,

אך למעשה היא כלל לא שתתה אלכוהול.

danit nir'ata/nišme'a/hirgiša/heri'xa le-dani šikora,
 Danit see.MID/hear.MID/feel/smell to-Danny drunk,
aḵ lema'ase hi klal lo šateta alkohol
 but in.fact she at.all NEG drank alcohol
 'Danit seemed/ sounded/ felt/ smelled to Danny drunk, but in fact she
 didn't drink alcohol at all.'

To conclude the factivity property, active voice verbs are factive with CP and SC, aside from some exceptions with 'hear' and 'feel'. Middle voice verbs are non-factive across the board.

3.2. Lower interpretation of negation

Active and middle voice verbs, with both CP and SC complements, also come apart with respect to Lower Interpretation of Negation (LIN) (Hegarty 2016, chapter 7).³⁴

LIN is the possible interpretation of matrix negation as negating the embedded predicate rather than the expected meaning in which the matrix verb is negated. In example (47a) from Hegarty (2016, p. 185, example (1e)), the attitude ascription *want* in English shows LIN, thus licensing the NPI *until* in the complement. In (47b), *hope*, which does not allow LIN, can only be interpreted as describing a lack of hope, and cannot mean that liberals hoped that Bush wouldn't win (p. 186 example (5a)).

- (47) a. They don't want (him) to find the document until Tuesday.
 b. Liberals didn't hope that Bush would win.

³⁴ This property is known in the literature as 'Neg-Raising' (Horn 1978, Gajewski 2007, among many others).

Among Hebrew alternating perception verbs, LIN is less acceptable with active voice verbs, while with middle voice verbs LIN is easily available, and even preferred.³⁵

- (48) a. שקד לא ראה/ שמע/ הרגיש/ הריח שדני היה שיכור
- <=/=> שקד ראה/ שמע/ הרגיש/ הריח שדני לא היה שיכור
- šaqed lo ra'a/šama/hirgiš/heri'ax še-dani haya šikor*
- ShakedNEG see/ hear/ feel/ smell that-Danny was drunk
- 'Shaked didn't see/ hear/ feel/ smell that Danny was drunk.'
- <=/=> *šaqed ra'a/šama/hergiš/heri'ax še-dani lo*
- Shakedsee/ hear/ feel/ smell that-Danny NEG
- haya šikor*
- was drunk
- 'Shaked saw/ heard/ felt/ smelled that Danny was not drunk.'
- b. שקד לא ראה/ שמע/ הרגיש/ הריח את דני שיכור
- <=/=> שקד ראה/ שמע/ הרגיש/ הריח את דני *לא שיכור
- šaqed lo ra'a/šama/hirgiš/heri'ax et dani šikor*
- ShakedNEG see/ hear/ feel/ smell ACC Danny drunk
- 'Shaked didn't see/ hear/ feel/ smell Danny drunk.'
- <=/=> *šaqed ra'a/šama/hergiš/heri'ax et dani *lo*
- Shakedsee/ hear/ feel/ smell ACC Danny NEG
- šikor*
- drunk
- 'Shaked saw/ heard/ felt/ smelled Danny not being drunk.'

³⁵ The middle voice verbs *nir'a* see.MID 'seemed' and *nišma* hear.MID 'sounded' also appear with negation in the phrases: (זה) לא נראה/נשמע לי, '(it) NEG see/hear.MID to-me' meaning 'It doesn't seem/ sound **good** to me'. I will not attempt to account for this reading, in which the embedded predicate 'good', which is negated, is implicit.

(49) a. לא נראה/ נשמע/ הרגיש/ הריח לשקד שדני שיכור

=> לא נראה/ נשמע/ הרגיש/ הריח לשקד שדני לא שיכור

lo nir'a/ nišma/ hirgiš/ heri'ax le-šaqed

NEG see.MID/ hear.MID/ feel/ smell to-Shaked

še-dani šikor

that-Danny drunk

‘It didn't seem/sound/feel/smell to Shaked that Danny was drunk.’

=> *nir'a/ nišma/ hirgiš/ heri'ax le-šaqed*

see.MID/ hear.MID/ feel/ smell to-Shaked

še-dan lo šikor

that-Danny NEG drunk

‘It seemed/ sounded/ felt/ smelled to Shaked that Danny was not drunk.’

b. דני לא נראה/ נשמע/ הרגיש/ הריח לשקד שיכור

=> דני נראה/ נשמע/ הרגיש/ הריח לשקד לא שיכור

dani lo nir'a/ nišma/ hirgiš/ heri'ax le-šaqed šikor

Danny NEG see.MID/hear.MID/feel/smell to-Shaked drunk

‘Danny didn't seem/sound/feel/smell drunk to Shaked.’

=> *dani nir'a/ nišma/ hirgiš/ heri'ax le-šaqed lo*

Danny see.MID/ hear.MID/ feel/ smell to-Shaked NEG

šikor

drunk

‘Danny seemed/sounded/felt/smelled not drunk to Shaked.’

In Hebrew alternating verbs, the availability of LIN seems to be independent from the embedded clause category, and only sensitive to the voice dimension – LIN does not arise with active voice (and NomExp), but is easily obtained with middle voice (and DatExp). Descriptively speaking, the LIN property aligns with the factivity contrast – the two active constructions are factive and do not generally allow LIN, while the two middle constructions are non-factive and allow LIN.

3.3 Embedded predicates

Active and middle verbs differ with respect to the type of predicates of the embedded clause. For non-verbal predicates, NP and AP, the basic distinction I will address here will be between predicates describing a permanent property of an individual versus a temporary one. This is a contrast known in the literature as Individual Level Predicate (ILP) versus Stage Level Predicate (SLP) (Kratzer 1995). The distinction can be illustrated by the following example from Kratzer (1995, p. 125, ex. 2):

- (50) a. Firemen are altruistic. ILP
 b. Firemen are available. SLP

Being available (50b) is a temporary state, while altruism (50a) is more of a permanent property.

With SC, middle voice verbs can embed both ILPs and SLPs. Active voice verbs only allow a more restricted range of non-verbal predicates in SC. The contrast is shown (51), where the active voice verbs are only felicitous with the SLP ‘tired’, but not with

the ILPs ‘Club-Med dancer’, ‘tall’ and ‘chef’ (51a).³⁶ The middle voice, in contrast, is felicitous with both SLPs and ILPs (51b).

- (51) a. דנית ראתה את דני עייף / רקדן בקלאב-מד / *גבוה / *שף
*danit ra'ata et dani ayef/ *raqdan ba-qlab-med/*
 Danit see ACC Danny tired/ dancer in.the-Club-Med/
 *gaḇo'ha/ *šep̄
 tall/ chef
 ‘Danit saw Danny tired/ Club-Med dancer/ tall/ chef.’
- b. דני נראה לדנית עייף / רקדן בקלאב-מד / יפה / שף
dani nir'a le-danit ayef/ raqdan
 Danny see.MID to-Danit tired/ dancer
*ba-qlab-med/ *gaḇo'ha/ šep̄*
 in.the-Club-Med/ tall/ chef
 ‘Danny seemed to Danit tired/ a Club-Med dancer/ tall/ a chef.’

The ILP predicates in (51a) can be replaced by SLPs as in (52):³⁷

³⁶ An exception for the active voice ungrammaticality with ILPs is when the perception verb is reflexive, in particular with ‘feel’. Consider the contrast in (i)-(ii), from Saydon (2009, p. 390), that shows that the predicate ‘smart’ is grammatical in active-SC ‘feel’ only with a reflexive pronoun.

- (i) היא מרגישה את עצמה חכמה
hi margiša et acma xaḁama
 she feel ACC herself smart
 ‘She feels herself smart.’
- (ii) דוד מרגיש את יעל חכמה
 *david margiš et ya'el xaḁama
 *David feel ACC Ya'el smart
 ‘David feels Ya'el smart.’

Agranovsky (2017, p. 79-80) shows that the ‘feel oneself’ construction in Hebrew may be Slavic influence. As suggested by Saydon (2009, p. 390), the sentence in (i) probably does not involve an embedded SC [herself smart] but rather the phrasal verb ‘feel oneself’, which can indeed be replaced by ‘feel’.

³⁷ The ILPs ‘Club-Med dancer’, ‘tall’ and ‘chef’ are grammatical in an imaginative reading, which will be further discussed in section 3.5.

- (52) דנית ראתה את דני רוקד בקלאב-מד/ מבשל
danit ra'ata et dani roqed ba-qlab-med/ meḇašel
 Danit see ACC Danny dance in.the-Club-Med/ cook
 'Danit saw Danny dance in the Club-Med/ cook.'

The distinction between the alternating perception verbs with respect to embedded predicates cannot be attributed to what is known in the literature as “subjective predicates” (Kennedy & Willer 2016). The perception verb *find* in English is claimed to embed only “subjective” predicates, such as *fascinating* (53a), but not *vegetarian* (53b). In Hebrew, both predicates are ungrammatical with active voice verbs embedding SC (54a), and grammatical with middle voice (54b).

- (53) a. Kim finds Lee fascinating.
 b. # Kim finds Lee vegetarian.

(Kennedy & Willer 2016, p. 914, example (1))

- (54) a. דני ראה את דנית *מרתקת/ *טבעונית
*dani ra'a et danit *merateqet/ *tib'onit*
 Danny see ACC Danit fascinating/ vegan
 'Danny saw Danit fascinating/ vegan.'
 b. דנית נראתה לדני מרתקת/ טבעונית
danit niratat le-dani merateqet/ tib'onit
 Danit see.MID to-Danny fascinating/ vegan
 'Danit seemed fascinating/ a vegan to Danny.'

PP predicates, such as comitative or locative PPs, are grammatical when embedded under active voice (55a), but rarely felicitous under middle voice (55b). Sentences (56a)-(56c), however, express more of an emotional state, which is temporary, rather than a physical PP location.³⁸

- (55) a. הוא ראה את דנית עם דני/ בבית/ על הבמה
hu ra'a et danit im dani/ ba-bayit/ al ha-bama
 He see ACC Danit with Danny/ at-home/ on the-stage
 'He saw Danit with Danny/ at home/ on stage.'

- b. דנית נראית לו עם דני/ בבית/ על הבמה
**danit nir'et l-o im dani/ ba-bayit/ al ha-bama*
 Danit see.MID to-him with Danny/ at-home/ on-the-stage
 'Danit seems to him with Danny/ at home/ on stage.'

- (56) a. היא שמעה את דני במצב רוח טוב
hi šam'a et dani be-macab_h-ru'ax tob
 She hear ACC Danny in-state-of.mind good
 'She heard Danny in a good mood.'

- b. דני נשמע לה במצב רוח טוב (adapted from Lasersohn 1995, p. 74, n3)³⁹
dani nišma l-a be-macab_h-ru'ax tob
 Danny hear.MID to-her in-state-of.mind good
 'Danny sounded to her in a good mood.'

- c. דני מרגיש בבית
dani margiš ba-bayit
 Danny feel at-home

³⁸ Sentence (55a) is ambiguous between subject and object comitative. Only the object comitative should be considered here.

³⁹ The original example in English is *John sounds in a good mood*.

‘Danny feels at home.’

d. זה מרגיש לדני בבית

ze margiš le-dani ba-bayit

It feel to-Danny at-home

‘It feels to Danny like home.’

Another special case of an embedded PP is with ‘smell’.

(57) דני מריח מאלכוהול; המשקה מריח מתפוזים

dani meri'axme-alkohol; ha-mašqe meri'ax mi-tapuzim

Danny smells from-alcohol; the-drink smells from-oranges

‘Danny smells of alcohol; the drink smells of oranges.’

This construction, however, is not grammatical with an overt experiencer, neither NomExp nor DatExp (58a)-(58b). In addition, to me, it is factive (58c).

(58) a. *הוא מריח את דני מאלכוהול; הוא מריח את המשקה מתפוזים.

**hu meri'axet dani me-alkohol;*

He smell ACC Danny from-alcohol;

**hu meri'axet ha-mašqe mi-tapuzim*

He smell ACC the-drink from-oranges

‘He smells Danny of alcohol; he smells the drink of oranges.’

b. דני מריח לו מאלכוהול; המשקה מריח לו מתפוזים.

?dani meri'ax l-o me-alkohol;

Danny smell to-him from-alcohol;

?*ha-mašqe meri'ax l-o mi-tapuzim*

the-drink smell to-him from-oranges

‘Danny smells to him of alcohol; the drink smells to him of oranges.’

c. המשקה מריח מתפוזים, #אבל זאת בכלל קולה.

ha-mašqe meri'axmi-tapuzim, #aḅal zot biḵlal qola

the-drink smell from-oranges, #but this at all coke

‘The drink smells of oranges, but this is Coke.’

It is not clear to me that (57) contains a bi-clausal structure, and thus may not belong to the paradigm discussed here. This is an issue for which I cannot propose an answer at this point.⁴⁰

Active and middle voice verbs also reveal a contrast with verbal predicates in SC. Participles are acceptable in SCs under active perception verbs, but not under middle verbs.⁴¹ Mental verbs, such as ‘know’ and ‘love’, could be treated as ILPs (59d) and (60d),⁴² and they are ungrammatical with active voice verbs, but felicitous with middle voice verbs.

(59) a. הוא ראה את דנית רוקדת

hu ra'a et danit roqedet

He see ACC Danit dance

‘He saw Danit dance.’

b. הוא ראה את דנית מציירת עיגול.

⁴⁰ A possible way to account for this use is to treat מריח *meri'ax* ‘smell’ here meaning ‘spreading scent’, homonymous with sensation and perception meaning. I am thankful to Ruth Stern for sharing this insight with me. I will leave it as an open issue.

⁴¹ Present participle in Hebrew is morphologically marked for gender and number, but not for person.

⁴² I am thankful to Prof. Malka Rappaport Hovav for proposing this classification.

hu ra'a et danit mecayeret 'igul

He see ACC Danit draw circle

‘He saw Danit draw a circle.’

c. הוא ראה את דנית נכנסת הביתה.

hu ra'a et danit niḵneset habayta

He see ACC Danit enter to.home

‘He saw Danit enter home.’

d. הוא ראה את דנית יושבת בגן; *הוא ראה את דנית יודעת צרפתית/ אוהבת את דני.

hu ra'a et danit yošeḇetba-gan;

He see ACC Danit sit in.the-garden;

**hu ra'a et danit yoda'atcarṗatit/ oheḇet et dani*

He see ACC Danit know French/ love ACC Danny

‘He saw Danit sit in the garden; he saw Danit know French/ love

Danny.’

(60) a. דנית נראתה לו רוקדת *

**danit nir'ata l-o roqedet*

Danit see.MID to-him dance

‘Danit seemed to him dance.’

b. דנית נראתה לו מציירת עיגול *

**Danit nir'ata l-o mecayeret 'igul*

Danit see.MID to-him draw circle

‘Danit seemed to him draw a circle.’

c. ⁴³*דנית נראתה לו נכנסת הביתה.

⁴³ Sentences (60a)-(60c) are grammatical when ‘seems’ is parenthetical, as in:

(i) *dani, nir'e l-i, roqerd/ mecayer 'igul/ niḵnas habayta*
 Dani, see.MID.3MS to-me, dance/ draw circle/ enter to.home
 ‘Danny, apparently, is dancing/ drawing a circle/ entering home.’

**danit nirata l-o nikneset habayta*

Danit see.MID to-him enter to.home

‘Danit seemed to him enter home.’

d. *דנית נראתה לו יושבת בגן; ?דנית נראתה לו יודעת צרפתית/ אוהבת את דני.

**danit nirata l-o yošebetba-gan;*

Danit see.MID to-him sit in.the-garden;

?danit nirata l-o yoda'atcarpatit/ ohebet et dani

Danit see.MID to-him know French/ love ACC Danny

‘Danit seemed to him sit in the garden; Danit seemed to him know

French/ love Danny.’

To give a clearer picture of the restriction on embedded predicates with SC, the data above is summarized in Table 2. The distinction can be stated as follows: active verbs cannot embed ILPs in SC, and middle verbs cannot embed verbs.

Table 2: types of embedded predicates in SC

	SLP (i.e. tired)	ILP (i.e. chef, know French)	verbs (i.e. run)
active-SC	✓	✗	✓
middle-SC	✓	✓	✗

Turning now to types of embedded predicates with CP, there is no contrast:

(61) a. דנית ראתה שדני עייף/ רקדן בקלאב-מד.

danit ra'ata še-dani ayef/ raqdan ba-qlab-med

The parenthetical distribution of the alternating perception verbs in Modern Hebrew calls for a comprehensive treatment, which is beyond the scope of the current work.

Danit saw that-Danny tired/ dancer in.the-Club-Med

‘Danit saw that Danny was tired/ a Club-Med dancer.’

b. נראה לדנית שדני עייף/ רקדן בקלאב-מד

nir'a le-danit še-dani ayef/

see.MID to-Danit that-Danny tired/

raqdan ba-qlab-med

dancer in.the-Club-Med

‘It seemed to Danit that Danny was tired/ a Club-Med dancer.’

With verbal predicates, all verb classes can be embedded under both active and middle voice verbs, especially in the present or past tense. Middle voice verbs allow future tense complements, but this is slightly degraded in the active voice.

(62) a. הוא ראה שדנית רוקדת/ רקדה/ תרקוד

hu ra'a še-danit roqedet/ raqda/ ?tirqod

He see that-Danit dances/ danced/ ?will.dance

‘He saw that Danit dances/ danced/ ?will dance.’

b. הוא ראה שדנית מציירת/ ציירה/ תצייר עיגול

hu ra'a še-danit mecayeret/ ciyra/ ?tecayer 'igul

He see that-Danit draws/ drew/ ?will.draw circle

‘He saw that Danit is drawing/ had drawn/ will draw a circle.’

c. הוא ראה שדנית נכנסת/ נכנסה/ תיכנס הביתה

hu ra'a še-danit nikneset/ niknesa/ ?tikanes habayta

He see that-Danit entered/ entered/ ?will.enter to.home

‘He saw that Danit enters/entered/?will enter home.’

d. הוא ראה שדנית יושבת/ יושבה/ ?תשב בגן; הוא ראה שדנית יודעת/ ידעה/ ?תדע

צרפתי

hu ra'a še-danit yošebet/ yašba/ ?tešebba-gan;

He see that-Danit sat/ sat/ ?will.sit in.the-garden;

hu ra'a še-danit yoda'at/ yad'a/ ?teda carpatit

He see that-Danit knew/ known/ ?will.know French

‘He saw that Danit sat/ had sat/ will sit in the garden; he saw that

‘Danit knew/ had known/ will know French.’

(63) a. נראה לו שדנית רוקדת/ רקדה/ תרקוד

nir'a l-o še-danit roqedet/ raqda/ tirqod

see.MID to-him that-Danit dances/ danced/ will.dance

‘It seemed to him that Danit dances/ danced/ will dance.’

b. נראה לו שדנית מציירת/ ציירה/ תצייר עיגול.

nir'a l-o še-danit mecayeret/ciyra/tecayer 'igul

see.MID to-him that-Danit draws/drew/will.draw circle

‘It seemed to him that Danit is drawing/ had drawn/ will draw a circle.’

c. נראה לו שדנית נכנסת/ נכנסה/ תיכנס הביתה.

nir'a l-o še-danit nikneset/niḵnesa/tikanas habayta

see.MID to-him that-Danit enters/entered/will.enter to.home

‘It seemed to him that Danit enters/ entered/ will enter home.’

d. נראה לו שדנית יושבת/ יושבה/ תשב בגן; נראה לו שדנית יודעת/ ידעה/ תדע

צרפתי

nir'a l-o še-danit yošebet/ yašba/ tešeb ba-gan;

see.MID to-him that-Danit sits/sat/will.sit in.the-garden;

nir'a l-o še-danit yoda'at/ yad'a/ ?teda carpatit

see.MID to-him that-Danit knew/known/?will.know French

‘It seemed to him that Danit sits/ sat/ will sit in the garden; it seemed to him that Danit knew/ had known/ will know French.’

To summarize this section, restrictions for the type of the embedded predicates arise mainly with SC complements. Embedded under active verbs, only ILPs are ungrammatical, and under middle voice verbs, verbal predicates are ungrammatical.

3.4 Mental apprehension (belief formation) and indirect perception

The active voice 'see' reveals an epistemic contrast between CP and SC complements, as was first pointed out by Dretske (1969, p. 33-34) for English:

- (64) a. *S* saw the man wave to his wife.
 b. *S* saw that the man was waving to his wife.

According to Dretske (ibid.), for (64a) to be true, it is “not enough for *S* to see the man, he must also have been in a position to differentiate some of the movement which constitutes a wave”. No belief about the event being a waving of a man to his wife is necessarily involved in the seeing. The meaning of (64b), however, is not only that *S* saw the event, “but that he identified it as described” (ibid.). It follows then that with CP, mental apprehension is involved, and the *seeing* is understood as a non-neutral perception, i.e., it must include apprehension. In order for (64a) to be true, it has to be the case that *S* senses directly the wave, but not necessarily acknowledging that fact. This contrast can be tested by the following test for epistemic non-neutral perception (Moulton 2009, p. 128, example (2), attributed to Barwise 1981), and

adopted here in (65). For (65a) to be true, Martha must believe the content of the CP complement, and a contradiction arises. Taking an SC as the complement of *see*, (65b) reports direct perception, and no belief is required.

- (65) a. Martha saw that Fred was driving too fast,
but she believed he wasn't.
- b. Martha saw Fred driving too fast,
but she believed he wasn't.

This contrast is also found in Hebrew for active voice verbs with SC complements. However, middle voice verbs with both clausal types are epistemically non-neutral.

- (66) a. דני ראה את דנה שיכורה, אבל הוא חשב שהיא רק עושה הצגה.
dani ra'a et dana šikora,
Danny see ACC Dana drunk,
aḇal hu xašab še-hi raq osa hacaga
but he thought that-she just makes show
'Danny saw Dana drunk, but he thought that she was just putting on a performance.'
- b. דני ראה שדנה שיכורה, # אבל הוא חשב שהיא רק עושה הצגה.
dani ra'a še-dana šikora,
Danny saw that-Dana drunk,
#aḇal hu xašab še-hi raq osa hacaga
#but he thought that-she just makes show

‘Danny saw that Dana was drunk, but he thought that she was just putting on a performance.’

c. נראה לו שדנה שיכורה, # אבל הוא חשב שהיא רק עושה הצגה.

nir'a l-o še-dana šikora,
 see.MID to-him that-Dana drunk,
#aḅal hu xašaḅ še-hi raq osa hacaga
 #but he thought that-she just makes show

‘It seemed to him that Dana was drunk, but he thought that she was just putting on a performance.’

d. דנה נראתה לו שיכורה, # אבל הוא חשב שהיא רק עושה הצגה.

dana nir'ata l-o šikora,
 Dana see.MID to-him drunk,
#aḅal hu xašaḅ še-hi raq osa hacaga
 #but he thought that-she just makes show

‘Dana seemed drunk to him, but he thought that she was just putting on a performance.’

Another contrast between CP and SC complements with the active voice verbs is the requirement for indirect evidence.

(67) a. רננה הרגישה שיורד גשם.

renana hirgiša še-yored gešem
 Renana felt that-descends rain

‘Renana felt that it was raining.’

b. רננה הרגישה את הגשם יורד.

<i>renana</i>	<i>hirgiša et</i>	<i>ha-gešem</i>	<i>yored</i>
Renana	felt	ACC	the-rain
			descend

‘Renana felt it rain.’

Sentence (67a) can be true in a context where Renana feels that her hair gets frizzy, an unfortunate side effect she experiences every time that it starts raining. In such a case, sentence (67a) can be true even if she has no direct perception of the rain. For (67b) to be true, it must be the case that Renana directly felt the rain. Embedded under active voice verbs, then, the SC requires direct perception of the event described. The active voice with CP enables, but does not necessarily require, indirect perception, or sensation. Consider the following examples:

- (68)
- a. רננה ראתה שיורד גשם.
- | | | | |
|---------------|---------------|-----------------|--------------|
| <i>renana</i> | <i>ra'ata</i> | <i>še-yored</i> | <i>gešem</i> |
| Renana | see | that-descends | rain |
- ‘Renana saw that it was raining.’
- b. רננה הרגישה שיורד גשם.
- | | | | |
|---------------|----------------|-----------------|--------------|
| <i>renana</i> | <i>hirgiša</i> | <i>še-yored</i> | <i>gešem</i> |
| Renana | feel | that-descends | rain |
- ‘Renana felt that it was raining.’

Sentence (68a) is felicitous in a context where Renana looks directly at the rain through a window. Sentence (68b) is not entirely felicitous in such a context. With active voice verbs with CP, it seems that the relation between the sensory perception and the embedded event/state is looser, and can be indirect.

Middle voice verbs embedding a CP require indirect perception. Consider the contrast in (69), in a context in which a person watched the rain outside.

- (69) a. הוא ראה שירד גשם
hu ra'a še-yared gešem
 he see that-descended rain
 'He saw that it was raining.'
- b. #נראה לו שירד גשם
#nir'a l-o še-yarad gešem
 see.MID to-him that-descended rain
 'It seemed to him that it was raining.'

The middle voice with SC also requires an indirect perception. Consider again (66d), adapted and repeated as (70):

- (70) דנה נראתה לעדינה שיכורה
dana nir'ata le-adina šikora
 Dana see.MID to-Adina drunk
 'Dana seemed drunk to Adina.'

The sentence in (70) is infelicitous in a context where Adina is a policewoman who tests if Dana is drunk with a breathalyzer, which shows, by the common standards, that Dana is drunk.⁴⁴

⁴⁴ With the first person DatExp, נראה *nir'e* see.MID 'seem' may be used when there is a direct perception in the context of hedging. I am thankful to Miri Bar-Ziv Levy for pointing out this issue. I will disregard the hedging uses special to the first person in the current discussion.

To conclude this section, the active voice verb embedding a SC does not require mental apprehension and requires direct perception. The three other constructions, i.e. active-CP, middle-CP and middle-SC involve belief formation and indirect perception.

3.5 Imaginative reading

A final contrast to be presented between active and middle voice verbs is the availability of a reading referred to as ‘imaginative’. The imaginative reading is one among several meanings discussed in the literature for the active voice verbs *see* and *hear*. Recall the inventory of meanings for *see* in English (Moulton 2009, p. 2, example (1)) with different clausal non-finite complements in (6), repeated here as (71):

- | | |
|------|--|
| (71) | a. bare infinitive: John saw Fred leave early. direct perception
b. gerundive: John saw Fred leaving early. direct perception
c. gerundive: John saw Fred owning a house. imaginative
d. infinitive: John saw Fred to be a party-pooper. belief |
|------|--|

The imaginative reading reported for English in (71c) is found also in Hebrew (Cohen 2015). Sentence (72a) can get an imaginative reading in a context where Danny sees Moshe, who is a young ambitious teenager, delivering fiery arguments at a family dinner about a burning issue on the news. This reading is found only with active voice verbs embedding SC. The active voice verb with CP in (73) does not have this reading.

- (72) a. דני ראה את משה פוליטיקאי
dani ra'a et moše politiq'a'i
 Danny see ACC Moshe politician
 'Danny saw Moshe being a politician.'
- b. דני שמע את משה זמר אופרה
dani šama et moše zamar opera
 Danny hear ACC Moshe singer opera
 'Danny heard Moshe being an opera singer.'
- c. הוא (כבר) הרגיש את אמו מחבקת אותו
hu (kḥar) hirgiš et im-o mexabeqet ot-o
 He (already) feel ACC mother-his hug ACC-him
 'He (already) felt his mother hugging him.'
- d. הוא (כבר) הריח את החופש מעבר לפינה
hu (kḥar) heri'ax et ha-xoṗeš me'eḇer la-piba
 He (already) smell ACC the-freedom over to.the-corner
 'He (already) smelled freedom around the corner.'
- (73) דני ראה שמשה פוליטיקאי
dani ra'a še-moše politiq'a'i
 Danny see that-Moshe politician
 'Danny saw that Moshe was a politician.'

The imaginative reading is more difficult to get with 'feel' and 'smell'. I will not attempt to explain the differences in acceptability between the different verbs.⁴⁵ As pointed out in section 3.3, active voice verbs are not grammatical with ILPs in SC

⁴⁵ A possible way to explain the difference is to claim that it is more difficult to get a clear mental image through touch or smell. However, Cohen (2015, p. 16-17) shows that for Hebrew, the imaginative reading is already degraded with 'hear' in comparison to 'see'.

complements. In (72a)-(72b), the only available reading for the complement is of a mental image which the experiencer can hold, not an actual scenario in the real world that he perceives through his senses: a scenario which could happen in the future based on the current state of affairs, as in (72a), or expressing more of a wishful thinking, as in (72c). It differs from the belief reading (71d) – in (72a), Danny doesn't know or believe that Moshe is currently a politician, only that Moshe being a politician is a viable future scenario. With verbal embedded predicates (74a), both the direct perception (71a)-(71b) and imaginative readings (71c) arise.⁴⁶ To me, the imaginative reading is also available with embedded stative states, which were shown to be ungrammatical when embedded under active voice perception verbs (74b).

(74) a. הוא רואה את דנית כובשת את הפסגה ✓direct perception/✓imaginative

hu ro'e et danit kobešet et ha-pisga

He see ACC Danit conquer ACC the-summit

‘He sees Danit conquering the summit.’

b. אני רואה את רונה יודעת סינית *direct perception/✓imaginative

ani ro'e et rona yoda'atsinit

I see ACC Rona know Chinese

‘I see Rona knowing Chinese.’

With middle verbs, no imaginative readings arise. The only reading obtained is an evaluation of a perceived state:⁴⁷

⁴⁶ However, the imaginative one is much more difficult to attain with a past-tense matrix verb.

⁴⁷ Example (75b) may be uttered about a child who is currently not an opera singer, but has some voice qualities that make us think he would make a good opera singer. However, for me, the salient reading is of an evaluation, which is shared with the other verbs in (75).

- (75) a. פזית נראתה לרונן פוליטיקאית
pazit nir'ata le-ronen politiq'a'it
 Pazit see.MID to-Ronen politician
 'Pazit seemed to Ronen like a politician.'
- b. חנוך נשמע לסתוונית זמר אופרה
xanok nišma le-sitvanit zamar opera
 Chanoh hear.MID to-Sitvanit singer opera
 'Chanoh sounded to Sitvanit like an opera singer.'
- c. ורד הרגישה לצחי גבוהה
vered hirgiša le-caxi gḥoha
 Vered felt to-Tzahi tall
 'Vered felt tall to Tzahi.'
- d. מיכל הריחה לגל בשלנית צמרת
mīkal herixa le-gal bašlanit cameret
 Michal smelled to-Gal chef top
 'Michal smelled to Gal like a top chef.'

In sentences (75a)-(75d), the DatExp argument believes that the content of the complement is true. Sentence (76) then, is a contradiction.

- (76) a. פזית נראית לרונן פוליטיקאית, #
 אבל הוא לא חושב שיש לה איזושהי תכונה של פוליטיקאית
pazit nir'et le-ronen politiq'a'it,
 Pazit see.MID to-Ronen politician,
#aḇal hu lo xošeb še-yeš l-a eyzošehi

#but he NEG thinks that-exist to-her whatever

tkuna šel politiq'a'it

characteristic of politician

‘Pazit seems to Ronen like a politician, but he doesn’t think that she has any characteristic of a politician.’

Concluding this section, the imaginative reading in Hebrew arises only in the active-SC construction. In this reading, the embedded predicate types are not as restricted as has been described in section 3.3. Rather, ILPs such as ‘tall’ and ‘knowing Chinese’ are grammatical. The imaginative reading is not available with active-CP and middle voice constructions, which only show a belief reading. Descriptively speaking, this aligns with the belief formation and indirect perception property, shown in the latter three constructions, and not in the active-SC.

To conclude the discussion of semantic properties, the four constructions of the alternating perception verbs show variation in semantic properties concomitant to the morpho-syntactic alternation between diathesis and clausal category of their complements. The semantic properties and contrasts are summarized in Table 3.

Table 3: Summary of the active/ middle voice and CP/ SC contrasts

Category Contrast	Active Voice		Middle Voice	
	CP	SC	CP	SC
1. Factivity	✓	✓	✗	✗
2. LIN	✗	✗	✓	✓
3. Restrictions on embedded predicates	✗	non-ILPs	✗	non-verbal
4. (i) Belief formation	✓	✗	✓	✓
(ii) Indirect perception	✓	✗	✓	✓
5. Imaginative reading	✗	✓	✗	✗

In what follows, I wish to propose an explanation for these contrasts. In the following section, I will propose a semantic and syntactic analysis for each of the four constructions of the alternating perception verbs. After laying out the proposal, I will return to the contrasts, and examine how the analysis may account for the array of alternating properties.

4. An account of alternating perception verbs

In this section, a semantic and syntactic account will be proposed for the alternating perception verbs in Hebrew. It will be shown how the different parts of the alternating perception verbs, i.e. diathesis, preposition introducing experiencer arguments, and the syntactic type of the embedded clause, give rise to the semantic properties surveyed above for the four constructions in the paradigm (namely, active-SC, active-CP, middle-CP and middle-SC). In section 4.5, I explore how a compositional analysis may provide the basis for explaining the characteristics presented in section 3, for each of the four constructions.

The discussion starts with a detailed derivation of the active-SC construction. The general semantic and syntactic framework of the account is then extended to the active-CP, middle-CP and middle-SC constructions. I will not attempt to specify a compositional semantics that delivers the truth conditions of the additional constructions. The development of a formal system that captures the phenomena in full generality is beyond the scope of the present work, and it will have to be left to further research. In what follows, I will formally analyze the active-SC construction, and then informally describe the proposed analysis for the other three constructions.

4.1 Active-voice perception verb with a SC complement (Active-SC)

The starting point of the analysis is the semantics of Modern Hebrew perception verbs: *li-r'ot* 'to-see', *li-šmo'a* 'to-hear', *le-hargiš* 'to-feel' and *le-hari'ax* 'to-smell'. For ease of presentation, I will discuss the Hebrew verb *ra'a* 'see', assuming that other members of the class of alternating perception verbs can be defined along the

same lines. The suggested basic lexical entry for perception verbs is formalized in (77), for the verb ‘see’.

$$(77) \llbracket \text{see} \rrbracket_{\langle s, \langle s, t \rangle \rangle} = \lambda s'. \lambda s: P=\text{see}. s' = P(s)$$

In (77), ‘see’ is analyzed as a relation between two situations, the situation s in which perception takes place, and a situation which is perceived, s' . Type s is the type of situations, and s and s' are variables of this type. Events, as well as situations, are assumed to be of type s . I abstract away from the distinction between events and situations (Kratzer 2007), and treat them both as situations, of type s . The lexical entry in (77) introduces the presupposition that s and s' , for ‘see’, are related by visual perception. The motivation for the presupposition with P is the proposal for a unified analysis of the verbs in the class which brings out their common perceptual core. The major difference of the denotation in (77) for ‘see’ with respect to Higginbotham (1983) and Moulton (2009, p. 136, example (10)), is that the ‘seer’ is not an argument of the verb.

This lexical entry of a predicate which is purely a relation between two situations, excluding an individual participant - the ‘seer’ in ‘see’ - builds on Kratzer’s (1996) notion of severing the external argument. According to this notion, external arguments, unlike internal arguments, are not arguments of the verb, but introduced by a functional head - the Voice head - that syntactically attaches right above the VP node. Accordingly, internal and external arguments are composed by different rules of combination. The interpretation of VP is composed through Function Application (Heim & Kratzer 1998, p. 49 example (5)) when a verb (V) takes a direct object as its

I start by discussing FA when the verb ‘see’ combines with its complement, first when the complement denotes an individual situation, as in (78), and next when it denotes a property of situations, as in (79). In example (78), the complement of ‘see’ is of type s , in this case the name ‘the Jerusalem Marathon’:

- In the next example, the complement of ‘see’ is a SC:

- (79) דן ראה את ג'ורג' רץ
 dan *vp[ra'a_{SC}[et žorž rac]]*
 Dan *vp[saw_{SC}[ACC George run]]*.
 'Dan saw George run.'

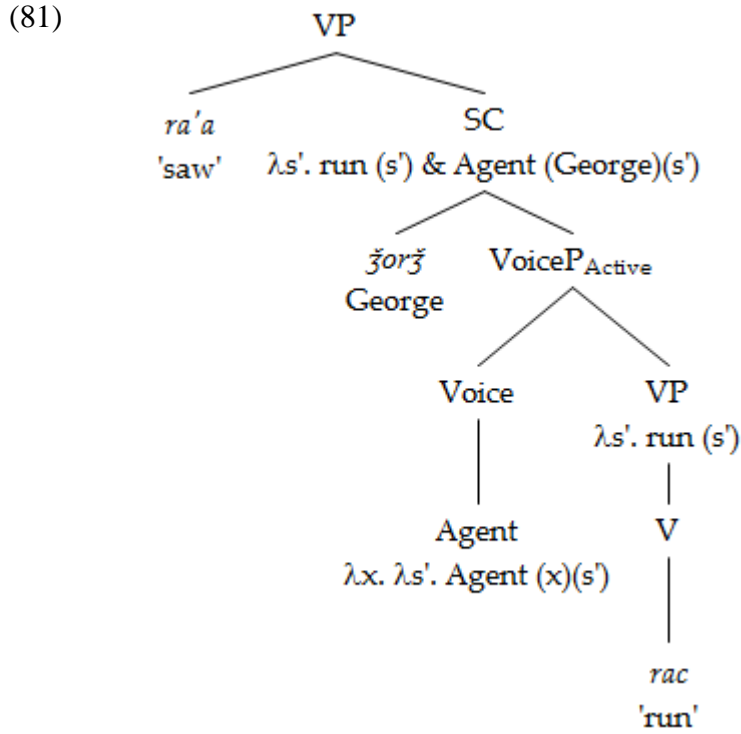
In the lexical entry (77) above, 'see' is of type $\langle s, \langle s, t \rangle \rangle$, defined for taking situation arguments. In the active-SC construction, the matrix verb 'see' combines with a SC, which as shown below is of type $\langle s, t \rangle$. Derived to be of type $\langle s, t \rangle$, the SC in (79) denotes the set of situations in which George runs (the embedded VP, which is the property 'run' of events, is combined with the agentive argument 'George' in VoiceP via Event Identification, as discussed above). The SC calculation is given in (80).

(80) SC calculation

$$\begin{aligned}
 \llbracket [\text{Voice VP}] \rrbracket &= \text{EI } ([\lambda x. \lambda s'. \text{Agent}(x)(s')], [\lambda s. \text{run}(s)]) && \text{by EI} \\
 &= [\lambda x. \lambda s'. \text{Agent}(x)(s') \ \& \ \text{run}(s')] \\
 \llbracket [\text{SC}] \rrbracket &= [\text{Voice VP}](\text{George}) && \text{by FA} \\
 &= [\lambda x. \lambda s'. \text{Agent}(x)(s') \ \& \ \text{run}(s')](\text{George}) \\
 &= \lambda s'. \text{Agent}(\text{George})(s') \ \& \ \text{run}(s')
 \end{aligned}$$

The matrix VP can now be represented syntactically in (81), and calculated in (82).⁴⁹

⁴⁹ For reasons of presentation, I will henceforth exclude functional categories such as tense and aspect altogether from the syntactic and semantic representations.



The SC is a property of situations, we therefore need to shift the basic denotation of the verb ‘see’, so that it takes properties of situations rather than individual situations (van Geenhoven 1998, p. 132):

(82) Matrix VP calculation:

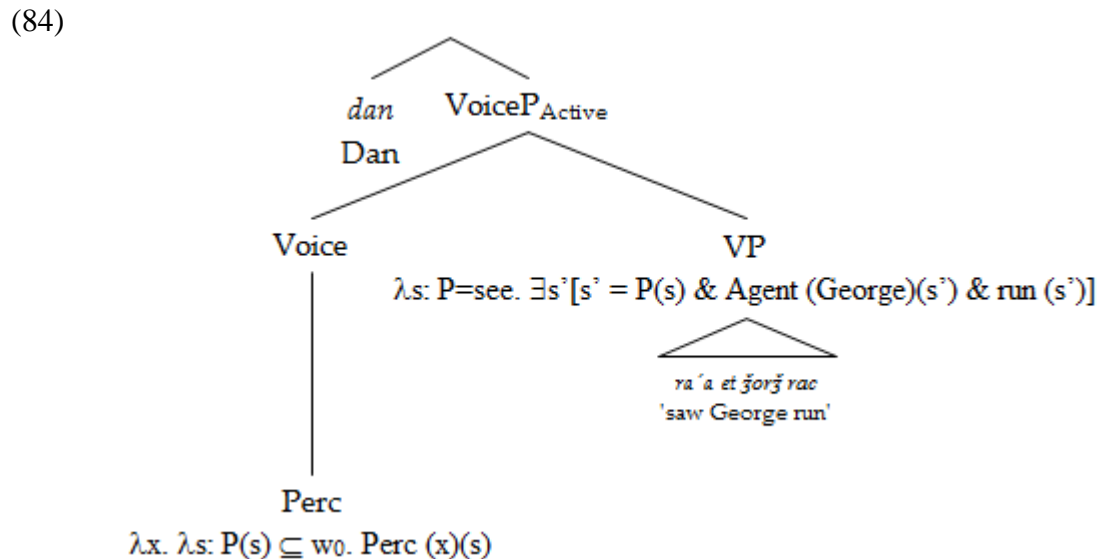
$$\begin{aligned}
\llbracket see \rrbracket_{\langle s, \langle s, t \rangle \rangle} &= \lambda s'. \lambda s: P=see. s' = P(s) \\
\llbracket see \rrbracket^{\text{shift}}_{\langle \langle s, t \rangle, \langle s, t \rangle \rangle} &= \lambda Q. \lambda s: P=see. \exists s' [s' = P(s) \ \& \ Q(s')]] \\
\llbracket \llbracket see \rrbracket^{\text{shift}} \rrbracket (\llbracket SC \rrbracket) & \\
= [\lambda Q. \lambda s: P=see. \exists s' [s' = P(s) \ \& \ Q(s')]] ([\lambda s'. \text{Agent (George)}(s') \ \& \ \text{run (s')}]) & \\
= \lambda s: P=see. \exists s' [s' = P(s) \ \& \ \text{Agent (George)}(s') \ \& \ \text{run (s')}] &
\end{aligned}$$

In prose, the topmost node in (81) denotes the set of situations of seeing a situation in which George runs. The final part of the derivation is the combination of the

NomExp, the ‘seer’, with the matrix verb marked for active voice. I propose that the nominative experiencer of alternating perception verbs is a special kind of attitude holder, which crucially comes with a factive presupposition.⁵⁰ This proposal amounts to the introduction of a new type of thematic role, reserved for the notion of perception: the perceiver. The proposed denotation of the perceiver role, which I will call *Perc*, is given in (83).

$$(83) \llbracket Perc \rrbracket_{\langle e, \langle s, \langle t \rangle \rangle} = \lambda x. \lambda s: P(s) \subseteq w_0. Perc(x)(s)$$

Perc introduces the presupposition that the situation perceived (*s'* above, the situation that is visually perceived in *s*) holds in *w*₀, the actual world. Together with the VP in (81) and VoiceP marked for active voice, construction active-SC is proposed to be combined as presented in (84), and calculated in (85).



⁵⁰ This proposal departs from Kratzer (2006) and Moulton (2009), who treat the experiencer of perception verbs, as well as of other mental or attitude verbs, as a “holder” (distinguished from an agent).

(85) Active-SC calculation

$\llbracket \text{Active-SC} \rrbracket =$

$\llbracket \text{Voice}P_{\text{Active}} \rrbracket(\llbracket \text{Dan} \rrbracket) =$

$(\llbracket \text{Perc} \rrbracket)(\llbracket \text{VP} \rrbracket)(\llbracket \text{Dan} \rrbracket) =$

$\lambda s: P=\text{see} \ \& \ P(s) \subseteq w_0. \text{Perc}(\text{Dan})(s)$

$\& \exists s'[s' = P(s) \ \& \ \text{Agent}(\text{George})(s') \ \& \ \text{run}(s')]$

In prose, (85) denotes the set of situations s with Dan as a perceiver such that the perceived situation $P(s)$ – a situation of George running – is in w_0 . The presupposition inheritance requires that the situation seen by the perceiver (Dan) takes place in w_0 . This is a welcome result with respect to the factivity property of this construction. Factivity is accounted for according to this proposal by the presupposition introduced by *Perc*, requiring that the perceived situation be seen by the seer in the actual world, w_0 .

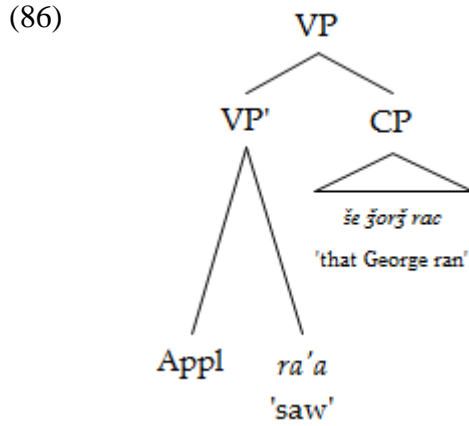
I will now discuss the other three constructions, active-CP, middle-CP and middle-SC, and introduce the notion of Applicative head in order to account for their properties. I will not attempt to specify a compositional semantics that delivers the truth conditions of these constructions, but informally describe the analysis proposed for them.

4.2 Active-voice perception verb with a CP complement (Active-CP)

I will treat CPs (consisting of a finite clause and complementizer) as a unit denoting propositions, or sets of worlds.⁵¹ The basic lexical entry for ‘see’ given in (77) takes only situations as its arguments. In the active-CP construction, ‘see’ takes a propositional CP as its complement. In order for the basic, non-type shifted, lexical entry of ‘see’ (77) to combine with this CP compositionally, some adjustment is required. In addition, an intensional component should be incorporated into the semantics of this construction to account for its epistemic non-neutrality. I propose that this component is an epistemic modal added together with an argument by the applicative head in (87).⁵² Applicatives are means by which a language can add an argument to the argument structure of a given verb (Pylkkänen 2008, 11). I assume that the epistemic applicative (*Appl*) adjoins at the VP level, takes ‘see’ as its argument, and returns a predicate that can take a propositional argument which can be apprehended by a belief holder. The syntactic structure of the VP is given in (86).

⁵¹ As already stated in section 2, I will only address the ordinary complementizer *še* ‘that’, and leave the possible additional semantic properties of the ‘like’ complementizers for future research.

⁵² In terms of Pylkkänen (2008), the added argument could be considered part of a ‘high applicative’ (collapsing different kinds of applicatives, such as *Appl*_{Ben}, *Appl*_{instr} and *Appl*_{Loc}). According to Pylkkänen, high applicatives - benefactives, malefactives, instruments, and so forth - are assumed to relate new event participants to the event described by the verb; they attach right above the VP (p. 13-14, 74). Low applicatives, on the other hand, relate individuals to the direct object of a verb and state that the direct object is either from the possession of this additional individual, or intended to enter the possession of this new individual. The position proposed here for the applicative departs from the position for the dative argument suggested by Landau 2010 (p. 8, example (12b)), above *v* combined with its complement. I leave empirical support for the proper position of the added argument in the case of perception verbs to further research.



This specific applicative head applies to ‘see’ and derives a predicate that takes a propositional complement, rather than a situation. In addition, *Appl* adds an argument, the “belief holder”. The proposed lexical entry for *Appl* is given in (87).

$$(87) \llbracket Appl \rrbracket_{\langle \langle s, s, t \rangle, \langle \langle s, t \rangle, \langle e \rangle, \langle s, t \rangle \rangle \rangle} = \lambda P. \lambda p. \lambda x. \lambda s: P = \text{see}.$$

$$\forall w \in \mathbf{MB}_{\text{abduction}(x, P(s))} [w \in p]$$

Where abduction modal bases are epistemic and involve specifically reasoning by abduction: $\text{abduction}(x, s') =$ the set of worlds compatible with what x abducts from s' .

Thus, *Appl* is proposed here to introduce a special kind of a thematic role - a percept-based kind of an experiencer. The current proposal attributes the epistemic modality to *Appl* rather than to the embedded clause (contrasting with proposals to locate this meaning specifically in the embedded complementizer; Kratzer 2006, Moulton 2009).

Appl in (87) is a function that takes ‘see’ as its argument, and returns a function that takes a proposition and an individual argument, the belief holder, returning a proposition. It introduces modal meaning to the perception construction. The meaning

is one of reasoning from perceptual evidence: all worlds compatible with the relevant sensory evidence, in which the proposition p is inferred, are worlds in which p is true. In (87), the worlds compatible with the relevant sensory evidence are introduced by the modal base (MB), which following Kratzer (1981, 1991, 2012) is a function defining the (here: epistemically) accessible worlds. I assume, then, that the belief holder is an argument of the applicative phrase, and since the MB is restricted to those worlds “compatible with percepts”, what (87) basically says is that the belief holder comes into believing the content of the propositional complement based on the percepts, visual percepts when the verb is ‘see’. This type of percepts-based-belief is a type of reasoning that is defined in (87) as “abduction”.

The term “abduction” as used by Peirce (1934: 94-131), refers to reasoning from data to the “best fit” explanation of the data (see Krawczyk 2012, p. 199-207). Citing Krawczyk, “Reasoning can be commonly categorized into three basic types: (logical) deduction, induction, and abduction. The latter two reflect defeasible reasoning, a non-logical deduction, a type of an observation-based reasoning to a conclusion that goes beyond the logical premises reasoning may render inference invalid”. An example of defeasible reasoning, given by Krawczyk (2012, p. 199) is a case in which “I have reasoned that it has rained based on a sensory evidence, that the street is wet. When I turn the corner, I see that a street sweeper has been spraying water as it drives down the streets. In this case, my conclusion that it rained has defeated my inference that it rained due to the fact that I now also know there is another cause for the wet street.”⁵³

⁵³ In her dissertation, Krawczyk (2012) discusses this type of inference in Yupik and in English, expressed by what she defines as “inferential evidentials”. In Yupik, this type of reasoning is claimed to be expressed lexically by the *llini* particle, and in English by the adverbials *apparently* and *evidently*.

In Hebrew, the active-CP construction of perception verbs does not have the characteristics of induction or deduction. This can be shown by adapting the tests Krawczyk (2012) proposes for inductive and deductive reasoning ((88) and (90) respectively, her examples (261a)-(261b)):

(88) Inductive reasoning, from general premises and particular conclusions:

General premise:	כל אבני הברקת שנצפו עד-כה היו ירוקות
	<i>kol aḇney ha-bareqet še-nicpu</i>
	all stones.GEN the-emerald that-watched
	<i>ad-ko hayu yeruqot</i>
	so-far were green
	‘All observed emeralds have been green.’
Conclusion:	לכן, אבן הברקת הבאה שתימצא תהיה ירוקה
	<i>laḵen, eḇen ha-bareqet ha-ba'a še-timace</i>
	Hence, stone the-emerald the-next that-found
	<i>tihye yeruqa</i>
	will.be green
	‘Therefore, the next emerald to be observed will be green.’

In a context where the belief of the perceiver is based on inductive reasoning as given in (88), the following sentence in Hebrew is infelicitous.

(89) # הוא ראה שאבן הברקת הבאה תהיה ירוקה

#hu ra'a še-eḇen ha-bareqet ha-ba'a tihye yeruqa

he see that-stone the-emerald the-next will.be green

‘He saw that the next emerald stone will be green.’

(90) Deductive reasoning, from particular premises and general conclusions:

Particular premises: ניו יורק היא ממזרח למיסיסיפי

nu-yorq hi mi-mizrax le-misisipi

New-York is from-east to-Mississippi

‘New York is east of the Mississippi.’

דלוור היא ממזרח למיסיסיפי

dalawer hi mi-mizrax le-misisipi

Delaware is from-east to-Mississippi

‘Delaware is east of the Mississippi.’

Conclusion: לכן, כל דבר שהוא ניו יורק או דלוור הוא ממזרח למיסיסיפי

laḵen, kol daḅar še-hu nu-yorq 'o

Thus, every thing that-is New-York or

dalawer hu mi-mizrax le-misisipi

Delaware is from-east to-Mississippi

‘Therefore, everything that is either New York or

Delaware is east of the Mississippi.’

In a context where the belief of the perceiver is based on deductive reasoning as given in (90), the following sentence in Hebrew is infelicitous.

(91) הוא ראה שניו יורק או דלוור הן ממזרח למיסיסיפי

#hu ra'a še-nu-yorq 'o dalawer hen mi-mizrax

he see that-New-York or Delaware are from-east

le-misisipi

to-Mississippi

‘He saw that New York or Delaware are east of the Mississippi.’

After eliminating inductive and deductive reasoning as the basis of belief formation in the active-CP construction, we hypothesize that it expresses abductive reasoning.

The final part required to obtain the active-CP construction is the combination of the VP with the NomExp. As already stated for the active-SC construction, the external argument is assumed here to combine with the verb via VoiceP and Event Identification. As in the derivation of active-SC, the NomExp is proposed to be introduced by a *Perc* role, introducing the presupposition of actualization. The structure of active-CP construction for sentence (92) is given in (93).

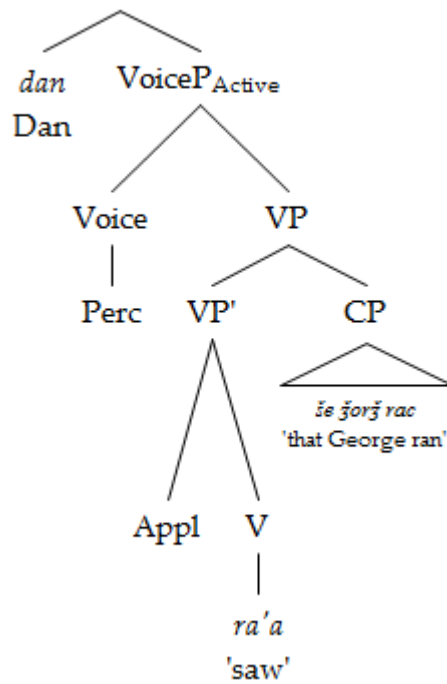
(92) דן ראה שג'ורג' רץ

dan _{VP}[*ra'a* _{CP}[*še-žorž* *rac*]]

Dan _{VP}[see _{CP}[that-George ran]].

‘Dan saw that George ran.’

(93)



In prose, the top node in (93) denotes the set of situations s where Dan perceives a situation s' in w_0 , and which abducts to Dan the proposition that George ran.

Importantly, the sentence also presupposes that George ran in w_0 . A potential problem arises, since both VoiceP and *Appl* are proposed to add an argument, the former introduces the argument of *Perc*, and the latter the belief holder, but only one argument is realized. I propose to resolve this by adding a compositional rule – Argument Identification. Similar to Event Identification, I assume this rule to apply in VoiceP, and to identify two argument variables as the same – individual variables in this case. Through Argument Identification in VoiceP_{Active}, the argument that satisfies the belief holder variable is the one introduced by *Perc*.⁵⁴ Composed together, the

⁵⁴ Another caveat arising is the potential “case-stacking” which is not treated here: It is assumed here that VoiceP_{Active} block the insertion of the *Appl* argument, in addition to the *Perc* argument, avoiding sentences like the following:

(i) דני ראה לדני שג'ורג' רץ
dani ra'a le-dani še-žorž rac
 Danny see to-Danny that-George ran
 ‘Danny saw to Danny that George ran.’

Perc and the *Appl* can account for the factivity and mental apprehension properties of the active-CP construction – *Perc* accounts for the factivity, requiring that the perceived situation will be seen by the seer in the actual world. At the same time, the epistemic MB is introduced by the *Appl*, and Argument Identification identifies the belief holder, the argument of *Appl*, as the perceiver.

As stated at the beginning of this section, the account proposed here for constructions active-CP, middle-CP and middle-SC is represented informally, and a detailed calculation of the truth conditions is an issue for further research.

4.3 Middle-voice perception verb with a CP complement (Middle-CP)

This construction is distinguished from the former by the parameter of diathesis. I will assume that the middle voice bears a feature or an index “flagging” that no external argument is about to join, and that this sign in Hebrew is marked overtly by the middle templates among the *binyanim* (see Doron 2003, 2008 on the semantics of middle templates), as exemplified in (94).

(94) נראה לדן שג'ורג' רץ

nir'a *le-dan* _{CP}[*še-žorž* *rac*]

see.MID to-Dan _{CP}[that-George ran].

‘It seemed to Dan that George ran.’

Similar to the active-CP construction, in order for the perception verb ‘see’ to take a CP, I propose that the VP incorporates *Appl*. The *Appl* takes the matrix verb ‘see’ as

It remains an empirical question whether VoiceP wins lower heads in case of clash. I am deeply thankful to Dr. Todd Snider for pointing out this issue.

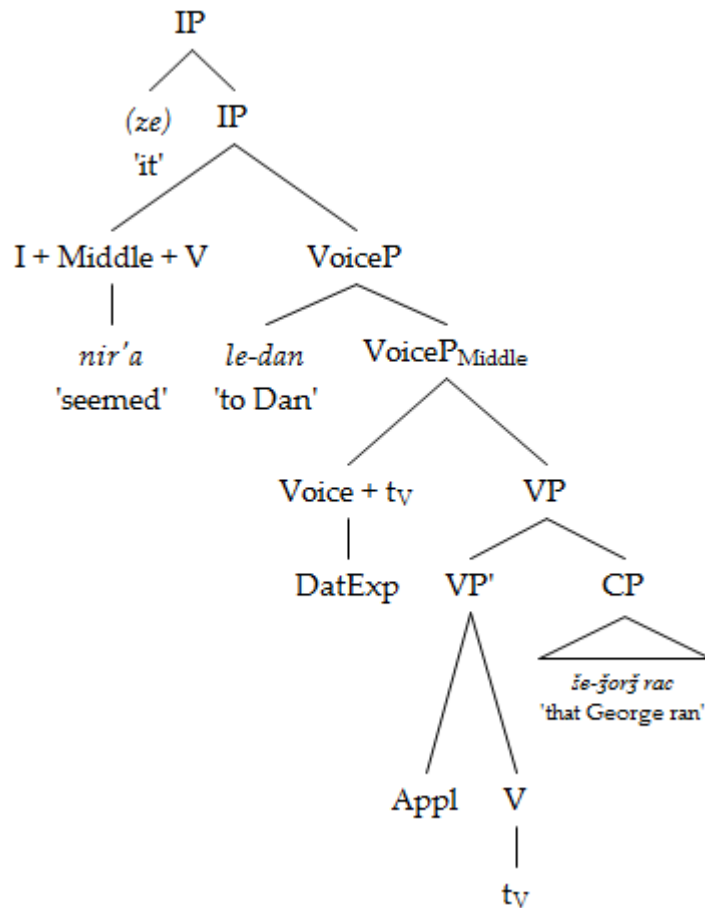
its argument, and returns a predicate that takes a propositional complement. The VoiceP middle is assumed to be combined above the VP. According to the proposed denotation, *Appl* introduces its own argument, the ‘belief holder’. This individual variable needs to be saturated, but the middle VoiceP is assumed to signal that no external argument is about to be added. I propose that the DatExp is combined at the VoiceP level, as a realization of the *Appl* argument. Therefore, I will treat DatExp as a ‘believer’,⁵⁵ which according to the proposal, is not an argument of the verb, but of the *Appl*. In order for the V to appear linearly before the dative, as in (94), it raises to I. The syntactic representation of (94) is illustrated in (95).

⁵⁵ Marked by an oblique case, the dative experiencers may be conceived as a mental location container or destination of mental states (Landau 2010, p. 10). It is worth mentioning in this regard that in Stát'imcets there is a sensory inferential evidential *lakw7a* (Matthewson 2011, cited by Krawczyk 2012) which historically was a locative adverb, but synchronically also functions as a non-visual-evidential. A typical example is in (i) (Matthewson 2011, p. 336, example (11)):

(i) wa7 **lákwa7a** u7s7-ám
 IMPF **lákwa7a** egg-MID
 ‘It’s laid an egg (by the sound of it).’

The dative in Hebrew, quite similarly, is also used as a locative argument.

(95)



Overall, the sentences denote those situations s such that $P(s)$ abduct to Dan the proposition that George ran. The demonstrative *ze* ‘it’ in highest subject position is assumed to be expletive, satisfying the EPP. In Hebrew, the expletive subject can also be null. Given the representation in (95), the middle-CP construction is understood as an epistemic attitude ascription, similar to ‘believe’ or ‘think’, with the unique component of a sensory-evidence-based MB. This is also a welcome result, with respect to factivity and mental apprehension. No *Perc* is incorporated into the structure, hence factivity is not expected to arise, and mental apprehension is achieved through *Appl*.

4.4 Middle-voice perception verb with a SC complement (Middle-SC)

The middle-SC construction is similar to the middle-CP construction with respect to VoiceP and *Appl*, but differs from it with respect to the category of the embedded clause. As stated earlier in (87), *Appl* takes a propositional complement. It is assumed here that the SC embedded under middle voice verbs denotes propositions, i.e. sets of worlds, and not situations. Crucially, only propositional SC complements, and not situational SCs as in active-SC, are allowed with *DatExp*. The propositional interpretation of SC is what determines the differences in the characteristics of the SC predicate in middle-SC vs. active-SC. Treating SC in this construction as propositional, *Appl* takes ‘see’ as its argument, adding the ‘belief holder’ argument and returning a predicate that takes a propositional complement, SC in this case. The *DatExp* adjoined at VoiceP fulfills the role of argument of *Appl*.

Syntactically speaking, the middle-SC construction is a raising construction. The verb in the middle voice cannot give the embedded subject accusative case. The subject of the embedded clause moves to the highest subject position, and is assigned nominative case. I assume that subject raising here is purely syntactic, with no semantic implications. The syntactic representation for sentence (96) is shown in (97).

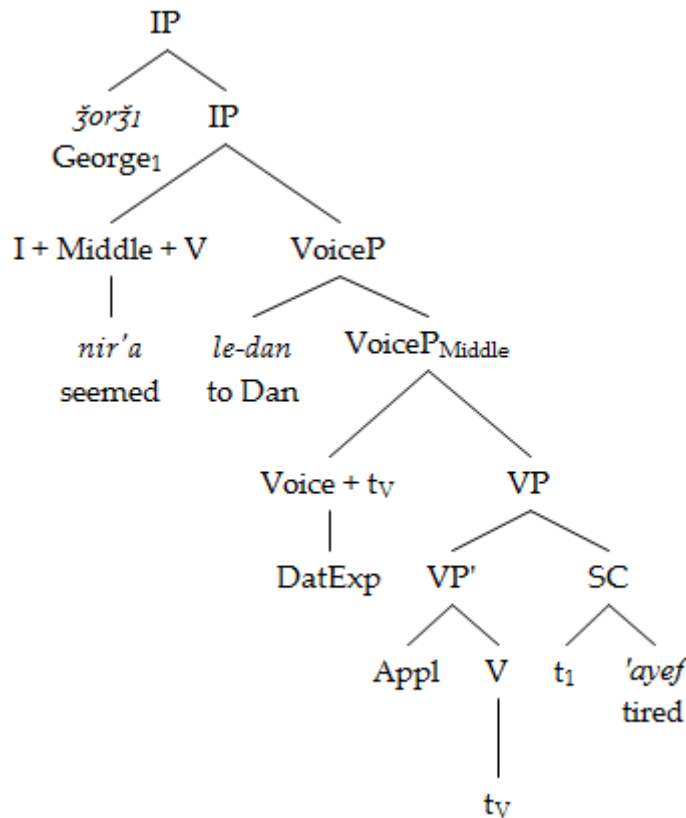
(96) ג'ורג נראה לדן עייף

žorž₁ nir'a le-dan_{SC}[t₁ 'ayef]

George₁ see.MID to-Dan_{SC}[t₁ tired].

‘George seemed tired to Dan.’

(97)



With the propositional SC together with *Appl*, which is assumed to insert a sensory-based epistemic MB, the meaning obtained is of Dan “abducting” the tiredness of George, based on a sensory evidence. Differently from the SC in the active-SC construction, no situation of George being tired is necessarily sensed. The “tiredness” in the propositional SC is obtained here as a property of George, perceived epistemically. Along the same lines as middle-CP, the non-factivity is explained here by the absence of *Perc*, and the mental apprehension is accounted for by the *Appl*.

4.5 Accounting for the central semantic properties

After laying out the general ingredients of a semantic and syntactic account of alternating perception verbs, I now return to the semantic properties of factivity, mental apprehension and restrictions on embedded predicates. The LIN and

imaginative reading properties will be discussed in section 5. Table 3, summarizing the contrasts, is repeated here.

Table 3: Summary of the active/ middle voice and CP/ SC contrasts

Category Contrast	Active Voice		Middle Voice	
	CP	SC	CP	SC
1. Factivity	✓	✓	✗	✗
2. LIN	✗	✗	✓	✓
3. Restrictions on embedded predicates	✗	non-ILPs	✗	non-verbal
4. (i) Belief formation	✓	✗	✓	✓
(ii) Indirect perception	✓	✗	✓	✓
5. Imaginative reading	✗	✓	✗	✗

4.5.1. Factivity

The active-SC and active-CP constructions are factive, while the middle-CP and middle-SC constructions are not factive. In the current analysis, factivity comes from the *Perc* argument, which is the nominative experiencer. *Perc* introduces a presupposition of actualization, as repeated in (98):

$$(98) \llbracket Perc \rrbracket_{\langle e, \langle s, \langle \rangle \rangle} = \lambda x. \lambda s: P(s) \subseteq w_0: \text{see. Perc } (x)(s)$$

The perceived situation is presupposed to occur in w_0 . The middle-CP and middle-SC have no *Perc*, hence factivity is not expected to arise. Consider examples (42) and (46), repeated here as (99).

- (99) a. רונן ראה/ שמע/ הרגיש/ הריח שדני שיכור, # אך למעשה דני כלל לא שתה.

ronen ra'a/ šama/ hirgiš/ heri'ax še-dani šikor,

Ronen see/ hear/ feel/ smell that-Danny drunk,

#ak lema'ase dani biḵlal lo šata

#but in.fact Danny at.all NEG drank

‘Ronen saw/ heard/ felt/ smelled that Danny is drunk, but in fact Danny didn't drink alcohol at all.’

- b. רונן ראה/ שמע/ הרגיש/ הריח את דני שיכור, # אך למעשה דני כלל לא שתה.

ronen ra'a/ šama/ hirgiš/ heri'ax et dani šikor,

Ronen see/ hear/ feel/ smell ACC Danny drunk,

#ak lema'ase dani biḵlal lo šata

#but in.fact Danny at.all NEG drank

‘Ronen saw/ heard/ felt/ smelled Danny drunk, but in fact Danny didn't drink alcohol at all.’

- c. נראה/ נשמע/ הרגיש/ הריח לדני שדנית שיכורה.

אך למעשה היא כלל לא שתתה אלכוהול.

nir'a/ nišma/ hirgiš/ heri'ax le-dani še-danit šikora,

see.MID/ hear.MID/ feel/ smell to-Danny that-Danit drunk,

ak lema'ase hi klal lo šateta alcohol

but in.fact she at.all NEG drank alcohol

‘It seemed/ sounded/ felt/ smelled to Danny that Danit is drunk, but in fact she didn't drink alcohol at all.’

- d. דנית נראתה/ נשמעה/ הרגישה/ הריחה לדני שיכורה.

אך למעשה היא כלל לא שתתה אלכוהול.

danit nir'ata/ nišme'a/ hirgiša/ heri'xa le-dani šikora,

Danit see.MID/ hear.MID/ feel/ smell to-Danny drunk,

ak lema'ase hi klal lo šateta alkohol

but in.fact she at.all NEG drank alcohol

‘Danit seemed/ sounded/ felt/ smelled to Danny drunk, but in fact she didn’t drink alcohol at all.’

The active constructions (99a)-(99b) are factive, and the middle constructions (99c)-(99d) are non-factive. According to the proposed account, factivity arises from the NomExp, Ronen, bearing the thematic role of perceiver (99a)-(99b). In the middle constructions, *Perc* is assumed not to be introduced by VoiceP. The DatExp Danny bears only the thematic role of “belief holder” (as an argument of *Appl*) and no factivity is derived.

4.5.2. Mental apprehension (belief formation) and indirect perception

Belief formation in active-CP, middle-CP and middle-SC constructions is due within the current proposal to *Appl*, which inserts a meaning of inference, namely abduction. In the case of the active-SC, no epistemic component is involved and no belief formation is assumed to arise. In all other three constructions, *Appl* turns the perception verb into a proposition embedding predicate. “Indirectness” is the result of the intervening *Appl* between the perception verb and the complement, and the epistemic modal flavor it bears.

However, indirect perception is marginally felicitous in the active-CP construction, while it is required in the middle verb constructions. Recall example (69), repeated here as (100).

- (100) a. הוא ראה שיורד גשם
hu ra'a še-yared gešem
 he see that-descended rain
 'He saw that it was raining.'
- b. #נראה לו שיורד גשם
#nir'a l-o še-yarad gešem
 see.MID to-him that-descended rain
 'It seemed to him that it was raining.'

Sentence (100a) is felicitous in a context where a person looks directly at the rain through a window. Sentence (100b) is infelicitous in such context. I suggest that the active-CP construction (100a) is tolerable to direct perception due to the *Perc* argument, which presupposes a perception situation in the actual world. However, the middle-CP (100b), not having a *Perc*, does not tolerate direct sensation.

4.5.3. Embedded predicates

The SC constructions show a nearly complementary distribution of embedded predicates in the SC – active-SC is restricted to non-ILPs, while what middle-SC allows is restricted to non-verbal predicates. The SC in the active construction is proposed to be situational SC, a set of situations, as opposed to the propositional SC in the middle construction, a set of worlds. In active-SC, the perception verb is assumed to take a set of situations as its complement. Thus, active-SC is restricted to a type of predicates that can occur situationally, typically SLP and eventive verbs. In middle-SC, the SC is propositional, and the perceiver is a belief holder, introduced by *Appl*. If the predicate is verbal, it requires the specification of tense and mood in order

to derive a proposition. Accordingly, verbal predicates are not found in SCs which are interpreted as propositions. As discussed by Kratzer (1995) and Mittwoch (2005), SLPs, such as ‘tired’, can be ambiguous between temporal and property predicates, depending on context. Accordingly, those predicates can function either as situational or propositional, and can be embedded in both situational SC and propositional SC. The CP constructions reveal no restriction regarding the embedded predicate in the CP.

5. Discussion

This work has analyzed the alternating perception verbs לראות *li-r'ot* 'to-see', לשמוע *li-šmo'a* 'to-hear', להרגיש *le-hargiš* 'to-feel' and להריח *le-hari'ax* 'to-smell' in Modern Hebrew, revealing unified syntactic alternations and an array of semantic contrasts. The current discussion counters the common objection of speakers, who object to the use of 'feel' as when stating an opinion or an assertion in conversation,⁵⁶ instead of 'think', for example. The account proposed here for alternating perception verbs provides support for the special need of speakers to use 'feel', which has been shown here to be a perception verb, and also includes a special epistemic flavor, i.e. sensory based.

The current proposal introduces a new thematic role - *Perc*, reserved for the notion of perception, and a special type of applicative head – the “abductive” *Appl*. This proposal might seem stipulative. It can, however, be supported. For one thing, there is a long-standing philosophical treatment of senses as having a special epistemic status, as the primary way to acquire knowledge about the world (Crane & Craig 2017, a.o.). In addition, the lexical encoding of evidential systems in languages cross-linguistically may indicate their special cognitive status (Aikhenvald 2004). However, the current proposal has only considered the alternating perception verbs of Modern Hebrew. It is hoped that it could be extended to sensation and perception verb systems in other languages.

The current proposal does not provide an account for the properties of LIN and imaginative reading. As was described, the LIN property lines up with the factivity

⁵⁶ See, for example, the discussion in: <https://www.nytimes.com/2016/05/01/opinion/sunday/stop-saying-i-feel-like.html>, and in <https://www.haaretz.co.il/magazine/theword/premium-1.2533521>

property. I suggest that these two properties may stem from the same component – the presupposition introduced by *Perc*. Among the class of attitude verbs, the LIN effect is known to be very strong with ‘believe’, and mostly not available with factive attitude verbs. It is proposed here that the middle construction incorporates an epistemic MB, and no *Perc*. I believe that the explanation proposed in the literature for LIN with ‘believe’, such as by Hegarty (2016, chapter 7), could be extended to the effect at hand. The imaginative meaning arises only with active-SC. According to the current account, all other three constructions incorporate *Appl*, which restricts the MB to a sensory-based-epistemic belief. I suggest that this “evidential” flavor is incompatible with an imaginative meaning. See Cohen (2015) for an account of the imaginative construction in Modern Hebrew. Thus, both LIN and the imaginative reading are properties left to be explored in future work.

Another open issue that arises from the current work is the case of ‘taste’ with respect to the alternating perception verbs in Hebrew. Matushansky (2002) shows that the verb *taste* is available in English in middle voice with a SC complement,⁵⁷ and considers it as one of the perception verbs *seem, look, sound, smell, feel*. In a typological study, Viberg (2008) shows that Swedish, English, German, French and Finnish differ with respect to lexicalization of a verbal form with a nominative experiencer. English is found as the most lexicalizing, having verbs for ‘see’, ‘hear’, ‘feel’, ‘smell’ and ‘taste’ with a nominative experiencer, while French, for example, has only a single verbal form for ‘feel’, ‘smell’ and ‘taste’ with a nominative experiencer (*sentir*, but a special form *tâter* for ‘touch’ with a nominative agent). A typological perspective on lexicalization may suggest the following sensory

⁵⁷ For example:

(i) The wine tastes sour (to me). (Matushansky 2002, p. 228, example (23b))

hierarchy:⁵⁸ sight → hearing → touch → smell → taste. The sensory hierarchy may be realized linguistically, as different languages cut the lexicalization in different points on the scale. From a typological view, the divergence of ‘taste’ from the alternating perception verbs in Hebrew seems unexceptional. Moreover, the typology may suggest additional support for the special linguistic status of a perceiver, distinguished from other types of experiences, such as physical or emotional.

The current work leaves many open questions. One major issue that was pointed out in the introduction is the place of voice alternation within the evidentiality typology presented by Aikhenvald (2004). The alternating perception verbs in Hebrew call for a broader (typological and other) investigation, to shed light on the relation between diathesis alternations and evidentiality phenomena. This kind of research may provide a possible extension, support, or challenge for the account proposed here.

⁵⁸This is an extended version of the hierarchy that appears in Viberg (2008, p. 126, table 4):

(ii) Sight → Hearing → touch
 taste
 smell

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"...seemingly different semantics of verbs of perception is a corollary of their transitivity [voice] patterns... It would be a worthwhile task to provide a cross-linguistic investigation of transitivity of verbs of perception..."

(Aikhenvald and Storch 2013, p. 20)

עבודה זאת מבקשת להשתתף בזעיר אנפין בפרויקט הטיפולוגי המקיף שהתוו אייכנוולד וסטורץ' בשאלת תרומתה של הדיאטזה בתחום פועלי תפיסה, דרך עיסוק בקבוצת פעלים קטנה בעברית החדשה: ארבעת פועלי החישה והתפיסה **לראות**, **לשמוע**, **להרגיש** ו**להריח**. כאשר המשלים של פעלים אלה הינו פסוקית, הם מגלים חילוף בין דיאטזה אקטיבית לתיכונה, המלווה בשינויים סמנטיים בתכונות הפעלים. הבחנה סמנטית בולטת שמתגלה בחילוף היא בין תכונה של פאקטיביות (Factivity) בדיאטזה אקטיבית, שבה מופיע החוֹנֶה, בעל החישה, כנושא נומינטיבי, להיעדר פאקטיביות בדיאטזה תיכונה, שבה נעדרת הופעתו של חווה נומינטיבי.

לפרמטר הדיאטזה בפועלי החישה והתפיסה מצטרף בעבודה זאת מימד נוסף – הקטגוריה התחבירית של הפסוקית המשועבדת על ידי פועל החישה-תפיסה. מימד זה מכניס הבחנה סמנטית חשובה נוספת, שהיא ההבדל בין חישה גרידא, או תפיסה ישירה, לבין חישה המלווה בתפיסה קוגניטיבית (יצירת האמנה), ובתפיסה עקיפה.

בעבודה מוזכרות גם שלוש תכונות נוספות, לצד הפאקטיביות ויצירת האמנה, הרגישות לשני המימדים לעיל, והן: התפרשות נמוכה של שלילה, סוג הפרדיקט המשועבד ומשמעות מדמיינת.

שני המימדים המוצגים בעבודה מניבים ארבעה סוגי מבנים, הנבדלים בתכונותיהם הסמנטיות, בהם משתתף כל אחד מארבעת פועלי החישה והתפיסה בעברית חדשה. תכונותיהם התחביריות והסמנטיות של כל אחד משני המימדים, הדיאטזה והקטגוריה התחבירית של הפסוקית המשועבדת, אינן תלויות זו בזו. אולם מסתבר מתוך העבודה הנוכחית כי עקרונות תחביריים כלליים של מבנה המשפט בשפה טבעית מעניקים חשיבות יתר למימד הדיאטזה. הדבר מתבטא בתכונת התפיסה (יצירת האמנה) והמשמעות

המדמיינת. בדיאתזה אקטיבית, קטגוריית פסוקית המשלים היא שקובעת את ההבחנה בין חישה ותפיסה ישירה לתפיסה עקיפה והאמנה ולזמינותה של משמעות מדמיינת. בדיאתזה תיכונה, שמסומנת בעברית החדשה באמצעות המורפולוגיה הפועלית, מתחייבת משמעות של חישה המלווה בתפיסה, ללא קשר לסוג המשלימים הפסוקיים, ולא מתקבלת משמעות מדמיינת. מכך עולה שהדיאתזה היא שמכריעה בעניין קביעת ההבחנה בין חישה נטולת תפיסה לבין חישה המלווה בתפיסה וזמינותה של משמעות מדמיינת. ייחודם של פועלי החישה והתפיסה בעברית החדשה היא בכך שהם מדגימים יחד כקבוצה התחלפות שיטתית הן בדיאתזה והן בין שני סוגי פסוקיות משועבדות. תכונותיהם הסמנטיות של הפעלים ומשלימיהם מאפשרות לבחון מקרוב את האינטראקציה והיחסים בין שני הפרמטרים.

האוניברסיטה העברית בירושלים

הפקולטה למדעי הרוח

החוג לבלשנות

התחלפויות צורניות בפועלי חישא ותפיסה של העברית החדשה

עבודת גמר למוסמך מאת בר אבינרי

בהנחיית פרופ' עידית דורון וד"ר עינת רובינשטיין

דצמבר 2017