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Individuating and Measure Readings of Classifier Constructions: Evidence from Modern Hebrew*

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Abstract
Classifier constructions in English such as *three glasses of water* are ambiguous between an individuating reading, in which the DP denotes plural objects consisting of three individual glasses of water, and a measure reading, in which the DP denotes quantities of water which equal the quantity contained in three glasses. A plausible semantic account of the contrast has been given in Landman 2004. In this account, on the individuating reading, the nominal *glasses* is the head of the noun phrase and has its expected semantic interpretation, while in the measure reading, *three glasses* is a modifier expression modifying the nominal head of the phrase *water*. However, there is little direct syntactic evidence for these constructions in English. Modern Hebrew, however, provides support for Landman's analysis of the dual function of classifier heads. There are two ways to express *three glasses of water* in Modern Hebrew. The first is via the free genitive construction where a nominal head in absolute form takes a prepositional phrase complement as in *šaloš kosot šel mayim*, and the second using the construct state as in *šaloš kosot mayim.* The first has only the individuating reading, while the second is ambiguous between the individuating and measure readings. We show that only in the construct state are the syntactic conditions fulfilled which allow the classifier + numeral to be interpreted as a (complex) modifier of the syntactically embedded noun.

Keywords
classifier constructions, measure phrases, construct state, semantics of counting

1. Introduction

Classifier constructions in English such as *three glasses of water* are ambiguous between an individuating reading, in which DP denotes plural objects

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consisting of three individual glasses of water, and a measure reading, in which the DP denotes quantities of water which equal the quantity contained in three glasses. A plausible semantic account of this contrast has been given in Landman 2004. He suggests that on the individuating reading, the nominal *glasses* is the head of the noun phrase and has the semantic interpretation usual to a nominal head, while in the measure reading, *three glasses* is a modifier expression modifying the nominal head of the phrase *water*. Although the semantic ambiguity between individuating and measure constructions is indisputable, there is little direct syntactic evidence in English to show that the ambiguity is syntactic and while Landman's analysis is semantically plausible, it is not so far syntactically supported. In this paper, I present evidence from Modern Hebrew which provides evidence that the semantic ambiguity has a syntactic reflection and that Landman's analysis of the dual function of classifier heads is correct. There are two ways to express *three glasses of water* in Modern Hebrew, represented in(1):

(1) a. šaloš kosot šel mayim
three cup(f.pl.) of water
b. šaloš kosot mayim
three cup(f.pl.) water

The first way, exemplified in (1a), uses the free genitive construction. The nominal *kosot* is in the absolute form and takes a prepositional phrase complement headed by the preposition *šel*. The second way, exemplified in (1b), is a construct state form, where the nominal head *kosot* takes a direct nominal complement. The first example, with the free genitive, has only the individuating reading, while the second is ambiguous between the individuating and measure readings. We show that careful analysis of the constructions indicates that only the construct state form provides the syntactic context in which the classifier head + numeral can be interpreted as a modificational expression, and we support this with evidence based on the contrasts between definite and indefinite construct state classifier constructions.

The paper is structured as follows. In the next section, I present a brief overview of the individuating/measure contrast in English, and the semantic analysis presented in Landman 2004. In section 3, I present the data about individuating and measure interpretations of classifier constructions in Modern Hebrew. In section 4 and 5, I present the syntactic and semantic analysis of the free genitive and construct state classifier constructions in Modern Hebrew. In section 6, I look briefly at lexical measure expressions, and in section 7, I draw some general conclusions about measure and individuating readings based on the data analysed in this paper.

2. The Individuating/Measure Ambiguity in English

2.1 The Data

English is an example of a typical mass/count language: numeral modifiers modify count nouns directly, and the nominal is marked as plural, as in *three flowers*, *four books*[1]. Classifiers like *box of N, cup of N* are used to count mass nouns, as in **three flours* vs. *three cups of flour* or *three kilos of flour.* Quantities of plural nouns can also be counted as in *three boxes of books,* where the classifier is used to 'repackage' pluralities into higher order entities which can then be counted. Lexical measure phrases such as *kilo* and *litre* can be used with numeral expressions with both mass and plural count nouns as in *four litres of water, three kilos of books.*

It has long been observed (Doetjes 1997, Chierchia 1998, Landman 2004 and others) that classifier phrases like *two glasses of water* are ambiguous between what we will call a 'individuating' reading illustrated in (2a) and a 'measure' reading, illustrated in (2b):

(2) a. Mary, bring two glasses of water for our guests!
b. Add two glasses of water to the soup!

If the instructions in (2a) are fulfilled, then we expect Mary to bring two concrete glasses, filled with water. In (2b) the instructions are to add an amount of water equivalent to the contents of two standard size glasses. If the right quantity of water (say 2 x 100ml) is added to the soup from a plastic jug, then the instructions in (2b) have been fulfilled adequately, but if Mary comes into the room carrying a jug containing 200ml of water, there is a sense in which she has not fulfilled the instructions in (2a). In English, as (2) shows, both readings are expressed by the same expression *two glasses of water.* The individuating reading involves two concrete glasses and two individuated quantities of water, one in each of the glasses, and the relational nominal *glasses* can be taken to have a denotation based on the normal denotation of the non-relational *glasses*, which denotes a set of glasses. In the measure reading, no actual glasses need be involved, nor need there be two individuated quantities involved. The nominal *glasses* is intuitively a unit of measure. If the glasses are contextually understood to be pint glasses, then (2b) is truth conditionally equivalent to "Add two pints of water to the soup!" and unlike (2a), fulfilling the instruction can involve only one quantity of water whose overall measure

[1] In some mass/count languages, such as Turkish, direct modification of a noun by a numerical does not induce pluralisation.

is equivalent to two pints or two glasses. Expressions like *kilo, litre,* exemplified in (3) which introduce only explicit measure functions, look identical syntactically to the expressions in (2), although they apparently only have the measure function and not the individuating function. In order to get the reading that Mary bought six individual quantities of flour each weighing one kilo, we need a sentence like (3b):

(3) a. Mary bought six kilos of flour/beans (in one sack).
b. Mary bought six kilo-packs of flour.

It has been noted by Doetjes 1997 that in Dutch, measure expressions such as *liter, kilo* can be distinguished explicitly from nominal classifiers since they do not necessarily agree in number with a numeral modifier:

(4) a. Jan heeft twee kilo('s) pruimen gekocht.
Jan has two kilo(-pl) plums bought.
"Jan has bought two kilos of plums."
b. Jan heeft twee zak*(ken) pruimen gekocht.
Jan has two sack(-pl) plums bought.
"Jan has bought two sacks of plums."

In (4a) plural agreement on *kilo* is optional, while in (4b) it is obligatory.

There is a semantic aspect to this property. When the measure expression is marked plural, then the preferred reading is that there are individuated units each of the size *kilo*, whereas a non-plural marked measure expression has no such implication. A grocer saying (5a) makes no commitments to the number of items delivered, and perhaps he delivered a single barrel of soft drinks whose volume was 20 litres. In (5b), the preferred reading is that twenty litre-bottles were delivered:

(5) a. Ik heb twintig liter frisdrank bezorgd voor het feestje.
I have 20 litre soft-drink delivered for the party.
"I have delivered 20 litres of soft-drinks for the party".
b. Ik heb twintig litres frisdrank bezorgd voor het feestje.
I have 20 litre-pl soft-drink delivered for the party.
Preferred reading: "I have delivered 20 litre-bottles of drink for the party."

Similarly *twintig halve liters bier* is a natural way of referring to 20 half-litre bottles of beer, while *twintig halve liter bier* is ungrammatical, since *halve liter* is not a natural measure unit, (although *liter*) is. So when inherent measure phrases are used as individuating classifiers, the shift shows up grammatically in the plural reading. However, this distinction does not extend to classifiers

such as *zak/zakken* (sack/sacks) and the overall quantity/individuated entity distinction for nominal classifiers is not grammatically encoded in Dutch any more than it is in English.

Despite the lack of grammatical encoding, the measure/individuating distinction in the use of classifiers is a very real semantic difference, and it shows up in some interesting ways which are listed below: We assume that *two glasses/cups of wine on this tray* denotes a set of individual glasses filled with wine, and thus represents the classifier reading, while *two glasses/cups of wine in the soup* denotes a quantity of wine and thus represents the measure reading.

(i) measure suffixes:

On the measure reading, the suffix *-ful(s)*can often be added to the classifier[2], but this is inappropriate for the individuating reading:

(6) a. Add two cup(ful)s of wine to the soup.
b. Bring two cup(#ful)s of wine for our guests.
c. We needed three bucket(ful)s of cement to build that wall.
d. Three bucket(#ful)s of mud were standing in a row against the wall.

(ii) pronominalisation

Plural individuating classifiers provide natural antecedents for individuating pronouns:

(7) There are two cups of wine on this tray.
a. They are blue.
b. They (each) contain 100 millilitres.
c. They (each) cost 2 Euros.

(8) There are two cups of wine in this soup.
a. #They are blue.
b. #They (each) contain 100 millilitres.
c. #They (each) cost 2 Euros.
d. It adds flavour/??They add flavour.

(iii) grammatical agreement.

Plural individual classifiers requires plural agreement, measure phrases may allow single agreement, especially in existential and copular constructions.

(9) a. There are two cups of wine on this tray.
b. *There is/There's two cups of wine on this tray.

[2] The Merriam-Webster on-line dictionary indicates that *cupsful* and *bucketsful* are alternative possible plural forms.

(10) a. There are two cups of wine in this soup.
b. There's two cups of wine in this soup.
(11) Two pieces of cake are/is enough for you to eat.

(iv) distributive operators operate on the individuals in the denotation of individuating classifier expressions and are unacceptable with measure phrases.

(12) a. Two packs of flour cost 2 euros each.
b. #Two kilos of flour cost 2 euros each.
c. The two cups of wine(#in this soup) cost 2 euros each.

(v) Relative clause formation (Carlson 1977, Heim1987, Grosu and Landman 1998).
Relative clauses denoting sets of individuals can be headed by *that* or *which*, while relative clauses denoting quantities are headed only by *that*. *Bottle* as a classifier is naturally ambiguous between an individuating and a measure reading and thus either complementiser is acceptable in (13a), although with *which* only the individuating reading is possible. *Litre* naturally has only a measure reading, therefore only *that* is acceptable in (13b). And since bottles of wine can only be drunk once, (13c) can have only the measure reading while (13d) is infelicitous (examples from Heim 1987):

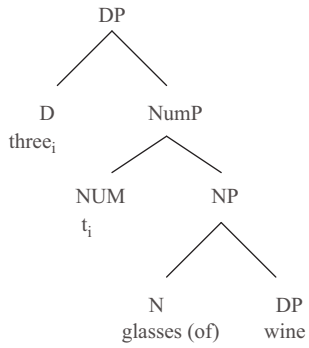
(13) a. I would like to be able to buy the bottles of wine that/which they bought for the party. (ambiguous)
b. I would like to be able to buy the litres of wine that/*which they bought for the party.
c. It would take us a year to drink the bottles of wine that they drank that evening.
d. #It would take us a year to drink the bottles of wine which they drank that evening.

We conclude that the individuating/measure contrast in the interpretation of classifiers is a genuine semantic ambiguity, although not one that is grammatically encoded in the classifier itself in English.

2.2 Landman's 2004 analysis

Individuating readings: On the individuating reading, *three glasses of wine* denotes three actual glasses containing wine. Following Landman, we assume that the syntactic structure for these expressions is as in (14) (*of* insertion is a late phenomenon, projecting no PP node, see Chomsky 1981):

(14)



We assume that *glasses* has a relational meaning derived from the non-relational noun *glasses*. On its non-relational reading, *glass* denotes the set of objects which are glasses and *glasses* the pluralisation of that set, namely the set of plural objects consisting of one or more glasses. Equivalently, we represent this reading of *glasses,* using the lambda calculus, as the function from objects to truth values which is the characteristic function of the set of plural glasses. This is represented in (15):

(15) λx.GLASSES(x)

On its relational reading, *cups* denotes the relation between entities which are cups and the substance they contain. Since the complement of the relational classifier is a bare plural or mass DP, we will assume for the sake of simplicity that it is a kind term. This allows us to give the relational interpretation of *glasses* as in (16a) and the interpretation of *glasses of wine* as in (16b), where *wine*, the kind noun denoting the kind WINE fills the second argument of the expression in (16a).

(16) a. λyλx. GLASSES(x) ∧ CONTAIN(x,y)
b. λx. GLASSES(x) ∧ CONTAIN(x,WINE)

Three is ambiguous between an expression denoting a numeral "3" and an adjectival reading in which it denotes a counting function which characterises those (plural) objects with three parts. (We will give a more precise account of the semantics of numerals in section 5.) In (14), it has an attributive adjectival reading (since it is generated as a modifier of *glasses of wine*) and is interpreted as in (17), i.e. as the function which modifies a predicate and gives those plural entities in the denotation of the predicate which are the sum of three atomic entities.

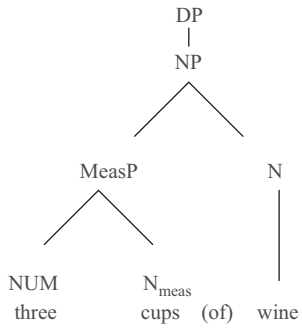
(17) *three*: λQλx. Q(x) ∧ |x| =3

This applies to the expression in (16b) to give the expression in (18), which characterises the set of plural entities which consist of three glasses containing wine.

(18) λx. GLASSES(x) ∧ CONTAIN(x,WINE) ∧ |x| =3

The measure reading is derived from the following tree:

(19)



(Again, o*f* -insertion is presumed to be a late phenomenon satisfying surface constraints and projecting no PP node.)

In Landman's account, in the structure in (19) *glasses* is a modifier which combines with the numeral denoted by *three* to form the complex predicate *three glasses.* This is interpreted semantically as a modifier as in (20a) and it combines with the nominal head, given in (20b) to give the meaning in (20c):

(20) a. *three glasses*: λPλx. P(x) ∧ MEAS(x) = <3, GLASS-FUL>
b. *wine:* λx. WINE(x)
c. *three glasses of wine* λx.WINE(x) ∧ MEAS(x) = <3, GLASS-FUL >

(20c) denotes a set of quantities of wine which measure three glassfuls.

Landman's analysis is semantically plausible, but he gives no syntactic support for it. Two sets of examples which do seem to support it are given in (21) and (22), but as judgments are not sharp, the support is not strong. Underlying the data in (21) is the prediction that if, in measure readings, *three glasses* is a modifier, then it should be possible for it to take scope under another modifier. For some people, none of the examples in (21) is acceptable, but for a significant group of speakers, the examples in (21b/c) are much more felicitous than (21a). The explanation for this is that in (21b/c) *three glasses* and *three teaspoonsful* are measure phrases and thus modifiers, and can come under the scope of the modifier *expensive.* But in (21a), the context favours an individuating reading of *three glasses of wine* in which *glasses* is the head and *three* is a determiner, and on this reading, *expensive* cannot have scope over the rest of the nominal:

(21) a. #The waiter brought/broke an expensive three glasses of wine!
b. You drank/spilled an expensive three glasses of wine!
c. She added an expensive three teaspoons(ful) of cognac to the sauce.

Conversely, if the classifier is a nominal head, then it should be independently modifiable, while the measure phrase should not be independently modifiable. So an individuating context should favour direct modification of the classifier, and the measure reading should disallow it. This seems to be the case as the examples in (22) show:

(22) a. #She added three expensive glasses of cognac to the sauce
b. The waiter brought three expensive glasses of cognac.

However, this is not, by itself, strong evidence for giving individuating and measure readings the analyses proposed in (14) and (19). For stronger evidence that the two readings have different syntactic structures, we turn to Modern Hebrew.

3. Individuating and Measure uses of Classifier Constructions in Modern Hebrew

3.1 The Syntactic Expression of Classifier Constructions in Modern Hebrew

Classifier constructions appear in one of two syntactic forms in Modern Hebrew, the free genitive (FG)[3] and the construct state (CS), illustrated in (23), repeated from (1):

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[3] Free forms, often called absolute forms, are the base forms may which appear without any complements, and which occur in the standard range of nominal constructions. Free genitives are thus the subset of free forms which occur with the preposition *šel*, standardly analysed as an assigner of genitive case. Although the examples we have given here all have non-derived heads, the free genitive and construct state minimal pairs appear in derived nominals as well, with both result and argument taking heads. The following examples are from Engelhardt 2000.

(i) a. ha- taxazit šel ha- paršan (FG)
DEF forecast(f) of DEF commentator (m)
b. taxazit ha- paršan (CS)
forecast(f) DEF commentator (m)
both: the commentator's forecast

(ii) a. ha- horada šel ha- ribit (FG)
DEF reduction(f) of DEF interest(f)
b'. horadat ha- ribit (CS)
reduction(f) DEF interest(f)
both: The reduction in interest.

(23) a. (šaloš) kosot šel mayim (FG)
(three) cup(f.pl.) of water
b. (šaloš) kosot mayim (CS)
(three) cup(f.pl.) water
Both: "three cups of water"

These forms are not restricted to classifier constructions, and in fact the most usually cited examples are the possessive constructions illustrated in (24a) and (24b) respectively. The corresponding plural forms are given in (25). Both free genitive and construct state nominals can be definite and indefinite, and indefinite forms are given in (26) and (27) (examples after Borer 2008):

(24) a. ha- bayit šel ha- mora (FG)
DEF house(m.sg.) of DEF teacher(f.sg.)
b. beyt ha- mora (CS)
house(m.sg.) DEF teacher(f.sg.)
both: "The teacher's house"
(25) a. ha- batim šel ha- mora (FG)
DEF house(m.pl.) of DEF teacher(f.sg.)
b. batey ha- mora (CS)
house(m.pl.) DEF teacher(f.sg.)
both: "The teacher's houses"
(26) a. bayit šel mora (FG)
house (m.sg.) of teacher(f.sg.)
b. beyt mora (axat) (CS)
book(m.sg.) teacher(f.sg.) (one)
both: "a teacher's house"
(27) a. batim šel mora (FG)
houses (m.pl.) of teacher(f.sg.)
b. batey mora (CS)
house(m.pl.) teacher(f.sg.)
both: "A teacher's houses"

These forms have been discussed in detail by Ritter 1988, 1991, Borer 1991, 2008, Danon 2006, 2008, Siloni 2001 and others. The construct state is characterised by in the following ways: (i) an altered (usually reduced) phonological form of the head nominal shows up with some, but not all, nominals. Thus the free forms *bayit* and *batim* become *beyt* and *batey* in the CS examples; (ii) definiteness is marked only on the complement and not on the head, as indicated in (23b/24b), but it percolates up to the whole nominal. It is completely

ungrammatical to mark the head nominal with a definite, whether or not the complement is marked as definite, as indicated in (28):[4]

(28) a. * ha- beyt ha- mora
DEF house(m.sg.) DEF teacher(f.sg.)
b. * ha- beyt mora
DEF house(m.sg.) teacher(f.sg.)

(iii) the head and complement are directly adjacent in a surface N-N string. While in the absolute form, an adjective usually immediately follows the head as in (29a), modifiers of the head in the construct state show up after the complement in both definite and indefinite construct states as in (29b) and (29c) respectively. Interposing the adjective in its 'normal' post-head position in construct states is impossible in both definite and indefinite constructions (see 29d/e):

(29) a. ha- bayit ha- gadol šel ha- mora (FG)
DEF house(m.sg.) DEF big (m.sg.) of DEF teacher(f.sg.)
b. beyt ha- mora ha- gadol (CS)
house(m.sg.) DEF teacher(f.sg.) DEF big(m.sg.)
both: "The teacher's big house"
c. beyt mora xadaš (CS)
house(m.sg.) teacher(f.sg.) new(m.sg.)
"a new [teacher's house]" (Borer 2008 ex.6)
d. *beyt xadaš ha- mora (CS)
house(m.sg.) new (m.sg.) DEF teacher(f.sg.)
e. *beyt xadaš mora (CS)
house(m.sg.) new(m.sg.) teacher(f.sg.)

Numeral modification in Modern Hebrew follows the general pattern in a language which distinguishes between mass and count nouns. Numerals precede the modified noun, and agree with the head noun with respect to gender, as illustrated in (30). Nouns modified by numerals greater than one are usually marked as plural[5]: Mass nouns may not be directly modified by numeral

[4] The exception to this is that lexical compounds (fixed forms with a non-compositional interpretation), **may** but need not have the definiteness features on the first N (Borer 2008). Thus, *beyt xolim* "hospital", but literally $[\text{house}]_N$ $[\text{sickpeople-(pl)}]_N$, is usually marked definite as in (i), but in colloquial speech may be marked as in (ii):

(i) beyt **ha**-xolim,
(ii) **ha**-beyt-xolim

[5] There are fairly regular exceptions to this. Low numeral modifiers modify nouns which are marked for plural. Some (but not all) nouns need not be marked for plural when modified by

expressions, and numeral modification is via a classifier, as in (31a). Plural count nouns can also be indirectly counted using classifier expressions as in (32):

(30) a. šloša sfarim / šloša praxim
three(m) books (m.pl.) / three (m) flowers (m.pl.)
b. šalož smalot / šalož kosot
three(f) dresses (f.pl.) / three(f) cups(f.pl.)

(31) a. *šloša kemax / *šloša sukar
three(m) flour(m)/ three(m) sugar (m)
b. šalož kosot šel kemax / sukar (FG)
three(m) cups (f.pl.) of flour (m) / sugar(m)
c. šalož kosot kemax / sukar (CS)
three(f) cups (f-pl.) flour (m) / sugar (m)
both: "three cups of flour/sugar"

(32) a. šalož(f) kufsaot šel sfarim (FG)
three boxes (fl.pl.) of books(m.pl.)
b. šalož(f) kufsaot sfarim (CS)
three boxes(fl.pl.) books(m.pl.)
both: "three boxes of books".

Note that numeral modifiers precede the head in construct state constructions. Presumably this is because the ban on directly modifying the head with an adjective in construct state constructions illustrated in (29) follows from the fact that nominal head and complement must be adjacent in the construct state. Since the numeral modifier doesn't intervene between the head and complement, it can remain in its standard pre-head position. Note that this is the case for all indefinite construct state nominals, and not only for classifier constructions, as shown by the examples in (33) from Borer 2008:

(33) a. hu bana li šloša batey ec
he built me three house (m.pl.) wood
"He built me three wooden houses" (adapted from Borer 2008: 14a)
b. amdu šam šney batey morot mi- xul
stood there two houses teacher(f.pl.) from abroad
"Two houses for teachers from abroad were standing there."

In definite numeral expressions, counting is more complicated. In the construct state, the numeral modifier + nominal occur in a construct state construction

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high numerals (where 'high' is at least partly context-dependent). Both *mea iš* (100 man) and *mea anašim* (100 men) are acceptable, although **šloša iš* (3 man) is impossible.

with the numeral as the head of the construct state.[6,7] Numerals up to and including 10 may have alternative phonological form, paralleling the reduced phonological form of the noun in this position, as in (34a). In the classifier constructions, there is a nested construct state construction, with the numeral

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[6] The number "two" has the peculiarity that even in indefinite constructions, it appears in its phonologically reduced form *šney*(m)/*štey*(f) as in *šney yeladim* "two boys" and *štey yeladot* "two girls". The full form *šnayim*(m)/*štayim*(f) is used only in enumerative counting contexts and with complex numerals such as *arba'im ve-štayim* lit: forty-and-two "forty-two", and when the numeral is the clausal predicate e.g. *ha-orxim hayu šnayim* "the guests were two". A reviewer points out that this property is shared by 'high' numbers, like *milionim* "millions", *alafim* "thousands", which appear in the phonologically reduced form in with nominals in the absolute state, e.g. *šiša milyoney yehudim* "six million Jews". Lower round numbers do not have this property *šlošim yeladim* "30 children". There is no evidence that indefinite noun phrases modified by *two* or *millions/thousands* should be analysed as a construct state. I assume, therefore, that the *šney/štey* are alternative phonological forms used when the numeral is directly adjacent to the noun modified. Thus the indefinite *štey kosot (šel) kemax,* "two cups (of) flour" will be analysed with the modifier *štey* directly modifying the noun *kosot*, exactly the same way as the examples in (23). Note that with co-ordinated indefinite numerals such as "two or three", as in *štayim o šaloš kosot (šel) kemax* "two or three cups of flour", the full form of "two" is used in a directly modifying context, indicating that there is no general ban on using *šnayim* in a directly modifying context. *exad* ,"one", also has properties which distinguish it from higher numerals. *exad* clearly directly modifies the noun, since it follows the nominal in the position of a standard adjective, e.g. *iš exad* lit: man one "one man/a man". The definite of this expression does not use the construct state, but ordinary post-nominal adjectival modification. However the adjective *yaxid* "only" is substituted for *exad.* i.e. *ha-iš ha-yaxid* lit: DEF-man DEF-only "the one man/the only man".

[7] There are a very few exceptional indefinite numeral construct state expressions, all Biblical in source. With one exception, the head nominal is always *yom* 'day'. Thus:

(i) še:šet̲ ya:mi:m taʔᵃbo:d (Exodus 20:9)
6 day-PL 2-.m-work
"6 days shall you work"

(ii) šibat̲ ya:mi:m maço:t̲ to:ʔ ke:lu: (Exodus 12:15)
7 day-PL unleavened breads you shall eat
"You shall eat unleaved bread for seven days"

(iii) ben šmo:nat̲ ya:mi:m (Genesis 21:4)
son eight days
"eight days old".

Indefinite numerals headed by "year" do not normally occur in the construct state:

(iv) wayyihəyu: ɦayye: sa:ra: me:ʔa: ša:na: wəʕeśri:m ša:na: wəšebaʕ ša:ni:m (Genesis 23:1)
and-were lives Sara 100 year and-20 year and -7 years
"And Sara lived to be 127 years old"

However, there is an instance of an apparent indefinite construct state which is used repeatedly in the list of genealogies in Genesis. An example is Genesis 5: 3

(v) wayəɦi: ʔa:da:m šəlo:ši:m ša:na: u:məʔat̲ ša:na: …..
and-lived adam 30 year and-hundred year
"And Adam lived 130 years…."

heading a construct state and taking a construct state nominal as complement. This is illustrated in (34b)[8]:

(34) a. šlošet/*šloša ha- sfarim;
3 (m) DEF book-PL.;
"The three books"
b. šlošet bakbukey ha- mayim
3 (m) bottles(m.pl.) DEF-water
"The three bottles of water"

Note that in (34b), as with all construct state forms, definiteness is marked only on the most embedded noun. In (35) a definite numeral construct state has a free genitive complement.

(35) šlošet ha- bakbukim šel *(ha) mayim
three(m) DEF-bottles (m.pl.) of DEF water
"The three bottles of water"

Here, the numeral modifier has its non-reduced phonological form, and modifies the classifier head directly. As indicated, there is a strong preference for the complement of a definite free genitive also to be marked definite.[9] Because of the issues introduced by definiteness, we will restrict our comparison of construct state and free genitive classifier constructions in the next section to indefinites. We return to some of the issues connected with definiteness in sections 5 and 6.

3.2 The Individuating/Measure Contrast in Modern Hebrew

Despite the surface similarity in interpretation in the examples in (23), and the other free genitive and construct state classifier constructions, the minimal

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[8] The prescribed form for the definite with feminine agreement is *šloš,* the reduced form of *šaloš* as in *šloš kosot mayim,* but this is almost never heard in colloquial speech. In fact, even when the embedded head noun is feminine, the masculine form of the construct form for "3" is frequently heard, despite the lack of agreement as in *šlošet kosot mayim.*

[9] But judgements about these cases are in any case confused because of the confusion between *šel* classifier constructions and true partitives. All my informants found examples of the form in (35) acceptable only if it was clear that the context was not partitive since partitive readings are expressed with the preposition *me* instead of *šel,* as in (i).

(i) *hu šata šalos kosot me- ha - mic /*šel ha- mic*
he drank 3 cups from DEF juice /of DEF juice
"he drank three glasses of the water"

If a clearly non-partitive context could be constructed, then the free genitive was acceptable, but a definiteness marker on the head noun requires the complement to be marked as definite too.

pairs are not semantically identical in interpretive possibilities. While the construct state is ambiguous between the measure and the individuating reading, the free genitive has naturally only the individuating reading. So, if I ask a waiter to bring me and two friends each a glass of water, then I can use either the free genitive or the construct state form, as illustrated in (36a, b). But, if the same expression is used to denote a quantity of water, then the construct state must be used. The context in (36c) makes this clear: if Dani is mixing paint and needs to add two cups of water, then (36b) is the only way to express it felicitously.

(36) a. tavi lanu **šaloš kosot šel mayim,** bevakaša! (FG)
Bring us three glasses of water, please!
b. tavi lanu **šaloš kosot mayim**, bevakaša! (CS)
Bring us three glasses water, please!
c. dani mexin ceva ve- hu carix le- hosif mayim.
dani prepare paint and he need to-add water.
"Dani is mixing paint and he needs to add water."
ten lo **štey kosot** (#šel) **mayim** be- kad plasti bevakaša (CS)
give him 2 cups (#of) water in – jug plastic please.
"Give him two cups of water in a plastic jug please."

Similarly, if I ask there is more soup in the pot, then (37a) using the construct state is an acceptable answer, but (37b) which uses the free genitive isn't.(37a) asserts that a certain quantity of soup is still in the pot, but (37b) implies that the concrete bowls filled with soup are in the pot. The free genitive can be felicitously used in a context in which the concrete bowls are physically present, for example in (37c):

(37) yeš od marak b- a- sir?
there-is more soup in- DEF pot?
"Is there more soup in the pot?"
a: Ken, yeš od **šaloš ka'arot marak** b- a- sir. (CS)
yes, there-are more three bowls soup in-DEF-pot
"Yes there are three more bowls of soup in the pot"
b. #Ken, yeš od **šaloš ka'arot šel marak** b- a- sir. (FG)
yes, there more three bowls of soup in-DEF-pot
"Yes there are three more bowls of soup in the pot"
c. Ken, yeš od **šaloš ka'arot šel marak** al ha- magaš. (FG)
yes, there more three bowls of soup on DEF tray
"Yes there are three more bowls of soup on the tray"

More examples of the same kind make the same point. Recipe context will naturally use the construct state, since they make reference to quantities, as in (38):

(38) mosifim **štey kosot (#šel)** **kemax** **ve-** **šaloš** **kapiot (#šel)** **sukar**
add 2-f cup(f.pl.) (#of) flour and 3(f) teaspoon(f.pl) (#of) sugar
l- a- batzek u- mearbevim.
to-DEF-dough and mix.
"Add two cups of flour and three teaspoons of sugar to the dough and mix".

The generalisation then is that the construct state is ambiguous between individuating and measure reading, while the free genitive has only the individuating reading. Thus if the measure reading is the only reading appropriate, the construct state is obligatory. If both readings are possible, but the speaker intends the individuating reading, then it is possible to disambiguate the sentence by using the free genitive. This follows from Grice's Maxim of Quantity (be maximally informative relative to the requirements of the conversation) and Maxim of Manner (avoid ambiguity). Example (39) is an example of how this works:

(39) **arba'im ve- štaim kufsaot (šel) sfarim** lo nixnasot l-a-madafim šelanu
forty and two boxes (of) books no enter(f.pl) to DEF shelves of-us
"Forty-two boxes of books don't fit on our shelves".

(39) can be felicitously uttered using both the free genitive and the construct state forms, but different contexts favour different syntactic forms. If I have just moved house and am contemplating quantity of books that we have to put on our shelves, the construct state form is preferable, since it is the only way of expressing the measure interpretation. The free genitive form would naturally favour the interpretation where the boxes themselves are too many to fit on the shelves, for example, if the boxes were archive boxes, and the books were to be stored in these boxes on the shelves.

That there is a semantic difference between the free genitive and the construct state form is not a new observation. However, changes in the language over the last fifty years mean that generalisations about the semantic contrasts which conform with current usage are not the same as those made by e.g. Rosén 1957. Rosén 1957 suggests that the free genitive construction *bakbuk šel šampanya* "bottle of/for champage" is naturally interpreted as denoting an empty container for champage, while the container full of champage is denoted by the construct state nominal *bakbuk šampanya.* In contemporary Modern Hebrew, the empty container would be designated by the construct state nominal *bakbuk šampanya* or a different prepositional construction *bakbuk le-šampanya* "bottle for champagne". Interestingly enough though, Rosén points out that *bakbuk exad šel yayin* "one bottle of wine" denotes a full bottle of wine, and does not have the empty container reading.

In addition to classifier constructions using a nominal head, numeral modification of mass and plural count nominals can use explicit measure terms such as *kilo*, *gram* and *litre*. Here, predictably, the construct state is preferred. The more natural way to say *4 kilos of flour* is (40a). (40b) is not totally infelicitous but suggests that each kilo is in some sense salient, so that (40c), where this implication is explicitly rejected, is definitely infelicitous. Note that in colloquial Modern Hebrew, explicit units of measurement such as *kilo* do not usually pluralise as nominal heads, even if the individual kilos are salient and the measure expressions seem to have shifted to an individuating use.

(40) a. kani-ti **arba'a kilo kemax** (be-štey sakiot šel šney kilo)
Bought-I 4(m) kilo flour (in- 2(f) bag(f.pl) of 2(m) kilo).
"I bought 4 kilos of flour in 2 bags of 2 kilos."

b. kani-ti **arba'a kilo šel kemax**
Bought-I 4(m) kilo of flour
"I bought four kilos of flour". (implication: in kilo packages).

c. #kani-ti **arba'a kilo šel kemax** be- štey sakiot šel šney kilo.
Bought-I 4(m) kilo of flour in- 2(f) bag(f.pl) of 2(m) kilo.

доспрос:
wet λant kilo

Note however that Modern Hebrew shows yet another change over the last 50 years. Rosén 1957 points out that the measure use of *four bottles of wine* would naturally be expressed using a construction which is rarely heard in colloquial Modern Hebrew, where the nominal *bakbukim* is pluralised in the absolute form and takes a nominal complement without a preposition:

(41) arba'a bakbukim yayin
4 bottle(m.pl.) wine
"Four bottles of wine"

A reviewer pointed out similar examples which are more likely to be heard among older speakers of the language, as in (42a-d). (42e) is Biblical (Numbers 28:9):

(42) a. hu kana xamiša argazim tut
he bought five box(m.pl.) strawberry
"He bought five boxes of strawberries"

b. lakaxti šloša yamim xofeš.
took-I 3 day(m.pl.) vacation.
"I took three days vacation"

c. carix lehosif l- a- marak šloša kimcucim melax.
need to add to-DEF-soup 3 pinch(m.pl.) salt
"You need to add to the soup 3 pinches of salt"

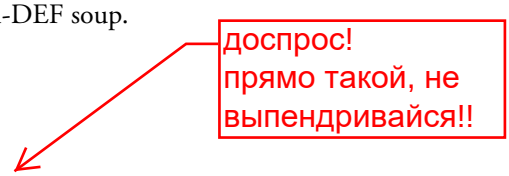
d. kaniti arba'a kilogramim kemax.
bought-I four kilogram(m.pl) flour
"I bought four kilograms of flour"

e. šəne: ʕesro:ni:m so:let
two tenths fine flour

We will come back to these constructions in our discussion of measure heads in section 6.

Most of the tests which distinguish between the measure readings and the individuating readings in English do not apply to Modern Hebrew. In contemporary Hebrew, there is no measure suffix parallel to *–ful(s).*[10] Agreement is strictly with the nominal head, so that even in the measure reading with the construct state form of (39), verbal agreement must be with the feminine classifier head *kufsaot* "boxes" and not with the masculine nominal *sfarim* 'books'. Restrictions on the interpretation of definites with classifier expressions mean that the minimal pairs constructed in (13) with degree relatives cannot be constructed in Modern Hebrew. However, we can construct contrasts parallel to the examples in (7) and (8):

(43) yeš **stey kosot mic agvaniot** b- a- marak
there are 2 cups tomato juice in-DEF soup.
a. #hen adumot.
They (are) red.
b. #hen kolelot 100 mililiter
They contain 100 millilitres.
c. #hen olot 2 euro kol axat.
They cost 2 euros each.
d. ?hen mosifot ta'am/ ze mosif ta'am.
?They add flavour/it adds flavour.



With this evidence of the semantic difference between free genitive and construct state constructions we turn to the interpretation and show how the difference in meaning follows from the different structural properties of the two constructions.

4. Analysis of Classifiers in Free Genitive Construction

We begin by analysing the Free Genitive constructions, which as we have seen, have only the individuating reading in contemporary Modern Hebrew. Thus an example like *šaloš ka'arot* **šel** *marak* "three bowls of soup" in (37c), repeated here, asserts that three individual bowls filled with soup are on the tray:

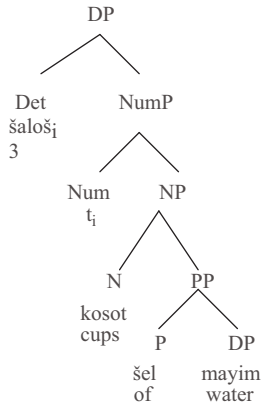
[10] There is an expression *məlʔo:* "full" in Biblical Hebrew, which expresses the measure reading e.g.: *məlʔo: qumço:* (Leviticus 5:12) lit:'full his-hand' "a handful". As a reviewer pointed out, this

(37c) Ken, yeš od **šaloš ka'arot šel marak** al ha- magaš.
Yes, there more three bowls of soup on DEF tray
"Yes there are three more bowls of soup on the tray"

The main interpretive questions with respect to free genitives then is where the individuating reading comes from, and why the measure reading is not available.

I assume the structure for free genitive construct state constructions to be as follows:

(44)



The complement nominal is analysed as a full DP. Although I cannot find examples of complement nominals with strong quantifiers such as *kol*, the nominal can be modified by numeral modifiers (45a), by explicit measure phrases (45b), and by non-essential modifiers (45c/d), The complement can also be definite in those contexts which make it clear that the reading is not partitive (45e). In each case, the corresponding construct state form is unacceptable.

(45) a. kaniti šaloš xavilot *(šel) esrim gulot ve- štey xavilot *(šel) eser gulot
bought-I three packs of twenty marbles and two packs of ten marbles
"I bought three packs of twenty marbles and two packs of ten marbles"
b. kaniti štey xavilot *(šel) ma'tayim gram šokolad ve- štey xavilot *(šel)
bought-I two packs of 200 gram chocolate and 2 packs of

---

still occurs in high register Modern Hebrew, mainly in literary expressions such as *melo ha-sal bikurim* "basketful of first-fruits".

mea gram
100 gram
"I bought two packets of 200 grams of chocolate and two packets of 100 grams"

c. ani roca šloš kosot *(šel) mic meurav/tari
I want 3 cups of juice mixed/fresh
"I want three cups of mixed/fresh juice"

d. šalaxti štey xavilot *(šel) (ha-) sfarim še- ani ohevet
send-I two packets of (DEF) books that I like.
"I sent two packets of books that I like."

e. hizmanti šloša bakbukim šel ha- yayin ha- adom še- ata ohev.
bought-I three bottles of DEF-wine DEF-red that you like
"I bought three bottles of the red wine that you like."

e'. *hizmanti šloša bakbukey ha- yayin ha- adom (še- ata ohev).
bought-I three bottles DEF-wine DEF-red (that you like)
"I bought three bottles of the red wine that you like."

I shall assume that the complements of *šel* are DPs on the basis of the evidence in (45), and leave to a closer examination of the semantics of classifiers the question of why they do not contain strong quantifiers.

The preposition *šel* is analysed (non-controversially) as assigning genitive Case. I shall make the added assumption that it is associated with the thematic role which we label "CONTAIN". I general, I propose that *šel* is always associated with a specific thematic relation, though this may come from different sources, and there may be more than one possible source for the relation. In derived nominals such as (46a) and (46b), where the *šel* argument is the patient/theme and the agent respectively, the thematic relation is derived from the role-assigning properties of the associated verbal head (examples from Engelhardt 2000). In (46c), the natural role of the *šel* is 'possessor' which is structurally associated with specifier of DP position, and in (46d) it is ambiguous between possessor, agent, and patient:

(46) a. ha- hadpasa šel ha- teza
DEF printing of DEF-thesis
"the printing of the thesis"

b. ha- cvia šel ha - poalim et ha- bad
DEF- dyeing of DEF- workers ACC DEF-fabric
"the workers' dyeing of the fabric"

c. ha- mexonit šel rut
DEF- car of ruth
"Ruth's car"

d. ha- ciyurim šel ha- yeladim
DEF drawings of DEF children
"the drawings of the children/the drawings by the children/ the children's drawings"

Crucially, then, *šel* is unlike the English preposition *of* which has long been analysed as a"dummy" preposition inserted at the post-syntactic level to assign genitive case to a nominal or adjectival complement, but which has no semantic interpretation (see e.g. Chomsky 1981). In support of this proposal that *šel* in the free genitive classifier constructions is not a case-marker but projects syntactic structure and is semantically interpreted, we note that *šel* is not acceptable in examples where the thematic relation expressed is outside a well-defined semantic range, or where a non-thematically specified case marker is required. An example of the first is given in (47a,b) where the thematic relation is "material composition" and the thematically appropriate preposition *mi* "from" is required. Note that the construct state version, where the relation between head and complement is underspecified and contextually determined, is fine.

(47) a. *sveder šel moher (OK: sveder mi-moher/sveder moher(CS))
sweater of mohair (sweater from mohair /sweater mohair)
"a mohair sweater"
b. *bayit šel ec (OK: bayit me- ec/ beyt ec (CS))
house of wood (house from wood/house wood)
"a wooden house"

An example of a non-thematically specified case marker is given by the partitive construction, where again *me/mi* and not *šel* is used:

(48) a. *šloša yeladim šel ha- kita (OK: šloša yeladim me- ha- kita)
Three children of DEF-class (Three children from DEF-class)
"three children from the class"
b. *šloša šel ha- yeladim (OK: šloša me- ha- yeladim)
Three of DEF-children (Three of DEF children)
"three of the children"

I suggest that in examples like (46), *šel* is associated with the thematic role of "container" assigned by the classifier nominal to its complement. This allows us to analyse the classifier nominal as a relational nominal derived from the basic predicate of individuals.

We will work out the details of the semantic analysis in the framework of a typed language, where the two basic types are the type e of individuals, and

the type t of truth values. Expressions of type <α, β> denote functions from expressions of type α into expressions of type β. In such a language, the basic form of *kos* "cup",[11] is as a predicate of individuals, or expression of type <e,t>, as in (49a). The thematic relation CONTAIN, is given in (49b). The classifier *kos* is a thus a relational nominal derived from the bare head by adding the thematic role via conjunction to the base form of the nominal as in (49c) to give an expression of type <e, <e,t>>.

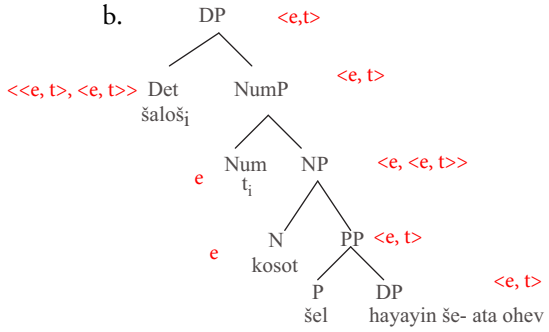
(49) a. λx.CUP(x)
b. λyλx.CONTAIN(x,y)
c. λyλx.CUP(x) ∧ CONTAIN (x,y)

Note that the shift from the non-relational to the relational forms of nominals is common cross-linguistically e.g. *mother/mother of John, king/king of England* and etc.

The expression in (49c) is used in the interpretation of the free genitive in (50a), which has the structure in (50b), based on (44):

(50) a. šaloš kosot šel ha- yayin še- ata ohev
three cup-pl.f šel DEF wine that you like
"three glasses of the wine that you like"

b.



The interpretation is given step-by-step in (51):

Note that we treat *šaloš* as we treated *three* in (17), that is as an adjectival modifier, which is intepreted in place, i.e. under Num. The adjectival modifier is λQλx.Q(x) ∧ |x| =3 and it applies to a predicate and gives the set of plural

[11] For simplicity, I use CUP to represent the meaning of the predicate *kos* even though *kos* does not correspond exactly to the English *cup*. For example, *a glass of juice/water/wine* as well as *a cup of tea/coffee* would all be expressed using the Hebrew *kos*.

entities in the denotation of the predicate P which have three atomic parts. We will say more about the semantics of numerals in the next section.

(51) *kos*: λx.CUP(x)
kosot-šel : λyλx.CUP(x) ∧ CONTAIN(x,y)
kosot-šel (*ha-yayin še ata ohev*):
λyλx.CUPS(x) ∧ CONTAIN(x,y) (THE WINE THAT YOU LIKE)
= λx.CUPS(x) ∧ CONTAIN(x, THE WINE THAT YOU LIKE)
šaloš (*kosot-šel ha-yayin še ata ohev*):
λQλx.Q(x) ∧ |x| = 3 (λx.CUP(x) ∧ CONTAIN(x, THE WINE THAT YOU LIKE))
= λx.CUP(x) ∧ CONTAIN(x, THE WINE THAT YOU LIKE) ∧ |x| = 3

Raising to type <<e,t> t> (the semantic correlate of syntactic movement from Num to Det), will give the appropriate generalised quantifier.

So the expression in (50a) in argument position, makes references to plural entities which are three glasses containing wine.

Why is the measure reading not available in the free genitive classifier construction? If we look at the analysis of the measure reading in (20) in section 2, we see that the crucial step is that the nominal head is combined with the numeral *three* and forms a complex predicate *three glasses* which is treated on a par with an adjective and modifies the head *wine*. This is impossible in (50) because the preposition *šel* denotes the CONTAIN relation between the entity denoted by the lexical head *kos* and the complement. In other words, the presence of *šel* as a semantically interpreted preposition forces the nominal to be interpreted as relational head, and blocks the reinterpretation of the head as a modifier.

5. Analysis of Classifiers in Construct State constructions

5.1 Modificational vs Referential Construct State Constructions (Borer 2008)

As we saw in section 3, classifier constructions using the construct state have both a measure and an individuating interpretation. In this section, we review results about the syntax of the construct state, and show how the differences in interpretation follow from the syntactic properties. I do not pretend to give a complete syntactic analysis of the construct state, but rather to show how the

semantic properties of the classifier constructions follow from what we know to be the syntactic properties of the construction.

We start with Borer's observation (Borer 2008) that syntactic construct state forms can be divided into two kinds: modifying constructions and referential constructions. These are illustrated in (52) and (53) (Borer 2008, (23)-(24))[12]:

(52) *Modificational constructs*:

beyt (ha)-ec; kos(ha)-mic; signon (ha)-ktiva;
house (DEF)-wood; cup (DEF)-juice; style(DEF)-writing;
"(the) wooden house"; "(the)glass of juice"; "(the) style of writing";

magevet (ha)- mitbax
towel (DEF)-kitchen
"(the) kitchen towel.

(53) *Referential constructs:*

beyt (ha)- mora; gag (ha)- bayit; na'aley (ha)- yalda;
house (DEF) teacher; roof (DEF) house; shoes (DEF) girl;
"the teacher's house"; "the roof of the house";"the girl's shoes";

mexonit (ha)- nasi;
car (DEF) president;
"the president's car";

Intuitively, the referential constructs (or R-constructs) are those in which the non-head or complement noun phrase denotes an individual which stand in the role of possessor to the head noun. (These are the Individual Genitives of Munn 1995). Borer suggests that in the modificational constructs (or M-constructs), the non-head or complement nominal is interpreted as some kind of "modifying property". Borer shows convincingly that the two kinds of construct states have different syntactic properties. The complement NP in modificational nominals has a number of properties which distinguishes it from the referential complement. The following five tests are from Borer 2008 (25)-(27).

[12] Borer (2008) compares three constructions which have the same surface syntactic form: lexical compounds, Modification CS forms and Referential CS forms. She argues that the lexical compound such as *orex-(ha)din* lit: 'editor-the-law', "the lawyer", which are non-compositional in meaning, are derived by a word formation process in the lexicon . We do not discuss these lexical compounds here.

(54) (i) *modificational nominals cannot be modified by a definite adjective:*

a. beyt ha – zxuxit {*ha- xadaša; ??ha – venezianit}
house DEF glass DEF new; ??DEF Venetian
*the house of new glass/?? the house of Venetian glass.

cf. a' beyt ha – mora ha- vatiqa
house DEF- teacher DEF- senior
"the house of the senior teacher."

(ii) *modificational nominals when indefinite, can only be modified by a property modifier*

b. beyt zxuxit {*xadaša; venezianit}
house glass new; Venetian
*a house of new glass; a house of Venetian glass.

cf. b' beyt mora vatiqa
house teacher senior
"a house of a senior teacher."

(iii) *modificational nominals cannot be pluralised unless the plural itself is interpreted as a property*

c. *beyt (ha)- zxuxiot ; kir (ha)- levenim; mic (ha) – tapuzim;
house (DEF)- glass(pl); wall (DEF)- bricks; juice (DEF) - oranges
the/a house of (several) kinds of glass; the/a brick wall the/a orange juice;

cf. c' beyt (ha) – morot
house DEF- teachers
"the/a teachers' house"

(iv) *modificational nominals cannot occur with numeral modifiers*

d. *kir me'a/harbe levenim;
wall 100/ many bricks(pl)
"a wall of a hundred bricks"

cf. d'. beyt šaloš/harbe morot
house 3/ many teachers
"a house of three/many teachers"

(v). *modificational nominals do not allow pronominal reference*

e. *xalon (ha)- zxuxit ve- dalt- a
window (DEF) glass$_{i-}$ and door her$_i$
the /a glass$_i$ window and its-$_i$ door

cf. e'. beyt (ha) – mora$_i$ ve- rehite- ha$_i$
house (DEF)- teacher$_{i-}$ and furniture - her$_i$
"the/a teacher$_i$'s house and her$_i$ furniture"

It seems immediately clear that indefinite construct state classifier expressions pattern generally with the modificational constructs, (although, contra (iii), unmodified plural complements are possible). The following examples illustrate that for the most part, classifier constructions are modificational constructs.

i. *classifier construct state complements (CCSCs) cannot be modified by a definite adjective:*

(55) šaloš kufsaot ha- sfarim *ha-xadašim
three(f) boxes(f) DEF- books(m.pl) DEF-new(m.pl)
Intended reading: "the three boxes of new books".

ii. *when indefinite classifier construct state complements can only be modified by a property modifier:*

(56) a. kos mic saxut / kos mic ??yakar
cup(f) juice(m) squeezed(m) / cup(f) juice(m) expensive(m)
"a cup of fresh-pressed juice"/ "a cup of expensive juice"

b. šaloš kufsaot sfarim mikco'iim / ??xadašim
three(f) boxes(f) books(m) professional/??new(m.pl)
"three boxes of professional books/??three boxes of new books".

c. *šalaxti šaloš kufsaot sfarim še- ani ohevet
send – I three(f) boxes(f) books(m) that I like
"I sent three boxes of books that I like".

такб, я это проверяла или неттт?

(iii) *CCSCs cannot be pluralised unless the plural itself is interpreted as a property*

As the examples in (a) and (b) show, this does not hold for classifier constructions. This is not surprising as the point of classifiers is to package pluralities and denotations of mass nouns (analysed by Chierchia 1998 as inherent pluralities) into higher order singularities.

(iv) *CCSCs cannot occur with numeral modifiers*

(57) *xavilat esrim gulot
packet 20 marbles
intended reading: "a packet of 20 marbles"[13]

(v) *CCSCs do not allow pronominal reference*

Here the data are not clear. Some informants find the example in (58) unacceptable, analogous to the example in (54e). Other informants find the example in (58) acceptable,

(58) mosifim le- tavšil xatixat limon ve- klipato
add-pl to-cooked food piece lemon$_i$ and skin-its$_i$
"add to the dish a piece of lemon$_i$ and its skin$_i$"

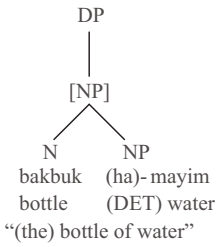
Classifier constructions then behave in most ways like Borer's description of modificational construct state constructions. In particular, the complement

[13] One of my informants suggested that this was acceptable if "20 marbles" was interpreted as a brand name. This is interesting because it fits in with the pattern that modification of the complement nominal is acceptable if the modified N can be interpreted as a kind expression.

nominal cannot be modified by numeral or 'non-essential' modifiers as (i), (ii) and (iv) show.

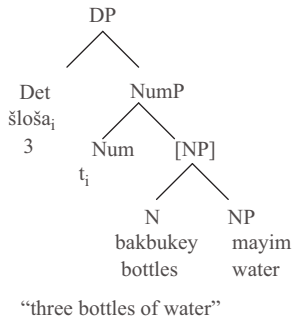
As regards syntactic analysis, Borer 1999, 2008, as well as Danon 2006, 2008 argue on the basis of these and other facts that the complement nominal in both referential and modificational construct states is not a DP but an NP, and that definiteness is a feature of nominal heads (rather than of DPs). We will adopt their analysis for the modificational construct states in general (thus including classifier constructions), without discussing whether referential construct state nominals also have the same structure. If the complement nominal is an NP, then we have an explanation for the fact that in the complement of classifier construction in both measure and individuating readings no numerical modifiers occur. Further restrictions on the NP complement in modificational construct states limit the adjectival modification to essential or inherent properties of the nominal denotation. Borer 1999, 2008 argues that the construct state head and complement form a syntactic unit via a reanalysis process which is syntactically analogous to lexical compounding, but which operates only in the syntax. This means that we assume the structure in (59) for construct state nominals, where [ ] indicates that the syntactic reanalysis leading to construct state formation has taken place:

(59)



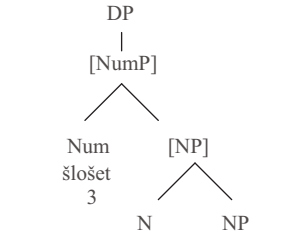
We assume that if the complement is marked definite, then the whole construct state is marked definite through some process of feature percolation or an agreement mechanism, see e.g. the discussion in Danon 2008, otherwise, the construct state is indefinite. When the construct state is indefinite, we assume that the numeral occurs under a number head, which has the construct state in its scope, as in (60a), and the number raises to Det. When the embedded NP is marked definite, then the construct state *bakbukey ha-mayim* is an NP embedded in another construct state headed by the numeral as in (60b):

(60) a.

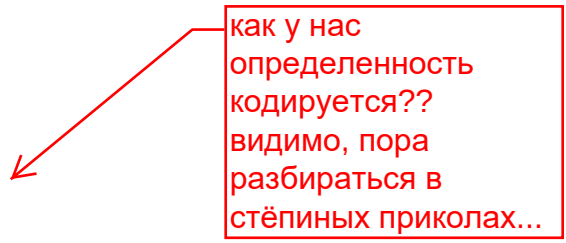


"three bottles of water"

b.



"the three bottles of water"



5.2 Individuating Readings of Construct State Classifier Constructions

We begin with the individuating reading of the classifier constructions. These are the readings relevant in examples like (36b), repeated here, where the classifier construct state denote three actual objects in the denotation of the head noun:

(36b) tavi lanu **šaloš kosot mayim**, bevakaša!
Bring us three glasses water, please!
"Bring us three glasses of water, please!"

It is intuitively clear that while the nominal *šaloš kosot mayim* denotes three cups containing water, there is no thematic expression of the containing relation in the construct state, since there is no preposition expressing this relation. If we contemplate the semantics of the modificational construct state in general (rather than just classifier constructions), then it is clear that there are many relationships that the complement nominal can have to the head nominal. A standard high school grammar book (Ginal and Sharavi 2005)

lists the following possible relations. The examples are theirs. (The text book does not distinguish between referential and modificational construct states, but I have listed only the relations which are plausibly the expression of M-constructs).

material constitution:
sus ec lit: [horse [wood]] "a wooden horse"
reason/cause:
nifgeay te'una lit: [injured people [accident]] "people injured in an accident"
comparison:
ananey noca lit: [clouds [feather]] feather-like clouds
superlative/exaggeration:
pela'ey pela'im lit: [wonders[wonders]] " wonder of wonders"
thematic argument:
ta'ut talmid lit: [mistake[student]] "a student's mistake"
bikur krovim lit: [visit [relatives]] "a visit to relatives"
connection of containment or measure:
kos šemen, lit: [cup [oil]] "a cup of oil" (ambiguous between measure and container reading)
liter mayim lit: [litre [water]] "a litre of water" (measure phrase)

None of these expressions contain any explicit lexical expression of the semantic relation between the head and the complement. It is plausible, therefore to assume that the modificational construct state is a syntactic mechanism which allows a head nominal to take a bare NP complement, where the content of the relation between head and complement is supplied contextually.

The construct state context, under this analysis, is a syntactic configuration which triggers a type shifting operation on the head nominal. A type shifting operation takes an expression of a particular type and shifts it into an expression of a different, though related type, thus changing its combinatorial possibilities. The type shifting operation which occurs here is an operation which takes the usual nominal head denotation, which is of type <e,t>, or equivalently a predicate of individuals, and shifts it into an function from NPs into NPs, or an expression which takes a direct NP complement. Put differently, as we saw in (49), a simple nominal can become a relational nominal through the addition of a thematic role which relates the head to a DP argument. In the construct state, the head becomes relational not through the addition of a thematic role, but through a shift in type which allows it to take a direct NP complement. The CS-SHIFT rule (for Construct-State Shift) is defined as follows:

(61) CS-SHIFT([λx. N(x)]) = λPλx.∃y[N(x) ∧ P(y) ∧ R(x,y)]

It is an operation which shifts a predicate of individuals into a function from properties into individuals related to that property via an underspecified R relation, whose content is supplied contextually.

Here is the derivation of *sus ec* lit: [horse [wood]] "a wooden horse", which is derived by shifting the predicate *sus* "horse" into an expression which can take a direct NP complement. It shifts the expression from one denoting the property of being a horse into the property of being a horse which is related via the R relation to some quantity of wood.

(62) $[sus]_N$: λx. HORSE(x)
CS-SHIFT ([*sus*]): λPλx. ∃y[HORSE(x) ∧ P(y) ∧ R(x,y)]
$[ec]_{NP}$: λx.WOOD(x)
$[sus]_N([ec]_{NP})$: λPλx. ∃y[HORSE(x) ∧ P(y) ∧ R(x,y)] (λz.WOOD(z))
= λx. ∃y[HORSE(x) ∧ WOOD(y) ∧ R(x,y)]

Crucial to the analysis is the assumption that the head is related to its complement via the unspecified R relation. This constrasts with the free genitive construction, where the relation between head and complement is semantically specified by the preposition *šel.* In (62) the R relation is one of material constitution: $[sus[ec]]_{CS}$ denotes the set of horses which are materially constituted out of some substance which is wood.

We can now look at the derivation for *šaloš kosot mayim* from (36b). We begin with *kos mayim,* which goes through the same derivation as *sus ec*, with the difference that the R relation is one of containment. The containment relation is the contextually appropriate one; also it is lexically preferred since, as we have seen, there is a lexical entry for *kos* explicitly associated with the thematic argument relation λxλy.CONTAIN(x,y). As discussions of derived nominals in Modern Hebrew have made clear (Ritter 1988, 1991, Borer 1999, Danon 2006, Engelhardt 2000), a derived nominal in the construct state will often assign to its complement the role that the free nominal normally assigns via *šel* to its complement.

To give the interpretation of *šaloš kosot mayim*, we need to make some assumptions about plurality and nominals. We assume a standard theory of plurality (e.g. Landman 2004), where pluralisation applies to a set of atomic elements and gives the closure of that set under the sum operation, i.e. the set of pluralities or plural entities. Numeral adjectives, as we saw above, are modifiers which apply to plural sets and give the subset of entities which have the relevant cardinality.

Here is the derivation of *šaloš kosot mayim* "three cups of water"

Stage 1: derivation of the construct state *kos mayim*

(63) kos: λx.CUP(x)
CS-SHIFT([*kos*]): λPλx.∃y[CUP(x) ∧ P(y) ∧ R(x,y)]
kos (mayim): λPλx. ∃y[CUP(x) ∧ P(y) ∧ R(x,y)] (λz.WATER(z))
= λx. ∃y[CUP(x) ∧ WATER(y) ∧ R(x,y)]

So *kos mayim* denotes the set of cups which contain water.

There is then a pluralisation operation which derives *kosot mayim*. This expression denotes the pluralisation of that set, i.e. the set denoted by *kos mayim* closed under sum.

Stage 2: numeral modification

As we saw in section 3, *šaloš*, is a predicate modifier which applies to a plural sets Q, and gives the subset of Q whose members all have three atomic parts. The denotation of *šaloš* was given in (17), and is repeated here:

(17) *šaloš* = *three*: λQλx.Q(x) ∧ |x| =3

This modifier applies to the predicate denoted by *kosot mayim*, λx. ∃y[WATER (y) ∧ CUPS(x) ∧ R(x,y)]:

(64) *šaloš*: λQλx. Q(x) ∧ |x| =3
kosot mayim: λx. ∃y[CUPS(x) ∧ WATER(y) ∧ R(x,y)]
šaloš (kosot mayim): λQλx. Q(x) ∧ |x|=3 (λx. ∃y[CUPS(x) ∧ WATER(y) ∧ R(x,y)])
= λx. ∃y[CUPS(x) ∧ WATER(y) ∧ R(x,y) ∧ |x| =3]

We assume that the R relation is interpreted as CONTAIN. This gives us (65):

(65) *šaloš kosot mayim*: λx.∃y[CUPS(x) ∧ WATER(y) ∧ CONTAIN(x,y) ∧ |x| = 3]

So *šaloš kosot mayim* denotes the set of plural objects which are cups and which contain water, and whose cardinality is three, i.e. which consist of three atomic cups containing water. If indefinites are interpreted as generalised quantifiers, then the numeral will raise to Determiner position, as in (60a), and as a semantic correlate, a standard type shifting rule (Partee 1987) will raise the predicate expression in (65) to the type of generalised quantifiers:

šaloš (kosot mayim)$_{DP}$: λPλxλy[CUPS(x) ∧ WATER(y) ∧ CONTAIN(x,y) ∧ |x| = 3 ∧ P(x)]

This analysis can naturally be extended to the interpretation of the numeral in definite construct states. Here, the numeral heads a construct state, which has as its complement an embedded construct state, as we saw in (60b): *šlošet bakbukey ha-mayim* "the three bottles of water". The definite correlate of (65) is *šaloš kosot ha-mayim,* which is also a construct state, although in contemporary Modern Hebrew, no phonological reduction appears on the numeral (see note 8). We assume that in [*šaloš* [*kosot* [*ha-mayim*]$_{CS}$]$_{CS}$]$_{DP}$, definiteness is interpreted on the highest nominal. In this construction, the denotation of the embedded CS form is the denotation of the expression *kosot mayim* in (64).

The interpretation of the numeral head of the construct state is via a suitable version of the CS-SHIFT rule suitably modified to apply to numeral modifiers. Since adjectives are of the same type as nominals i.e. <e,t>, this is not a problem. *šlošet/šaloš* is thus derived from the adjectival use of *three* by the CS-SHIFT rule as in (66). We assume that in a multiple embedding of construct state nominals, an independent R relation is introduced for each construct state operation. Further, when the construct state head is a numeral, the R-relation is constrained to be identity:

(66) *šlošet*(m)/ *šaloš*(f)
= CS-SHIFT ([*šaloš*])
= CS-SHIFT ([λx. |x| = 3])
= λPλx. ∃y[|x| = 3 ∧ P(y) ∧ x = y]

The construct denotation of "three" then takes *kosot mayim* "cups of water" as a complement:

(67) *šaloš* (*kosot mayim*):
λPλz.∃z'[|z| = 3 ∧ P(z') ∧ z = z'] (λx.∃y[CUPS(x) ∧ WATER(y) ∧ [R(x,y)])
= λz. ∃z'[|z| = 3 ∧ ∃y[CUPS(z') ∧ WATER(y) ∧ R(z',y)] ∧ z = z']

This expression denotes the set of entities which have three atomic parts which are (identical to some) entities which are cups which contain some water. The definiteness operator will apply to this predicate to give us the unique maximal element in the domain which is a set of three entities which are cups containing water. I use the sigma sign σ to represent the standard definiteness operation, such that σP denotes the unique maximal element in P (if such an element is in P, otherwise undefined).

(68) σλz.∃z'[|z| =3 ∧ ∃y[CUPS(z') ∧ WATER(y) ∧ R(z',y) ∧ z = z']

5.3 Measure Readings of Construct State Classifier Constructions

As we saw in section 3, construct state classifier constructions have an alternative interpretation where they denote measures. *šaloš kosot mayim* [3 cups [water]$_{NP}$]$_{CS}$ has a reading in which it denotes a quantity of water equal to three cupfuls.

Obviously, this creates a puzzle for compositional interpretation in Hebrew, just as it does in English. *kosot* "cups" is clearly the head of the construct state. If a construct state such as *šaloš kosot mayim* is the subject of a sentence, then the matrix verb of the sentences agrees with *kosot*, which is feminine plural, and not with *mayim*, which is masculine plural. In example (39) above, repeated here only in the construct state version, even on the measure interpretation where it is the books, and not the boxes, which need to fit on the shelves, the verb must be feminine plural in agreement with *kufsaot,* "boxes" and not in agreement with *sfarim* "books":

(39) arba'im ve- štaim kufsaot sfarim lo nixnasot l-a madafim šelanu
forty and two boxes(f) books(m.pl) no enter(f.pl) to-DEF shelves of-us
"Forty-two boxes of books don't fit on our shelves".

So syntactically, the classifier is the head of the construct state phrase, and classifier construct state constructions with measure readings have the same syntactic structure as those with individuating readings. However, despite the similar syntactic structures, measure readings of classifier construct states have different semantic interpretations, since on the measure reading, the construct state denotes a set of entities in the denotation of the complement and not a set of entities in the denotation of the head. *šaloš kosot mayim*, lit: 3–cups–water, denotes a set of quantities of water each of which is a quantity equal to three cupfuls. This means that the head of the construct state "three cups" must be interpreted as a modifier of the complement and not the other way round.

We now specify the details of the interpretation of numeral expressions, which we skipped over earlier. Following Landman 2004, we assume that a numeral expression like *three/ šaloš* starts as an individual expression of type n denoting the number 3. *šaloš* as an adjective is of type <e,t>, as we saw, and is derived from the number expression in two stages. The IDENT function (Partee 1987) raises takes the number 3 and raises it to a predicate expression, λn.n=3, which characterises the set of numbers equal to 3 (see (69a). This expression is composed with the standard cardinality function| |, which applies to a plural entity, and gives its cardinality, i.e. the number corresponding to its atomic parts. The result of the composition is the predicate of type <e,t> given in (69b) (where "∘" is the operation of function composition). The predicate modifier interpretation of *šaloš* which we are already familiar with is given in

(69c). It is derived from (69b) by the standard operation which derives attributive adjectival readings from predicative adjectives:

(69) a. IDENT(*šaloš*): λn.n=3
b. $šaloš_{<e,t>}$: λn.n = 3 °| |
= λx. |x| = 3 (= the set of plural entities with three atomic parts)
c. $šaloš_{<<e,t>, <e,t>>}$: λQλx. Q(x) ∧ |x| = 3

Once we have broken down the meaning of the adjectival numeral *šaloš* into its component parts in this way, it is easier to see how the measure interpretation of construct states works. On the measure reading, nominal heads such as *kosot* denote functions from numbers to functions from individuals into truth values. (In English, as we saw, the lexical operation which derives this meaning is optionally indicated by the suffix *–ful* as in *cupful, bucketful* etc. and we will use this in the semantic translation for clarity):

The measure interpretation of *kos* is derived from the nominal interpretation by an operation which takes λx.CUP(x) and turns it into the function λnλx.CUP-FUL(x) = n. The measure interpretation of *kos* thus uses the numeral interpretation of *šaloš* at type n, and not the adjectival interpretation we have been using up till now. The derivation of the measure reading of *šaloš kosot mayim* "3 cups of water" thus proceeds as follows:

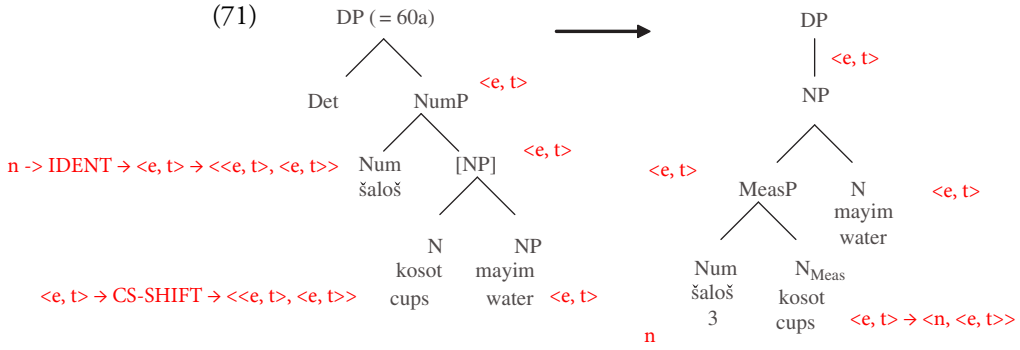
(70) a. $kos_{<n, <e,t>>}$: λnλx. CUP-FUL(x) = n
b. *šaloš kosot* = *kosot (šaloš)*: λnλx. CUP-FUL(x) = n (3)
= λx. CUP-FUL(x) = 3
c. *šaloš kosot*$_{Modifier}$: λQ λx. Q(x) ∧ CUP-FUL(x) = 3
d. *šaloš kosot(mayim)*: λQ λx. Q(x) ∧ CUP-FUL(x) = 3
(λx.WATER(x))
= λx. WATER(x) ∧ CUP-FUL(x) = 3

In (70a) we have the measure interpretation of the nominal head. In (70b), the measure head combines with the numeral 3 to give the complex modifier expression equivalent to the English *three cupfuls*. This expression has the semantics of an adjective, and in (70c), it shifts to the standard modificational semantics of adjectives. In (70d) it combines, as an adjective, with the nominal *mayim* "water", which is the syntactic complement of the construct state but its semantic head. The result is the expression equivalent to "water to the measure of 3 cupfuls". This expression can then be raised to the generalised quantifier type in the same way that any other predicate expression can be raised.

What makes this interpretation possible is two things: (i) the construct state does not specify structurally any semantic relation between the head of the construct state and its complement. (ii) the NP complement of the construct state is a bare N (or a N modified only by "essential properties" and

possibly reanalysed as a complex N), and it can therefore easily be reanalysed as a head; As a result, it is possible to reanalyse the structure [N NP] as [N_{meas} N], where the original complement is reanalysed as the head of the phrase and the original head is reanalysed as a modifier which combines with the numeral to form a complex predicate. The semantic R relation is reversed and interpreted as modification. Put differently, in a measure interpretation, the construct state structure in (60a) is reanalysed as below:

(71)



What stops this from happening in the free genitive is the fact that *šel* as a lexical preposition expressing a thematic relation has to be interpreted, and thus requires the nominal head *kos* to be interpreted as a relational head assigning a thematic role. Since thematic relations in the construct state are supplied contextually, and are not specified by the construction, the construction can be reanalysed as in (71), with the syntactic complement interpreted as the head of the complex nominal.

5.4 Definite Construct State Constructions only have an Individuating Reading

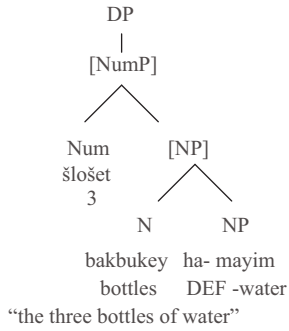
This account of measure expressions makes the interesting prediction that measure readings should not be possible in Modern Hebrew definite construct state numeral expressions. This is why: As we saw above, all definite numeral expressions have a construct state form with the numeral heading its 'own' construct state instead of directly modifying the nominal it counts, and this is true also if the nominal denoting the counted entity is itself a classifier construct state, as illustrated in the examples in (72d), cited here in the context of the examples already discussed, for ease of comparison:

(72) a. [šloša bakbukim]
three bottles (indefinite)
"three bottles"

b. [šloset [ha- bakbukim]$_{NP}$]$_{CS}$
three DEF-bottles
"the three bottles"
c. [šloša bakbukey$_{N}$ [mayim]$_{NP}$]$_{CS}$] $_{CS}$
three bottles water
"three bottles of water"
d. [šlošet [bakbukey$_{N}$ [ha- mayim]$_{NP}$]$_{CS}$] $_{CS}$
three bottles DEF- water
"the three bottles of water"

Definite numeral classifier construct state nominals such as (72d) with individuating interpretations were analysed as having the structure in (60b), repeated here, and were interpreted compositionally above in (66-68):

(60 b)



The interpretation in (68) respected the syntactic structure in (60b). Measure interpretations, as we saw in (71), require reanalysing the nominal head (in this case *bakbukey*) as a modifier. This reanalysis is not possible in (60b) since the numeral *šlošet* takes a whole construct state as a complement. The head *bakbukey* cannot be reanalysed as a measure expression and combined with the numeral to form a complex predicate, since it itself is the head of an independent construct state.

This prediction is borne out by the data: definite measure interpretations cannot be expressed using construct state constructions. In appropriate contexts, classifier construct state expressions which were acceptable with measure readings in the indefinite become infelicitous if they are made definite. (37a) contrasts with (73):

(37) yeš od marak b- a- sir?
There-is more soup in-DEF pot?
"Is there more soup in the pot?"

a. Ken, yeš od **šloš ka'arot marak** b- a- sir.
Yes, there-are more three bowls soup in-DEF-pot
"Yes there are three more bowls of soup in the pot"

(73) hizmanti esrim orxim ve- hexanti esrim ka'arot marak be- sir gadol.
I invited twenty guests and I-prepared twenty bowls soup in- pot big
"I invited twenty guests and I prepared twenty bowls of soup in a big pot."

#rak šiva-asar orxim higiu, ve- **šaloš ka'arot ha- marak ha- axronot** nišaru
only seventeen guests came, and three bowls DEF soup DEF last remained
b- a- sir.
in DEF pot.
"Only 17 guests arrived, and the last three bowls of soup remained in the pot."

The definite classifier phrase "the last three bowls of soup", has a perfectly acceptable measure interpretation in English, but this interpretation is not a possible interpretation of the corresponding definite classifier phrase in Modern Hebrew. There is no definite classifier phrase in Hebrew, either construct state or free genitive, which can express the definite measure reading.

6. Explicit Measure-Headed Nominals

A further prediction can be made about measure phrases in the construct state. Suppose a definite construct state (which cannot have a measure interpretation) has a nominal head which can only have a measure reading. This should result in an internal contradiction which should make the construction ungrammatical. This is indeed what happens in definite construct states with measure expressions as heads, as in (74b), which contrasts with the grammatical indefinite expression in (74a):

(74) a. xamiša kilo kemax
5 kilo kemax
"five kilos of flour"
b. *xamešet kilo ha- kemax
five kilo DEF- flour
intended reading: "the five kilos of flour

(74b) is ungrammatical since *kilo* requires a measure reading, but the definite construct state form makes the measure reading impossible. Let us look more closely at this example. We assume that *kilo* is a measure expression, which is born at type <n,<e,t>>, that is, it naturally denotes a function from numbers to measures, and naturally combines with a numerical expression to form a complex modifier. *kilo* thus has as its basic interpretation the meaning in (75a). In (75b) it combines with *šloša* to form the complex modifier *šloša kilo* "three kilos":

(75) a. $kilo_{<n, <e,t>>}$: λnλx. KILO(x) = n
b. *šloša kilo* : λnλx. KILO(x) = n (3)
= λx. KILO(x) = 3

As we saw in the example in (40b), repeated here, it is possible to use *kilo* with an individuating reading in *šel* constructions, although my informants mostly preferred the construct state:

(40 b) kani-ti **arba'a kilo šel kemax**
Bought-I 4(m) kilo of flour
"I bought four kilos of flour". (implication: in kilo packages).

I assume that the individuating reading of *kilo* which is available in (40b), and which is apparently not available in (74b) is induced by the presence of the preposition *šel*, which, as thematically interpreted preposition, forces the reinterpretation of *kilo* as a nominal head. In the absence of the preposition, this reinterpretation is impossible in (74b), and the construction is ungrammatical. Note that this analysis of *kilo* also explains the possibility of the examples noted in (41) – (42) above. (41) and (42a/d) are repeated here:

(41) arba'a bakbukim yayin
4 bottle(m.pl) wine
"Four bottles of wine"
(42) a. hu kana xamiša argazim tut
he bought five box(m.pl) strawberry
"He bought five boxes of strawberries"
b. kaniti arba'a kilogramim kemax
bought-I four kilograms flour
"I bought four kilograms of flour"

In these examples, the measure head (or the nominal head shifted into a measure reading) combines directly with the numeral, with which it agrees, and forms a complex adjective. If we compare these examples with (74a), then all that has changed in contemporary colloquial Modern Hebrew is that the agreement between an inherent measure head and numeral has been lost, while agreement between a numeral and a nominal head used as a measure expression has been maintained.

7. Conclusions

I have suggested here that Modern Hebrew provides evidence for analysing classifier phrases as having two interpretations which are derived compositionally

from different structures, and which are associated with two different semantic interpretations of nominal classifier heads. The individuating reading of a classifier phrase is associated with an interpretation of the classifier head as a relational nominal related to its complement by the CONTAIN relation. The measure interpretation of a classifier phrase requires an interpretation of the nominal head as an expression denoting a function from numbers to modifiers, that is, a use in which the noun combines with a numeral to form a complex measure expression which is essentially adjectival. This requires a syntactic configuration in which the nominal classifier head can be reanalysed as a modifier, and the complement of the classifier can be reanalysed as the head of the phrase. The syntactic constraints on the construct state in Modern Hebrew, and in particular the contrast between definite and indefinite construct states, allow us to see clearly the syntactic configurations in which such a reanalysis is permitted. One essential feature is that the construct state is configuration which is syntactically licensed, but semantically underspecified, or put differently, is licensed as an independent syntactic structure and not projected from the lexical properties of the heads which generate it. The measure construction is an extreme exploitation of this underspecification, since the standard head-complement relations have been reversed, and the syntactic head of the construction is semantically interpreted as a modifier (the measure expression) and not as the lexical head of the phrase. One might describe it as a situation in which the syntactic nominal head has been reduced to a functional head. Presumably what makes this possible is the fact that the construct state is anyway licensed with non-nominal heads, as discussed in Siloni 2001, Danon 2008, and Borer 2008, and as we have seen here exemplified by definite numeral-headed construct states. This reanalysis is not allowed in the free genitive, since the structure is not independently licensed, but is projected from the lexical properties of the head plus general features of DP structure. The complement of the nominal head is a DP and is semantically related to the head by a thematic role introduced by N itself and assigned via the thematically interpreted preposition *šel*. Since the preposition is thematically interpreted, the nominal head must be a relational nominal, and cannot be shifted into a measure reading.

Modern Hebrew then provides evidence that individuating and measure readings of classifier expressions do have different compositional interpretations and that these correlate with different syntactic structures. The comparison with English shows that while the languages are similar in the fact the classifier constructions can have either an individuating or measure interpretation, the precise way in which these interpretations are realised are constrained by the

language-specific constraints on syntactic structures. This opens the way for exploring cross-linguistic differences in how the semantic measure/individuation contrast is syntactically realised.

References

Borer, Hagit. 2008. Compounds: the view from Hebrew. In *The Oxford Handbook of Compounds*, eds. R. Lieber and P. Stekauer, Oxford: Oxford University Press (to appear).

Borer, Hagit. 1999. Deconstructing the construct. In *Beyond Principles and Parameters*, eds. K. Johnson and I. Roberts, Dordrecht: Kluwer publications.

Carslon, Greg. 1977. *Reference to Kinds in English*. Ph.D. dissertation, University of Massachsetts at Amherst.

Chierchia, Gennaro. 1998. Plurality of mass nouns and the notion of 'semantic parameter'. In *Events and grammar*, ed. S. Rothstein, Dordrecht: Kluwer.

Chomsky, Noam. 1981. *Lectures on Government and Binding*, Dordrecht: Foris.

Danon, Gabi. 2008. Definiteness spreading in the Hebrew construct state, *Lingua*: 118:7, 872-906.

Danon, Gabi. 2006. Caseless nominals and the projection of DP. *Natural Language and Linguistic Theory* 24:4, 977-1008.

Doetjes, Jenny. 1997. *Quantifiers and Selection*. Ph.D. dissertation, University of Leiden.

Doron, Edit. 2003. Bare Singular Reference to Kinds. *Proceedings of Semantics and Linguistic Theory* 13. 73-90.

Engelhardt, Miriam. 2000. The projection of argument taking nominals. *Natural Language and Linguistic Theory* 18, 41-88

Ginal, Noga and Yif'at, Sharavi. 2005. *lašon al kol lašon(šlav alef)* ["language on every tongue" part 1.] Jersusalem: Israel Ministry of Education.

Grosu, Alex. and Fred Landman. 1998. Strange relatives of the third kind. *Natural Language Semantics* 6, 125-170.

Grice, Paul. 1975. Logic and conversation. In *Speech Acts*, eds. P. Cole and J. Morgan, Syntax and semantics, vol 3. 42-58. New York: Academic Press.

Heim, Irene. 1987. Where does the definiteness restriction apply? Evidence from the definiteness of variables. In *The Linguistic Representation of (In)definiteness*, eds. A. ter Meulen and E. Reuland (eds) 21-42, Cambridge: MIT Press, 1987.

Landman, Fred. 2004. *Indefinites and the Type of Sets*. Oxford: Blackwell.

Munn, Alan. 1995. The possessor that stayed close to home. In *Proceedings of the West Coast Conference on Linguistics*, eds. V. Samiian and J. Schaeffer (*WECOL 24*) 181-195.

Partee, Barbara. 1987. Noun phrase interpretation and type-shifting principles. In *Studies in Discourse Representation Theory and the Theory of Generalized Quantifiers*, eds. J. Groenendijk, D. de Jongh, and M. Stokhof, GRASS 8, Dordrecht: Foris, 115-143.

Ritter, Elizabeth, 1988. A head movement approach to construct state phrases. *Linguistics* 26. 909-929.

Ritter, Elizabeth, 1991. Two functional categories in noun phrases: evidence from Modern Hebrew. In *Perspectives on Phrase Structure*, ed. S. Rothstein, Syntax and Semantics vol 25, New York: Academic Press. 37-62.

Rosén, Haim. 1957. *Ivrit Tova* (Good Hebrew). Jerusalem:Kiryat Sefer.

Siloni, Tal. 2001. Construct states at the PF interface. In *Linguistic Variation Handbook*, Volume 1, eds. P. Pica and J. Rooryck. Amsterdam: John Benjamins p. 229-266.