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RESEARCH

Exponence, allomorphy and haplology in the number and State morphology of Modern Hebrew

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This paper provides an account of the regularities of plural exponence in Modern Hebrew. There are two genders in Modern Hebrew, each with its specific plural marker. Nouns can appear in the Construct or Free states, and the State of a noun also has an effect on the plural marking, though only in the case of masculine nouns. Finally, in nouns with possessive suffixes and in newly-formed dual nouns, plural number seems to be marked twice in the feminine noun, but only once in the masculine noun. The analysis first formalizes the distribution of the plural allomorphs of gender and State in the language using the Vocabulary Items of Distributed Morphology (Halle & Marantz 1993). It is then claimed that the morpho-syntactic structures of N+possessive and of new duals involve two number projections, and therefore two plural exponents are expected in both constructions. However, in the masculine case the vocabulary Items provided in the paper result in the repetition of two overly similar exponents, creating an OCP violation. The repair is to delete one of the two, and so the double marking does not survive in the phonetic form. In the feminine case the two markers are not similar, and so there is no OCP violation, and double marking is surface-true.

Keywords: allomorphy; haplology; morpho-syntax; Modern Hebrew; possessive

1 Introduction

In this paper, I analyze the regularities of plural marking in Modern Hebrew. There are two genders in this language, each associated with a distinct plural marker, but the two plural markers behave asymmetrically. Of special interest are two cases of apparently redundant plural marking, hitherto undiscussed in the literature. In both cases, plurality is marked twice on a feminine noun, while in the parallel masculine noun it is marked only once. I analyze this asymmetry as a result of haplology in the masculine case. The proposed structures predict double plural marking in both genders; but it is shown that in the masculine case, the two markers are both adjacent and phonologically similar, and so one is deleted.

In section 2, I present the data and the generalizations that will be accounted for, and introduce the framework in which the analysis is conducted. Section 3 provides an analysis of the basic cases, where there is never double marking of plural number. Two asymmetries are covered by the analysis: i) the mere fact that there are distinct plural markers, and ii) the different behaviors of these markers in N + N compounds. Section 4 provides the analysis of the two cases of double marking. Section 5 concludes with a short discussion of the results.

2 Data and theoretical background

2.1 Data

Before we look at the two-gender system of Modern Hebrew, consider the following paradigm from another two-gender system, that of Spanish in (1).

(1) Nominal inflection in Spanish *gato* 'cat'

	Singular	*Plural*
masculine	gat-o	gat-o-s
feminine	gat-a	gat-a-s

The paradigm in (1) exhibits a one-to-one correspondence between gender and number features and their exponents. Masculine and Feminine genders are marked with *-o* and *-a* respectively, and plural number is marked with *-s*. The suffixes are concatenated in the order gender > number, and there is no phonological interaction between them.[1]

Now consider the system of Modern Hebrew. In Modern Hebrew, nouns appear in two "States": the Free State, which is the citation form, and the Construct State, which is the form of the noun when it is the head of a nominal compound $N_{head} + N_{modifier}$. As can be seen in (2), in both States the masculine singular does not carry any overt marker. Feminine singular nouns appear with one of several overt markers. In this paper, I will be concerned with only the most common of these markers, namely *-a* (see Schwarzwald 1982 for a thorough description of all suffixes). In the Construct State, this feminine singular marker appears with an additional [t]: *sus-at*. Masculine plural is exponed by a suffix *-im* in the Free State and by a suffix *-ej* in the Construct State. In contrast, feminine plural nouns carry a plural suffix *-ot* in both States.[2]

(2) Nominal inflection in Modern Hebrew for *sus* 'horse', *sus ets* 'wooden horse'

	Singular		*Plural*	
	Free State	*Construct State*	*Free State*	*Construct State*
masculine	sus	sus ets	sus-im	sus-ej ets
feminine	sus-a	sus-at ets	sus-ot	sus-ot ets

Two asymmetries to be discussed in this paper are apparent in (2). The first concerns only the Free State. Like in the Spanish example, masculine nouns exhibit one-to-one correspondence between features and realizations. The plural marker is concatenated to the singular form. However, this correspondence is destroyed in the feminine in two ways: first, plural number is not exponed by *-im*, but by *-ot*; and second, that marker is not concatenated to the singular marker, but rather appears to replace it.

A second asymmetry between the plurals of the two genders lies in the relation between their Free and Construct States. Masculine nouns exhibit allomorphy: *-im* conveys plural number in the Free State, but *-ej* expresses it in the Construct State. Feminine nouns, in contrast, do not exhibit allomorphy: *-ot* seems to be compatible with both States.

[1] The situation is considerably more complex in the system as a whole, and there is a debate whether *-o, -a* are only gender marker or also class markers. The paradigm in (1) should be understood as illustrating an ideal system.

[2] I will ignore, in this paper, irregular plurals. For these, see Aronoff (1994), Kihm (2005), and Faust (2011). In all the examples in this paper, stress is final unless marked. In N + N compounds, the second N bears main stress.

It might be assumed on the basis of (2) that *-ej* marks plural number in the Construct State, but that for some reason it is incompatible with gender marking, ruling out the options **-at-ej* or **-ot-ej*. We will return to **-at-ej* in the analysis. A source for the ungrammaticality of **-ot-ej* is redundancy: since plural number is already marked by *-ot*, there is no reason to mark it again with *-ej*. However, there *are* morphological constructions in Modern Hebrew in which plural number is marked twice, and specifically through the concatenation of *-ot* and *-ej*. Interestingly, the parallel masculine nouns do not exhibit double marking.

The first of two such cases is found in the context of possessive suffixes. Possessive suffixes come in two sets, according to whether the possessed is singular or plural. To illustrate, consider (3), where the 2PL.POSS suffix *-xem* is attached to all four basic forms. If the possessed is plural, the marker *-ej-* (in bold) appears between the base and *-xem*.

(3) Interaction of plural and possessive markers: *-xem* '2PL.POSS'

	possessed is singular	*possessed is plural*
masculine	sus-xem 'your$_{[mpl]}$ horse'	sus-**ej**-xem 'your$_{[mpl]}$ horse**s**'
feminine	sus-at-xem 'your$_{[mpl]}$ mare'	sus-**ot-ej**-xem 'your$_{[mpl]}$ mare**s**'

As can be seen in (2), the feminine noun is marked twice for the plural number of the possessed: once by *-ot*, and again by *-ej-*. Marking plural number only once is ungrammatical: **sus-ot-xem* or **sus-at-ej-xem*. The masculine plural, in contrast, is marked only once (**sus-im-ei-xem*, **sus-ej-ej-xem*).

The second case of double plural marking exhibits the same asymmetry. It is found in the formation of new dual nouns (Schwarzwald 2002). As shown in (4), the dual suffix *-ájim*, which includes the plural [im], attaches to the masculine singular base, but to the feminine *plural* base.

(4) New dual formation[3]

	singular	*dual*
masculine	sus	sus-áim
feminine	sus-a	sus-**ot**-áim

The double marking in (3) and (4) has never been motivated in any way in the literature on Modern Hebrew. These cases constitute the third and fourth asymmetries to be analyzed here.

To summarize, the present paper will account for four asymmetries in the plural marking of nouns in Modern Hebrew. These asymmetries are presented in question form in (5).

(5) Explananda
1) Why are feminine and masculine Free State plurals exponed differently?
2) Why is there State allomorphy in the plural markers of masculine nouns, but not in those of feminine nouns?
3) Why is there double plural marking in possessed feminine nouns, but not in masculine nouns?

[3] The feminine dual form in (3) is non-standard. See section 4.2 for more details.

4) Why is there double plural marking in new dual feminine nouns, but not in masculine nouns?

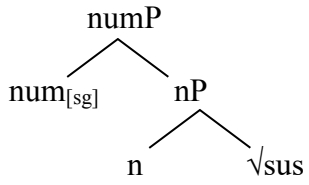
Before we can begin to answer these questions, the next subsection briefly introduces the theoretical framework of the analysis.

2.2 Distributed Morphology

Distributed Morphology (DM; Halle & Marantz 1993; Marantz 2007; Embick 2010) is a theory of word formation. Work in this theory emphasizes the syntactic aspects of word formation, with the general goal of unifying certain aspects of the morphological and syntactic modules.

According to this theory, content words are constructed in the syntax by adding category heads to roots with no category. Thus, the Modern Hebrew word *sus* 'horse' has the structure in (6). Such structures are then "spelled out": the morpho-syntactic information is matched with phonemic sequences. In Modern Hebrew, neither the category-assigning head nor the feature [sg] (=singular) on the number head *num* are associated with phonemic material. Consequently, the noun 'horse' has the same phonemic sequence as its root.

(6) *sus* 'horse' as a complex structure



(Here and throughout the paper, specifier positions will be ignored unless occupied).

When we turn to feminine nouns, I will adopt a view of grammatical gender as the appearance of a [gender] feature on the categorizing head *n*. In the present context, I note that masculine gender is regarded here as the absence of that feature, rather than a feature [masculine] or [-gender].

As we have seen, a [plural] feature on *num* does have a realization, namely a suffix [im]. In other words, it is associated with phonemic material, presumably /im/. In DM, such pairings of features and lexical representations are called Vocabulary Items (VI's):

(7) Vocabulary Item

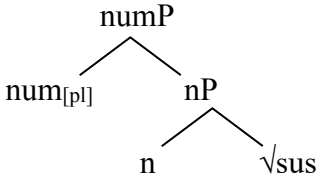
Morpho-syntactic information	is translated into	lexical representation
[plural]	⇔	/im/

The structure of the plural *sus-im* 'horses' is given in (8a). Just like work in syntax strives to derive word order, DM strives to derive the order of morphemes. One must therefore explain why plural /im/ is a suffix rather than a prefix, because in the tree in (8a) the feature [plural] appears on the head *num*, which is situated to the left of the root. I will assume here without discussion that *n* moves out of the nP and left-adjoins the *num* head as in (8b).[4] Spell-out applies after this movement. The features of the tree are matched with phonological sequences, and the VI in (7) instructs the computation to match [pl] on the *num* head with /im/. This exponent ends up linearized as a suffix to *sus*.

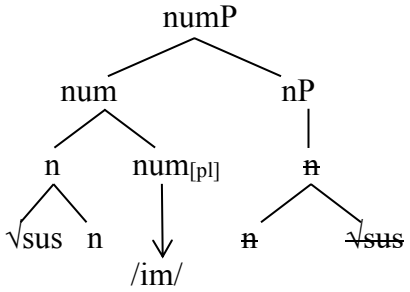
[4] Note that it is *n*, and not the entire *nP*, which is raised.

(8) Movement, spell-out and the order of morpheme

a. before movement



b. Spell-out after movement



As expected in a theory of the translation of morpho-syntax into phonological form, another central issue in DM is allomorphy. Let us leave the analysis of Modern Hebrew to the next section and consider a case of allomorphy from Yiddish. In this language, there are several plural suffixes. The most productive are *-s* and *-ən*. The distribution of the two suffixes is regular and complementary. For instance *-s* appears after (unstressed) vowel-final nouns (*kátʃkə*, *kátʃkə-s* 'duck(s)'), and *-ən* appears after consonants (*brem, brém-ən* 'eyebrow(s)'). This is a clear case of allomorphy, since the two suffixes cannot conceivably be derived from a single lexical representation. The allomorphy is restated in the form of a VI with specific environments:[5]

(9) Yiddish plurals

a. [plural] ⇔ /s/ / V_

b. [plural] ⇔ /ən/ / C_

Of course, (9) is little more than a restatement of the facts. Still, it may be interpreted as a claim about this case of allomorphy, namely that it does not follow from phonological considerations and cannot therefore be left for the phonology to handle. In other words, this is not phonologically-optimizing allomorphy, and could have been the opposite (i.e. *-ən* after unstressed vowels, *-s* after consonants).[6]

This section introduced the basic facts and theoretical assumptions of this paper. Both data and theory will be elaborated on in the course of the analysis of the Modern Hebrew facts, to which we now return.

3 Analysis of basic cases

In this part of the paper, I will propose an account of the first two asymmetries. The questions to be answered are:

1) Why are feminine and masculine Free State plurals exponed differently?
2) Why is there State allomorphy in the plural markers of masculine nouns, but not in feminine nouns?

3.1 Feminine nouns in the Free State

3.1.1 The suffix [-a]

As shown in (2) above, feminine singular nouns in the Free State carry the suffix *-a*, e.g. *sus-a*. Since singular number is not exponed in the masculine gender, I assume that it is in

[5] Of course, a complete account of Yiddish plurals is not a goal of this paper. This is only an illustrative example.

[6] For an exploration of allomorphic statements such as (9) see Bonet & Harbour (2012). Specifically for the discussion around phonologically-conditioned allomorphy, see Embick (2010), Nevins (2011a), Paster (2014).

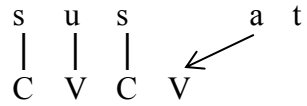
fact never realized: *-a* expones only gender, rather than both gender and singular number. In other words, singular number is never associated with a phonological representation.

Besides the feature it expones, two other aspects of feminine *-a* must be discussed here. They are 1) its underlying, phonemic form, and 2) its position in the morpho-syntatic structure.

The issue of the underlying form of the singular feminine suffix is independent of the ensuing account and is mentioned here for the sake of completeness. As already discussed, *-a* is not the only suffix associated with feminine gender. The other suffixes are: [-it], [-ut], and unstressed [-at] (after historical gutturals) and [-et] (elsewhere). A common feature of all these suffixes – common also to the plural [ot] – is the final [t]. While this feature is not shared by the Free State marker [-a], we saw above that in the Construct State, even this marker includes a final [t], e.g. [sus-a**t** ets] 'wooden mare'. Bat-El (1989) assumes that the underlying representation of [-a] is /-at/. Faust (2013) concludes that /at/ expones gender throughout the language, and the vowels of [it, ut] are "theme vowels", which replace the underlying /a/.

But if the lexical representation of /at/ includes a feminine /t/, why doesn't the surface representation? Faust (2014) proposes the autosegmental explanation in (10). The analysis assumes that all phonetically C-final words end in an empty V-slot (Harris & Gussmann 1998). It is further claimed the lexical representation of /at/ does not involve any skeletal support. As a result, /at/ is parasitic on its base for such support. Since the base ends in an empty V-slot, the /a/ can be realized; but the /t/ remains afloat:

(10) Autosegmental account of /at/ => [a]

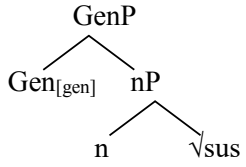


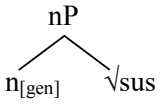
In the Construct State, skeletal support for the floating /t/ is provided by the structure (for details, see Faust 2014; in Faust 2013, I assume the same for the rest of the feminine singular exponents, as well as for the plural configuration).

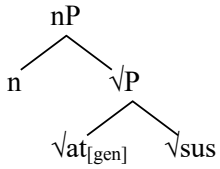
More important in the present context is the second aspect of feminine exponence, namely the morpho-syntactic structure that it corresponds to. As gender is a nominal feature, it is a recurrent claim in DM that it cannot be part of the root (see e.g. Acquaviva 2008). Instead, it must be a feature on some head in the nominal structure. Some studies, e.g. Picallo (1991), argue that gender features reside on a head *Gen* (11a). This position is criticized in several recent studies. For Lowenstamm (2008) and subsequently Kramer (2015; 2016), gender is a feature on the nominal head *n* (11b). In contrast, Faust (2011) and Fathi & Lowenstamm (2016) (for Modern Hebrew and French respectively) pursue an analogy between derivational suffixes and gender; these studies argue that since gender in inanimate nouns is not predictable, its position in the structure should reflect this fact. Against the general trend, they claim that gender is a feature carried by a "bound root", which is merged with the root ((11c); for bound roots, see Lowenstamm 2014). Note that the root in (11c) will end up left-adjoining its head, and the order base-suffix will emerge.[7]

[7] In fact, the proposal in Fathi & Lowenstamm (2016) involves GenP, too. Since the present proposal is largely independent of the question of the representation of gender, I abstract away from the details of that analysis.

(11) Three representations of gender

a. 

b. 

c. 

For reasons that will become clear, the analysis in the present paper is compatible with both (11b) and (11c), while (11a) seems to be more problematic for it. Since (11b) is the most widely-accepted of the two, it will be assumed for the rest of the study. The issue of the representation of gender will be returned to in the concluding discussion.

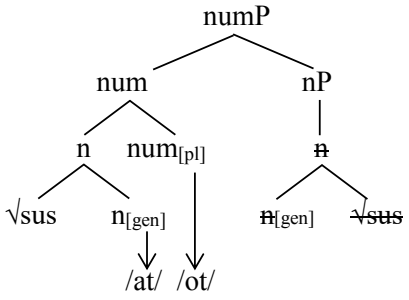
3.1.2 The suffix [-ot]

The masculine plural *sus-im* in (8b) above exhibits a one-to-one correspondence between features and exponents: masculine gender is unexponed, and plural number is exponed as *-im*. By analogy, assuming again that /at/ is the exponent only of gender, one expects to find *-at-im* in the feminine plural, as in Spanish *gat-**a-s***. Instead, one finds the form *sus-ot*. In this form, *-ot* behaves like a "portmanteau" morpheme: a single underlying unit of form expressing two distinct features.

Bat-El (1989; 1997) presents an analysis that avoids the portmanteau characterization of *-ot*. For Bat-El, the suffix *-ot* denotes only plural number, and is subcategorized for [+gender]. In the terms of the present analysis, this proposal can be expressed as the VI in (12a): the plural feature on *num* will be realized as *-ot* if the noun carries a feature [gender], as in (12b).

(12) Subcategorizing VI of /ot/ (Bat El 1989) and feminine structure

a. [plural] ⇔ /ot/ / [gender]

b. 

As in (11c), I assume that the root left-adjoins to its selector n. In (12b), that selector is *n*. The *n* head then move up to left-adjoin the *num* head, as in the masculine plural in (8b) above. The result of these two operations is the order base > $n_{[gen]}$ > number.

All other things being equal, one expects the structure in (12b) to be spelled out as the unattested */sus-at-ot/*. Bat-El proposes that this is indeed the underlying sequence, but that the first feminine /t/ is deleted by an OCP rule specific to feminine /t/'s, and the resulting hiatus is resolved by omitting the first vowel. Under this view, presented in (13), /ot/ is not a portmanteau morpheme because it does not realize gender at all (for further elaboration of the proposal, see Bat-El 2009).[8]

[8] An alternative which does not require such sensitivity to morphological information is to attribute the disappearance of *-at-* to the haplological deletion of the first of two -Vt sequences. However, elsewhere there does not seem to be a problem with such sequences: the adverbial suffix *-it* freely attaches to feminine bases, e.g. *ʃit-a* 'method', *ʃit-at-it* 'methodically'.

(13) MH feminine pluralization in Bat-El (1989)

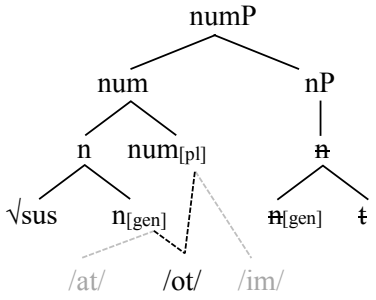
Input to Phonology	/sus-at-ot/
OCP of Feminine /t/'s	/sus-a-ot/
hiatus resolution	/sus-ot/
Surface form	[susot] 'mares'

A treatment of *-ot* as portmanteau can be based on the proposal in Svenonius (2016). It is argued in that paper that within a single spell-out domain, if an exponent is listed which can be used to realize two or more adjacent terminal nodes as in (14a), then that exponent is preferred to two exponents that realize each node separately. Therefore, given the VI's in (14b), /ot/ will be inserted, rather than /at-im/ (as indicated by the difference in shading).

(14) Portmanteau preferred for [plural,gen]

a.
[plural]	⇔	/im/
[gen]	⇔	/at/
[plural,gen]	⇔	/ot/

b.



Like Bat-El's analysis, the one in (14) assumes an exponent /-ot/ with information about its environment of insertion. This analysis seems preferable because it avoids the opaque derivation and the morpheme-specific phonological rule in (13). It is the one I will adopt here.[9]

In the last two subsections, I provided an account of the first explanandum, namely "why are feminine and masculine Free State plurals exponed differently?" I assumed with Svenonius (2016) that if the material of two adjacent nodes within one spell-out domain is encapsulated in one VI, rather than more than one, then that VI will apply. It so happens that Modern Hebrew has a VI referring to both [gender] and [plural], mapping this feature bundle to /ot/. Since the terminal nodes carrying the two features are adjacent and in the same domain, the feminine plural will emerge with *-ot*, rather than with a combination of the gender marker *-at* and the general plural *-im*.

3.2 The Construct State

As explained in the introduction, the Construct State refers to the form that a noun takes when it is placed immediately before another noun, in a construction that is analogous to compounding. The first N heads the construction. Thus, *sus ets*, literally 'horse wood', means 'wooden horse'.

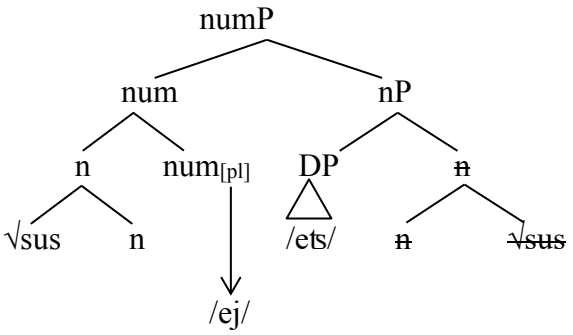
The generative literature on the structure of this construction in Semitic is ample. Generally speaking, researchers have been concerned with issues of word order and

[9] Yet another alternative account appears in Faust (2011). According to that analysis, the exponent of the feature [plural] on the *num* head is a floating rounding agent U (in the sense of Element Theory, Kaye et al. 1985), accompanied by a CV slot to which it is not lexically associated. The U merges with the vowel /a/ of the base to yield the quality [o], and the additional CV allows the floating /^{t}/ of the singular exponent /a^{t}/ to be realized. If so, [ot] is in fact an augmented /-at/. This analysis expresses the phonological similarity between the singular and plural feminine exponents, which remains unexpressed in the two analyses in (12) and (14). Note, however, that the analysis adopted in (14) is not incompatible with this view: in (14), too, there is merger. A full discussion of the details of Faust (2011) would constitute too much of a deviation here.

definiteness spreading or agreement (Shlonsky 2004; Borer 2008; 2013; Danon 2008).[10] One consensus among researchers is that the modifying noun is initially situated above the head noun in the tree, usually in [spec, NP], creating the order $N_{modifier} > N_{head}$. This raises the question of how the head noun ends up preceding the modifier. It has been suggested as early as Ritter (1988) that the noun raises out of the NP into a position above the modifier. In addition, the modifier is assumed to be base-generated under a DP structure, because it may carry the definite marker *sus* ***ha****-ets* 'the wooden horse'.[11] A similar analysis is proposed in Borer (1999), though definiteness is not taken to be an indication of the presence of D in the structure: it is base-generated in the NP. Most later studies adopted Borer's proposal.

For the present purpose, I will assume that just like in the Free State, the head noun is raised to left-adjoin *num*. This derives the appearance of number marking on that head noun.

(15) Movement of *n* to left-adjoin *num* in MPL N + N



As shown, a plural feature on the head *num* corresponds to a suffix *-ej* in this configuration. One must now ask why the form is not *-im*, that is, what is wrong with **sus-im ets*.

In Faust (2014), I argued at length for the traditional view of compounds such as *sus ets*, according to which the two nouns belong to one phonological word, rather than two. Assuming this traditional view, the exponent of [plural] in the Free State *sus-****im*** is situated at the right edge of the phonological word. In contrast, in the Construct State *sus-ej ets* plural number is not marked at the right edge of the phonological word, but inside it. I propose to encode this fact in the following VI's for [plural]:

(16) Modern Hebrew Plurals
a. [plural] ⇔ /-im/ / _]$_{PhonWord}$
b. [plural] ⇔ /-ej/

The VI's in (16) makes the specific prediction that no suffix may ever appear after [-im]. This prediction is correct.[12]

Like the statement about Yiddish plurals in (9) above, (16) is only slightly more than a restatement of the facts. It nevertheless expresses the following claims: i. masculine

[10] Another topic which is regularly discussed in the literature is genitive case assignment. This discussion is not relevant for the present purposes. A summary of it can be found in Siloni (2001).

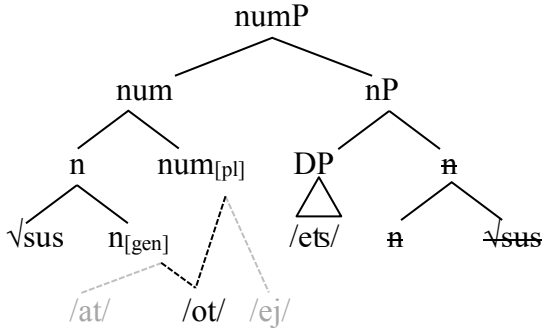
[11] Another indication that the structure of the modifier is larger than *n* can be found in the fact that in many N + N compounds, the modifier noun is plural, e.g. *dov nemal-****im*** 'anteater', literally 'bear ant-PL'.

[12] Another intriguing aspect of this VI, which could be regarded by some as problematic, is that the edge of a phonological domain is designated as the trigger of vocabulary insertion. In DM, phonological domains are in principle created after vocabulary insertion. However, beyond the principled architectural point, there seems to be little support for this purported lack of communication between phonology and syntax and much evidence against it. For specific interaction between syntax and prosody, see for instance Pak (2008), Henderson (2012), Bennett et al. (2016) (I thank two reviewers for referring me to these recent studies). For the parts of phonology that arguably may or may not trigger allomorphy, see Scheer (2016).

plurals are not masculine, but default (they are unrelated to gender); ii. the conditioning factor is the right edge of the phonological domain; and iii. the two forms are not derivable from a single UR.

We may now return to the second explanandum of the introduction, namely "Why is there State allomorphy in the plural markers of masculine nouns, but not in those of feminine nouns?" In order to answer this question, consider the structure that the analysis developed here attributes to a pluralized feminine noun in the Construct State, such as *sus-ot ets* 'wooden mares'. As shown in (17), the conflict between the portmanteau *-ot* in (14a) and the VI in (16) is again expected to arise. And again, for the same reason as in the Free State plural, *-ot* will win over the more analytic **at-ej*.

(17) Movement of *n* to left-adjoin *num* and portmanteau exponence in FMPL N + N



To summarize, in the structures of feminine nouns in the Free and Construct states, the terminal nodes carrying the features [gender] and [number] are linearly adjacent and within the same spell-out domain, owing to the upwards movement of *n*. As a result, and because there is an exponent that can realize both features, they will be realized together in both states. The general exponents of plural number, *-im* and *-ej* realize a single node (depending on the position within the phonological word); *-ot* is a portmanteau, and thus wins out over *-im* and *-ej*.

In the structure of 'wooden mares' in (17), the suffix *-ot* was inserted instead of *-ej*. It is therefore surprising to see that they *both* appear in the form *sus-**ot**-**ej**-nu* 'our mares'. We turn to such double marking in the next section.

4 Analysis of double marking

This section of the paper treats explananda 3 and 4. We will see that the surprising aspect of the data is not the double marking on feminine nouns, but rather the absence of that double marking on masculine nouns.

4.1 Possessive suffixes

This subsection begins with a more thorough presentation of the possessive suffixes and their bases. In the ensuing analysis, I will claim that the plurality of the possessed is always marked on the inflectional non-head. The VIs of the preceding section operate so that it appears twice on the feminine plural, but only once on the masculine plural.

4.1.1 Data

Modern Hebrew has two sets of possessive markers, one for a possessed singular and one for a possessed plural:[13]

[13] The construction N + possessive is only used in very frequent items in the spoken language, e.g. *tor-i* 'my turn' or *ašm-at-am* 'their fault', *zxut-o* 'his right'. At the same time, it is very much present in newspapers, popular music and books (including children's books). Moreover, the same sets are used in the declensions of prepositions of all registers. It is therefore safe to say that speakers have an active knowledge of the two

(18) Possessive suffixes for *sus* 'horse'

a. possessed singular				
num/gen \ person		1	2	3
SG.	ms.	sus-**i**	sus-**xa**	sus-**o**
	fm.		sus-**ex**	sus-**a**
PL.	ms./fm.	sus-**énu**	sus-**xem/xen**	sus-**am/an**
b. possessed plural				
num/gen \ person		1	2	3
SG.	ms.	sus-**aj**	sus-**é-xa**	sus-**av**
	fm.		sus-**áj-ix**	sus-**é-ha**
PL.	ms./fm.	sus-**éj-nu**	sus-**ej-xem/xen**	sus-**ej-hem/en**

The similarity between the singular and plural sets in (18) is considerable. A reasonable analysis will have the plural set employ the same markers as the singular's, with the additional plural marker *-ej-* (already familiar from the masculine Construct State). For instance, *sus-ej-xem* 'your$_{(pl)}$ horses' simply concatenates the base 'horse', the plural suffix and the 2MPL possessive pronoun, also apparent in *sus-xem* 'your$_{(pl)}$ horse'.

It is therefore tempting to analyze *sus-ej-xem* 'your$_{(pl)}$ horses' as analogous to compounds such as *sus-ej ets* 'wooden horses': instead of the modifier *ets*, here the modifier is *xem.* I will indeed make this analogy in my analysis below. Yet the parallelism cannot be complete. The plural marker in (18b) is not always *-ej-* and the possessive markers are not always identical to those of the singular. The conclusion seems inescapable that the marker */ej/* and the possessive suffixes are morpho-phonologically conditioned with respect to each other. In contrast, there is never any interaction between the plural marker *-ej* of a compound like *sus-ej ets* and the modifier. Unlike this *-ej*, morphologically the plural marking of the possessed in (18b) seems to be part of the possessive pronoun, not part of the head noun. In other words, the morphological decomposition is /(sus) + (ej-xem)/ rather than /(sus-ej) + (xem)/.[14]

The high degree of cohesion between the two affixes of the plural set is further motivated by the independence of this set of the number of some bases. Indeed, the plural affix set is used in the inflexion of several prepositions, such as *el* 'toward', *al* 'on', *bil?ad-* 'without' and *taxat* 'under', even though the prepositions themselves are not plural in

sets (though the same cannot be said as to their effects on some bases). (This has no bearing on the present problem.)

[14] It is crucial to the analysis that all of the forms of the possessed plural be derived from the initial concatenation of /ej/ + POSS. Some forms, especially [áix] 'PL.POSS.2FMSG' and [áj] 'PL.POSS.1SG', seem to resist this analysis. In Faust (2011), I argue that the underlying form of the plural suffix is in fact /aj/, and its /a/ is reduced to [e] when unstressed or in non-final closed syllables. This then straightforwardly derives the problematic forms: [áix] is derived from from /aj-x/ through epenthesis of [i] after /j/ and loss of the glide in /ji/ sequences; and [áj] is derived from /aj-i/ with coalescence of the glide and the homorganic vowel. The alternation between stressed [áj] and unstressed [ej] is independently attested in Modern Hebrew, e.g. [báit] 'home', [bejt-í] 'domestic'. For clarity, I nevertheless continue to use /ej/ for the plural marker in this paper.

any meaningful sense, and their uninflected form does not synchronically carry a plural morpheme (though in some cases, it did carry one historically).

(19) The inflection of *bil?ad-* 'without'

person / num/gen		1	2	3
SG.	ms.	bil?ad-**aj**	bil?ad-**é-xa**	bil?ad-**av**
	fm.		bil?ad-**áj-ix**	bil?ad-**é-ha**
PL.	ms./fm.	bil?ad-**éj-nu**	bil?ad-**ej-xem/xen**	bil?ad-**ej-hem/en**

We have seen two pieces of evidence in favor of grouping the *-ej-* of the possessive complex with the following pronoun, rather than with the preceding noun: i. allomorphic interaction with the pronoun, never with the noun; and ii. the existence of the "plural" set as the inflection of several non-plural prepositions.

But the strongest evidence in favor of the view promoted here comes from the interaction between the feminine and possessive suffixes. As (20) shows, the same two sets appear on the feminine base. If the possessed is singular, the feminine suffix is *-at-*; if the possessed is plural, the feminine suffix assumes the form *-ot-*. This is again identical to the Construct State. However, in the N + N construction, the plural number of the non-head is independent of that of the head; with possessive suffixes, in contrast, it seems that the appearance of a plural exponent on the base noun leads to marking the same plural number on a possessive suffix. Indeed, as we saw in the introduction, the plural number of the possessed is marked twice in feminine nouns: once on the base noun and then again as part of the possessive suffix. In the present context, this fact serves first as another illustration of the relative independence of the plural possessive set.

(20) Possessive suffixes for *sus-a* 'mare'

a. possessed singular				
person / num/gen		1	2	3
SG.	ms.	sus-at-**i**	sus-at-**xa**	sus-at-**o**
	fm.		sus-at-**ex**	sus-at-**a**
PL.	ms./fm.	sus-at-**énu**	sus-at-**xem/xen**	sus-at-**am/an**
b. possessed plural				
person / num/gen		1	2	3
SG.	ms.	sus-ot-**aj**	sus-ot-**é-xa**	sus-ot-**av**
	fm.		sus-ot-**áj-ix**	sus-ot-**é-ha**
PL.	ms./fm.	sus-ot-**éj-nu**	sus-ot-**ej-xem/xen**	sus-ot-**ej-hem/en**

Yet this double marking is only true for feminine nouns. This fact is accounted for in the next section.

4.1.2 Analysis

To understand what is surprising about the double marking in (20b), let us now consider alternative, but unattested scenarios. In (21a) we see the attested form, with the plural number of the possessed marked both on the noun and on the possessive suffix. In the ungrammatical, but otherwise expected nouns (21b,c), the plural number of the possessed is exponed only on the noun (21b) or only on the suffix (21c), in which case one expects the singular feminine suffix to appear on the noun. Compare this distribution of exponents to the masculine case, in which plural number is exponed only once, as I have been claiming only on the suffix (21d). If double marking were to apply in the masculine, too, then by the application of the plural VI in (16) above we would expect (21e):

(21) Attested and unattested marking on possessed plurals

	N	N_{num}	N_{num}	Possessor	
a.	sus	**-ot-**	**-ej-**	xem	'your$_{(pl)}$ mares'
b.	*sus	**-ot-**		xem	
c.	*sus	**-at-**	**-ej-**	xem	
d.	sus		**-ej-**	xem	'your$_{(pl)}$ horses'
e.	*sus	**-ej**	**-ej-**	xem	

The third explanandum in the introduction concerned the double marking in the feminine plural, but not in the masculine plural. The illicit form in (21e) is revealing in this sense.

There is a cross-linguistic tendency against adjacent similar markers, a situation commonly referred to as the morphological Obligatory Contour Principle. Many instances of this phenomenon are documented and discussed at length in Nevins (2012). For instance, Nevins reports that the English possessive /-z/ is commonly realized with epenthesis after a base ending with a [s], e.g. *bus's* [bʌs-ɪz], but the same marker is banned from appearing after a plural /-z/, as in *parents'* [pærənt-s], *[pærənt-s-ɪz]. This example also illustrates the common repair to this problem, namely haplology, the omission of one of the two similar exponents.

Back to Modern Hebrew, if we inverse our initial question and ask not why there is double marking in the feminine, but why there is no double marking in the masculine, the morphological OCP and haplology are a clear answer: in fact, at spell-out there *are* two markers in the masculine possessed plural, but one is omitted because the two markers are too similar (indeed, they are identical in this case). This proposal immediately explains the double marking in the feminine possessed plurals (21a): since in this case the exponents are different, there is no OCP violation and no haplology applies.[15]

If so, provided that at spell-out there are two plural exponents, haplology explains why the masculine form ends up carrying only one. But why are there two plural suffixes to begin with?

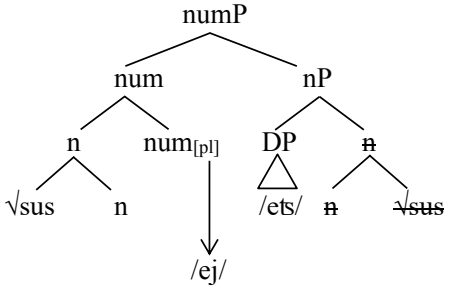
In order to answer this question, we must understand the internal structure of possessive suffixes as well as the structure of nouns carrying such a suffix. To begin with the second

[15] That Modern Hebrew disprefers sequences of jods in consecutive suffixes is apparent elsewhere in the language. For instance, words ending in the suffix sequence *-ij-ut*, such as *medin-ij-ut* 'policy', are expected to be pluralized as ??*medin-ij-uj-ot*. However, speakers prefer to find other ways to pluralize such words (see Bat-El 2009 for data and analysis).

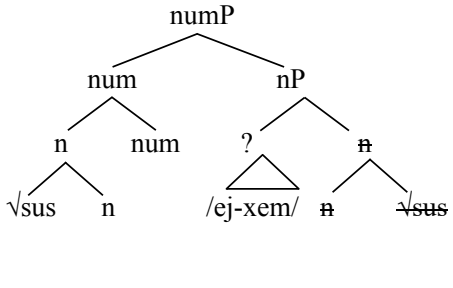
task, I submit that the structure of N + possessive is analogous to the compound structure: just like the modifier noun modifies the head noun in the compound structure in (22a), the possessive suffix modifies the head noun in (22b). In both cases, *n* moves to a position above numP. Above, I argued that sequences such as *-ej-xem* form a cohesive unit; crucially for the present analysis, this view is expressed in (22b) by placing the entirety of this sequence in the modifier position of [spec,nP], rather than distribute it over *num* and [spec,nP]. Because I have not yet discussed the internal structure of the suffix, the label of the constituent in [spec,nP] is not specified.

(22) N + N vs. N + possessive

a. *sus-ej ets* 'wooden horses'



b. *sus-ej-xem* 'your horses'



The analogy between the compound and possessive structures is not hard to argue for. On the semantic side, the relation between the genitive case assigned in the Construct State and possession is clear. On the morphological side, besides the appearance of the underlying /t/ of /at/ discussed above, there are numerous other cases of head allomorphy triggered in the Construct State, which are *also* attested when N carries a possessive suffix. Note that the changes in the stems in bold in (23) cannot be attributed to general phonological processes; they are allomorphic facts about these specific nouns, which must be memorized for these specific lexical items:

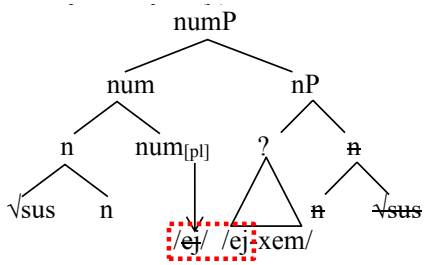
(23) Identical allomorphy of N in Construct State and in N + possessive

	Free State	*Construct State*	*N + possessive suffix*
a.	**brax**-a 'blessing	**birk**-at ha-mazon 'blessing of the food'	**birk**-at-i 'my blessing'
b.	**matar**-a 'goal'	**matr**-at ha-kurs 'goal of the course'	**matr**-at-xem 'your(pl) goal'
c.	**xarad**-a 'anxiety'	**xerd**-at netiʃa 'separation anxiety'	**xerd**-at-i 'my anxiety'

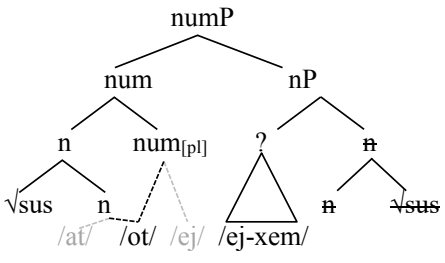
If the analogy in (22) is correct and the structure of N + possessive is indeed like (22b), then the origin and the distribution of double marking is clear. The [plural] feature on the *num* head must be spelled out alongside the plural *-ej-* of the suffix. In the masculine, however, it will be identical to the plural exponent immediately following it, and so it will be omitted (as shown by the barred script and frame in (24a)); in the feminine, because of the portmanteau /-ot/, no haplology occurs (24b).

(24) Double plural marking: origin and distribution through haplology

a. *sus-ej-xem* 'your$_{(pl)}$ horses'



b. *sus-ot-ej-xem* 'your$_{(pl)}$ mares'



As mentioned in footnote 14, haplology will apply not just before *-xem*, but before all other possessive suffixes, because they are all derived from the underlying concatenation of /ej + possessive pronoun/ (or possibly /aj + possessive pronoun/).

The question of double marking is therefore narrowed down to the internal structure of the possessive suffix: why does the plural number of the possessed appear on the possessive suffix at all? I will turn to this question presently. Still, I emphasize that it is a relatively independent question: once one accepts that the *-ej-* in *-ej-xem* is in the same constituent as *-xem*, the double plural marking follows from the need to realize the plural feature on *num*.

First, consider the label of the possessive suffix. It is impossible here to do justice to the literature on possessive constructions. Roehrs (2013) is one reference where structures similar to the ones in this paper are proposed and the relevant references mentioned.[16] In that paper, as in much of the syntactic literature, possessive constructions involve PossP. Such a choice seems unwarranted in the present case. If N + possessive is analogous to N + N, the possessive meaning can emerge in the former as in the latter, i.e. by the mere juxtaposition of two nominal structures. If so, the label of the possessive suffix is a DP, just like the label of the modifier noun in *sus ets*. And if it is indeed a DP, then it must contain the usual nominal layers, i.e. at least numP and nP. This view immediately identifies the source of the exponent *-ej-* in this structure: as elsewhere, it is the realization of a [plural] feature on the *num* head. Moving on to the possessor *-xem*, it is now clear that it cannot be expressing the head noun of the embedded structure, because the *-ej-* in *-ej-xem* refers to the plural of the possessed, not of the possessor *-xem*. But if neither *-ej* nor *-xem* express the head noun of the structure of the suffixed possessive pronouns, what does head it?

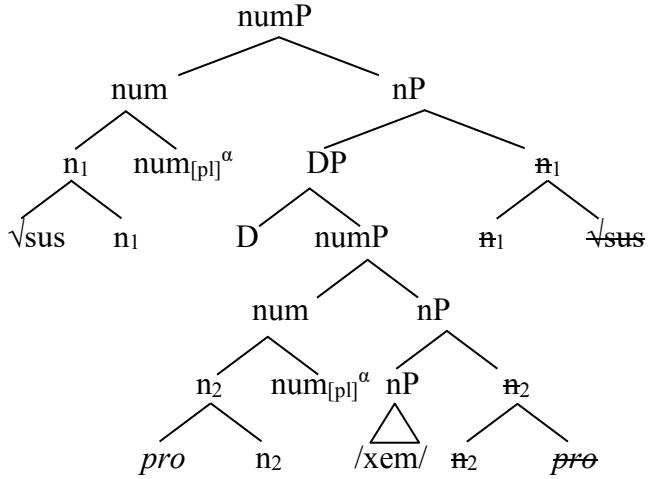
Goldenberg (1995) analyzes possessive inflection in Semitic as involving a co-indexed null pronoun. A form like *sus-i* 'my horse' is regarded as sus_i-X_i-*i*, with X standing for a silent element which carries inflection. Under this view, *sus-i* is the co-indexed juxtaposition of sus_i 'horse' and X_i-*i* '(one which is) of me'. Goldenberg does not specify how the mechanism of co-indexation works.

Below I adopt Goldenberg's view of this construction and adapt it to the analysis developed here. I submit that possessor exponents such as *-i* and *-xem* are situated in the [spec, nP] position of the modifying DP, which is headed by a null *n*. In other words, the root selected by *n* is unexponed; I therefore refer to it as *pro*. To express Goldenberg's notion of co-indexation, I will assume that because *pro* is a structural entity without its own reference, this reference will be inherited from the head noun. Accordingly, its number features will be inherited from those of the head noun through an agreement process, such as feature percolation. This agreement is marked in (25) by the superscript $^{\alpha}$. As is regular in

[16] For a discussion on several aspects of possessive morphology, see Alexiadou et al. (2007: 547–615).

all compound forms, the head noun moves to left-adjoin *num* in both the matrix and the embedded structures (in both n_1 and n_2).[17]

(25) The structure of a plural noun with a 2PL possessive suffix



Consistent with the structures in the previous section, the structure of a plural *feminine* noun is the same as in (25), except that a [gender] feature appears on n_1.

The linear order of morpho-syntactic information in (25) is /sus-PL-*pro*-PL-xem/. Since the pronoun is null, and the two [plural] exponents are non-final, spell-out will insert two adjacent identical exponents: /sus-ej-ej-xem/. Haplology will then apply, and the first /ej/ will be omitted to yield the attested *sus-ej-xem*. In contrast, if (25) had a [gender] feature on n_1, its linearization would be /sus-**GEN**-PL-*pro*-PL-xem/. Accordingly, the first [plural] feature would be spelled out together with the [gender] feature by the portmanteau VI /-ot/, giving *sus-ot-ej-xem*. This sequence does not violate the morphological OCP, and so all exponents are realized.

To summarize, I have argued that the asymmetric double marking in the N + possessive construction – the third explanandum of this paper – is the result of the application of spell-out to the structure of possessive pronouns. This structure agrees with the head noun and therefore includes a plural feature denoting the plural number of that noun. Spell-out results in haplology in the masculine nouns, but not in feminine nouns.

It must be emphasized that the haplology in this case is phonological. It does not erase the first of two identical *features* – or we would expect it to hold in the feminine structure, too. Instead, like the English case mentioned above, it is the omission of one of two phonemically similar exponents. Despite appearances, the fact that the two exponents denote the same plural reference is therefore unimportant. This aspect of the account will be crucial in the analysis of new duals in the next section.

[17] Note again that the structure in (25) is essentially like a CS structure; but the non-head of the N + N compound is a lexical noun and therefore does not inherit reference from the head noun and does not agree with it in number.

I purposely do not explore the structure in (25) any further. As mentioned in the text, the specific formalization of the agreement between possessor and possessed is not crucial to the paper's main concern: given that there is some agreement between the two, haplology follows in the masculine but not in the feminine N + possessive.

4.2 Duals

In this subsection, I will show that the analysis developed above extends to the lexically-marginal, yet revealing domain of new dual morphology. As in the previous subsection, the analysis will follow a more detailed presentation of the phenomenon.

4.2.1 Data old and new

To understand and contextualize what I call "new" duals, it is first necessary to present the duals of the standard language. Historically, Hebrew had a suffix *-ájim* denoting dual number. However, the systematic morphological distinction between plural and dual references was largely lost already in Biblical Hebrew. Dealing with standard Modern Hebrew, Ritter (1995) classifies the items carrying *-ájim* into three groups. The largest group contains items that are pluralized only by *-ájim*, never by *-im* or *-ot* (26a–d). While most of these items denote entities that naturally paired, this is not true of all of them (26d), nor is it true that all such entities carry *-ájim* (e.g. *gab-a, gab-ot* 'eyebrows'). In none of these cases does the plural form necessarily denote 'exactly two'. The second group contains nouns denoting inherently bipartite entities. These nouns are usually *pluralia tantum* (26e, f). The third group is composed of nouns whose paradigms contrast plural and dual forms (26g, h). Only on such nominal bases, which principally denote duration, does the *-ájim* suffix denote '*exactly* two'.[18] All of the items in (26) trigger plural agreement, a fact I will return to below.

(26) Duals in the standard language, "old" duals

Group		*Singular*	*Plural/dual*	*Gloss*	
I	a.	ʃad	ʃad-ájim	'breast'	*ʃad-im
	b.	náʔal	naʔal-ájim	'shoe'	*neʔal-im
	c.	kanaf	knaf-ájim	'wing'	*kanf-im
	d.	ʃen	ʃin-ájim	'tooth'	*ʃen-im
II	e.	–	miʃkaf-ájim	'(eye-)glasses'	
	f.	–	melkax-ájim	'forceps'	
III	g.	xódeʃ	xodaʃ-im, xodʃ-ájim	'month'	
	h.	ʃaʔ-a	ʃaʔ-ot, ʃaʔ-at-ájim	'hour'	

The suffix *-ájim* in (26) appears to be attached to the singular stem. This fact is especially noticeable in the few feminine nouns that carry a dual suffix, such as *ʃaʔ-**a**t-ájim* 'two hours': it is not **ʃaʔ-**o**t-ájim*. So much for the duals inherited from earlier stages of the language or modeled on these stages by the Hebrew Language Academy.

Very few dual nouns have been coined since Modern Hebrew has acquired a substantial community of native speakers. Today, group I is completely closed: there are no new items whose plurals are formed exclusively with *-ajim*. A few new items have joined group II (27a): although a corresponding, semantically-related unsuffixed form may exist, these new nouns with *-ajim* are *pluralia tantum* nouns with lexicalized meanings.

Beyond these items, dual morphology is only marginally productive today: new dual formations appear mostly in a playful register, with *-ájim* functioning more like a paucative

[18] For a survey of *-ájim* in Modern Hebrew see Schwarzwald (2002). The suffix is in fact pronounced as disyllabic [á.im], because /j/ disappears before /i/ (the sequence [ji] is never found in Modern Hebrew). As we will see, the view of [áim] as underlyingly /ajim/ makes correct predictions that are not made when assuming a UR /aim/.

marker, similar to English 'a couple' (27b). These can be classified on a par with group III, since their number marking is compositionally added to the meaning of the base: *asor-ajim* can only mean 'a couple of decades'. Surprisingly, all new duals in (27) behave uniformly *unlike* old duals in that they take the feminine *plural* base (with *-ot-*). As in the case of possessive suffixes, this behavior is asymmetric: new masculine duals take the singular base.

(27) New duals

	Singular		*Dual*	
a.	ofan	'wheel'	ofan-ájim	'bicycle, lit. two wheels'
	nekud-a	'point'	nekud-**ot**-ájim	'colon, lit. two points'
	kom-a	'story, floor'	kom-**ot**-ájim	'two-story (e.g. bed)'
b.	asor	'decade'	asor-ájim	'a couple of decades'
	ʃniy-a	'second'	ʃniy-**ot**-áijm	'a second or two'
	stir-a	'slap'	stir-**ot**-ájim	'a couple of slaps'

The productive suffixation of *-ajim* to the plural base cannot have come about by applying a rule inherited from the standard language, where this suffix appears on the singular base. It can therefore only be regarded as reflecting a natural linguistic phenomenon (as opposed to some arbitrary generalization or the result of intervention from language-regulating institutions).[19] Interestingly, this aspect of new duals has never been motivated or explained. As we will now see, it can be analyzed much in the same vein as the double marking in N + possessive suffix.

4.2.2 Analysis

Let us begin the analysis by examining the new dual formations in the context of agreement. As mentioned, the dual suffix triggers plural agreement on agreeing categories (in MH adjectives, verbs, demonstratives), as illustrated for adjectives in (28). Two additional aspects of the inflection in (28) are important to our analysis. First, dual number is never inflectional: it never appears on any agreeing category. Second, the gender of the original noun is preserved in the agreement: feminine new duals not only include a feminine plural marker, they also trigger feminine plural agreement.

(28) Agreement triggered by a dual noun

a. asor-ájim tov-im, *tov-ájim/-a/-ø
decade-DUAL good-PL
'a good couple of decades'

b. stir-ot-ájim tov-ot, *tov-ot-ájim/-ájim/-im/-a/-ø
slap-FM.PL-DUAL good-FM.PL
'a good couple of slaps'

Ritter (1995) provides a structure for the old duals of group III which involves the *num* head carrying the features [dual] and [plural]. The former is exponed by *-áj-*, the latter unsurprisingly by *-im*, and together they are realized [áim]. Because of the triggering of plural agreement and the consistent appearance of *-im* in the dual suffix, I will adopt Ritter's (1995) view of the complexity of the suffix *áj-im*. However, I do not agree with

[19] The Academy for the Hebrew Language has tried to uproot these deviant forms, but as usual in such cases, the logic of the spoken language prevails over imposed rules. Accordingly, speakers' choice of the feminine plural base can also be advanced as evidence for the productivity of dual morphology, marginal as it may be.

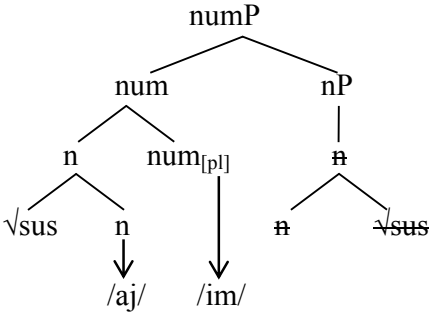
the placement of the [dual] feature in *num*: if [dual] and [plural] were able to co-exist on *num*, one would expect dual agreement in adjectives and verbs in this case. Yet as we saw there is agreement only in gender and sg/pl number. Moreover, if group III nouns are dual by virtue of carrying a [dual] feature on *num*, and that dual feature is realized by *-aj-*, then why is [plural] present on *num* at all? [20,21]

Another reason to reject this view, at least for new duals, is that it cannot derive the realizational facts. Consider the sequence of features $n_{[gender]} > num_{\{dual,plural\}}$. If /aj/ and /im/ expone [dual] and [plural] respectively on the *num* head, the feature [gender] is predicted to be exponed separately from the feature [plural] as /at/, and we expect **susatáim*. Alternatively, the [gender] and [plural] features can be exponed jointly as /ot/, in which case we do not expect /im/ to be inserted and wrongly predict **susotaj*.

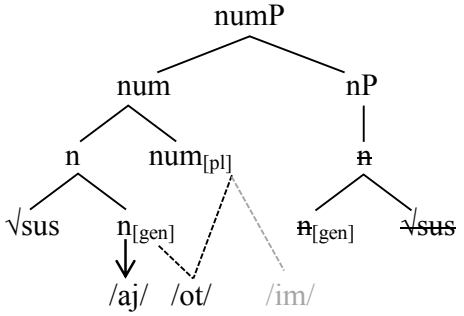
Another option is to view *-aj-* as a realization of the *nominal* head in the context of [plural], as represented in (29a). The masculine form is correctly predicted to be *susájim*. However, this view also predicts wrongly for the feminine form *susotájim*, which is expected to be **sus-aj-ot* (29b). In addition, *-aj-* in (29) heads the noun. Heads are expected to impose their gender features. Whatever the gender feature of *-aj-* (it would probably be masculine, since it takes the suffix *-im*), agreement in gender is always with the base noun. If *-aj-* were the head of the noun, one would expect the same agreement in both masculine and feminine bases.

(29) New duals cannot be derived if *-aj-* realizes *n*

a. [sus-a-im] 'a couple of horses'



b. *[sus-aj-ot]



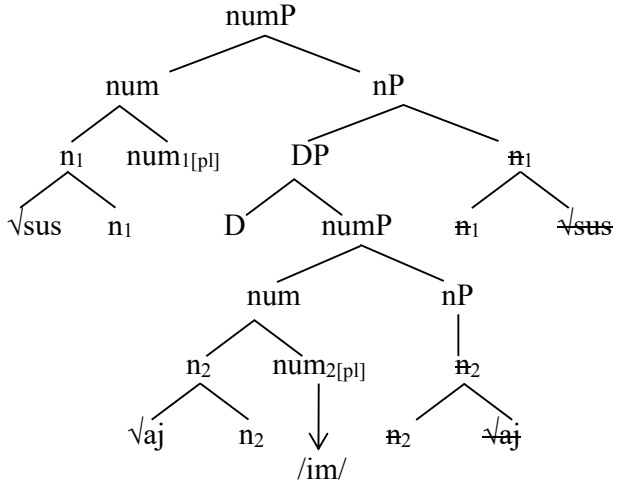
If so, *-aj-* cannot correspond to a [dual] feature either on *num* or on *n*. But how can an exponent end up suffixed to a noun without realizing either of these and without heading that noun? Incidentally, this was exactly the case in possessive suffixes. These suffixes were positioned under a DP in [spec, nP], just like modifiers in compounds. I submit that this is the position of dual *-aj-*, too. As I will now show, this proposal can derive the attested patterns.

Unlike possessor suffixes, which were headed by *pro*, in the new dual construction *-aj-* is the head of its own structure. In other words, as presented in (30), *-aj-* is a root which stands at the base of a nominal DP structure, situated under [spec, nP].

[20] In her analysis, which is the only existing analysis of old duals that I know of, Ritter assumes that word formation can occur in two loci: the lexicon and syntax. Thus, the same affix can either be inserted lexically with its stem (lexical word formation) or realize a feature on a terminal nodes (syntactic word formation). Besides this claim, which in my opinion is a drawback, Ritter's analysis is difficult to extend to new duals, because it considers there to be only one plural feature in the structure of dual. If plural number is exponed by *-ot-*, then it is unclear what is exponed by *-im* in *-ot-aj-im* (or vice versa).

[21] Lack of dual agreement can be treated by assuming markedness-targeting impoverishment on adjectives and verbs. Numerous cases of impoverishment of dual in favor of the plural are presented in Nevins (2011b). Yet for Modern Hebrew such a solution seems too ad-hoc: unlike the cases Nevins surveys, where dual agreement fails to arise in a specific morphological configuration, there is *never any* dual agreement in Modern Hebrew.

(30) The structure of a dual masculine noun as a construct state



The structure in (30) depicts *-áj-* as analogous to a modifier *noun*, rather than to a derivational or an inflectional suffix. In other words, *-áj-* in *sus-áj-im* 'a couple of horses' is analogous to *ets* in *sus ets* 'wooden horse'. If this analogy is correct – that is, if *-áj-* is indeed a noun – then a reason for it being exceptionlessly accompanied by *-im* can now be provided: *-áj-* is not only a noun, it is a *pluralia tantum*. Just like any other *pluralia tantum* noun, e.g. *nisu?-im* 'marriage', it can never appear without a plural suffix, here *-im*.[22] In addition, since this analysis does not situate a [dual] feature on *num*, it does not suffer from the formal incompatibility of [dual] and [plural] in Ritter's analysis of group III. Instead, the dual meaning of *-ájim* is of a lexical nature, like that of derivational suffixes: *-áj-* simply means 'a couple'. It does not carry any formal dual feature any more than the root √COUPLE does in English. Accordingly, another advantage of this view is that the absence of [dual] agreement in MH becomes irrelevant – there is never any *formal* feature [dual] to agree with.

Yet even if there was such a feature on *-áj-*, note that the present account predicts its irrelevance for any type of agreement. Indeed, the positioning of *-áj-* as a modifier explains the lack of number *or* gender agreement, because modifiers are not expected to trigger agreement. As a modifier, *-aj-* cannot impose its gender or number features on any target any more than another *pluralia tantum* like *nisu?-im* is expected to do so in modifier position. Indeed, a compound like *jo?éts-et nisu?-im* '(female) marriage counselor' is feminine singular because its head *jo?éts-**et*** 'counselor-F' is feminine singular; the masculine gender and plural number of the modifier *nisu?-im* are irrelevant for agreement.

Finally, this proposal makes correct predictions with respect to exponence. As we saw, it is a fact of the language (rather than a claim here) that all dual nouns productively trigger plural agreement. If the structure in (30) is correct, this agreement cannot be triggered by the feature realized as *-im*, because this feature is found on the *num* head of the *modifier*. Indeed, if *sus* is the head noun in (30), number agreement should be triggered by a feature on the higher *num* head (num_1 in (30)). I propose therefore that this matrix *num* head carries a feature [plural], as presented in (30). In (31), the column labeled "features" provides the predicted linear order of features to be spelled out in the masculine and feminine cases. In the "spell out" column we see that this linearization provides the correct result for the feminine noun (31b): the suffix /-ot/ realizes both [gender] and the adjacent [plural] (in bold), and is then followed by /-aj-im/. In the spell-out of the masculine

[22] How exactly *pluralia tantum* nouns may be modeled while still having the plural exponent realize a plural feature is a separate question. It is dealt with, for instance, in Arregi and Nevins (2014).

noun, /-ej/ is linearized before /-aj-im/ (31a). But we know that the surface form only has [áim]. In other words, exactly like in the possessive case, the expected *-ej-* does not make it to the surface form.

(31) Expected linearizations

		features	*spell out*
a.	*masculine noun with dual suffix*	/sus > PL > aj > PL/	/sus-**ej-aj**-im/
b.	*feminine noun with dual suffix*	/sus > **GEN** > PL > aj > PL/	/sus-ot-aj-im/

The reason for the omission of /-ej-/ can now be understood easily. Just like the first *-ej-* in the possessed plural masculine noun in (22a) above, the *-ej-* in (31a) precedes a very similar /Vj/ marker (both are in bold in (31a)). I submit that as in the /-ej-ej/ case, haplology applies and the masculine plural is omitted. As I have stressed at the end of section 4.1.2, the haplology is phonological, and therefore independent of the meaning of the suffixes. The fact that *-áj-* does not mark plural is therefore irrelevant for the application of haplology.[23]

An additional advantage of the OCP-based analysis concerns the ungrammaticality of the Construct State of new duals (also shared by the compositional old duals of group III). While the new dual *dak-ot-áj-im* 'two minutes' is perfectly acceptable, such nouns cannot appear in the Construct State: some other construction must be used to express 'two minutes of X'. This ungrammaticality is in fact predicted by the present view. Under the generalizations made in this paper, the form will have to be /dak-ot-**ej-ej** X/, again with an OCP violation. Since the syntactic construction is different from that of N + dual, one may assume that the solution is different: rather than haplological deletion, here the OCP violation leads to ineffability, much like the cases discussed in Bat-El (2009), mentioned here in ft. 15.

The fourth explanandum can now be returned to: why is there double plural marking in new dual feminine nouns, but not in masculine nouns? In the case of duals, the exponent for plural number of the base noun (the first [pl] in (31)) is inserted only once. But in the masculine dual, it is exponed as *-ej-*, and so gives rise to an OCP violation with the dual marker *-áj-*. This results in the haplological deletion of this plural exponent. In contrast, the feminine dual structure involves a plural exponent *-ot-*, which does not create an OCP problem before *-áj-*.

To conclude, the patterns of realization are correctly predicted based on the assumption that *-ájim* is a modifier noun. The analysis also predicts the insignificance of *-ájim* for agreement, the compatibility of *-áj-* and *-im* in the dual and the absence of compositional Construct State duals.[24]

[23] As anticipated in ft. 19, for the analysis to work, the underlying form of the dual suffix must be /aj/, rather than the /a/ that the phonetic realization [áim] might suggest. If it were /a/, no haplology would be expected.

Also recall from ft. 14 that it is possible to argue that the underlying form of the plural suffix is /aj/ and not /ej/. Under that view, the dual and plural suffixes are not similar but identical, as in the case of N + possessive, and there is all the more reason for haplology.

[24] The analogy drawn between the new dual suffix and modifier nouns in compounds cannot be complete. Consider the following three differences between regular nouns and *-ájim*. First, in a regular N + N compound the definite marker can appear on the modifier noun, e.g. *sus* ***ha-ets*** 'the wooden horse', whereas it can only appear on the head N in the dual construction: ***ha-****sus-ajim* 'the couple of horses', **sus ha-ájim*. Second, all nouns appearing as modifiers can also appear outside of the modifier position; but *-ájim* may never appear in isolation. Finally, N + N compounds freely appear in the singular or plural: the matrix *num* head (num_1 in (30)) may or may not carry a [plural] feature. In the present analysis of the dual construc-

5 Concluding remarks

In this paper, I proposed an analysis of four asymmetries in the plural morphology of Modern Hebrew. The first two asymmetries concerned gender-related number allomorphy. They were i) the mere fact that masculine and feminine nouns have different plurals, and ii) the State allomorphy of masculine plural exponents as opposed to the stability of the feminine plural across nominal States. The analysis of the feminine plural built on the interpretation of portmanteau morphemes in Svenonius (2016), and the masculine State allomorphy was claimed to be triggered by the edge of the phonological word. These two asymmetries were more *formalized* than they were explained: they were merely stated in the form of rules of realizations, "Vocabulary Items" as they are called in Distributed Morphology. Yet this formalization set the stage for the understanding of the third and fourth asymmetries between masculine and feminine plural exponents in N + possessive and new duals.

In the analyses of these asymmetries, I showed that it is the absence of the plural exponent on masculine nouns that must be explained, rather than its presence in feminine nouns. I claimed that the structures of these two complex constructions are analogous to the structure of compounds, in that they involve two DPs: a head and its modifier. Accordingly, not one but two *num* projections are implied. As a consequence, plural number is exponed twice. Based on the VI's devised in the preliminary analysis, exponing plural number twice leads to a morphological OCP violation in the masculine noun, which is resolved at spell-out by deleting the first of two overly similar exponents. No violation arises in the case of feminine nouns.

Of the entire analysis in this paper, the structure proposed for the new dual construction is the most unorthodox. It depicts what is usually considered to be a number suffix as a root heading a nominal complex. Nevertheless, the analysis carries advantages in the realms of agreement and feature-exponent matching, besides the correct predictions it makes with respect to plural exponence. Further research might ask whether the proposal can be extended to old duals, which this paper could not address.

In the analysis of N + possessive, I proposed – in line with Goldenberg's (1995) analysis of possession – that the possessive marking is constructed on top of a null pronoun, whose structure agrees with that of the matrix noun. In the context of that proposal, I would like to return in these final lines to the analytic issue of the representation of gender. As explained in (11) above, gender is commonly considered to be a feature on the nominal head; yet there is a competing account, based on the unpredictability of gender in inanimate nouns, which regards gender as carried by a root, in the Modern Hebrew case √at. All other things being equal, if gender were a simple feature on *n*, one would expect it to appear also on the agreeing structure headed by *pro*. We know that this cannot be true, because the possessive complex always carries *-ej-* as the exponent of the possessed plural, never *-ot-*. This fact might therefore serve as evidence for the opposing view, that of gender as carried by a "root": since [gen] is not carried by *n*, it will not appear on the modifying *n* head by agreement. However, the elaboration of such a proposal must be anchored in a wider discussion of gender marking and agreement in Modern Hebrew.

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tion, when *-ájim* modifies a noun, that noun always triggers plural number agreement: its *num* head must always bear a [plural] feature.

The first two issues can be resolved together by lexically marking the root *-áj* as prosodically-dependent (although how exactly this can be done is an issue for a separate paper). Such marking would express the fact that *-ájim* cannot stand alone, and since the definite *ha* is itself prosodically dependent, a sequence *ha-ájim* does not satisfy the prosodic requirements of either *ha-* or *-áj*. The obligatory plural agreement, in turn, is in fact expected on semantic grounds. Recall that the meaning of the modifier *-ájim* is 'a couple of'; just like in English one cannot say **a couple of horse*, the meaning of the new dual formation requires the modified noun to carry a plural feature.

Let me conclude on a more general note. This paper showed that by considering the syntactic structures that complex words realize, one may understand several aspects of exponence, such as multiple exponence, exponence asymmetries, and absent agreement patterns. Cases of absent exponence are commonly treated in Distributed Morphology with the unconstrained tool of Impoverishment (Halle 1997), which does little more than formalize the issue and assert that in a certain environment, a certain feature will not be realized. Instead, this paper gave principled reasons for absent exponence, such as syntactic structure (for the lack of agreement in new duals) and phonology-based haplology (for the asymmetry in plural exponence). In doing so, the paper calls for more sophisticated treatments of absent exponence, and specifically for more attention to phonological form.

Abbreviations

F = feminine, M = masculine, SG = singular, PL = plural, POSS = possesive

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Competing Interests

The author has no competing interests to declare.

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