Gender Neutralization in Hebrew
The Case of the Numerals in Colloquial Hebrew

Einat Gonen*
Tel Aviv University, Tel Aviv, Israel
goneneinat@gmail.com

Doron Rubinstein
The Academy of the Hebrew Language, Jerusalem, Israel
doron.rubinstein@gmail.com

Abstract

Classical Hebrew, as well as Modern Hebrew, distinguishes between the genders of nouns, and every noun, whether or not it is animate, is characterized as masculine or feminine. However in colloquial Modern Hebrew we witness a process of neutralization. In this paper we address one aspect of gender neutralization in Hebrew: the case of the numerals in colloquial Hebrew. The use of numerals in spoken Modern Hebrew is varied, and many speakers do not regularly distinguish numerals according to the grammatical gender of the modified noun, but rather use the unmarked 'neutral' form of the numeral, which in Hebrew is typically the feminine form. The object of this paper is to study gender agreement between Modern Hebrew numerals and the nouns they modify in a corpus of casual spoken Hebrew discourse. Previous studies have argued, within a variety of methodologies and frameworks, for a gradual ongoing neutralization of the gender distinction of numerals in this environment. In our research, we will explore the conditions and the scope of this neutralization. This study is based on the collection of recordings in the CoSIH "Corpus of Spoken Israeli Hebrew", and it analyzes the various usages of the numerals in this corpus. It presents the scope and nature of the neutralization process in colloquial Hebrew and shows that although there is a bias towards neutralization, this bias is not absolute and depends on particular circumstances.

Keywords

1   Agreement Neutralization in Hebrew

1.1   *Agreement in Hebrew*
The Hebrew language distinguishes between the genders of nouns, and every noun, whether or not it is animate, is genderized as masculine or feminine. The grammatical gender of the noun determines the inflection of its modifiers, and thus verbs, adjectives, and demonstratives are inflected in agreement with the gender of the noun. For example:

(1)   a. *sefer   katan*
          book.SM small.SM
          'a small book'

      b. *maxberet   ktana*
          notebook.SF small.SF
          'a small notebook'

(2)   a. *ha-sefer   ha-ze   avad*
          the-book.SM this.SM lost.SM
          'This book was lost'.

      b. *ha-maxberet   ha-zot avda*
          the-notebook.SF this.SF lost.SF
          'This notebook was lost'.

As can be seen in the examples, in Hebrew the masculine form is the unmarked, basic form, while the feminine is generally indicated by the suffix /a/ or, less commonly, /t/.

   The common plural form for masculine nouns is formed by the addition of the suffix /im/, while the feminine plural form is formed by the addition of the suffix /ot/:

(3)   a. *jeladim jafim*
          boy.PM beautiful.PM
          'beautiful boys'

b. *jeladot jafot*
  girl.PF beautiful.PF
  'beautiful girls'

This rule has a few hundred exceptions wherein a feminine noun receives the suffix /im/ when pluralized, or a masculine noun receives the suffix /ot/:

(4) a. *aronot gdolim nivnim*
       closet.PM big.PM built.PM
       'Big closets are built'.

  b. *avanim gdolot tsvu'ot*
     stone.PF big.PF painted.PF
     'Big stones are painted'.

1.2 *Agreement Neutralization in Modern Hebrew*

Agreement neutralization in colloquial Hebrew has been examined in several studies. It was especially examined in specific syntactic structures.

Meir (2005) creates a linkage between gender neutralization in the numeral system and gender/number neutralization in predicate-initial constructions, as mentioned in Berman (1992: 15):

(5) *oti macxik   dvarim   pratijim*
     me makes.laugh.SM thing.PM private.PM
     'Private things make me laugh'.

It is clear that this marked construction in which the predicate precedes the subject causes neutralization (as well as other examples such as *haya li mesiba* 'I had a party' and *ko'ev li ha-beten* 'my stomach aches').

Ziv (1976) examined neutralization processes as part of an ongoing change in progress in colloquial Hebrew. She claims that certain constructions in Modern Hebrew are currently undergoing grammatical reanalysis such that the term that functions as subject in the normative literary style is losing some of its subject properties in the colloquial dialect.

Kuzar (2002) analyzes simple impersonal construction in spoken Hebrew. The construction he presents is headed by an indeclinable predicate or an invariable predicate in the third person, masculine, singular form.

(6) *davka   matim   le-xa   ha-madim*
     actually suits.SM to-you.SM the-uniform.PM
     'The uniform actually suits you'.

(7) *me'anyen   ha-katava   ha-zot*
     interesting.SM the-report.SF this.SF
     'This report is interesting'.
            ibid.: 347

Melnik (2014) investigates predicate-initial existential and possessive clauses as they are used in spoken Hebrew discourse. She conducts an empirical corpus-based study of the usage of two patterns—prescriptive and colloquial—in order to assess the degree of entrenchment of the colloquial construction in the language. Her data show that the impersonal structure, in which there is no agreement between the verb and the subject in this type of sentences, becomes more and more common in colloquial Hebrew.

Levon (2012) suggests a broader theory regarding the blurring of the distinction between grammatical genders, especially in the plural form:

(8) *aval hem   lo   merutsot*
     but they.PM NEG satisfied.PF
     'But they are not satisfied'.

Levon (2012: 52–54) argues that there exists a regular pattern of gender morphology variation in the relevant Hebrew contexts that is disrupted by plural pronominals. Moreover, in his opinion, plural pronominal elements in Modern Hebrew are already neutralized with respect to gender, and that the occasional appearance of feminine plural pronouns/clitics is the product of external prescriptive pressure to use these forms. Levon argues that Modern Hebrew grammar is fundamentally lacking distinctions between grammatical genders in many morphological categories, and he attributes the appearance of prescriptive numeral forms to extra-linguistic pressures. He proposes that Hebrew plural pronominals have already undergone morphological change and are thus already fully neutralized with respect to gender. What this means is that regular allomorphic variation is impossible for plural pronouns/clitics since only one gender neutralized allomorph exists in the grammar. This case is due to a process of gender neutralization in the plural pronominal paradigm that took place in Rabbinic Hebrew and was transmitted to the Hebrew of today. While feminine plural pronominals occasionally do appear, Levon suggests that these forms are the result of prescriptive pressure to adhere to a Biblical Hebrew model of the language, and are otherwise unrelated to a stable process of variation in which other constituent types participate.

Normative Hebrew preserves also two sets of numerals: masculine and feminine (see explanation *infra*). In this paper we will investigate the scope and nature of gender neutralization in **colloquial** Hebrew numerals.

2 Gender Neutralization in Numerals

2.1 Numerals in Classical and Modern Hebrew

In prescriptive Modern Hebrew, numerals also have to be inflected in agreement with the grammatical gender of the nouns:[1]

(9) a. *šaloš   jeladot*
     three.F girl.PF

    b. *šeš   smalot*
     six.F dress.PF

(10) a. *šloša   jeladim*
     three.M boy.PM

    b. *šiša   susim*
     six.M horse.PM[2]

Only for some cardinal numbers (e.g. *esrim* twenty.F/M, *šlošim* thirty.F/M, *me'a* hundred.F/M) the masculine and feminine forms are not distinguished, and we mark their agreement form neither as M or F, but as F/M.

The inversion of masculine and feminine suffixes in numerals (i.e. zero suffix for F and *-a* for M) has ancient roots, it is characteristic of classical Hebrew as well as other Semitic languages (Hetzron, 1967: 180). We return to this point below, but in this article will not discuss the diachronic aspects of the issue; rather, it will focus on the use of numerals in Modern Hebrew.

2.2 Gender Neutralization in the Number System

2.2.1 Factual Description

It is well known that the use of numerals in spoken Modern Hebrew is irregular, and many speakers do not regularly distinguish numerals according to the grammatical gender of the modified noun.[3]

---

1 For a full detailed description of the normative system of the numerals see for example Kautzsch, 1910, § 97, and recently Shivtiel, 2015; Rendsburg, 2015, section 5. Ordinal numbers will not be discussed here, since they do not pose a grammatical problem to speakers (they are adjectives that follow the noun), and their behavior is quite regular (See Ravid, 1995: 83).

2 For expansion on this explanation and examples of the general use of Hebrew male and female patterns, see Ravid, 1995 and Meir, 2008.

3 See for example Schwarzwald, 2015. In ancient Hebrew, there was a similar subversion of the

This phenomenon is well known in other spoken Semitic languages, as Zewi (2006) describes. A description of counting methods requires a discussion at the level of abstraction which the numeral requires. It is an issue of perception which is fertile ground for theoretical and practical psycho-linguistic research, often linked to the arithmetic development of children (e.g. Resnick, 1983; Radford, 1988; Carey, 2001; Barth, Kanwisher and Spelke, 2003; Rips, Bloomfield and Asmuth, 2008; Cohen Kadosh, Lammertyn and Izard, 2008, and many more. See also Zadka, 2001: 44 and on). This article will not discuss these psychological and cognitive aspects; rather, it will focus on presenting the common usage in spoken Hebrew.

2.2.2 Emotional Reaction towards Numeral Neutralization

The neutralization of gender agreement in numerals creates negative emotional reaction among prescriptive Hebrew language aficionados. Marco (2008) held interviews with eight senior radio anchorpeople regarding their opinions on the broadcasted language, and they each mentioned numerals as one of the marked characteristics of the language which must be preserved (ibid.: 84 and on). Most of the broadcasters interviewed were of the opinion that inconsistencies in numerals were of the most grating in the language. Hebrew language scholars dealt with the issue of non-prescriptive numeral usage, and they too singled out the gaps between prescriptive grammar and the forms in common usage (Bentolila, 1990; Zadka, 2003; Meir, 2005). Zuckermann even predicted at a lecture in 2010 that within 10–15 years, the Academy of the Hebrew Language will accept the expression *šaloš šekel* 'three.F shekel.SM' instead of the prescriptive *šloša škalim* 'three.M shekel.PM', and will change the rules of prescriptive Hebrew.[4] Shekel, the Israeli currency, is a masculine noun, but it is very common to hear people using the non-derived feminine numeral to express prices, much to the chagrin of educated speakers. Without getting into the probability of this prediction coming true and the Academy actually creating new rules (a development which we are doubtful of), Zuckermann reflects the perception that the genderized distinction in numerals will soon disappear completely from the language.

Biblical Hebrew system, which was generally precise regarding agreement. See for example Sharvit, 1995; Dodi, 2007 (note, however, that in Catalonia, the area upon which Dodi focuses, Hebrew was only used in texts written for the purpose of learning ancient Hebrew during the relevant time period, and thus this was not a development of a living spoken language). We will not extensively deal with this here.

4   The lecture took place in Ra'anana, Israel, on January 14th, 2010.

2.2.3   Previous Research Regarding Gender Neutralization[5]

2.2.3.1   *Neutralization in One Direction—From Masculine to Feminine*

As was shown in example 1, the adjective in Hebrew follows the noun. Thus, the fact that the numeric form comes before the noun, contrary to most Hebrew adjectives, makes it more difficult for the speaker to utilize the grammatical gender distinction in spontaneous speech (Zadka, 2003: 263; Meir, 2005: 35). This difficulty is compounded by the fact that other pronominal quantifiers do not distinguish between the grammatical genders.

The difficulty with normative usage of numerals is commonly attributed to the fact that the morphological notation of the grammatical gender of numerals is the reverse of the gender notation in the rest of the linguistic system (Avinery, 1964: 356, and see other citations in Meir, 2005: 32). The non-derived, unmarked form is used to count feminine nouns, while the derived form is used to count masculine nouns. This phenomenon has been described at length in literature (see for example Kautzsch, 1910: § 97a; Hetzron, 1967: 180, and see a survey in Bolozky and Haydar, 1986).

Schwarzwald (1997: 404) asserts that the changes in the numeric system work in one direction of unifying the system towards the non-derived form in the numbers 3–19. Glinert (1989: 80–81) also refers to the preference for the non-derived feminine form, especially in the form 2, but also in 10, and adds that this use is very common in the numbers between 11 and 19.

Ravid's empirical study (1995) found that the neutralization of numerals is spreading in spoken Hebrew. The study was centered on forty children: twenty fourth grade students, and twenty seventh grade students. The students were asked to read texts with six arithmetic questions at a fourth grade level, with sixteen numerical phrases written in numbers between 3 and 10, each with a noun that was being counted (eight masculine nouns and eight feminine nouns). Each number appeared twice: once before a masculine noun, and once before a feminine noun. Each participant was tested twice, once in a nonspecific situation, wherein he was told that he was needed to help to compose an arithmetic test, and again two weeks later in a situation that was geared towards correct pronunciation, wherein he was told explicitly that he was being tested on the proper use of Hebrew numerals and received the hint that he should distinguish between reading 5 boys and 5 girls. In the reading that was not geared towards linguistic precision, there was almost no difference between the fourth and seventh grade students, and the students almost always used the non-derived feminine form, regardless of the gender

---

5   See also Meir's survey (2015, sections 2 and 3).

of the noun that was being counted. In the reading that was aimed at linguistic precision, there was greater use of the derived masculine form, especially amongst the seventh grade students, but also when the noun being counted was feminine (a sort of hyper-correction). Ravid holds that it will not be possible to maintain the distinction between masculine and feminine numerals through linguistic education, because while the seventh grade students were aware of the two forms, they did not know how to use them properly (ibid.: 93–95).

2.2.3.2   *Selective Neutralization*

In a different study, Meir (2008) analyzed the use of the compound form of the numeral, through assigning production and judgment tasks (see explanation *infra*). The production test results showed that only two numerals reflected a clear preference for the masculine form regardless of whether the forms were masculine or feminine: 3 (*šlošet*) and 6 (*šešet*). In contrast, the numerals 5, 7, 8, and 9 showed a clear preference for the feminine form, and the numbers 4 and 10 showed a minor preference for the feminine form. In the judgment tests, however, there was a preference for the masculine form in every number except 9, which was used evenly in the masculine and feminine forms. Thus, Meir concluded that production and evaluation processes are subject to different kinds of constraints: in the production process, prosodic constraints play a more important role, while in evaluation processes, functional-morphological constraints are no less important than the prosodic constraints.

2.2.3.3   *Prosodic Explanation for the Neutralization*

Bolozky also analyzed the inflection of numerals in spoken Hebrew, based on his own impressions and in connection with the theory of rhythmic stress which he developed in spoken Hebrew (1982: 282–286, see also his paper with Haydar, 1986). He offers a prosodic explanation of the phenomenon wherein the speaker is motivated to use the non-derived feminine form, where the stress generally comes before the final syllable, in order to prevent a sequence of stressed syllables, as in *arba'á íš* 'four.M man.SM' or *xamišá šékel* 'five.M shekel.SM'.

Meir (2005: 40) disagrees with Bolozky's conclusions. According to her, non-normative phrases with sequences of stressed syllables like *xaméš šékel* 'five.F shekel.SM', *ša'loš méter* 'three.F meter.SM', are very common in the language. She adds that things may have been different in the 1980's, when Bolozky's paper was written.

3   The Study

3.1   *Goals*

Previous studies highlighted the growing strength of neutralization in the numeral system of Modern Hebrew, and most of them were written from a normative point of view that emphasizes the gap between normative Hebrew and the Hebrew currently in use. Other studies presented a description of the "common use" based on intuition or elicitation tests.

The present study is a corpus linguistics study that focuses on a given corpus and reveals the data in its contexts. The study will present for the first time the usage of numerals in Modern Hebrew taken from a spontaneous corpus. These data differ from that elicitated by designed tests. In addition we will describe specific categories in which the neutralization process is expected. These categories will be formed by analyzing the data and finding the common denominator of special usages of neutralized numerals. Exploring new grammatical regularities will enable a deeper understanding of linguistic change in Modern Hebrew and a new evaluation of the scope of the neutralization phenomenon in Modern Hebrew numerals.

3.2   *The Corpus*

The last few decades, and especially the last 20 years, have seen around the world a rapid expansion in the field of corpus linguistics. However, as the field of corpus linguistics evolves and includes different corpora of spoken and written languages, the research of Hebrew corpus linguistics has lagged behind. In the late 1990s, a group of researchers began an initiative to create a corpus of Spoken Hebrew open to all (CoSIH, Corpus for Spoken Israeli Hebrew[6]). The model aimed to include examples of Hebrew speakers in Israel, with spontaneous recordings and supplemental materials, and reach five million words (Hary and Izre'el 2003). The first step was to initiate a pilot study which aimed to examine the possibilities of reaching a wide coverage of the main socio-demographic groups in the population.

In 2009, researchers of Spoken Hebrew formed a research group for ongoing research that was to focus on the investigation of a single spoken language corpus. The members of the group received a basic corpus taken from the CoSIH pilot, that included over three hours of recordings and transcriptions (over 30 thousand words[7]). The collection represents about 40 varied speakers:

---

6   http://humanities.tau.ac.il/~cosih/english/.

7   Including proclitic particles such as [*h*]*a* 'the', *ve* 'and', *mi* 'from'.

men and women, young adults and old, educated and non-educated, and was the database for the team's investigation. We were given full information on the main informants who carried the recording devices. The present study is a product of this research group.

This investigation allows us to contrast the findings revealed in the spontaneous corpus of Spoken Israeli Hebrew with the linguistic perception prevalent in research not based on recorded data. The database contains full biographic details for the nine primary speakers who carried the recorders. However, information about the other interlocutors recorded in conversation with the informants is unknown. Some of the information can be assumed, such as sex and age group, and occasionally some other information as well. In order to improve the possibilities of investigation, a database was established and the various forms in the corpus were manually annotated in essentially lexical and morphological terms: Each word was given a lexicographical entry, and a concordance of all the documented material was prepared. The various verb forms were classified by root, verbal stem and tense, and the possibility of searching by noun derivation pattern was also included. All this created a platform for quantitative work on the corpus.

This collection was the primary source for our quantitative description. However, for our qualitative description, we also used examples taken from additional CoSIH recordings. While not broad, the corpus contains valuable information regarding speakers' use of numerals. Based on this data we will assess the pronunciation of numerals and attempt to describe the rules of numeric neutralization in Modern Hebrew. We will use qualitative and quantitative methods to present the results.

3.3   *The Data*

This study will discuss numerals in which the masculine form is basically derived by suffixation from the feminine form (e.g. *šaloš* 'three.F' *šloša* 'three.M'). Numerals where the masculine form is not suffixally derived from the feminine form (e.g. 1, 2 and 8) will not be discussed here, as well as numbers, such as 20, 30, etc., which do not distinguish masculine and feminine forms. In the corpus that we used, there were 248 numbers, which, based on normative rules, should distinguish between masculine and feminine according to the noun being counted.

83.5 % of the occurrences (207 out of 248) reflected agreement between the numeral and its noun. It is clear that these results do not accurately reflect the essence of the neutralization phenomenon because there is no free interchange between feminine and masculine forms, and forms such as *šloša jeladot* 'three.M girl.PF' did not occur almost at all.[8] Thus, an accurate quantitative description should not include numerals that count feminine nouns or unspecified numerals ('bus number 5'), which would use the non-derived feminine form in speech in any case. After excluding the 140 occurrences of numerals used to count feminine nouns and unspecified numerals, we were left with 108 occurrences which should all have been in the masculine form. In this group, there were 68 (63 %) derived forms (= normative) and 40 (37 %) non-derived forms (= non-normative). These results indicate a majority of normative usage of the derived masculine form, but the frequent use of the non-derived form, which points to a subversion of the classical Hebrew rules, cannot be ignored.

Assessing all of this data as a single result misses linguistic subtleties, and thus we will suggest an in-depth analysis of the different uses, and then we will reassess the scope of neutralization in spoken Hebrew.

3.4   *Discussion: The Unspecified Numeral and Its Boundaries*

3.4.1   The Unspecified Number

In the normative Hebrew language, which has morphological differences between masculine and feminine numerals, the unspecified number possesses a special and distinct status. The unspecified number does not explicitly count masculine or feminine nouns, and the accepted form today (both normative and common) is the non-derived, unmarked form, even when it is used adjacent to masculine nouns, as in: *kav arba* 'bus-line.M four.F', as opposed to *arba'a kavim* 'four.M bus-lines.M', or *bayit mispar arba* 'house.M no. four.F', as opposed to *arba'a batim* 'four.M houses.M' (see Bahat and Ron, 1960: 235; Kor, 1986: 92; and a comprehensive analysis in Zadka, 2003).

However, analysis of the results reveals that the use of the unspecified numeral is much broader and it is possible to find certain cicumstances in which the usage of the feminine neutral form is common. In the following sections we will attempt to distinguish categories that use the unspecified numeral.

---

8 We found reverse switching that does not reflect shortening, in which the masculine form is used to count a feminine noun, in only one utterance: *arba'im u-šnajim ša'ot* 'forty-two.M hour.PF' (OCh).

3.4.2   *pi* 'Multiplied By'

The term *pi* expresses multiplication: *pi šnajim* '*pi* two.M (= twice)'; *pi šloša* '*pi*
three.M (= thrice)'. According to normative grammar, the number following *pi*
should be in the masculine form, based on biblical usage: 'He must acknowl-
edge the son of his unloved wife as the firstborn by giving him a double share
(*pi šnajim*.M) of all he has. That son is the first sign of his father's strength. The
right of the firstborn belongs to him' (Deuteronomy 21:17, and in other places).
The reason for using the masculine is the perception of *pi* as the construct-state
form of *pe* 'mouth', which is masculine (Bendavid and Shay, 1974: 112; Peretz,
1980: 184).

   In our corpus and in the complementary corpus, we found three examples
of the feminine form in spontaneous Hebrew:

(11) *pi štajim* '*pi* two.F (= twice)' (P321[9])

(12) *pi štajim pi šaloš* '*pi* two.F (= twice) *pi* three.F (= thrice)' || (OCh; see also
       table 3 in the appendix)

Crucially, both in scholarly productions in the masculine form, which did not
occur in our corpus but can be found extensively on the internet, and in 'freer'
productions using the feminine form, there is no actual counting.

3.4.3   Indicating Dates

Indicating the day of the month was done through various linguistic forms
since a very early time (See Peretz, 1980: 179–184). In modern normative He-
brew, it is accepted that the day of the month should be indicated with mas-
culine cardinal numerals, as it agrees with the gender of the noun *day* (e.g.
exad be-maj 'one.M May (= May first)', *tiša be-av* 'nine.M of [the Jewish-calendar
month of] Av'), due to the fact that in essence, the day of the month is being
counted. In contrast, the speakers tend to use different alternatives. In our texts,
three different expressions were used: the masculine ordinal number (exam-
ples 13–15); non-derived feminine numbers (the majority of uses; examples 17–
18), and derived, masculine numbers (example 16). We will distinguish between
the numbers 1 through 10, which have an observable ordinal form, and the num-
bers from 11 and upwards where it is not always possible to distinguish between
ordinal and cardinal numbers. Up to 10, only the masculine ordinal numbers
occurred, e.g.:

---

9   The recordings can be found by their numbers on CoSIH website.

(13) from.the-first (*meha-rišon*.M) of July until the-tenth (*ha-asiri*.M) || (Y32).

(14) but I am still on standby on.the-second (*ba-šeni*.M) of August | (Y32).

(15) be there on.the-third (*ba-šliši*.M) || (Y32).

From 11 and upwards, numbers do not all indicate whether they are ordinal or cardinal numbers, and both derived and non-derived forms were documented, e.g.:

(16) the-twenty-third (*esrim ve-šloša*.M) of the month || (C711_1).

(17) A: see | twenty-ninth (*esrim ve-teša*.F) | I have a ticket || on-the-thirtieth (*ba-šlošim*.F/M) I will already be in Thailand ||
    B: and then she arrives in India on the-fifteenth (*xamiša asar*.M) of the month || (Y32)

In the continuation of the conversation, the dates were indicated with the non-derived form:

(18) on.the-fifteenth *ba-xameš esre*.F (Y32).

It seems to us that preferring the non-derived form to the derived form may indicate that this is perceived as the unspecified form, even amongst speakers who regularly distinguish between masculine and feminine numerals.

The assumption that this is the unspecified form and not necessarily the true feminine form is strengthened by the exclusive use of masculine ordinal numbers, as in (13)–(15) above. It seems as though the use of the non-derived form, and not the grammatical gender of the noun, is the real issue at hand, whether the non-derived form is masculine (*šliši* 'third.M') or feminine (*esrim ve-šaloš* '23.F').[10]

---

10   We did not find evidence of the special derivation of the ordinal numbers between 20 and 30 in the corpus, for example *esrim ve-šliši* '23rd', but these uses are recorded in writing and show up in the Google search engine.

3.4.4   Decimals and Percentages

There is prominent use of the non-derived form when discussing decimals:

(19) They told him three (*šaloš*.F) point seven (*ševa*.F) percent to bring it up to me || (OM)[11]

(20) And I exchange it at | four (*arba*.F) point four (*arba*.F) which gives me | (D933, lecturing speech; the context is exchanging shekels to the dollar rate.)

The issue of the decimal is a complicated one, which is connected with the method of counting. Proof of the complexity of the matter can be found in a series of normative discussions held by the Committee for Grammatical Issues of the Academy of the Hebrew Language, and in the 314th General Assembly session (on May 17th, 2010). There are two basic approaches to reading whole and decimal numbers: the first prefers keeping the agreement between the numbers and the object being counted, while the second sees them as technically numeric entities that should be read as unspecified, feminine, numbers (ibid.). In the general assembly, it was decided that when a number includes both whole and decimal numbers, the whole number will agree with the noun counted, and the decimal number will be in the unspecified, feminine, form. This resolution has not yet been published, and the Academy will reconsider it.

It appears that speaking of percentages invites neutralization, although we did not find evidence for it in our corpus,[12] because the noun being counted, *axuz* 'percentage', occurred in the singular only (on counting in the singular, see below).[13]

---

11 It should be noted that the use of non-derived neutral productions when referring to masculine numerals typified this specific speaker's language (5 utterances, as opposed to 11 utterances in the derived form), but this is not an insignificant finding, and it seems to represent the standard use by most speakers.

12 However, Internet search engines retrieved many such uses, and in the name of the cheese derived from its fat percentage, e.g. *gvina teša axuz* 'cheese.SF nine.F percent.SM', the form is especially prevalent.

13 And also *tišim axuz* 'ninety.F/M percent.SM', *esrim axuz* 'twenty.F/M percent.SM' (C612_4), *xamišim axuz hanaxa* 'fifty.F/M percent.SM discount' (X2, C714), as well in the collocation *me'a axuz* 'one-hundred.F/M percent.MS (= OK)' (e.g. OM).

3.4.5   Implied Nouns

When a numeral is counting a noun that isn't explicitly mentioned, even speakers who generally distinguish between the non-derived and derived forms tend to use the non-derived form when referring to masculine nouns.

In the following conversation the two speakers are discussing the dropping value of cars when they are put up for sale, as opposed to when they are bought. From their use of language, it is apparent that while they are counting thousands (masculine) regarding the price, they are actually referring to the Israeli currency, the Shekel, and the following is reflected: if the counted noun is masculine and is explicitly referred to, the numeral will be masculine, however if the noun is not mentioned, the numeral will be feminine despite the fact that it refers to a masculine noun.

(21) A: how much did you lose ||
     B: now |
     A: ten (*eser*.F) /
     B: no || twe- | twelve (*štem esre*.F) || me too || I think about it | I think that when I bought the car | I had eighteen (*šmona esre*)[14] || and I took a loan of another twelve (*šnem asar*.M) thousand (*elef*.SM) shekels || and I went into debt | because the car was thirty-five (*šlošim ve-xamiša*.M) thousand.SM shekel || now I am selling it | the list price is twenty-three (*esrim ve-šaloš*.F) | I don't know if I will be able to sell it for twenty-three (*esrim ve-šaloš*.F) || (Y34).[15]

In a different conversation, the speakers are planning a vacation, and are talking about the number of rooms in the guest house:

(22) A: it seems as though it's twenty-four (*esrim ve-arba'a*.M) roo- | twenty-eight (*esrim ve-šmona*.M) rooms || it's | in terms of size | it's not | it's not small ||
     B: so how many rooms /
     A: here, twenty-six (*esrimve-šeš*.F) | twenty-nine (*esrimve-tiša*.M) rooms (M) || (D142)

Speaker B continues: (we remove the responses of A, which are not important for our purposes)

---

14   The form *šmona esre* combines masculine (*šmona*) and feminine (*esre*) numerals.

15   In the same conversation when the thousands were not mentioned, we also found: let's say that I will sell it for 'twenty-two' (*esrim ve-štajim*.F) || (Y34).

(23) add it up | if you are talking about it || say it is half-board || if if let's | y- s-
      say eighty (*šmonim*.F/M) | we said how much | seventy (*šivim*.F/M) even
      if we said | let's say seventy-five (*šivim ve-xameš*.F) | seventy-five (*šivim
      ve-xamiša*.M) dollar | (D142)

In the next paragraph, the conversants are participating in a 'co-construction'
of the numeral use, in which both jointly construct the full utterance (for
co-construction in Hebrew syntax, see Borochovsky Bar-Aba, 2010: 117–121):[16]

(24) A: how much do I have to give him /
      B: eight (*šmona*.M) shekels (PM)
      A: here is exactly seven (*ševa*.F) (D741_3)

In these examples, we can see the dependence of linguistic variation on a
clear condition: when the counted noun (thousand, dollar, shekel, room) is not
explicitly mentioned, the non-derived, feminine form is used. However, when
the speakers are required to explicitly mention the counted noun, they may use
the normative derived, masculine form.[17]

3.4.6   Common Units of Measurement

Studying the material in the corpus shows a number of examples where the
speakers count units of measurement: units of monetary value, height, dis-
tance, and more. It seems that with these units, the process is not actual count-
ing (as in counting six tomatoes or twenty-three chairs). Rather it is a process
of using a measurement scale to indicate a relative value of the unit of mea-
surement. These indications carry a more obvious abstract value than true
counting.

   Let us look at the following dialogue:

(25) A: she is a meter seventy-four (*šivim ve-ārba*.F) ||
      B: that's above you | no /
      A: I am a meter seventy-seven (*šivim ve-ševa*.F) || a meter seventy-four
         (*šivim ve-ārba*.F) | seventy-three (*šivim ve-šaloš*.F) maybe ||
      B: that's really good || (P423_2)

---

16   Later on speaker A says *šmone* 'eight.F' *šekel* 'shekel.SM', thus he may not distinguish
     between masculine and feminine numerals in general.
17   Although at one point, the derived form was used despite the masculine noun "nights"
     being dropped: *arba'a* 'four.M'.

The numbers in (25) indicate centimeters which are masculine nouns, but the centimeters are not explicitly mentioned, and it may well be that they are unclear in the speaker's consciousness as they are talking about relative heights (possibly relative to the listener's height).

Suggestive evidence is found in the following example:

(26) you see / how Mongolia / one thousand eight hundred and sixty-five (*elef šmona me'ot šišim ve-xameš*.F) || altitude || all of Mongolia is one high plateau || (OCh).

While this specific speaker's speech is partially neutralized in the use of numerals, this example demonstrates that our measurement scale, i.e. the counted unit (meter.M) isn't explicitly mentioned, and even when the speaker feels that he must clarify, he explicates that he is talking about altitude without stating the unit of measurement (see also table 7 in the appendix).

Sometimes unclear units of measurement are used, for example in medical tests. In the following example, speaker C is talking about a medical test that she underwent. This is how the dialogue proceeds:

(27) C: I have twelve (*štem esre*.F) ||
      A: I have twelve (*štem esre*.F) one (*exad*.M) || I beat you || (C711_3).

Later on the first speaker explains:

      twelve is hemoglobin ||.

After checking with professionals, it appears that units of hemoglobin are measured in grams per deciliter (dl). However only professionals know about the exact unit of measurement, and the layman patient has no need for that knowledge: it is a linear scale of measurement which indicates the normal and abnormal ranges. In order to understand if we are healthy, we have no need for expertise in the units of measurement and their meaning.

It is reasonable to assume that in the living language there are other similar uses. Consider, for example, the Richter Scale for measuring the magnitude of earthquakes (for example, an earthquake that measured 4.2 on the Richter Scale): professionals can tell us what the units of measurement are, but mentioning those units is not particularly important for general use, because the important measurement is the relative scale, and not counting the specific units of measurement. Another example relates to expressing grades: grades on tests are expressed in non-derived form (for example *tišim ve-šeš* 'ninety.F/M

six.ꜰ'). It would seem as though this is referring to the number of points (ꜰ), but it is also reasonable that the grade scale of 0–100 refers to a percentage (ᴍ). Either way, it would seem as though there isn't a specific noun being counted here, rather an abstract scale of measurement which combines points and percentages.

3.4.7   The Shekel and Other Forms of Currency
We will begin by presenting the use of shekels and dollars in contexts that allow distinguishing between masculine and feminine. In our corpus, the shekel is counted many times in tens (e.g. 20, 30), hundreds (e.g. 100, 200), and thousands (e.g. 3,000), all of which are not applicable to this study as they bear no distinction between masculine and feminine in Hebrew. When counting currency, there was a distinct bias towards non-normative use of the numeral: from four different speakers, we found four different non-normative uses:

(28) *arba šekel* 'four.ꜰ shekel.sᴍ', (C842);[18] *xamišim ve-arba šekel* 'fifty-four.ꜰ shekel.sᴍ', (C612_2); *me'a ve-eser dolar* 'one hundred and ten.ꜰ dollar.sᴍ' (D142); *eser dolar* 'ten.ꜰ dollar.sᴍ', (C612_4).

We also found five normative uses in the masculine from four speakers:

(29) *šnem asar elef šekel* 'twelve.ᴍ thousand.sᴍ shekel.sᴍ'; *šlošim ve-xamiša elef šekel* 'thirty-five.ᴍ thousand.sᴍ shekel.sᴍ' (Y34, the same speaker; apparently counting thousands, but referring to shekels); *šivim ve-xamiša dolar* 'seventy-five.ᴍ dollar.sᴍ' (D142); *xamiša dolar* 'five.ᴍ dollar.sᴍ' (OCh); *šmona dolar* 'eight.ᴍ dollar.sᴍ' (C612_2).

The use of the non-derived form is very prevalent even when the masculine unit of measurement is explicitly mentioned:

(30) *šmonim ve-šaloš dolar* 'eighty-three.ꜰ dollar.sᴍ' (D142); *šivim ve-xameš dolar* 'seventy-five.ꜰ dollar.sᴍ' (D142, twice); *me'a ve-xameš esre dolar* 'one hundred and fifteen.ꜰ dollar.sᴍ'.

From here we learn that in many forms of currency, both Israeli and foreign, the use of the feminine form is very common, regardless of its grammatical

---

18   The speaker preformed this utterance three times in the same context.

gender (see also table 8 in the appendix). One might guess that the use of the feminine form regarding the shekel was caused by tradition, as until 1980 the local currency was the Israeli Lira, which was feminine, and many speakers had a hard time getting used to counting currency in the masculine. Younger speakers, who were born into the world of the shekel, were influenced by the previous generation, and also had difficulty with counting the coins. However, a broader view of counting in the corpus and earlier testimonies of Modern Hebrew make it seem as though stronger motivation causes the neutralization of the masculine numeral, For example, the use of *štej gruš* 'two.F cents.SM' (Barak and Gadish, 2008: 192), or *xameš esre gruš* 'fifteen.F cents.SM' (Gavrieli, 1966: 66).

3.4.8   On Singular and Plural in the Counting System

In normative Hebrew, it is only acceptable to state the counted noun for the numbers 2–10 in plural: *šloša axuzim* 'three.M percent.PM', *xamiša š[e]kalim* 'five.M shekel.PM', *ševa agorot* 'seven.F cent.PF'. Above 10, the counted noun can be stated in singular or plural. In spoken Hebrew, for nouns that do not represent certain units, most speakers tend to state the counted noun in the plural for all numbers, i.e. from two up, e.g. *arba'im ve-štajim ša'ot* 'forty-two hours' (OCh), *be-šlošim ha-šanim ha-axronot* 'in the past thirty years' (Y313_1), *esrim ve-arba'a xadarim* 'twenty-four rooms' (D142_2).[19] However, in fixed counting units, Modern Hebrew shows the use of the singular in certain phrases. Glinert (1977) lists certain units, such as *iš* 'person', *xajal* 'soldier', *roš* 'head (of cattle)', *axuz* 'percent', *gruš* 'cent', *mark, dolar, meter* and so forth, *liter, kilo, gram, vat* 'watt', *ton, kešer* 'knot', *karat, miljon, miljard* 'billion'. All these nouns end in a masculine suffix, whereas hardly any singular units are found with the feminine suffix.

A review of the forms of the numerals in our corpus strengthens the hypothesis that in a place where the singular form of the unit is used (as in *shekel, meter, kilo*—all of them typically counted, unlike other nouns as *girls, shirts* or *closets*, that apear in varied contexts without counting), there is greater potential for neutralization. In these places, we can also expect a greater use of the non-derived neutral form. The examples above of counting of shekels in the plural strengthen this claim: When the measurement unit is in the plural (*škalim*), the

---

19   But we found singular forms in our corpus in other expressions, which echo parallel expressions in the Bible, e.g. *arba'im šana* 'forty years' (C711_1), *matajim šana* 'two hundred years' (OCh), and in other places; *esrim jom* 'twenty days' (OCD_1); *šišim iš* 'sixty people' (OM).

derived form is used,[20] whereas when the measurement unit is noted in the singular (*šekel*), the non-derived form is used (as in the examples noted above).

3.5   *Scope of Neutralization: Re-evaluating the Data*

3.5.1   Have the Numerals Been Neutralized?

In the preceding sections, we indicated a clear bias towards neutralization in certain categories. These data compel us to re-evaluate the scope of the neutralization phenomenon in Hebrew.

After removing the categories already considered, there remain 55 occurrences of numerals, which should have masculine agreement, have explicitly mentioned counted nouns, are not preceded by *pi*, do not refer to to dates, and do not count currency or other fixed units of measurement. An analysis of the data suggests different explanations and a variety of presentation options. As the method of presenting the data may bias the results, we will show the results in their entirety and offer a few different ways in which the reader may interpret them. Of the 55 occurrences, 46 were in the derived form, i.e. normative, and 9 were in the non-derived form, i.e. non-normative. Thus, normative use was five times greater than non-normative use (see tables 1 and 2 in the appendix).

3.5.2   Influencing Factors: Frequency and Sociolinguistics

It is difficult to assess the significance of the factor of frequency since this is a very complex issue and numerous other factors may play a role in it (Bybee and Hopper, 2001). It is known that in a sound change, frequent nouns are more prone to processes of change, while in morphology, it is the frequent nouns that tend to be more immune to change (ibid.). We have seen many frequent phrases in which the masculine is preserved (e.g. *šloša xodašim* 'three.M month.PM', *arba'a jamim* 'four.M day.PM'), but the non-normative counting of specific measurement units, such as coin units, is very common as well. It is possible that the fact that the non-normative forms are so frequent in those special cases adds to the feeling amongst most speakers that all the rules of numeral use have been seriously subverted.

At any rate, we will generalize cautiously: even in natural speech, especially regarding that of educated informants, the normative masculine form is used frequently, particularly when it does not refer to frequently used units of measurement like shekels, kilometers, centimeters, and the like (see *supra*), and when the counted noun is explicitly mentioned.

---

20   Except when thousands are involved: *šnem asar elef šekel* 'twelve thousand shekels', *šlošim ve-xamiša elef šekel* 'thirty-five thousand shekel' (Y34).

If we analyze the data by the speakers who produced them, we get a similar or perhaps clearer picture: fourteen speakers used this category of derived masculine numerals, three speakers (all around 20 years of age, and all three in the same recording) used only the non-derived form, and one speaker, who was 26 at the time of the recording, used both the non-derived and derived form.

Of the fourteen speakers who only used the derived form for masculine nouns, three were 27 years old or younger. The rest of them were older, or their ages are not known. The tendency to neutralize appears to typify the younger generation, but age cannot be the only indicator, as a similar number of young speakers use the masculine form in their speech. Even though our sample does not allow us to draw a full sociolinguistics analysis, especially because only the main informants who carried the recording device filled in the background questionnaire, it seems to us that speakers' personal profile (i.e. socio-economic status, education, intelligence, cultural background, etc.) is the decisive factor.[21]

Another question is: should we focus on tokens, that is, the number of occurrences in the text, or on types, without discussing the frequency of the forms occurring? What we have presented here is closer to a types analysis, but it should be taken into account that in reality these types are very common, especially those indicating currency.

4 Conclusion

In this article, we addressed the issue of neutralization in Modern Hebrew in a specific aspect of the spoken language: the numerals.

We reviewed the different uses of numerals that appear in the CoSIH corpus. We found that most of the productions indicate the existence of a double set of numeral productions: the normative production of non-neutralized masculine vs. feminine numerals, and alongside it, productions of only a single form, generally the non-derived 'feminine', uncorrelated with the gender of the counted noun.

We also saw how particular categories, such as common units of measurement or the use of numerals without explicitly indicating the counted noun, tend towards the neutral non-derived forms. We noticed that when the counted noun is not explicitly mentioned, the non-derived, feminine form is used. How-

---

21   Cf. Schwarzwald, 2015.

ever, when the speakers are required to explicitly mention the counted noun, they use the normative derived, masculine form. Also, in specific measurement units, especially units that are used in the singular (*šekel*), the non-derived form of the numeral is used.

When we removed these categories from the quantitative sample, it became apparent that the vast majority of forms, and the vast majority of speakers, sustain the classical double system of masculine and feminine form numerals.

These results raise an important question for discussion: does the linguistic data show an active process of neutralization (those who oversee the normative language education in Israel would say 'deterioration'), or is this not the case? A discussion of this issue requires a quantitative analysis of the spoken language today compared to the language that was spoken in the nineteen fifties and sixties, or even earlier. Seeing that there is no comprehensive corpus with recordings of spontaneous, informal speech from that era (Reshef, 2012 [c]: 164), there will probably never be a comprehensive analysis. However, many testimonies support the assumption that even in the 1930s, and certainly later on, there was a double standard: there were those who maintained the distinction between the numerals' gender, and there were those who maintained a single, neutral system (Jabotinsky, 1930; Reshef, 2012 [a, b]; Avinery, 1964; Gavrieli, 1966—and many other sources). This diachronic issue will be discussed in forthcoming research.

References

Avinery, Isaac. 1964. *Yad Ha-Lašon*. Tel Aviv: Izre'el.

Bahat, Ya'acov, and Mordechay Ron. 1960. *Ve-Dayek*. Tel Aviv: Ha-Kibbutz Ha-Meuchad.

Barak, Smadar, and Ronit Gadish. 2008. *Safa Qama: Selections from the Leshonenu La'am Column, Ha'aretz, 1932–1944*. Jerusalem: The Academy of the Hebrew Language.

Barth, Hilary, Nancy Kanwisher, and Elizabeth Spelke. 2003. "The Construction of Large Number Representations in Adults". *Cognition* 86: 201–221.

Bendavid, Abba, and Hadassah Shay. 1974. *Madrix Lašon La-Radio Vela-Televizya*. Jerusalem.

Bentolila, Ya'akov. 1990. "Spoken Hebrew". *Lĕšonénu La'am* 40–41: 266–278.

Berman A., Ruth. 1992. "Child Language and Language Change". In: Rina Ben-Shachar, and Gideon Toury (eds.). *Hebrew—a Living Language 1: Studies on the Language in Social and Cultural Contexts*. Tel Aviv: The Porter Institute for Poetics and Semiotics and Ha-kibbutz Ha-meuchad. 9–22.

Bolozky, Shmuel, and Adnan F. Haydar. 1986. "Colloquial Gender Neutralization in the Numeral Systems of Modern Hebrew and Lebanese Arabic". *Al-'Arabiyya* 19: 19–28.

Bolozky, Shmuel. 1982. "Remarks on Rhythmic Stress in Modern Hebrew". *Journal of Linguistics* 18: 275–289.

Borochovsky Bar-Aba, Esther. 2010. *Issues in Colloquial Hebrew*. Jerusalem: The Bialik Institute.

Bybee, Joan L., and Paul J. Hopper (eds.). 2001. *Frequency and the Emergence of Linguistic Structure*. Amsterdam: John Benjamins Publishing Co.

Carey, Susan. 2001. "Cognitive Foundations of Arithmetic: Evolution and Ontogenisis". *Mind and Language* 16: 37–55.

Cohen Kadosh, Roi, Jan Lammertyn, and Veronique Izard. 2008. "Are Numbers Special? An Overview of Chronometric, Neuroimaging, Developmental and Comparative Studies of Magnitude Representation". *Progress in Neurobiology* 84: 132–147.

Dodi, Amos. 2007. "Similar Linguistic Features in Liturgical Catalonian Medieval and Modern Hebrew". *Hebrew Linguistics*. 60: 55–62.

Gavrieli, Nahum. 1966. *Pe Dover*. Tel Aviv: Otsar Ha-More.

Glinert, Lewis. 1977. *Number Switch: A Singular Feature-Change Rule in Modern Hebrew*. Malibu: Undena Publications.

Glinert, Lewis. 1989. *The Grammar of Modern Hebrew*. Cambridge: Cambridge University Press.

Hary, Benjamin H., and Shlomo Izre'el. 2003. "The Preparatory Model of the Corpus of Spoken Israeli Hebrew (CoSIH)". In: Benjamin H. Hary (ed.). *Corpus Linguistics and Modern Hebrew: Towards the Compilation of the Corpus of Spoken Israeli Hebrew (CoSIH)*. Tel Aviv: Tel Aviv University. 189–219.

Hetzron, Robert. 1967. "Agaw Numerals and Incongruence in Semitic". *Journal of Semitic Studies* 12: 169–197.

Izre'el, Shlomo (ed.). *The Speech Machine as a Language Teacher: Hebrew Spoken Here—Hebrew Voices from Nazi Germany: A Testimony on Spoken Hebrew and Jewish Life in Palestine during the British Mandate*. Tel Aviv: The Haim Rubin Tel Aviv University Press. (= *The Speech Machine*)

Jabotinsky, Ze'ev. 1930. *The Hebrew Pronunciation*. Tel Aviv: Ha-Sefer.

Kautzsch, Emil. 1910. *Gesenius' Hebrew Grammar*. Oxford: Clarendon Press.

Khan, Geoffrey (ed.). 2015. *Encyclopedia of Hebrew Language and Linguistics*. Brill Online. First appeared online: 2013. (= *EHLL*)

Kor, Avshalom. 1986. *Beautiful Hebrew or the Beauty of Hebrew*. Tel Aviv: Sifriyat Ma'ariv/Misrad Ha-bitahon.

Kuzar, Ron. 2002. "The Simple Impersonal Construction in Texts Represented as Colloquial Hebrew". In: Shlomo Izre'el (ed.). *Speaking Hebrew: Studies in the Spoken Language and in Linguistic Variation in Israel*. Tel Aviv: Tel Aviv University. 329–352.

Levon, Erez. 2012. "Gender, Prescriptivism, and language Change: Morphological Variation in Hebrew Animate Reference". *Language Variation and Change* 24: 33–58.

Marco, Aryeh. 2008. *The Language of Advertising in National and Regional Radio Stations*. MA Thesis, Bar-Ilan University.

Meir, Irit. 2005. "The Vulnerability of Gender Marking in Modern Hebrew Numerals". *Hebrew Linguistics* 55: 31–42

Meir, Irit. 2008. "The Role of Prosody in Morphological Change: The Case of Hebrew Bound Numerals". *Language Variation and Change* 20: 41–65.

Meir, Irit. 2015. "Numerals: Modern Hebrew". *EHLL* 2015. ⟨http://referenceworks .brillonline.com/entries/encyclopedia-of-hebrew-language-and-linguistics/ numerals-modern-hebrew-EHLL_COM_00000538⟩

Melnik, Nurit. 2014. "Language Change in Spoken Hebrew: Existence and Possession". *Hebrew Linguistics* 68: 67–82.

Peretz, Yitzhak. 1980. *Ivrit Ka-halaxa*. Tel Aviv: Joseph Srebrek.

Radford, Andrew. 1988. *Transformational Grammar*. Cambridge: Cambridge University Press.

Ravid, Dorit. 1995. "Neutralization of Gender Distinctions in Modern Hebrew Numerals". *Language Variation and Change* 7: 79–100.

Rendsburg, Gary A. 2015. "Morphlogy: Biblical Hebrew". *EHLL*. ⟨http://referenceworks .brillonline.com/entries/encyclopedia-of-hebrew-language-and-linguistics/ morphology-biblical-hebrew-EHLL_COM_00000832⟩

Reshef, Yael. 2012 [a]. "Hebrew Speech Talking Root During the British Mandate Period". In: *The Speech Machine*. 143–162.

Reshef, Yael. 2012 [b]. "The Linguistic Character of Early Spoken Hebrew". In: *The Speech Machine*. 188–211.

Reshef, Yael. 2012 [c]. "Spoken Hebrew at its Inception: Sources of information". In: *The Speech Machine*. 163–187.

Resnick, Lauren. B. 1983. "A Developmental Theory of Number Understanding". In: H.P. Ginsburg (ed.). *The Development of Mathematical Thinking*. New York: Academic Press. 109–151.

Rips, Lance J., Amber Bloomfield and Jennifer Asmuth. 2008. "From Numerical Concepts to Concepts of Number". *Behavioral and Brain Sciences* 31: 623–642.

Schwarzwald, Ora (Rodrigue). 1997. "Language knowledge and linguistic awareness". In: Moshe Bar-Asher (ed.). *Hebrew through the Ages in Memory of Shoshana Bahat*. Jerusalem: The Academy of the Hebrew Language. 399–412.

Schwarzwald, Ora (Rodrigue). 2015. "Modern Hebrew: Language Varieties". *EHLL*. ⟨http: //referenceworks.brillonline.com/entries/encyclopedia-of-hebrew-language-and -linguistics/modern-hebrew-language-varieties-EHLL_COM_00000102⟩

Sharvit, Shimon. 1995. "The cardinal number in Rabbinic Hebrew: The weakening of gender correlation". In: Aron Dotan and Abraham Tal (eds.). *Studies in Hebrew Language in Memory of Eliezer Rubinstein*. Tel Aviv: Tel Aviv University. 49–63.

Shivtiel, Avihai. 2015. "Numerals: Pre-Modern Hebrew". *EHLL*. ⟨http://referenceworks

.brillonline.com/entries/encyclopedia-of-hebrew-language-and-linguistics/
numerals-pre-modern-hebrew-EHLL_COM_00000896⟩

Zadka, Yitzhak. 2001. "Logic—Syntax and Meaning". *Hebrew Linguistics* 49: 35–55.

Zadka, Yitzhak. 2003. "Every Number Has an Identity". In: Yitzhak Shlesinger and Malka Muchnik (eds.). *Studies in Modern Hebrew: On the 30th Anniversary of the Israeli Association of Applied Linguistics*. Jerusalem: Tzivonim. 249–267

Ziv, Yael. 1976. "On the Reanalysis of Grammatical Terms in Hebrew Possessive Constructions". In: P. Cole (ed.). *Studies in Modern Hebrew Syntac and Semantics*. Amsterdam: North-Holland. 129–152.

Zewi, Tamar. 2006. "Gender of Numerals in Several Semitic languages". *Hebrew Linguistics* 57: 89–93.

Appendix

TABLE 1   *Agreement with masculine nouns (section 3.3)*

Expression	Translation	Comments
šloša xodašim	three months	7 occurrences by 6 speakers in 5 recordings
šloša jamim	three days	5 occurrences by 4 speakers in 3 recordings
šloša lelot	three nights	2 occurrences by 2 speakers in the same recording
be-šloša xodašim ha-axronim	in the last three months	
be-šloša xodašim	in three months	
šlo⟨ša⟩ šloša xalakim	th⟨ree⟩ three parts	
šloša susim	three horses	
šloša lelot ve-arba'a jamim	three nights and four days	
šloša šavu'ot	three weeks	
arba'a jamim	four days	5 occurrences by 3 speakers in 2 recordings
arba'a xodašim	four months	3 occurrences by 3 speakers in 3 recordings
arba'a koxavim	four stars	2 occurrences by one speaker in the same recording
le-arba'a lelot	for four nights	
arba'a lelot	four nights	
arba'a sofej šavua	four weekends	
ba-arba'a jamim ha-ba'im	in the next four days	
ba-arba'a jamim ke-ilu	as though in these four days	
šloša lelot ve-arba'a jamim	three nights and four days	
esrim ve-arba'a xada⟨rim⟩	twenty-four roo⟨ms⟩	
xamiša xadarim	five rooms	
šiva jam⟨im⟩	seven da⟨ys⟩	
esrim ve-š⟨iša?⟩ tiša xadarim	twenty-s⟨ix⟩-nine rooms	

Expression	Translation	Comments
asara xodašim	ten months	2 occurrences by one speaker in the same recording
be-šana ve-asara xodašim	by a year and ten months	
asara jamim	ten days	
asara mašgixim	ten supervisors	
ha-asara jamim	these ten days	

TABLE 2   *Non-agreement in masculine nouns (section 3.5.1, 6)*

Expression	Translation	Comments
šaloš švu'ot	three weeks	4 occurrences by 2 speakers in the same recording
šaloš mikrim	three cases	2 occurrences by 2 speakers in the same recording
ha-šaloš švu'ot	the three weeks	
šaloš si'im	three peaks	
ārba tsavim	four turtles	

TABLE 3   *Pi (section 3.4.2)*

Expression	Translation	Comments
pi šaloš	three times	

TABLE 4   *Dates (section 3.4.3)*

Expression	Translation	Comments
ba-esrim ve-šal⟨oš⟩	at the twenty-thi⟨rd⟩	
esrim ve-šloša ba-xodeš	the twenty-third of the month	
ba-esrim ve-teša	at the twenty-ninth	
esrim ve-teša	the twenty-ninth	
ha-esrim ve-teša	the twenty-ninth	

TABLE 4   *Dates* (*section 3.4.3*) (cont.)

Expression	Translation	Comments
esrim ve-teša be-juli	the twenty-ninth of July	
ba-xameš esre	at the fifteenth	2 occurrences by 2 speakers in the same recording
⟨ba-?⟩ xamiša asar	⟨at⟩ the fifteenth	

TABLE 5   *Decimals and Percentages* (*section 3.4.4*)

Expression	Translation	Comments
šaloš nekuda ševa axuz	three point seven percents	

TABLE 6   *Implied Nouns* (*section 3.4.5*)

Expression	Translation	Comments
esrim ve-šaloš ⟨elef šekel⟩	twenty-three ⟨thousand shekels⟩	2 occurrences by one speaker in the same recording
mi-šmonim ve-šaloš ⟨dolar?⟩	from eighty-three ⟨dollars?⟩	
bi-šlošet alafim ⟨dolar⟩	in three thousand ⟨dollars⟩	
arba'at alafim šekel	four thousand shekels	2 occurrences by one speaker in the same recording
arba'a ⟨lelot⟩	four ⟨nights⟩	
ārba ⟨anašim⟩	four ⟨people⟩	
šivim ve-xameš ⟨dolar⟩	seventy-five ⟨dollars⟩	2 occurrences by one speaker in the same recording
ha-xamešet alafim ⟨šekel⟩	the five thousand ⟨shekels⟩	2 occurrences by one speaker in the same recording
šlošim ve-xamiša elef šekel	thirty-five thousand shekels	
esrim ve-šeš ⟨xadarim⟩	twenty six ⟨rooms⟩	
"šiva"	"shiva" (seven days of mourning)	

Expression	Translation	Comments
arbaim ve-ševa ⟨elef šekel⟩	forty-seven ⟨thousand shekels⟩	
arbaim ve-ševa va-xets⟨i elef šekel⟩	forty-seven and a ha⟨lf thousand shekels⟩	
ševa elef ⟨šekel⟩	seven thousand ⟨shekels⟩	
me'a ve-eser ⟨dolar⟩	one hundred and ten ⟨dollars⟩	2 occurrences by 2 speakers in the same recording
šmone me'ot ve-eser ⟨dolar⟩	eight hundred and ten ⟨dollars⟩	
štem esre	Twelve	
šnem asar elef šekel	twelve thousand shekels	
me'a ve-xameš esre ⟨dolar⟩	one hundred and fifteen ⟨dollars⟩	

TABLE 7 *Common units of measurement (section 3.4.6)*

Expression	Translation	Comments
xamiša santimeter	five centimeters	
elef šmona me'ot šišim ve-xameš ⟨meter⟩	one thousand eight hundred sixty-five ⟨metrers⟩	

TABLE 8 *Currencies (section 3.4.7)*

Expression	Translation	Comments
šlo⟨ša⟩ xamiša dolar	th⟨ree⟩ five dollars	
me-ārba šekel	more than four shekels	3 occurrences by one speaker in the same recording
xamišim ve-ārba šekel	fifty-four shekels	
šivim ve-xamiša dolar	seventy-five dollars	
šlo⟨ša⟩ xamiša dolar	th⟨ree⟩ five dollars	
ve-eser dolar	and ten dollars	
me'a ve-eser dolar	one hundred and ten dollars	