Some Oddities of Ancient Hebrew Numeral Syntax*

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Research on numerals in the field of linguistics offers insight that is directly applicable to numerals in Ancient Hebrew. As Cynthia Miller and others have argued,[1] linguistic analysis of Ancient Hebrew is possible and should be carried out, despite certain obstacles—for example, that there are no living speakers of Ancient Hebrew or that we have less data for Ancient Hebrew than for modern languages. The numerals of Ancient Hebrew provide a clear example of how linguistic analysis of a dead language can be fruitful.

In this study, I consider two areas where numerals behave in a seemingly odd manner. First, the cardinal numerals show a wide variety of morpho-syntactic and syntactic features—some numerals are more fully inflected than others, and some take different word order than others. I will demonstrate that this variety stems from the underlying nature of numerals and the resulting way in which they straddle the word classes noun and adjective. Significantly, this is how numerals in all languages behave. Second, some nouns are grammatically plural when quantified by numerals 2–10, but revert to singular with numerals 11 and higher. Moreover, this rule, as just stated, sometimes appears to be contravened. Whence the phenomenon, and why the exceptions to the rule? I suggest that the use of the singular with numerals 11 and higher is a frozen feature from older periods of Hebrew, found in the language of our texts only with high-use phrases. Moreover, most exceptions to the rule stem from the deep structure of complex adding numerals—a structure common to all languages.

In both of these areas, cross-linguistic evidence from languages throughout the world can shed significant light. Similar phenomena in Slavonic, Dravidian, Bantu, Germanic, and Romance languages, and current research undertaken on these phenomena, demonstrate underlying, universal features that are applicable to numerals and numeral syntax in Ancient Hebrew.

1 The Semantics and Word Class of Cardinal Numerals

What are numerals, and why do they exhibit such a variety of features? In his 1893 monograph on numerals, Sven Herner wrote, "die Grundzahlen von 2 an [Substantive] sind, die jedoch immer mehr in [Adjektive] übergegangen sind."[2] Paul Joüon believed that

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1 Cynthia L. Miller, "Methodological Issues in Reconstructing Language Systems from Epigraphic Fragments," in *The Future of Biblical Archaeology: Reassessing Methodologies and Assumptions*; eds. J. K. Hoffmeier and A. Millard (Grand Rapids, Mich.: Eerdmans, 2004); Robert D. Holmstedt, "Issues in the Linguistic Analysis of a Dead Language, with Particular Reference to Ancient Hebrew," *JHS* 6 (2006):1–21.

2 Sven Herner, *Syntax der Zahlwörter im Alten Testament* (Lund, 1893), 139.

some numerals originated as "substantives" and others as "adjectives," though in the periods of ancient Hebrew we study they now have mixed features of both word class.[3] In Williams' syntax, the number 2 is categorized with certainty as a noun, but then the oddity of this classification is highlighted in the following sentence: "Despite being a noun, the number two has separate masculine and feminine forms, and agrees in gender with whatever it counts."[4] Most reference grammars, whether they explicitly acknowledge it or not, struggle (rightly) with the classification of numerals;[5] as a result, many prefer to move straight into description of individual numerals rather than consider, with Joüon, what exactly these words are. As for the diversity of features used by numerals, Arnold and Choi lament concerning Hebrew numbers that, "unfortunately, their syntax is varied."[6] The sheer variety of features is reflected by the large number of categories used to address numerals in most reference grammars—for example, JM has 20 categories in the syntax section alone.[7]

Cardinal numerals in Ancient Hebrew have some substantival and some adjectival features, and various classes of numerals partake in these features to different degrees. This phenomenon is, in fact, present in most languages. Are cardinals nouns or adjectives? In order to answer this question and explain the variety of features used by cardinals, I begin with a basic outlook on the nature of numerals and their underlying semantics. I then discuss Ancient Hebrew cardinals in light of cross-linguistic evidence. The nature of numerals as somewhere between noun and adjective, and each numeral to varying degrees, explains why we see different features employed by different numerals.

1.1 The Nature and Semantics of Numerals

Cardinal numerals[8] in any language—and ordinal numerals, insofar as they are based on cardinals—are unique in nature. Their semantics might seem straightforward initially:

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3 "The nouns denoting number are in origin either substantives or adjectives, but all of them, to varying degrees, now possess a mixed character, partly substantival and partly adjectival"; Paul Joüon and Takamitsu Muraoka, *A Grammar of Biblical Hebrew*, 2nd ed (hereafter 'JM'; Rome: Pontifical Biblical Institute, 2006), §100a. The original French is clearer on the first point: "Les noms de nombre sont, originairement, les un des substantifs, les autres des adjectifs"; Paul Joüon, *Grammaire de l'Hébreu Biblique* (Rome: Pontifical Biblical Institute, 1947), §100a.

4 Ronald Williams, *Williams' Hebrew Syntax* (revised and expanded by John C. Beckman; Toronto: University of Toronto Press, 2007), §95a.

5 In contrast, see Rebecca Hasselbach on various Semitic languages; she distinguishes sharply between numerals that are adjectives and numerals that are substantives; "Agreement and the Development of Gender in Semitic (Part I)," *ZDMG* 164 (2014): 33–65, here 59–61.

6 Bill T. Arnold and John H. Choi, *A Guide to Biblical Hebrew Syntax* (Cambridge: Cambridge University Press, 2003), §2.7.

7 JM §142.

8 I use the term "numeral" to refer to numeral *words* used in language; when I refer to numeral *concepts* or *properties* in a mathematical or philosophical sense, I do not use "numeral" alone but clarify that I am referring to mathematics and/or concepts and/or properties.

three is three, and what more can be said? However, when we try to pinpoint their precise word class and syntax, we realize that their underlying semantics are complicated. Like all lexemes, cardinal numerals like "fourteen" and שְׁלֹשָׁה represent something beyond language (in these cases, English and Hebrew), for example, the concepts 14 and 3.[9] It is likely that the acquisition of number language and the acquisition of mathematical concepts in children co-occur in some inter-dependence on one another.[10] For example, while a child may have the concepts of 1 or 2 before learning the words "one" and "two," she will be exposed to the word "seven" before the concept 7, learning the concept by way of the language.[11] The concept of *sequence*—that is, that numbers are ordered, the next in line always being 1 more than the preceding—is also an important factor present early on in the acquisition of both number language and mathematical concepts, and it remains an important factor in the nature of numeral words.[12] By the time that a child has acquired their first language, both the mathematical concepts and the language of numerals are in place.

Just as there is a relationship between the lexeme שָׁלֹשׁ (or English "three") and the mathematical concept of 3, there are relationships between mathematics and the formation of complex numerals that require internal syntax. We can think of the numerals שְׁלֹשׁ מֵאוֹת and "three-hundred" as the result of multiplying the numbers 3 and 100—thus the term *complex multiplying numeral*. While some linguists speak of mathematic operations as the underlying basis of complex numerals,[13] it is more probable that the semantics of linguistic relationships common to all nominal words[14] lie behind the semantics of complex numerals. Just as the phrase "three cats" indicates a quantity of cats, three of them, the phrase "three hundreds" in earlier English indicated a quantity of hundreds, three of them. Similarly, the semantics of שְׁלֹשׁ מֵאוֹת ("three of hundreds") is the same as שְׁלֹשׁ בָּנוֹת ("three of daughters"). A quantity of *something* is essentially multiplication; the

9 Cf. James R. Hurford, *The Linguistic Theory of Numerals* (Cambridge Studies in Linguistics 16; Cambridge: Cambridge University Press, 1975), 1–2. As I will discuss below, we can also think of numerals as representing *properties* of sets of things in the real world; for example, the set of pens on my desk has the property 3—there are three of them. We can represent these concepts or properties graphically using Arabic numerals. Like the phonologically realized lexemes of our languages, Arabic numerals *represent* concepts or properties; for the sake of clarity in my discussions, I will use written words like "three" and "fourteen" to refer to the cardinal numerals in language, and Arabic numerals like 3 and 14 to refer to the concepts/properties.

10 James R. Hurford, *Language and Number: The Emergence of a Cognitive System* (New York: Blackwell, 1987), 121–31.

11 Cf. Ferdinand von Mengden, *Cardinal Numerals: Old English from a Cross-Linguistic Perspective* (Topics in English Linguistics; Berlin: De Gruyter, 2010), 46–47.

12 Hurford, *Numerals*, 1–2; Hurford, *Language and Number*, 121–31; Von Mengden, *Cardinal Numerals*, 18–19, 46–47.

13 E.g., Von Mengden, *Cardinal Numerals*, 30–32.

14 That is, words built with nominal features, including adjectives and nouns; I reserve the adjectives "adjectival" and "substantival" for features and characteristics of adjectives and nouns, respectively.

underlying semantics of both "three-hundred" and שְׁלֹשׁ מֵאוֹת, then, have to do with quantities of hundreds. In the same way, "twenty five" and עֶשְׂרִים וְחָמֵשׁ reflect the mathematics of 20 + 5, but stem from the semantics of conjoined noun phrases; like "cats and dogs," the relationship represented in "X and Y" (and עֶשְׂרִים וְחָמֵשׁ; and "twenty and five" in earlier phases of English) is the relationship of addition. Although they are less common, some of the world's languages also employ subtraction and division in complex numerals,[15] reflecting the semantics of "X from Y" (subtraction) and "X of Y" where "X" is a fraction (e.g., "half of four"). Although complex numerals have their basis in linguistic relationships common to nominals, it is appropriate to discuss the semantics of complex numerals in terms of mathematics, because at some point the common linguistic language transforms into something more mathematical. The simplification of "three hundreds" to "three hundred" and "twenty and five" to "twenty-five" enshrines the mathematical operations of multiplication and addition.

We can specify the nature of numerals further by recognizing that they are a type of quantifier,[16] used to refer to properties of sets. Here I follow Ferdinand von Mengden's position on the semantics of numerals and of quantifiers in general. Von Mengden writes that quantifiers "specify the size of a set," with the quantified noun "[denoting] the kind of elements that are contained in this set."[17] There are two types of quantifier: "numerically unspecific" quantifiers fall on a wide range of universality, from (non-universal) "a/an" to "some," "several," and "many," to (universal) "all" and "every"; "numerically specific" quantifiers specify an exact number, whatever the universality of that number.[18] For example, the numbers 2, 12, or 110 could all be "some," "most," or "all" of a given thing. Numerically specific quantifiers include cardinal numerals and other words that are not (at that moment in the language's grammar) fully or systematically integrated into the cardinal numeral system—for example, "dozen" or "few" (when

15 James R. Hurford, "The Interaction between Numerals and Nouns," in *Noun Phrase Structure in the Language of Europe*; ed. Frans Plank (Berlin: De Gruyter, 2003), 601. For example, Danish uses both subtraction and division, older forms of Welsh used subtraction, and Yoruba uses subtraction extensively; see Hurford, *Numerals*, 130–31, 140–41, and 211–14, respectively. For examples of numerals in many of the world's languages, the website "Numeral Systems of the World's Languages" is an excellent tool; https://mpi-lingweb.shh.mpg.de/numeral/, last accessed 17 August, 2017; the extent of the evidence is remarkable. Unfortunately, examples were not collected for complex numerals that employ more than one operation (e.g., an adding numeral within a multiplying numeral).

16 So C.H.J. van der Merwe, J.A. Naudé and J.H. Kroeze, *A Biblical Hebrew Reference Grammar* (hereafter 'MNK'; Sheffield 1999), §37.1.

17 Von Mengden, *Cardinal Numerals*, 12. Susan Rothstein, *Semantics for Counting and Measuring* (Cambridge: Cambridge University Press, 2017), 16–20, argues that numerals are adjectives, against the view that they are determiners. Though I agree that numerals are not determiners (though they are quantifiers), I disagree that they are adjectives, both semantically and syntactically; they are properties of sets, not items in a set, and cross-linguistically their syntax differs from adjectives (see further below).

18 Von Mengden, *Cardinal Numerals*, 12–16.

understood to mean exactly 3) are numerically specific but are not cardinals.[19]

Figure 1 – Cardinal Numerals within Mengden's Typology of Quantifiers[20]

numerically unspecific			**numerically specific**	
existential	*mid-range*	*universal*	*systemic =cardinal*	*non-systemic*
"a/an"	"some," "several," "many"	"all," "every"	"one," "two," "three"	"dozen," "score"

This concept of cardinal numerals as numerically specific quantifiers fits nicely with the connection noted above between numerals and the concept of numbers in mathematics. As numerically specific quantifiers, cardinal numerals refer to properties of sets: any set containing 5 things has the property *fiveness*.[21] Hurford has a similar concept of numerals based on set theory; despite significant overlaps with Von Mengden, I find it less helpful. Hurford takes any numeral (e.g., "five") to be a "set of all collections of five things."[22] I would rather understand the numeral "five" to be a property common to all collections of five things; though this logically entails that "five" refers to a set of all such collections, the primary aspect has to do with the numeral being a property.[23] Ordinal numerals in most (possibly all) languages are based morphologically on cardinal numerals, reflecting the cardinal numeral as basic conceptually;[24] for example, חֲמִישִׁי, "fifth," is built on the cardinal חָמֵשׁ with the adjectival sufformative *-î*.[25] Whereas cardinal numerals quantify the members of a set, ordinals designate the place of a member of a set within the sequence of members in that set.[26] יוֹם חֲמִישִׁי is the "fifth" day in a sequence of a set of days; the "fifth" tomato is the tomato numbered "five" when the tomatoes are lined up (conceptually) in a sequence.

Oftentimes in language, *properties* are represented by adjectives, for example, "red" or "happy." Numerals, however, do not fit this generalization. As Hurford points out,

19 On numerically specific quantifiers that are not cardinals, cf. Von Mengden, *Cardinal Numerals*, 42–45.

20 Cf. Von Mengden, *Cardinal Numerals*, 15.

21 Von Mengden, *Cardinal Numerals*, 16–17; cf. 17–20, which attempts to correlate the linguistic concept of numerals with theories of number from philosophy of mathematics.

22 Hurford, *Language and Number*, 200–206, quote from 200.

23 Cf. Hurford, *Language and Number*, 219, where numerals are "properties of collections."

24 Von Mengden, *Cardinal Numerals*, 22.

25 JM §88M*g*.

26 Von Mengden, *Cardinal Numerals*, 21.

"numerals indicate properties of *collections* (=sets)" while "adjectives indicate properties of *individual objects* (=members of sets)."[27] When we move to the morphosyntax of numerals in the following section, we find that the unique semantics of numerals, as discussed in this section, result in numerals being caught somewhere between the word classes *noun* and *adjective*.

1.2 Cardinal Numerals on the Noun—Adjective Scale

In most of the world's languages—or all, as far as we can tell—numerals participate in substantival and adjectival morphosyntax to varying degrees. Different classes of numerals have varying degrees of adjectiveness and nounness.[28] In a brief but seminal study published in 1978, Greville Corbett shows that cardinal numerals exist on a sliding scale of features from almost fully adjectival to almost fully substantival.[29] Beginning with Russian, Corbett demonstrates the impossibility of assigning numerals to a single word class (noun or adjective), and moreover that different numerals use substantival or adjectival features to different degrees.[30] Curiously, the lower a numeral is, the more adjectival features it tends to have, while higher numerals take more substantival features. Yet, no numerals are *fully* adjectival or substantival: Russian *odin*, "one," is *almost* but not fully adjectival, and high multipliers like *thousand* are nearly nouns, but not completely.[31] Corbett assembles an impressive array of evidence from many modern languages to demonstrate that this phenomenon is probably universal.[32]

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27 Hurford, *Language and Number*, 219, my emphasis.

28 The Oxford English Dictionary defines *nounness* as "the nature or quality of a noun." I do not know of any English dictionary with an entry for *adjectiveness*, but if there were such a word it would mean "the nature or quality of an adjective."

29 Greville G. Corbett, "Universals in the Syntax of Cardinal Numerals," *Lingua* 46: 355–68.

30 Corbett, "Universals in the Syntax of Cardinal Numerals," 355–59.

31 Corbett, "Universals in the Syntax of Cardinal Numerals," 358, 362.

32 Corbett, "Universals in the Syntax of Cardinal Numerals," 363–68; cf. Eytan Zweig, "Nouns and Adjectives in Numeral NPs," in *NELS 35: Proceedings of the Thirty-fifth Annual Meeting of the North East Linguistic Society* (eds. Leah Bateman and Cherlon Ussery; Amherst, Mass.: Graduate Linguistic Student Association, 2005), 666–68.

Figure 2 – Corbett's Table of Adjectival Features in Russian Numerals[33]

		odin 1	*dva* 2	*tri* 3	*pjat'* 5	*sto* 100	*tysjača* 1,000	*million* 1,000,000
	1. Agrees with N in syntactic number	+	–	–	–	–	–	–
	2. Agrees in case throughout	+	–	–	–	–	–	–
	3. Agrees in gender	+	(+)	–	–	–	–	–
	4. Marks animacy	+	+	+	–	–	–	–
not the case that	5. Has own plural	+	+	+	+	(–)	–	–
not the case that	6. Takes agreeing determiner	+	+	+	+	+	–	–
not the case that	7. Takes N in genitive plural throughout	+	+	+	+	+	±	–

Hurford suggests that cardinal numerals "all enter a language as nouns, but move towards being adjectives,"[34] an analysis that fits Ancient Hebrew well. As for ordinal numerals, they are always based on cardinals and almost universally take fully adjectival features.[35] Developing Corbett's idea, Hurford points out that the notion of higher cardinals tending toward substantival features and lower toward adjectival features applies to morphology, but not syntax.[36] In my summary of deep structure below, we will see that there may be some correlation within syntax after all; however, for the most part the idea of a noun—adjective scale that correlates roughly with the value of a numeral is based on morphological features. Syntactically speaking, nouns can be used to modify other nouns, and the syntax of apposition is similar to the syntax of adjectival modification and modification by a relative clause. At a certain point, then, the basic distinction between adjective and noun is primarily about morphology. There is also an important sense in which a numeral can be both "nouny" and "adjectivey": when complex multiplying numerals quantify a noun, for example, the higher-member of the multiplying numeral is mostly substantival, but the multiplying numeral it heads is adjectival insofar as it modifies a noun.[37]

The cardinal numerals of Ancient Hebrew fit well within this notion of the noun—adjective scale.[38] The reference grammars associate numerals with nouns, chiefly by

33 Corbett, "Universals in the Syntax of Cardinal Numerals," 359. The further left a numeral falls in the table, the more adjectival it is; the further right, the more substantival it is.

34 Hurford, *Language and Number*, 196.

35 Hurford, "Interaction between Numerals and Nouns," 566–67.

36 Hurford, *Language and Number*, 187–97.

37 Hurford, *Language and Number*, 210–12.

38 To my knowledge, only Zweig makes use of Hebrew evidence to support this concept, and to a limited extent; Zweig, "Numeral NPs," 667, 670–71. Corbett refers to chiastic concord agreement features in

including subsections on numerals within chapters devoted to nouns. Many classify numerals as "substantives" or nouns,[39] while others treat numerals as something noun-like but distinct;[40] all recognize that the numerals for 1 and 2 behave somewhat differently. JM comes closest to expressing the notion discussed above: "to varying degrees, [all numerals] possess a mixed character, partly substantival and partly adjectival."[41] Cardinal numerals, like participles,[42] participate in more than one part of speech; though they developed from nouns and are similar to nouns in many ways, they also have some of the features that are characteristic of adjectives.

The most obvious adjectival feature of numerals is that they appear to modify nouns directly, in a semantic sense—that is, they *quantify* nouns, though they do not necessarily "modify" in a syntactic sense. Most of the ways in which cardinals straddle both worlds of adjectives and nouns are morphosyntactical and easily observable. It is not merely the case that cardinal numerals have adjectival and substantival features—as noted in the reference grammars—but moreover different *classes* of numerals have varying degrees of adjectiveness and nounness. The scale of adjectival-vs-substantival corresponds to the numerical value, lower numbers being more adjectival, higher numbers being more substantival, as argued by Corbett. The cardinal אחד, "one," is inflected for gender and number to agree with the noun it quantifies,[43] has corresponding articulation to the noun it quantifies, follows the noun it quantifies, and cannot itself be quantified by another numeral. In Exod 26:8, הַיְרִיעָה הָאַחַת ("the one curtain"), for example, הָאַחַת follows the noun and takes its gender and articulation from the noun. אחד thus displays the full range of features typical of adjectives, though in some ways it still behaves differently.[44] The numeral שנים, "two," sometimes behaves like אחד,[45] but more often displays a slightly different set of features, together with the cardinal numerals for 3–10: these are inflected for gender to agree with the nouns they quantify[46] and cannot be quantified by other numerals; however, they usually precede the nouns they quantify,[47] they cannot take the

Arabic; "Universals in the Syntax of Cardinal Numerals," 366.

39 E.g., Bruce K. Waltke and M. O'Connor, *An Introduction to Biblical Hebrew Syntax* (hereafter 'WO'; Winona Lake, Ind.: Eisenbrauns, 1990), §15.1a; J.C.L. Gibson, *Davidson's Introductory Hebrew Grammar: Syntax* (Edinburgh: T&T Clark, 1994), §46; Herner, *Syntax der Zahlwörter*, 4.

40 E.g., MNK §37.

41 JM §100a.

42 See John Cook, "The Hebrew Participle and Stative in Typological Perspective," *JNSL* 34 (2008): 1–19, for an overview.

43 Where it quantifies a plural noun, it has the sense of "some" or "a few"; e.g., Gen 27:44, יָמִים אֲחָדִים, "a few days."

44 For example, אחד can be used as part of a complex teen numeral for the number 11.

45 WO §15.2.1.

46 So-called "chiastic concord" with numerals 3–10 constitutes an agreement feature, though feminine morphology is matched to masculine nouns and *vice versa*.

47 See Screnock, "The Syntax of Cardinal Numerals in Judges, Amos, Esther, and 1QM," *JSS* 63 (2018), 132–34.

article when used with an overt noun, and they are not inflected for number—the morphologically plural forms being reserved for the 10s digits. In Exod 36:10, חֲמֵשׁ הַיְרִיעֹת ("the five curtains"), the cardinal חֲמֵשׁ is morphologically masculine to agree (via "chiastic concord") with feminine הַיְרִיעֹת, but does not take articulation or number inflection to agree with the noun. שנים is distinct from numerals 3–10 in that it does not follow "chiastic concord."[48]

In the 10s digits, created using plural forms of the cardinals, a few further features of adjectives are lost: most apparently, they cannot be inflected for gender to agree with the quantified noun. In Deut 9:25, for example, אַרְבָּעִים הַלַּיְלָה ("the forty nights"), the morphological *-îm* in אַרְבָּעִים is not optional; feminine morphology to agree with הַלַּיְלָה is impossible. Another less apparent difference in features between 10s digits and 3–10 is the agreement in number of some high-use nouns in conjunction with the 10s digits. In Ancient Hebrew, some high-use nouns (e.g., יום, "day," איש, "man," and שנה, "year") are singular when they are quantified by numbers over ten, whether complex adding numerals or simple numerals like עשרים, "twenty," or מאה, "hundred."[49] Another way to think of this revolves around the various classes of numerals: with the more adjectival numeral classes (אחד, שנים, and 3–10), these high-use nouns are inflected for number to agree with their conceptual quantity—singular with אחד, and plural with 2–10.[50] With more substantival numeral classes (10s and multipliers), these high-use nouns appear in the singular.

The most substantival class of numerals are the multipliers מאה, "hundred," אלף, "thousand," and רבוא/רבבה,[51] "ten-thousand." These behave like nouns in most ways:

48 On the origins of chiastic concord, see Rebecca Hasselbach, "Agreement and the Development of Gender in Semitic (Part II)," *ZDMG* 164 (2014): 319–344.

49 See the extended discussion in section 2 below; and cf. Screnock, "Syntax of Cardinal Numerals," 136–37; A. B. Davidson, *Introductory Hebrew Grammar: Hebrew Syntax* (Edinburgh: T&T Clark, 1901), §37; cf. §47 Rem. 1; *Davidson's Syntax*, §47 (and remark 1); Heinrich Ewald, *Syntax of the Hebrew Language of the Old Testament* (translated by James Kennedy; Edinburgh: T&T Clark, 1891), §287i; Eduard König, "Zur Syntax der Zahlwörter im Alten Testament," *The American Journal of Semitic Languages and Literatures* 18 (1902), 138; Zweig, "Numeral NPs," 670; Martin Abegg, "Hebrew of the Dead Sea Scrolls," in *The Dead Sea Scrolls after Fifty Years* (eds. Peter Flint and James C. Vanderkam; Leiden: Brill, 1998), 354.

50 Despite some morphological vestiges of dual number, dual syntax is no longer productive in the Ancient Hebrew for which we have evidence; although cf. Gary A. Rendsburg on dual syntax in the P-source in "Once More the Dual: With Replies to J. Blau and J. Blenkinsopp," *ANES* 38 (2001): 28–41; and cf. the response of Elitzur Avraham Bar-Asher, "Dual Pronouns in Semitics and an Evaluation of the Evidence for their Existence in Biblical Hebrew," *ANES* 46 (2009): 32–49.

51 I use רבבה as shorthand for both רבבה and the variant form רבוא. It is important to note that many languages employ bases and landing-points other than those found in English—hundred, thousand, million, etc. Hawaiian, for example, uses bases like 40, 400, and 4,000 in multiplying numerals, and uses 20 as a landing-point in adding numerals (30 is "twenty with ten more"); Hurford, *Numerals*, 205–210. The use of רבבה as a base in Ancient Hebrew, though virtually impossible to reflect in English

they cannot be inflected for gender, they are preceded by lower numerals that quantify them (e.g., 2 Sam 23:18, שְׁלֹשׁ מֵאוֹת, "three hundred"), they take singular high-use nouns, and they utilize node-raising when found with internal adding numerals (on which, see section 2 below).[52]

As in other languages, the cardinal numerals of Ancient Hebrew can be plotted on a scale from adjectival to substantival, as illustrated below.

Figure 3 – Hebrew Cardinals on the Noun—Adjective Scale

<table>
<tr><td>Adjectival</td><td colspan="4">◄——————————————————►</td><td>Substantival</td></tr>
<tr><td><u>Adjectives</u></td><td colspan="4"><u>Cardinal Numerals</u></td><td><u>Nouns</u></td></tr>
<tr><td rowspan="6"></td><td>1</td><td>2–10</td><td>20, 30, 40, 50, 60, 70, 80, 90</td><td>100, 1000, 10000</td><td rowspan="6"></td></tr>
<tr><td>adjectival position</td><td colspan="3">precedes quantified noun</td></tr>
<tr><td colspan="2">inflected for gender agreement</td><td colspan="2">no inflection for gender agreement</td></tr>
<tr><td colspan="2">in high-use phrases, quantified noun agrees in number</td><td colspan="2">in high-use phrases, quantified noun is singular</td></tr>
<tr><td colspan="3">cannot be modified by other numerals</td><td>modified by other numerals; thus: right node raising[53] can occur, and lower numerals agree in gender</td></tr>
</table>

In summary, cardinal numerals in Ancient Hebrew are neither adjectives nor nouns,

translation ("two ten-thousand"?) because 10,000 in English is a complex numeral, is nevertheless perfectly normal in the context of cross-linguistic evidence. רבבה, then, is the same sort of numeral as מאה and אלף in Hebrew, and "hundred," "thousand," and "million" in English.

52 Because of how adding numerals and multiplying numerals are expressed in [the extant] Ancient Hebrew, only אלף exhibits the last two features. One would never find מאה, for example, as the higher member of a multiplying numeral where the lower member was over 10; the number would instead be expressed using אלף. In other words, 2,300 would be אַלְפַּיִם וּשְׁלֹשׁ מֵאוֹת, not *עֶשְׂרִים וְשָׁלֹשׁ מֵאָה.

53 On the term and concept "right node raising," see section 2.1.

but somewhere in-between. Importantly, each sub-set of numerals is at a different point on the scale from adjectiveness to nounness. This is why we see a considerable diversity of morpho-syntactic and syntactic features utilized by various numerals.

2 The Grammatical Number of Words Quantified by Numerals over Ten

Certain words appear in the plural when quantified by numerals 2–10 but in the singular with numerals over 10.[54] In fact, most of the Number Phrases in Ancient Hebrew—whether with numerals 1, 2–10, or 11+—involve such words, which include (among others) אִישׁ, חֹדֶשׁ, שָׁנָה, יוֹם, שֶׂכֶל, עִיר, אַמָּה, לַיְלָה, נֶפֶשׁ, אֶלֶף, כִּכָּר, בָּקָר, and גֵּרָה. Several scholars have referred to this use as "collective,"[55] but such a description does not explain *why* the feature exists. The explanation I suggest involves diachronic development of the language.

Cross-linguistically, higher numerals are more likely to take singular nouns than lower numerals.[56] This is because "groups which we quantify with larger numbers are the groups which are less individuated and conversely are more likely to be viewed as a unit."[57] Outside the Semitic language family, some languages switch from plural back to singular at a different point; Czech and Slovenian, for example, are plural with 2–4 and singular with 5 and above.[58]

Returning to Semitic languages, some treat *all* nouns in the manner describe above for the particular set of nouns in Hebrew: 2–10 with plural, 11+ with singular.[59]

Classical Arabic[60]:	*khamsatu rijālin* ("five men") *wāḥidun waʿišrūna rajulan* ("twenty-one men")
Ugaritic[61]:	*ṯamānû lubūšūma* ("eight lubušu-garments") (KTU 4.337) *šabʿūma lubūšu* ("seventy lubušu-garments")

54 Screnock, "Syntax of Cardinal Numerals," 136–37; Davidson 1901, §37; cf. §47 Rem. 1; Gibson, *Davidson's Syntax* 1994, §47 (and remark 1); Ewald, §287i; König, "Zur Syntax der Zahlwörter im Alten Testament," 138; Zweig, "Numeral NPs," 670; Abegg, "Hebrew of the Dead Sea Scrolls," 354.

55 *Davidson's Hebrew Syntax* §47 rem. 1; MNK §37.2.2.6; Screnock, "Syntax of Cardinal Numerals," 136.

56 Greville Corbett, *Number* (Cambridge: Cambridge University Press, 2000), 216–217.

57 Corbett, *Number*, 217; cf. Hasselbach, "Agreement and the Development of Gender in Semitic (Part I)," 40.

58 Corbett, *Number*, 215.

59 There are also Semitic languages (e.g., Akkadian) that show no signs of this phenomenon.

60 Saqib Hussain, private correspondence; Wolfdietrich Fischer, *A Grammar of Classical Arabic* (trans. Jonathan Rodgers; New Haven: Yale University Press, 2002), §§129b, 130b, 131, 132b.

61 Ugaritic shows more complexity on this point: other syntactic features (e.g., the gender and structure of complex teen numerals) appear to cause irregularities; Josef Tropper, *Ugaritische Grammatik: Zweite, stark überarbeitete und erweiterte Auflage* (AOAT 273; Münster: Ugarit-Verlag, 2012), §69.142; John Huehnergard, *An Introduction to Ugaritic* (Peabody, MA: Hendrickson, 2012), 50.

Moreover, what characterizes the set of words in Hebrew that follow this rule is the higher likelihood of their being quantified: people, days, years, etc., are items that are often enumerated in ancient Hebrew. On the basis of these two points, it is reasonable to conclude, with Joüon, that "the singular is [probably] the primitive use, which was preserved with nouns of things which are very often counted."[62] At an earlier period in the Hebrew language, the agreement pattern exhibited by these nouns was the norm for all nouns, as in Classical Arabic and Ugaritic. When the language developed so that nouns were plural with any quantity over one (e.g., Exod 26:5, חֲמִשִּׁים לֻלָאֹת, "fifty loops"), high use phrases resisted the diachronic change and continued to use the older feature.[63] Given considerations I discuss immediately below, I propose that it is high use *phrases*, rather than often counted *nouns*, that cause the older feature to be retained. The older feature comes through *not* when a word on my list above (or another's comparable list) is used, but when a phrase or type of phrase that is often said is used.

Why do we find exceptions to the rule, phrases like Ps 90:4, אֶלֶף שָׁנִים, "a thousand years," and Gen 50:22, מֵאָה וְעֶשֶׂר שָׁנִים, "one hundred and ten years"—with plural שָׁנִים where we expect singular—and 1 Kgs 20:1, שְׁלֹשִׁים וּשְׁנַיִם מְלָכִים, "thirty-two kings"—with singular מֶלֶךְ where we expect plural? Some reference grammars note that there are exceptions, but none to my knowledge offer an explanation that covers the majority of exceptions. Van der Merwe, Naudé and Kroeze, for example, cite examples in Josh 21:19 and 33 that are nearly verbatim but differ with respect to our rule: the former has a plural noun (שְׁלֹשׁ־עֶשְׂרֵה עָרִים, "thirteen cities") while the latter has a singular noun (שְׁלֹשׁ־עֶשְׂרֵה עִיר, "thirteen cities"). The absence of further comment seems to indicate that MNK are not sure why such examples exist.[64]

Deviations from our rule can occur for one of three reasons. First, when a new feature replaces an old feature of language, the old feature never completely dies out.[65] Given this

62 JM §142*e* n. 4; Joüon, JM §142*e* n. 5, "Le singulier est [probablement] l'usage primitif, qui se sera conservé dans les noms de choses très souvent comptées."

63 More frequently used lexemes and phrases are known to resist language change. For example, some high-use verbs in English form the past tense through ablaut (an older feature of English) instead of suffixed *-ed*. It is tempting to connect the phenomenon of singular with numerals 11+ with measuring expressions (including frequency and duration), given the syntactic differences between measuring and counting (Moshavi and Rothstein, "Indefinite Numerical Construct Phrases," 108–114) and the concentration of measuring words occurring with this phenomenon (e.g., כִּכָּר and יוֹם). Expressions with words like אִישׁ and עִיר, however, are best interpreted as counting expressions; the use of so many measuring words with this phenomenon is likely due to measuring expressions being high-use.

64 MNK §37.2.2.6.

65 Jacobus A. Naudé, "Qumran Hebrew Syntax in the Perspective of a Theory of Language Change and Diffusion," *JNSL* 26 (2000): 105–32; "The Transitions of Biblical Hebrew in the Perspective of Language Change and Diffusion," in *Biblical Hebrew: Studies in Chronology and Typology* (ed. Ian Young; London: T&T Clark, 2003); Walt Wolfram and Natalie Schilling-Estes, "Dialectology and Linguistic Diffusion," in *The Handbook of Historical Linguistics* (eds. Brian D. Joseph and Richard D.

facet of diachronic development, and moreover that different speakers of a language speak differently in minor ways, we should expect some variety even during a single period of language. By the time of the Hebrew for which we have evidence, the process of change and diffusion has finished; the old feature (*all* nouns plural with numerals 2–10 but singular with numerals 11 or higher) has been replaced by the new feature (nouns plural with numerals 2 or higher), except in high use phrases where the old feature has been preserved. Yet, we should not be surprised to find the old feature used sporadically. In an unrelated but similar linguistic situation, in Britain you sometimes hear singular nouns where you would expect plurals: "It costs *ten pound*," or "I've been an electrician for *twenty year*." Given that old features do not die out completely, we find cases like 1 Kgs 20:1, שְׁלֹשִׁים וּשְׁנַיִם מְלָךְ, "thirty-two kings," where the noun is singular despite not being in a high-use phrase.

Second, some Number Phrases contain a word from our list above, but are not as a result *high use* phrases. Alongside Ps 90:4, אֶלֶף שָׁנִים, "a thousand years," further examples are 1QM II 6 (שלוש ושלושים שני המלחמה הנותרות, "the remaining thirty-three years of the war") and 9 (חמש ושלושים שני העבודה, "the thirty-five years of service"). Though all of these involve שנה, they are not high use *phrases* because it was not typical to think of so many years of life (1,000) or of war (30+). The phrases that resist the new agreement pattern are not those that merely contain the particular words above, but rather phrases that are typical in usage. This is not to say that the specific phrase "twenty-eight years" had to be used often, but that such a quantity of years (or days, or people, etc), was within a typical range.

Third, varieties of syntactic structure in complex adding numerals sometimes result in deviations to our rule. The following section explores this point.

2.1 The Structure of Complex Adding Numerals

Sometimes, a quantity over 10 is expressed by a simple numeral (e.g., "twenty," or מאה, "hundred"), but often, a complex adding numeral is involved.[66] The typical grammatical number with high use phrases is singular as Gen 17:24, תִּשְׁעִים וְתֵשַׁע שָׁנָה, "ninety-nine years." Sometimes, as in Gen 50:22 cited above, "years" appears instead in the plural. The key to unravelling the deviation is to consider a *third* way in which quantified nouns take grammatical number, when the noun is "repeated" as it were; an example in Gen 17:1 contrasts nicely with Gen 17:24 above: תִּשְׁעִים שָׁנָה וְתֵשַׁע שָׁנִים, "ninety-nine years." When the quantified noun appears twice, the noun behaves as if it is quantified *only by the simple numeral that immediately precedes it*: the instance of שָׁנָה appearing with the 1s digit is plural—despite the total quantity being over ten—while the instance of שָׁנָה appearing with the 10s digit is singular (because the quantity, 90, is over

Janda; London: Blackwell, 2003), 713–35; Mark Hale, *Historical Linguistics: Theory and Method* (London: Blackwell, 2007), 27–47.

66 On complex adding numerals in general, see John Screnock, "Complex Adding Numerals and Hebrew Diachrony," *JBL* 137 (2018): 789–819.

10).

Cross-linguistic evidence shows that the last type of complex adding numeral is in fact the deep structure of all complex adding numerals. In Old English, Biblical Welsh,[67] Kalabari, and Bantu languages such as Luvale, nouns (and multipliers) quantified by an adding numeral appear after each simple numeral *within* the adding numeral.[68]

> **mikoko** makumi atanu na-**mikoko** vatanu
> *sheep ten five and-sheep five*
> "fifty-five sheep" (Luvale)

This deep structure can be transformed in two ways: right node raising and deletion. Languages can use one, two, or all three of these structures in their adding numerals. Ancient Hebrew appears to use all three.[69]

The deep structure of complex adding numerals is sometimes manifested transparently in Ancient Hebrew, for example in Lev 12:4, שְׁלֹשִׁים יוֹם וּשְׁלֹשֶׁת יָמִים, "thirty-three days."[70]

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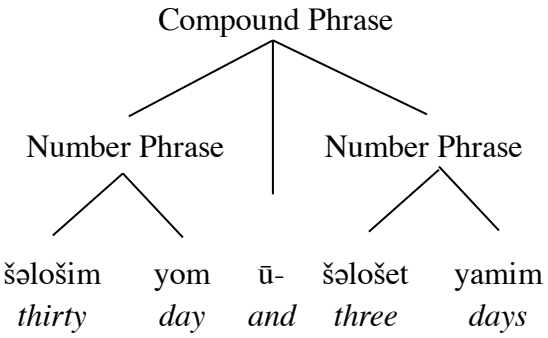
67 An older stage of Welsh, distinct from both Classical Welsh and Modern Welsh, is preserved solely in the Welsh Bible; in the linguistic literature, it is referred to as "Biblical Welsh"; cf. Hurford, *Numerals*, 136.

68 See Screnock, "Complex Adding Numerals," 795–96; Hurford, *Numerals*, 175–77; *Language and Number*, 232–36. Tania Ionin and Ora Matushansky, "The Composition of Complex Cardinals," *Journal of Semantics* 23 (2006), 340–42. On Biblical Welsh and Kalabari, see James R. Hurford, *Language and Number*, 236; Hurford, *Numerals*, 176. On Old English, see Von Mengden, *Cardinal Numerals*, 136–41, 146. On Bantu, see Eytan Zweig, "Numeral NPs," 666.

69 Hurford suggests that multiple distribution (where the surface structure reflects the deep structure) is probably diachronically prior in languages that behave like Hebrew; *Language and Number*, 237. Welsh and English are examples of languages that have developed from multiple distribution to deletion and right node raising; I have also argued that Ancient Hebrew developed in this direction; Screnock, "Complex Adding Numerals."

70 This structure also occurs fully or partially in Gen 5:5, 6, 7, 8, 10, 11, 13, 14, 15, 16, 17, 18, 20, 23, 25, 26, 27, 28, 30, 31 ; 9:28, 29; 11:13, 15, 17, 19, 21, 25, 32; 12:4; 16:16; 17:1; 23:1; 25:7, 17; 35:28; 47:28; Exod 12:40, 41; 38:26; Lev 12:4, 5; Num 1:46; 2:9, 16, 24, 31, 32; 26:51; 31:32, 36, 43; 1 Sam 6:19; 1 Ki 6:1; 1 Chr 21:5; 2 Chr 2:16; 26:13.

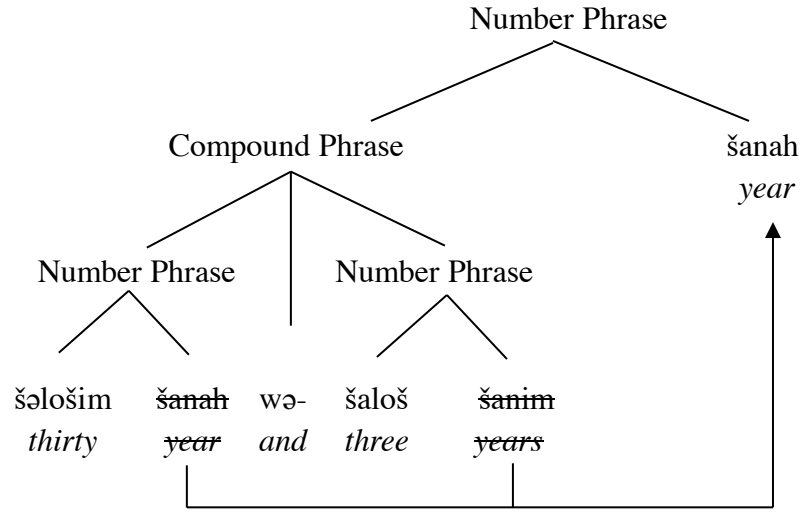
Figure 4 – Deep Structure of Complex Adding Numerals (Lev 12:4)



More commonly, however, Ancient Hebrew uses right node raising.[71]

שְׁלֹשִׁים וְשָׁלֹשׁ שָׁנָה
"thirty-three years" (2 Sam 5:5)

Figure 5 – Structure of Right Node Raising (2 Sam 5:5)



Right node-raising is a common linguistic phenomenon in all languages. For example, in English *I saw but did not eat the sandwich*, the noun phrase *the sandwich* has been right-node-raised. In 2 Sam 5:5, the quantified noun שָׁנָה is moved from two internal numeral positions within the compound phrase to a higher, "rightward" position outside the compound phrase, and is reanalyzed to agree (according to the rule of collective-use

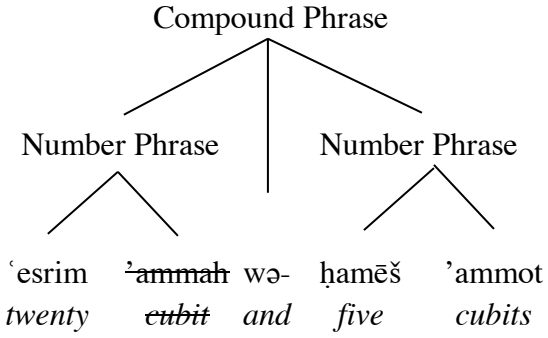
71 On right node raising in adding numerals, cf. Ionin and Matushansky, "Complex Cardinals," 340; Zweig, "Numeral NPs," 666. The use of "right" and "left" in linguistics is unfortunate for languages, like Hebrew, written from right to left. The terms when used in linguistics refer to how far forward ("left") or backward ("right") something appears in an utterance.

nouns) with the total quantity of the compound phrase.[72]

Another structure that often looks identical to this structure involves deletion of the quantified noun.[73]

עֶשְׂרִים וְחָמֵשׁ אַמּוֹת
"twenty-five cubits" (Ezek 40:13)

Figure 6 – Structure of Deletion (Ezek 40:13)



In this structure, the first instance of the quantified noun is deleted, leaving the second, which continues to agree in number (according to the rule of collective-use nouns) with the simple numeral חָמֵשׁ, "five," rather than taking its number from the larger adding numeral עֶשְׂרִים וְחָמֵשׁ, "twenty-five." Deletion can occur with any of the internal number phrases, as an example from Tell Qasile illustrates.

72 It is *not* the case that *šanah* within the 10s digit is moved directly to the rightward position while *šanim* is deleted. Rather, both internal instances of the lexeme are removed and combined in the rightward position, with the appropriate number to agree with the total quantity of the adding numeral. For evidence of this reanalysis, note Ezek 45:12, עֲשָׂרֶה וַחֲמִשָּׁה שֶׁקֶל, "ten and five shekel," where both members of the adding numeral are 1s digits that should take plural שְׁקָלִים. Because שֶׁקֶל is singular, it is clear that the number of the quantified noun is reanalyzed after it is moved rightward, based on the total quantity of the adding numeral. Similarly, in multiple distribution with אלף, we find bound constructions as in standalone multiplying numerals (e.g., Judg 3:29, עֲשֶׂרֶת אֲלָפִים, "ten-thousand"), because each unit within the compound phrase is a distinct number phrase (e.g., Num 2:9, מְאַת אֶלֶף וּשְׁמֹנִים אֶלֶף וְשִׁשֶּׁת־אֲלָפִים, "one-hundred and eighty-six thousand"); in node-raising, however, the relationship between the adding numeral and the quantified noun is always appositional, showing that node-raising involves reanalysis. In just one aberrant case in Ancient Hebrew can we discern a lack of reanalysis, in Ezek 45:12, חֲמִשָּׁה וְעֶשְׂרִים שְׁקָלִים, "twenty-five shekels," where שְׁקָלִים is taken directly from within the 1s digit, without reanalysis of number:
[[ḥ^{a}mišah ~~šəqalim~~] wə- [ʿesrim ~~šeqel~~]] [šəqalim].
↳_____↑

73 Ionin and Matushansky, "Complex Cardinals," 340–41. Note Old English, where deletion can occur at the end, rather than the middle, of the adding numeral, leaving the quantified noun in the middle of the number phrase. For example, *þreo hund* ***muneca*** *and twa and fiftig*, "three-hundred and fifty-two monks"; Von Mengden, *Cardinal Numerals*, 141–42. I have not found any examples of this sort of deletion in Ancient Hebrew.

אל[פ] שמנ ומאה
"a thousand [units] oil and a hundred [units oil]" (Qasile 1:1–2)

The quantified noun שמנ, "oil," has been deleted from the second number phrase. Compare Ugaritic, where we find numerous examples of deletion.

t̲amaniyīma kaspi t̲alāt̲ati kubda
eighty silver three plus
"for eighty [shekels of] silver plus three [shekels of silver]" (KTU 4.337)

In many cases, node-raising and deletion are indistinguishable. We can discern these two structures with certainty when an overt,[74] collective-use noun is quantified by an adding numeral that ends with a 1s digit.[75] We know that node-raising has occurred if the noun is singular: the node raising results in the noun being reanalyzed as quantified over 10.[76] We also know that node-raising has occurred if the final numeral is אחד, "one," and the noun *follows* אחד: if deletion had occurred, the noun would appear before אחד, which as an adjective follows the word it modifies.[77] We know that deletion has occurred if the noun is plural: without node-raising, the undeleted noun remains as if it were quantified only by a numeral 2–10.[78] Given the higher use of node-raising in distinguishable contexts, it is more likely to be the structure that is used in cases where we cannot tell the difference.

An additional structure, which uses both deletion and multiple distribution, deserves a brief description. Partial deletion occurs when the adding numeral contains three or more members, and only one of the quantified nouns has been deleted.

(20) חָמֵשׁ וְתִשְׁעִים שָׁנָה וּשְׁמֹנֶה מֵאוֹת שָׁנָה
"eight-hundred and ninety-five years" (Gen 5:17)

74 That is, the collective-use noun is explicit, not covert/null/implied from context.

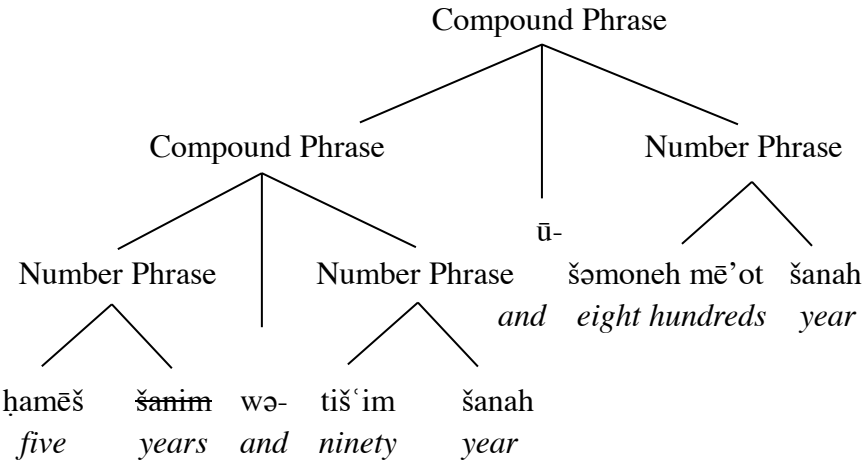
75 And, moreover, where the order of the number phrase is *numeral–quantified*. I take all apparent cases of *quantified–numeral* order to actually be cases of apposition with the structure *noun, numeral [covert quantified noun]*.

76 Gen 6:3; 17:24; Num 35:6, 7; Deut 2:14; Josh 7:5; 14:10; Judg 7:3; 8:14; 10:2, 3; 12:6; 20:15, 35, 46; 1 Sam 4:15; 22:18; 2 Sam 5:5; 8:5; 1 Kgs 8:63; 10:14; 14:20; 15:33; 16:8, 15, 29; 20:1, 16, 30; 22:42^{twice}; 2 Kgs 8:17, 26; 10:14, 36; 12:7; 13:1, 10; 14:2^{twice}; 15:1, 2, 8, 13, 17, 27, 33; 18:2^{twice}; 19:35; 21:1, 19; 23:31, 36; 25:27; Isa 7:8; 37:36; Jer 52:31; Ezek 8:16; 11:1; 29:17; 40:1; 45:12; Neh 6:15; 1 Chr 3:4; 5:18, 21; 7:2, 5, 40; 12:35, 36; 23:3, 4; 27:1, 2, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15.

77 1 Kgs 14:21; 15:10; 16:23; 2 Kgs 14:21 (par 2 Chr 12:13); 22:1; 24:18; Jer 52:1.

78 Gen 50:22, 26; Josh 24:29; Judg 2:8; 1 Ki 2:11; Ezek 40:13, 29; Neh 11:6; 1 Chr 2:22.

Figure 7 – Structure of Partial Deletion (Gen 5:17)



Partial deletion more usually entails deletion within the 1s digit,[79] but does occur with deletion within the 10s digit[80] and 100s digit.[81] Note that adding numerals with three or more members do not *require* this sort of structure, given several cases where the quantified noun appears more than two times.[82]

Returning to our main question—the number of nouns within high use phrases—when the syntax of *deletion* occurs, the quantified noun will be plural even though the value of the adding numeral is over 10. In our example Gen 50:22, מֵאָה וְעֶשֶׂר שָׁנִים, "one hundred and ten years," noted at the beginning of this section, the singular שָׁנָה has been deleted after מֵאָה, leaving plural שָׁנִים which takes its number from עֶשֶׂר.

3 Conclusion

Numeral syntax is often regarded as an aspect of Ancient Hebrew that evades comprehension. Students and scholars to whom I have spoken, when hearing that I research numerals, remark that they are glad *someone* is finally figuring them out, and moreover that they have never been able to fully understand them. The problem, I suspect, is that the semantic content of numerals is often easy to understand, even if their syntactical behavior is not. The present study addresses several difficult aspects of numeral syntax. First, what exactly *are* numerals, and why do they all behave differently? Numerals are *properties of sets*, and as such are somewhat like adjectives and somewhat like nouns; their underlying nature results in a wide diversity of morpho-syntactic and syntactic features, a variety that is present to some degree in most or all language. Second, why do some quantified nouns regularly appear in the singular with numerals over 10? Moreover, why

79 Gen 5:17, 18, 20, 23, 25, 26, 27, 28, 30, 31; Num 2:16, 31.

80 Gen 47:28.

81 Chr 2:16.

82 Gen 23:1; 25:7, 17; Num 2:9; 31:32, 36, 43; cf. Zweig, "Numeral NPs," 666.

are there some exceptions with those very same nouns? The use of the singular with numerals 11 and higher is a frozen feature from an earlier stage of Hebrew, found in the language of our texts only with high-use phrases. Like Classical Arabic and Ugaritic, Hebrew at some earlier point in its history put all quantified nouns in the singular with numerals 11 and higher; by the time of our evidence, this feature had been replaced except in high-use phrases. Deviations to the rule stem from the fact that old features sometimes occur even after they are replaced, from the fact that high use *phrases*, not oft quantified *words*, preserve the earlier feature, and from the deep structure of complex adding numerals, where right node raising results in reanalysis of the quantified noun along the lines of our rule but deletion leaves the number of the quantified noun as in multiple distribution.