

The Syntax of Complex Adding Numerals and Hebrew Diachrony*

John Screnock

Abstract

The syntax of complex adding numerals and its apparent development in Ancient Hebrew add several new pieces to the puzzle of Hebrew diachrony, and consequently the dating of biblical texts. I describe undiscussed aspects of the structure of adding numerals and analyze the distribution of structural types according to diachrony. I also provide a diachronic analysis of the order of adding numerals that challenges the traditional position. The syntactical phenomena of adding numerals confirm the idea that the Hebrew found in the biblical texts changed over time. Although the diachronic progression of adding numeral syntax argues against a strict periodization of Hebrew into two stages, the evidence of adding numerals is compatible with the traditional model of Hebrew diachrony.

Keywords

Ancient Hebrew, numerals, syntax, Hebrew diachrony, linguistic dating

1 Introduction

The syntax of cardinal numerals has received little attention from Hebrew linguists and philologists. With the exception of a handful of studies, discussions of numeral syntax are relegated to reference grammars.¹ I offer the following study as part of an attempt to fill this lacuna in Ancient Hebrew scholarship.

My investigation focuses entirely on complex adding numerals (or simply “adding numerals”), where two or more numerals are used in tandem to convey a value that would otherwise not be possible, specifically by *adding* the value of the component parts. For example, שבעים ושבעה (Gen 4:24) is equal to 70 (שבעים) plus seven (שבעה), that is, *seventy-seven*. I will admit that when I first began to study numeral syntax, I found the adding numerals quite dull. They seem, on first sight, rather straightforward. How much syntactic complexity could really be involved? I endeavor to show there is actually quite a bit.

In addition to the intrinsic value of studying adding numerals, the data suggest diachronic development when variations in the syntax are plotted on a text-by-text basis. I suggest a process of change and diffusion for both the *structure* and the *order*

* I would like to thank Jan Joosten for feedback on previous drafts of this study.

1 See John Screnock, “The Syntax of Cardinal Numerals in Judges, Amos, Esther, and 1QM,” *JSS* 63 (2018): 125-26.

of adding numerals. The most plausible scenarios for both areas of syntax show a similar relative dating of the language of texts for which we have a high number of tokens—Genesis, Exodus, Numbers, Joshua-2 Kings, Ezra–Nehemiah, and Chronicles.² The language of Genesis, Exodus, and Numbers falls earlier than the language of Joshua-2 Kings, Ezra–Nehemiah, and Chronicles in both diachronic developments.³ Or, following source-critical distinctions, the language in the Toledoth book is earliest, language in P material falls in a period of transition in adding numeral syntax, and language in Joshua-2 Kings, Ezra–Nehemiah, and Chronicles comes later; there is not enough evidence to plot J/E material, and the texts falling at the end of the process of change cannot be further distinguished on the basis of adding numeral syntax.

These models contribute but one piece to the overall picture of Hebrew diachrony. To a certain extent they confirm traditional views of diachrony in the biblical texts, inasmuch as the language of Genesis, Exodus, and Numbers belong (according to the features in question) to a relatively older stratum. The traditional place of Joshua-2 Kings, in the period of so-called “Classical Biblical Hebrew” alongside Pentateuchal texts, is neither confirmed nor disconfirmed, though for the features in question it falls later than Pentateuchal material in the processes of change.

2 Method

Before presenting and analyzing the data of adding numerals, I will briefly outline my framework for approaching numerals in general, my method of diachronic analysis, and my corpus.

2.1 General Framework

My basic framework for approaching cardinal numerals is as follows.⁴ A *number phrase* contains a cardinal numeral and the noun that it quantifies.

2 The notion of “the language of texts” can be problematized in a variety of ways. There are a number of textual witnesses for each of these texts, which contain different language in particular places; cf., e.g., Michael O. Wise, “Accidents and Accidence: A Scribal View of Linguistic Dating of the Aramaic Scrolls from Qumran,” *Abr-Nahrain Supplement* 3 (1992): 124–67. Moreover, identifying “Genesis,” for example, as a text isolates one main stage of development, whereas we could instead think about various earlier sources or traditions (also conceivable as “texts”) that stand behind what today is known as Genesis. I group Joshua-2 Kings together because they are often conceived of as a single “Deuteronomistic History,” and because their adding numeral evidence aligns.

3 Moreover, the language of the Mishnah agrees in both areas with the latter group of texts.

4 Cf. Screnock, “Cardinal Numerals,” 127–31.

(1) חֲמִשָּׁה אָנָשִׁים, “five men” (Judg 18:2)

 | numeral
quantified noun

There are simple numerals, as in Judg 18:2, and complex numerals, which are made up of two or more simple numerals working together to express a value. In *multiplying numerals*, interior numerals or “members” are multiplied to produce the resulting numeral.

(2) שִׁבְעֵ-מֵאוֹת, “seven-hundred” (Num 1:39)

 | 1s member
100s member

Teen numerals express values 11-19 by combining a 1s digit with עָשָׂר or עֶשְׂרִים, “teen.”

(3) תִּשְׁעֵ-עֶשְׂרִים, “nineteen” (Gen 11:25)

 | 1s member
teen member

In *adding numerals*, the focus of this study, the value of the complex numeral results from addition. Adding numerals can have more than two members, usually one for each digit (1s, 10s, 100s, etc.).

(4) שִׁבְעַתְּ-וָעֶשְׂרִים וּמֵאָה, “a hundred and twenty seven” (Esth 1:1)

 | 1s member
 | 10s member
100s member

Each member of an adding numeral can be a simple cardinal, as in Esth 1:1, or can itself be a multiplying or teen numeral. Moreover, adding numerals can themselves be embedded within multiplying numerals.

(5) שְׁנַיִם וְשִׁשִּׁים אֶלֶף וְשִׁבְעֵ-מֵאוֹת, “sixty-two thousand seven-hundred” (Num 2:26)

 | 100s member is adding numeral
multiplying numeral w/in multiplying

One of the distinct advantages of my approach is that I have isolated adding numerals and included them in my data regardless of whether they contain other internal

complex numerals and regardless of whether they are the main numeral in a number phrase or embedded in a multiplying numeral.

2.2 Diachronic Analysis

In my diachronic analysis of the features under study, I follow the methodology of Robert D. Holmstedt and others who argue that the principles of historical linguistics can be applied successfully to Ancient Hebrew.⁵ Diachronic development is but one way to explain variable linguistic evidence. David Crystal identifies several kinds of uncontrollable and controllable features that result in linguistic variation.⁶ Uncontrollable features belong to three types of dialect: temporal dialect (diachrony), regional dialect (what we usually mean by “dialect”), and class dialect (register). In other words, distinct varieties of language can arise because of geography, social strata, or the passage of time. Controllable features belong to the stylistic aspects of language and text. Although alternative explanations that draw on register, dialect, and stylistics should always be understood and kept in mind,⁷ when a plausible diachronic explanation for language variation exists, the alternative explanations carry the burden of proof.

Language change involves the replacement of an old feature with a new feature. The replacement is not immediate; rather, there is a process of change and diffusion wherein the new feature gradually replaces the old.⁸ To track diachronic change, one

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- 5 Robert D. Holmstedt, “Historical Linguistics and Biblical Hebrew,” in *Diachrony in Biblical Hebrew* (eds. Cynthia L. Miller–Naudé and Ziony Zevit; Winona Lake, Ind.: Eisenbrauns, 2012), 97–124; “Investigating the Possible Verb–Subject to Subject–Verb Shift in Ancient Hebrew: Methodological First Steps,” *KUSATU* 15 (2013): 3–31; John Screnock and Robert D. Holmstedt, *Esther* (Waco, Tex.: Baylor, 2015), 18–23; cf. B. Elan Dresher, “Methodological Issues in the Dating of Linguistic Forms: Considerations from the Perspective of Contemporary Linguistic Theory,” in *Diachrony in Biblical Hebrew*, 19–38; Jacobus A. Naudé, “Diachrony in Biblical Hebrew and a Theory of Language Change and Diffusion,” in *Diachrony in Biblical Hebrew*, 61–81; John A. Cook, “Detective Development in Biblical Hebrew Using Diachronic Typology,” in *Diachrony in Biblical Hebrew*, 83–95.
 - 6 David Crystal, “New Perspectives for Language Study. 1: Stylistics,” *English Language Teaching* 24 (1970): 99–106; cf. “Style: The Varieties of English,” in *The English Language* (eds. W. F. Bolton and David Crystal; London: Penguin, 1987), 199–222.
 - 7 See, for example, Robert D. Holmstedt and Alexander T. Kirk, “Subversive Boundary Drawing in Jonah: The Variation of אִשָּׁר and שָׁ as Literary Code–Switching,” *VT* 66 (2016): 542–55.
 - 8 Jacobus A. Naudé, “Language Change and Diffusion”; “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. Janda; London: Blackwell, 2003), 713–35; Mark Hale, *Historical Linguistics: Theory and Method* (London: Blackwell, 2007), 27–47.

should ideally use features and corpora containing a large amount of evidence or tokens. An analysis should not lean on texts that have only one or two points of data. Finally, the process of change and diffusion for a few diachronic changes cannot conclusively speak to the relative timeframe of the language of each text. Rather, hundreds of changes should be tracked and then averaged, because individual users of a language adopt different changes at different rates. Thus, when I describe the relative positions occupied by each text in the process of change and diffusion for two types of change, these positions do not indicate the overall relative timeframe of that text's language.

The process of change and diffusion is often plotted along a Sigmoid- or S-curve. When the date of language use (whether in a text or spoken) is known, S-curves often, though not always, approximate the distribution of language change. They can therefore serve as a visual model of the process of change and diffusion. Moreover, we can use S-curves, albeit cautiously, to plot the language of various texts of unknown date⁹ within a single sequence; significantly, this sequence is not pegged strictly to temporality, since a language user may be more or less innovative than other users, employing new features before or after the average. Given the potential pitfalls, I will use S-curves in this study merely as good visuals and a heuristic tools.

In theory, there is the potential for textual "noise", whether text-critical, source-critical, or redaction-critical, to threaten a diachronic analysis. Ancient Hebrew texts are undoubtedly complicated, and wherever reasonable I have accounted for this complexity.¹⁰ Moreover, my impression from working with this data and taking a close look at the potential effect of textual complexity—various sources in the Pentateuch, for example, or text-critical variation in the manuscript evidence—is that such "noise" can change the data slightly, but never in a way that fundamentally changes the overall analysis. This is the advantage of working with language features that occur hundreds of times in Ancient Hebrew; one or two odd variants do not make a significant impact.

2.3 Corpus

My corpus consists of every text in Ancient Hebrew before the Mishnah. This includes biblical texts, epigraphic evidence, and the Dead Sea Scrolls. In my discussion, I try to clearly present the evidence, allowing readers to access all the data and potentially come to alternative conclusions. Most of the evidence comes from biblical texts. In the Dead Sea Scrolls, 1QH and 1QS have no adding numerals; Ben Sira also has no adding numerals, while the Damascus Document has just two adding

9 We fortunately have some texts for which we have knowledge about dating on non-linguistic grounds; for example, the self-presentation and content of Esther and Ezra-Nehemiah present a post-exilic *terminus post quem*.

10 When, for example, there are textual variants in the manuscript evidence.

numerals. Given their lack of evidence, I have not included those texts. The data in the Temple Scroll is problematic, given how thoroughly the Temple Scroll reflects a patchwork of different biblical texts, and as a result I have not included it either.¹¹ The evidence outside the Bible comes from 1QM and the Copper Scroll, which both of which have several adding numerals, and the Siloam Tunnel inscription, which contains one.¹² There is no evidence from the supposedly archaic poetry in the Hebrew Bible. Where texts are in parallel, as in Chronicles, Nehemiah, Isaiah, and Jeremiah, I do not count evidence unless the secondary text is unique in terms of the feature under consideration.¹³

3 The Structure of Complex Adding Numerals

The internal structure of adding numerals seems simple at first glance. Each member of the adding numeral appears to be coordinated by *waw*, similar to lists of coordinated noun phrases. One complexity in the data, however, reveals a deeper structure: the quantified noun is sometimes repeated two or three times in the midst of the adding numeral that quantifies it. A close look at these cases, together with cross-linguistic evidence, tells us more about the structure of adding numerals. Diachronic analysis based on this understanding provides a picture of how Ancient Hebrew developed with respect to adding numeral structure.

3.1 *Distribution of Quantified Noun*

The majority of adding numerals in Ancient Hebrew have similar surface structure to modern English adding numerals: the adding numeral appears to stand in for a simple numeral.

(6) twenty-six paperclips

(7) six paperclips

11 The language used in the Temple Scroll is frequently borrowed directly, with slight changes, from a text in the Hebrew Bible; moreover, a main source and secondary sources are often spliced together; cf. Dwight D. Swanson, *The Temple Scroll and the Bible: The Methodology of 11QT* (STDJ 14; Leiden: Brill, 1994). The difficulty of identifying the sources and determining which linguistic aspects belong to the Temple Scroll makes using the Temple Scroll highly problematic.

12 Because the one token occurs in a monumental inscription, it provides more weighty evidence: we have reason to believe that, in an inscription meant to last, the use of particular linguistic features would be careful and deliberate. There are also some adding numerals written in ciphers (e.g., Arad 17.8; 33.2; 34.11; 60.2; 112.1), but we should not expect these to transparently reflect the syntax of spoken language any more than Arabic numerals reflect the numeral syntax of any modern language that uses them.

13 While some cases of semantic variation in parallel texts are interesting—e.g., Ezra 2:12 has 1,222, while Neh 7:17 has 2,322—only *syntactic* changes are relevant to the present study.

(8) תִּשְׁעִים וְתֵשַׁע שָׁנָה
 “ninety-nine years” (Gen 17:24)

(9) תֵּשַׁע שָׁנִים
 “nine years” (2 Kgs 17:1)

In the preceding examples, the numerals *twenty-six*, *six*, תִּשְׁעִים וְתֵשַׁע, and תֵּשַׁע seem to belong in a single position reserved for the numeral, and the nouns *paperclips*, שָׁנָה, and שָׁנִים in a single position reserved for the noun.

A number of cases in Ancient Hebrew where the quantified noun is repeated¹⁴ complicate this analysis. In the following example, the noun שָׁנָה appears twice, once after each member of the adding numeral.

(10) שְׁלֹשִׁים שָׁנָה וְאַרְבַּע מֵאוֹת שָׁנָה
 “four-hundred and thirty years” (Gen 11:17)

There are other languages where a noun quantified by an adding numeral can appear multiple times. In Old English, Biblical Welsh,¹⁵ Kalabari, Arabic, and B ǎ ntu languages such as Luvale, this is the surface structure of adding numerals.¹⁶

(11) mikoko makumi atanu na-mikoko vatanu
sheep ten five and-sheep five
 “fifty-five sheep” (Luvale)

In Old English and Biblical Welsh, the multipliers *þusend* and *mil*, (both mean

14 Cf. Bruce K. Waltke and Michael O’Connor, *An Introduction to Biblical Hebrew Syntax* (Winona Lake, IN: Eisenbrauns, 1990), § 15.2.4b.

15 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. James R. Hurford, *The Linguistic Theory of Numerals* (Cambridge Studies in Linguistics 16; Cambridge: Cambridge University Press, 1975), 136.

16 On Biblical Welsh and Kalabari, see James R. Hurford, *Language and Number: The Emergence of a Cognitive System* (New York: Blackwell, 1987), 236. On Old English, see Ferdinand von Mengden, *Cardinal Numerals: Old English from a Cross-Linguistic Perspective* (Berlin: De Gruyter, 2010), 139–41. On Arabic, see Joshua Blau, “On Some Vestiges of Univerbalization of the Units and Tense of the Cardinalia 21–99 in Arabic and Hebrew,” in *Bar-Ilan Departmental Researches: Arabic and Islamic Studies, II* (Ramat Gan: Bar Ilan, 1978), 10. On B ǎ ntu, see 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.

“thousand”) can also appear two or more times.¹⁷ Ancient Hebrew, too, can use this sort of distribution at times with the multiplier אֶלֶף, “thousand.”

- (12) twa hund þusend & twa & feowertig þusend
two-hundred thousand and two and forty thousand
 “two-hundred and forty-two thousand” (Old English)

- (13) bedair mil a saithugeinmil
four thousand and seven-twenty-thousand
 “one-hundred and forty-four thousand” (Biblical Welsh; Rev 14:1)

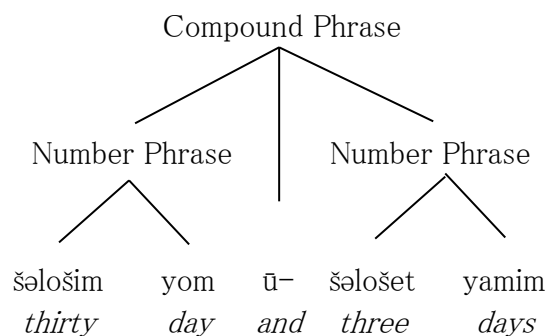
- (14) מֵאֵת אֶלֶף וְשִׁבְעָה וְחִמְשִׁים אֶלֶף
 “one-hundred and fifty-seven thousand” (Num 2:31)

The evidence suggests that the quantified noun and multiplier “thousand” are not *repeated* in these examples, but rather *removed* in examples like (6)-(9) above. Moreover, this is possibly the deep structure of adding numerals found in the majority of the world’s languages, as linguists have argued for similar syntactic structures underneath the surface structure of adding numerals in Modern English, Russian, German, and Inari Sami.¹⁸

The following tree represents this deep structure, which lies beneath all adding numerals in Ancient Hebrew.

- (15) שְׁלֹשִׁים יוֹם וְשָׁלֹשׁ יָמִים
 “thirty three days” (Lev 12:4)

Figure 1 - Structure of Multiple Distribution (Lev 12:4)



17 On Old English, see Mengden, *Cardinal Numerals*, 136-39; on Biblical Welsh, see Hurford, *Numerals*, 176. Multipliers behave like quantified nouns in this and several other ways; cf. Screnock, “Cardinal Numerals,” 139.

18 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.

In addition to being the deep structure of all adding numerals, this surface structure is found in many numerals in Ancient Hebrew.¹⁹

Cross-linguistic studies on adding numerals show that this deep structure, besides being manifested transparently in multiple-distribution surface structure, can be transformed in two ways—*right node raising* and *deletion*.²⁰ Languages can use one, two, or all three of these surface structures in their adding numerals. Though there is insufficient space here, in a future publication I will describe these structures and demonstrate that Ancient Hebrew uses all three. In both right node raising and deletion, the quantified noun appears only once, making it easy to distinguish these from multiple distribution.

3.2 Diachronic Analysis

Despite the complex nature of adding numeral structure and its evidence, it is possible to plot some aspects of the syntactic variety along a line of diachronic progression. Both node-raising and deletion appear to be used at the same time when the evidence is analyzed diachronically; the use or non-use of multiple distribution, on the other hand, does exhibit correspondence with diachrony. Multiple distribution appears to be an older feature that was replaced by deletion and node-raising.

Beginning with all the adding numerals in pre-Mishnaic Hebrew, we must remove from consideration any adding numerals that are complements in copular clauses, have a null/covert quantified noun, or seem to have *quantified-numeral* order.²¹ Even so, we are left with a considerable amount of data with which to work. The evidence is as

19 Gen 5:5, 6, 7, 8, 10, 11, 13, 14, 15, 16; 9:28, 29; 11:13, 15, 17, 19, 21, 25, 32; 12:4; 16:16; 17:1; 23:1; 25:7, 17; 35:28; Exod 12:40, 41; 38:26; Lev 12:4, 5; Num 1:46; 2:9, 24, 32; 26:51; 31:32, 36, 43; 1 Sam 6:19; 1 Ki 6:1; 1 Chr 21:5; 2 Chr 26:13. Multiple distribution is also found in combination with partial deletion in the following cases: Gen 5:17, 18, 20, 23, 25, 26, 27, 28, 30, 31; 47:28; Num 2:16, 31; 2 Chr 2:16. Cf. Eduard König's incomplete list in "Zur Formenlehre der hebräischen Zahlwörter," *ZAW* 16 (1896), 328—based on his tables in *Historisch-Kritisches Lehrgebäude der Hebräischen Sprache: Zweite Hälfte 1. Theil* (Leipzig: J.C. Hinrichs'sche Buchhandlung, 1895), 215-24.

20 Ionin and Matushansky, "Complex Cardinals," 340-41; Zweig, "Numeral NPs," 666. Right node raising is a common phenomenon in all languages; cf. David Crystal, *A Dictionary of Linguistics and Phonetics* (6th ed.; Oxford: Blackwell, 2008), entry "right node raising (RNR)." For example, in *I wrote but did not send the email*, the noun phrase *the email* is the complement to the verbs *wrote* and *send* and as such appears twice in the deep structure, but both instances have been moved to a higher point in the structure so that the single phrase *the email* can do "double-duty" for both verbs.

21 Because the quantified noun is null in the first two cases, its distribution cannot be determined. Where *quantified-numeral* order occurs, a significantly different structure is being used, and it is unclear how or whether multiple distribution is possible within such a structure.

follows.²²

Multiple Distribution. 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.

Node-raising or Deletion. Siloam Tunnel Inscription line 5; Gen 5:3, 21; 6:3; 7:24; 8:3, 13, 14; 11:12, 16, 20, 24; 17:24; 47:9; 50:22, 26; Exod 6:16, 18, 20; 7:7; 38:24^{twice}, 25, 29; Lev 25:8; Num 1:21, 23, 25, 27, 29, 31, 35, 37, 39, 41, 43; 2:4, 6, 8, 11, 13, 15, 21, 23, 26, 28, 30; 3:39, 43; 7:88; 8:24; 16:2, 17, 35; 25:9; 26:7, 10, 14, 22, 25, 34, 37, 41, 43, 47, 50, 62; 31:33, 34, 35, 38, 40, 44, 52; 33:39; 35:6, 7; Deut 2:14; 31:2; 34:7; Josh 7:5; 14:10^{twice}; 24:49; Judg 2:8; 7:3; 8:10, 14, 26; 10:2, 3; 12:6; 16:5; 17:2, 3; 20:15, 21, 35^{twice}, 46; 1 Sam 4:15; 22:18; 2 Sam 2:31; 5:5; 8:4, 5; 1 Kgs 2:11; 7:3; 8:63^{twice}; 9:14, 28; 10:10, 14, 26; 12:21; 14:20, 21; 15:10, 33; 16:8, 15, 23, 29^{twice}; 18:22; 20:1, 16, 30; 22:42^{twice}; 2 Kgs 2:24; 8:17; 8:26; 10:14, 36; 12:7; 13:1, 10; 14:2^{twice}, 23; 15:1, 2, 8, 13, 17, 27, 33; 18:2^{twice}; 19:35; 21:1, 19; 22:1; 23:31, 36; 24:18; 25:27; Isa 7:8; Ezek 4:5, 9; 8:16; 11:1; 29:17; 40:1, 13, 25, 29, 30, 33, 36; 45:1, 3, 5, 6, 12^{twice}; 48:8, 9, 10^{twice}, 13^{twice}, 15, 20^{twice}, 21^{twice}, 30, 33; Job 42:16; Esth 1:1, 4; 8:9; 9:16, 30; Dan 10:13; Ezra 8:9, 10, 11, 12; Neh 5:17; 6:15; 11:6; 1 Chr 2:22; 3:4; 5:18, 21; 7:2, 5, 11, 40; 9:13; 12:25, 31, 35, 36, 38; 19:7*; 21:5*; 23:3, 4; 27:1, 2, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15; 29:7; 2 Chr 11:21; 12:3; 13:21; 14:7; 17:15, 18; 24:15; 28:6; 1QM II 6, 9, 10; VI 10; VII 3; IX 4–5.

The table in figure 2 provides the profiles of texts containing five or more tokens of evidence.

22 I do not include exact parallels with Samuel–Kings and Ezra found in Isaiah, Jeremiah, Nehemiah, and Chronicles. If the texts are parallel but the dependent text is different with regard to structure, I count it as a token. References marked with an asterisk (*) are cases where the source text does not contain the adding numeral found in the former (whether there is no numeral or whether the counterpart is a simple or multiplying numeral). References marked with a caret (^) are cases where the source text has the adding numeral, but its structure has been changed.

Figure 2 - Multiple Distribution versus Deletion or Node-raising

	Multiple Distribution (old)	Deletion or Node- raising (new)	% Deletion or Node- raising
Gen	37	15	29
Exod	3	8	73
2 Chr	2	8	80
Num	10	52	84
Chr	3	40	93
1 Kgs	1	25	96
Josh-2 Kgs	2	78	97
1 Chr	1	32	97
Judg	0	16	100
2 Kgs	0	28	100
Ezek	0	31	100
Esther	0	5	100
Ezra-Neh	0	7	100
1QM	0	6	100

Numerous source and redaction-critical distinctions could be made to complicate the “texts” of figure 2, but only two potential distinctions help to make better sense of the data.²³ If we consider the Toledoth book to be a distinct source, it patterns differently from other material in Genesis. Moreover, there is a higher concentration of [what I will argue are] earlier features in material that is widely understood to belong to P. Nearly all the data in Genesis, Exodus, and Numbers come from P material,²⁴ with the exception of six adding numerals from J/E material in Genesis. I will therefore include figures for the Toledoth book and the rest of P Genesis (“P Gen” for simplicity) as distinct texts in my analysis here and in section 4.2; since there are fewer than five usable tokens from J/E Genesis for the analysis of structure and order, I will not include J/E Genesis.²⁵ Note that the profiles given for Exodus and Numbers are identical to the profiles of P Exodus and P Numbers, and as such I will not make any distinction within these two books.

23 For further discussion of the following summary, readers should see section 5 below.

24 This depends in part on how one analyzes the evidence in Numbers; see section 5.

25 On J/E versus P and the methodological difficulty of saying anything certain about the language of J/E, see section 5.

Figure 3 - Structure of Adding Numerals in the Toledoth book and P Genesis

	Multiple Distribution (old)	Deletion or Node-raising (new)	% Deletion or Node-raising
Toledoth	29	6	17
P Gen	8	5	38

Unfortunately, the earliest stage of the language according to this reconstruction—the stage when multiple distribution was completely dominant—is not evidenced in any of our texts. Although the Toledoth book, at 17%, is close to this period, my proposed diachronic interpretation would be more obvious if we had evidence extant from the period before there was change. Using a model of gradual change and diffusion, however, we can discern a direction of change and project backwards to reconstruct the earlier stage. The data, when plugged into an S-curve model, patterns as in figure 4, where y equals the percentage of uses following the new feature (deletion or node-raising) and x equals an arbitrary integer approximating the stage in the process of change and diffusion.

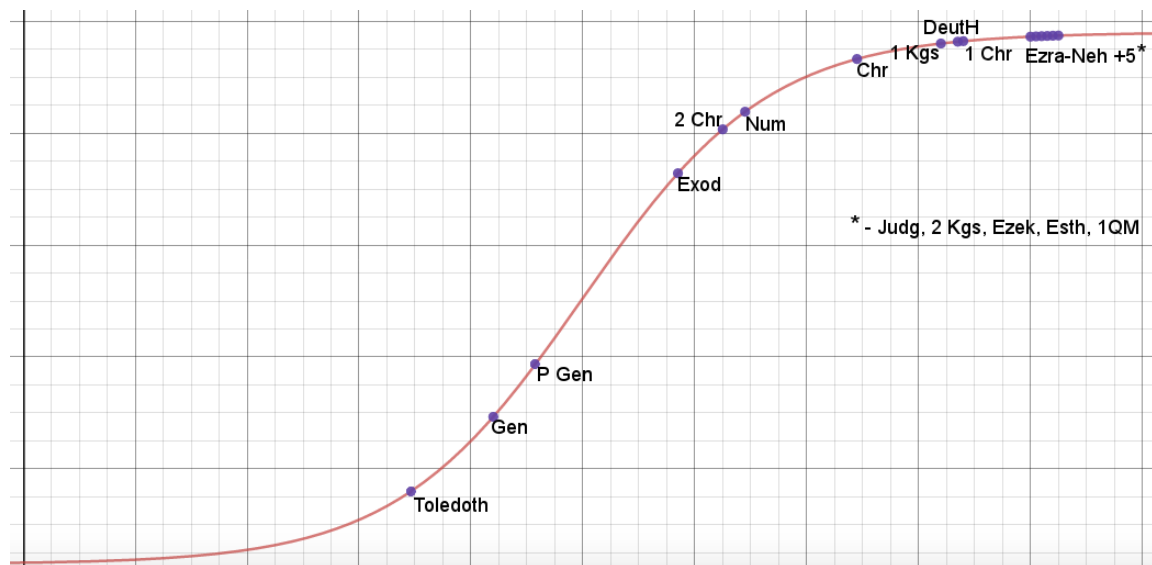


Figure 4 - S-curve Model of Diachronic Change in Adding Numeral Structure²⁶

As far as I am aware, Mishnaic Hebrew does not employ multiple distribution,²⁷ confirming the trajectory of this diachronic change and corroborating the hypothesis that multiple distribution is replaced by deletion and node-raising.

²⁶ All graphs were made using Desmos Graphing Calculator (<https://www.desmos.com>).

²⁷ I have not undertaken an exhaustive analysis of adding numerals in the Mishnah or related texts.

The evidence from 2 Chronicles is slightly out of place. However, it contains only ten tokens and it may be statistically anomalous for this feature. It is reasonable to balance the data from 2 Chronicles with that in 1 Chronicles, considering the language of Chronicles as a whole. It may also be possible that one or two of the cases of multiple distribution are present because of sources older than Samuel-Kings.

Because I use a model of change-and-diffusion, I do not take the mere presence, however small, of an old or new feature as indicative of old or new language. We see a few cases in Chronicles where multiple distribution is used because the old feature has not completely died out. This does not, however, indicate that Chronicles is earlier than texts not containing multiple distribution. Moreover, this particular diachronic development tells us nothing about the language of Joshua-2 Kings relative to Ezra-Nehemiah and Chronicles, since all of these fall at the end of the process of change-and-diffusion.

4 The Order of Complex Adding Numerals

The members within adding numerals can be ordered in several ways. At times they decrease in order:

(16) שְׁלֹשִׁים וְשָׁלֹשׁ 10s - 1s
 “thirty-three” (2 Sam 5:5)

(17) אֲלָפִים וְשֵׁשׁ מֵאוֹת וְשָׁלֹשׁ 1000s - 100s - 10s
 “two-thousand six-hundred and thirty” (Num 4:40)

At other times adding numerals increase in order:

(18) תִּשְׁעֵי וְעֶשְׂרִים 1s - 10s
 “twenty-nine” (Exod 38:24)

(19) חֲמֵשֶׁה וְשֹׁשִׁים וְשָׁלֹשׁ מֵאוֹת וְאֶלֶף 1s - 10s - 100s - 1000s
 “one-thousand three-hundred and sixty-five” (Num 3:50)

There are even cases in Ancient Hebrew that use *both* orders:²⁸

(20) שֵׁשׁ מֵאוֹת חֲמִשָּׁה וְשִׁבְעִים 100s - 1s - 10s
 “six-hundred and seventy-five” (Num 31:37)

Although many texts show a clear preference for decreasing (e.g., Ezra) or increasing (e.g., 1QM) order, some texts (e.g., Numbers) exhibit the full variety of options. This

28 Exod 38:25, 28; Num 2:16, 31; 3:43; 31:37; 1 Kgs 20:15; Ezra 2:5.

variety is reflected in van der Merwe, Naudé, and Kroeze's statement that "there is no rigid sequence for the different elements within the compound number."²⁹ Scholars have noted that adding numerals made up of 1s and 10s can be found with both increasing and decreasing order,³⁰ while other adding numerals are generally thought to prefer decreasing order.³¹

The diversity in the evidence was interpreted by Sven Herner as resulting in part from diachronic development of Hebrew,³² and subsequent commentary on adding numerals has followed his interpretation.³³ Herner interacted with the reference grammars of Heinrich Ewald and Bernhard Stade, both of whom viewed decreasing order as the dominant order in later texts.³⁴ He concluded that their claims were flawed because of an outdated view of the provenance of P.³⁵ Ewald considered P to be older, while Stade appeared to simply follow Ewald's faulty analysis. According to Herner, increasing order is rarely found in pre-exilic texts, while J, E, D, Judges, Samuel and Job primarily use decreasing order. On this basis, Herner argues that decreasing order is old and increasing order new.

Although Herner had a large amount of evidence at his disposal, a decreasing-to-increasing model of diachronic development in this area is unlikely given all the data. This is because, as Herner acknowledged, several of our latest texts heavily favor decreasing order, including Ezra-Nehemiah, the unique sections of Chronicles, and most significantly, the Mishnah.³⁶ As such, a feasible diachronic explanation of the order of adding numerals must see increasing order as earlier, *contra* Herner and

29 Christo H. J. van der Merwe, Jackie A. Naudé, and Jan H. Kroeze, *A Biblical Hebrew Reference Grammar* (Sheffield: Sheffield Academic Press, 1999), § 37.2.1.v. Cf. Robert Hetzron, "Innovations in the Semitic Numeral System," *Journal of Semitic Studies* 22 (1977), 169 n. 1, on the similar apparent variety in other Semitic languages.

30 E.g., Waltke and O'Connor, § 15.2.4a; Van der Merwe, Naudé, and Kroeze, § 37.2.2.v; Joüon and Muraoka, § 100m; Emil Kautzsch, *Gesenius' Hebrew Grammar* (trans. A. E. Cowley; Oxford: Clarendon, 1910), § 97f.

31 Cf. Waltke and O'Connor, § 15.2.5d; Kautzsch, *Gesenius' Hebrew Grammar*, § § 97f, 134i. Against this trend, cf. Screnock, "Cardinal Numerals," 147-48.

32 Sven Herner, *Syntax der Zahlwörter im Alten Testament* (Berlin, 1893), 71-75.

33 S. R. Driver, *Notes on the Hebrew Text and the Topography of the Books of Samuel* (Oxford: Clarendon, 1913), x; *Davidson's Syntax*, § 47c; Joüon and Muraoka, § 100m.

34 Heinrich Ewald, *Ausführliches Lehrbuch der Hebräischen Sprache des alten Bundes* (Göttingen: Dieterichschen Buchhandlung, 1870), § 268c; Bernhard Stade, *Lehrbuch der Hebräischen Grammatik* (Leipzig: F. C. W. Vogel, 1879), 218.

35 Herner, *Syntax der Zahlwörter*, 73. Many of the cases of increasing order occur in the supposed P-source in Genesis and Numbers.

36 On Ezra-Nehemiah and Chronicles, cf. Herner, *Syntax der Zahlwörter*, 73, 75. I have not conducted an exhaustive survey of the order of adding numerals in the Mishnah, but an initial survey of the data indicates that the evidence is strongly for decreasing order.

those who have followed him.³⁷ The following table provides the profiles of texts containing five or more tokens of evidence.³⁸

Figure 5 - Increasing Order versus Decreasing Order

	Increasing order (old)	Decreasing order (new)	% Decreasing order
Siloam Tunnel	1	0	0
Esther	6	0	0
1QM	9	1	10
Toledoth ³⁹	31	4	11
Ezek	34	9	21
Gen	40	17	30
Exod	14	6	30
P Gen	7	8	53
Num	65	72	53
Jer 52	1	5	83
1 Kgs	5	30	86
Josh	1	7	87
1 Chr	8	52	87
Chr	9	77	90
Josh-2 Kgs	8	89	92
Judg	1	15	94
Neh	1	18	95
Ezra-Neh	3	78	96
2 Chr	1	25	96

37 In an article written shortly after his dissertation, Herner criticizes König for König's work on numerals in his reference grammar (*Historisch-Kritisches Lehrgebäude der Hebräischen Sprache*); "Einige Anmerkungen über die Behandlung der Zahlwörter im 'Lehrgebäude der Hebräischen Sprache', Zweite Hälfte I. Theil, von Prof Fr. Eduard König," *ZAW* 16 (1896): 123-28. Had König accounted for various sources within the Pentateuch, argues Herner, he would have concluded that decreasing order is the older syntax of adding numerals; "Einige Anmerkungen," 126-27. (König, in his own defense, pointed out that he did not intend to make these sorts of analyses in his reference grammar; "Zur Formenlehre der hebräischen Zahlwörter," 329.) Herner's argument, however, is based on the presupposition that P is post-exilic. While it is theoretically possible that the order of adding numerals changed from decreasing to increasing and then back again, I find this unlikely; given our knowledge of the date of the Mishnah, I prefer to postulate one process of change from increasing to decreasing.

38 See section 4.2 for full references to all of the data used here.

39 On the inclusion of "Toledoth" and "P Gen," see section 3.2.

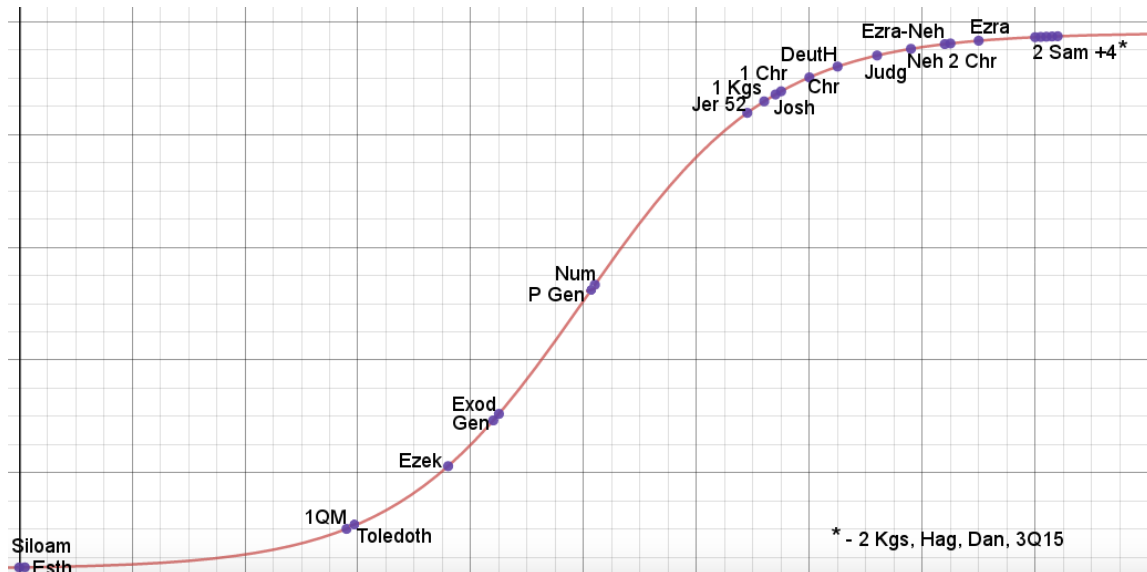
Ezra	2	60	98
2 Sam	0	6	100
2 Kgs	0	29	100
Hag	0	5	100
Dan	0	7	100
3Q15	0	5	100

The language of texts that we know to be late generally falls at the end of the spectrum, along with the texts in Joshua-2 Kings (and related Jer 52). There are a few unexpected points in the data: Esther and 1QM are certainly younger than Joshua-2 Kings, yet they fall at the very beginning of the spectrum; Ezekiel, too, we would expect to come at the end, while the unique material in 1 Chronicles falls a little earlier than would be expected. The language of Esther and 1QM can only be explained as classicizing;⁴⁰ they in fact contribute important evidence for the existence of an early stage where increasing order was primarily used, without much or any decreasing order, insofar as they show an awareness of this stage through their classicizing. The position of 1 Chronicles, on the other hand, becomes clearer when we consider another wrinkle in the evidence in the following section. The remainder of the evidence, it should be noted, is similar to the evidence for multiple distribution, node-raising and deletion, where the best evidence of the earliest stage may be the Toledoth book; already in Joshua-2 Kings we have the new feature dominating. Note, also, the number of late texts where decreasing order dominates, suggesting that Herner's analysis of decreasing-to-increasing change is incorrect. Besides Ezra-Nehemiah and Chronicles, pointed out above, Haggai, Daniel, and 3Q15 (the Copper

40 The War Scroll's classicizing is perhaps betrayed in the very copying of 1QM, where in col. II line 10 the scribe began to write עשרים ותשע, "twenty-nine," with decreasing order, but stopped short after writing half of the initial 'ayin—catching himself in a slip into vernacular language and then correcting to the language of the *Vorlage*, תשע ועשרים. The language of Esther has been described as classicizing with other features as well, and is known to use language reminiscent of earlier biblical texts (e.g., the Joseph story, 1 Kgs 21). See Steven E. Fassberg, "The Infinitive Absolute as Finite Verb and Standard Literary Hebrew of the Second Temple Period," in *Conservatism and Innovation in the Hebrew Language of the Hellenistic Period: Proceedings of a Fourth International Symposium on the Hebrew of the Dead Sea Scrolls & Ben Sira* (eds. Jan Joosten and Jean-Sébastien Rey; Leiden: Brill, 2008), 57-58; Jon D. Levenson, *Esther: A Commentary* (Louisville, Kent.: Westminster John Knox, 1997), 54; Joyce G. Baldwin, *Esther: An Introduction and Commentary* (Intervarsity, 1984), 26; Michael V. Fox, *Character and Ideology in the Book of Esther* (Grand Rapids, Mich.: Eerdmans, 2001), 52, 284; Frederic W. Bush, *Ruth, Esther* (Dallas, Tex.: Word Books, 1996), 437; Jonathan Grossman, "'Dynamic Analogies' in the Book of Esther," *VT* 59 (2009): 394-414. Esther's use of differential object marking may also indicate classicizing; Peter Bekins, personal correspondence; cf. also *Transitivity and Object Marking in Biblical Hebrew: An Investigation of the Object Preposition 'et* (Winona Lake, Ind.: Eisenbrauns, 2014), 135-39.

Scroll) all use decreasing order; although each has a small number of tokens, taken together they are suggestive. Figure 6 below shows an S-curve with this data plotted.

Figure 6 - S-curve Model of Diachronic Change in Adding Numeral Order



This preliminary sketch of diachronic change is clarified when we take into account the internal structure of adding numerals.

4.1 The 1s/10s Grouping

Cross-linguistic evidence suggests that in adding numerals of three or more members the 1s and 10s members are more closely related than the rest of the members. In contemporary English, for example, use of coordination “and” between the 10s and 1s digit is ungrammatical, whereas use of “and” between other members is acceptable.

- (21) One-hundred twenty
- (22) One-hundred and twenty
- (23) Fifty-two
- (24) *Fifty and two⁴¹

In German, Dutch, Old English, some dialects of Norwegian, Arabic, and Brythonic languages, the standardized order is decreasing until the end, where the 1s and 10s members are increasing.

41 “Two and fifty” might strike a native speaker as *possibly* grammatical, *via* remembrance of an older order fossilized in some texts, for example, “four and twenty blackbirds.”

- (25) tweehonderd vijfendertig
two-hundred five-and-thirty
 “two-hundred and thirty-five” (Dutch)

This same order, though not dominant in any text, can be found in Ancient Hebrew, as in most of the cases of “mixed” order noted above.⁴²

- (20) שש מאות חמש וּשְׁבַעִים 100s - 1s - 10s
 “six-hundred and seventy-five” (Num 31:37)

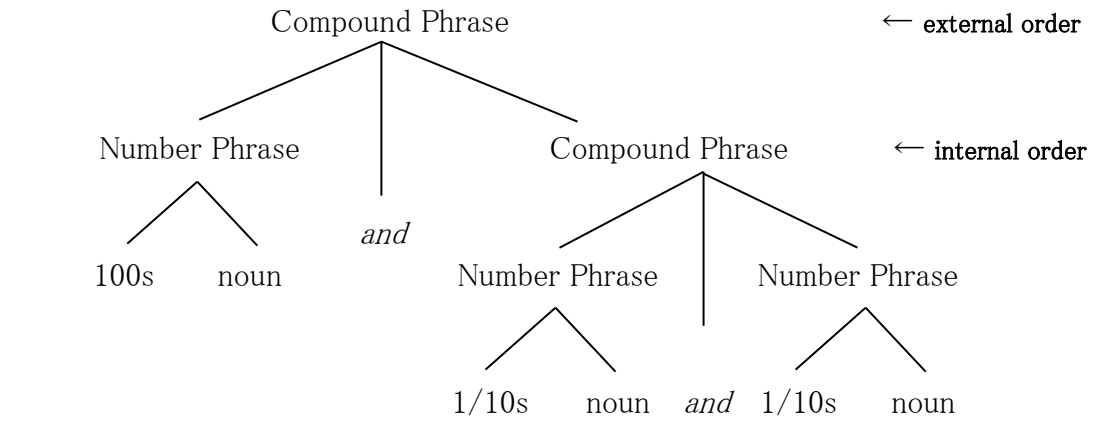
This evidence suggests both that the 1s and 10s members form a discrete unit *and* that this unit is very capable of taking an order different from the external order of the entire adding numeral.

Finally, the evidence of partial multiple distribution in Ancient Hebrew suggests that the 1s and 10s members form a discrete unit within adding numerals.⁴³

- (26) חֲמֵשׁ וְתִשְׁעִים שָׁנָה וְשִׁמְנֵה מֵאוֹת שָׁנָה
 “eight-hundred and ninety-five years” (Gen 5:17)

On this basis, I suggest that the structure of most adding numerals had the 1s/10s as a compound phrase that itself was compounded with the 100s [and/or 1000s] member.

Figure 7 - Structure of Adding Numeral: Discrete 1s/10s Unit



42 Cf. also modern dialects of Neo-Aramaic, where decreasing order is the standard, but mixed order sometimes occurs with the 1s/10s unit taking increasing order; Geoffrey Khan, *A Grammar of Neo-Aramaic: The Dialect of the Jews of Arbel* (Handbuch der Orientalistik 47; Leiden: Brill, 1999), § 12.1.6.

43 In the majority of cases the 1s and 10s members are grouped, as in example (26); cf. Gen 5:17, 18, 20, 23, 25, 26, 27, 28, 30, 31; Num 2:16, 31. The only exceptions are Gen 47:28 and 2 Chr 2:16. Cf. Blau, “Univerbalization,” 10-11.

4.2 Diachronic Analysis

The internal grouping of the 1s and 10s members helps explain why we see cases of mixed order in the data. It also helps to clarify the diachronic development of adding numeral order. More frequently used lexemes and phrases are known to resist language change.⁴⁴ Our evidence suggests that adding numerals consisting of 1s and 10s members were in greater use than other adding numerals; a speaker was almost twice as likely to speak a 1s and 10s member as they were to speak an adding numeral without both 1s and 10s member.⁴⁵ Therefore, we should not be surprised if the 1s/10s unit of adding numerals change from increasing to decreasing order at a slower pace. When the data are analyzed and a distinction is made between 1s/10s adding numerals—whether as individual adding numerals or as a unit embedded in a larger adding numeral—and other adding numerals (which I term “non-1s/10s” for simplicity), the results are as follows.⁴⁶

Increasing non-1s/10s. Siloam Tunnel line 5; Gen 5:3, 6, 7, 8, 10, 11, 13, 14, 16, 17, 18, 20, 23, 25, 26, 27, 28, 30, 31; 7:24; 8:3, 13; 11:13, 15, 17, 19, 21, 25, 32; 14:14; 47:9, 28; Exod 6:16, 18, 20; 12:40, 41; 30:23^{twice}; Num 3:43, 50; 7:49, 55, 61, 67, 73, 79, 85, 86; 16:2, 17, 35; 26:10; 33:39; 1 Sam 6:19; 1 Kgs 5:12; 6:1; 9:23; 10:29; Ezek 48:16^{four times}, 17^{four times}, 30, 32, 33, 34; Esth 1:1, 4; 8:9; 9:30; Neh 7:69*; 1QM VI 10.

Increasing 1s/10s. Gen 5:15, 17, 18, 20, 21, 23, 25, 26, 27, 28, 30, 31; 8:14; 11:12, 16, 20, 24; 12:4; 47:28; Exod 6:16, 18, 20; 7:7; 12:18; 26:2; 36:9; 38:24, 25, 28; Lev 25:8; Num 1:21, 23, 25, 27, 29, 31, 35, 37, 39, 41, 43; 2:4, 6, 8, 11, 13, 15, 16, 21, 23, 26, 28, 30, 31; 3:39, 43^{twice}, 50; 8:24; 25:9; 26:7, 14, 22, 25, 34, 37, 41, 43, 47, 50, 62; 31:33, 34, 35, 37, 38^{twice}, 39, 40, 44; 33:39; Josh 14:10; Judg 20:21; 1 Kgs

44 See, for example, the high-use verbs in English that form the past tense through ablaut (an older feature of English) instead of suffixed *-ed* (the new feature).

45 In my corpus, 1s and 10s adding numerals appear about 450 times, including 84 times within larger adding numerals; other digits (100s, 1000s, and 10000s) are involved in just over 260 cases, including the 84 that contain an internal 1s/10s unit. Gary Rendsburg has argued that the specific “numeral 75 in ancient Hebrew operated in a unique fashion,” because it is found four times with increasing order inside an adding numeral with decreasing order (i.e., 100s-1s-10s), and because it is used in a late text (Esther) with increasing order; “Hebrew Philological Notes (III),” *HS* 43 (2002), 27-29. However, Rendsburg’s evidence includes too few tokens, and he does not account for numerals with multiple distribution; there are examples of the number 75 with decreasing order in Gen 25:7 and Num 31:32, and examples of 1s-10s increasing order inside decreasing order with numerals *other than* 75 in Num 2:16, 31; 3:43; and 1 Kgs 20:15 (the last of which is noted by Rendsburg).

46 On my use or non-use of parallel texts, and the references marked with an asterisk (*) or caret (^), see footnote 22.

20:15; Jer 25:3; 52:30; Ezek 40:21, 25, 30, 33, 36; 41:6; 45:1, 3, 5, 6, 12; 48:8, 9, 10^{twice}, 13^{twice}, 15, 20^{twice}, 21^{twice}; Esth 1:1; 8:9^{twice}; 9:16, 30; Ezra 1:9; 2:5; 1 Chr 19:7*⁴⁷; 24:17^{twice}, 18^{twice}; 25:28, 29, 30, 31; 2 Chr 36:2[^]; 1QM II 1, 2, 6, 9, 10; VI 14; VII 3; IX 4-5.

Decreasing non-1s/10s. Gen 5:5; 6:3; 9:28, 29; 23:1; 25:7, 17; 35:28; 50:22, 26; Exod 38:24, 25, 26^{twice}, 28, 29; Num 1:21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 46^{twice}; 2:4, 6, 8, 9^{twice}, 11, 13, 15, 16^{twice}, 19, 21, 23, 24^{twice}, 26, 28, 30, 31^{twice}, 32^{twice}; 3:22, 28, 34, 43⁴⁸; 4:36, 40, 44, 48; 7:85; 17:14; 26:7, 14, 18, 22, 25, 27, 34, 37, 41, 43, 47, 50, 51^{twice}; 31:32, 36^{twice}, 37, 39, 43^{twice}, 45, 52; Deut 31:2; 34:7; Josh 24:49; Judg 2:8; 8:10; 8:26; 16:5; 17:2; 17:3; 20:35; 2 Sam 2:31; 8:4; 1 Kgs 5:30; 8:63; 9:14, 28; 10:10, 14, 26; 12:21; 18:19, 22; 20:15; 2 Kgs 19:35; Jer 52:28, 29, 30^{twice}; Ezek 4:5, 9; Job 42:16; Dan 8:14; 12:11, 12; Ezra 1:10, 11; 2:3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 18, 19, 21, 23, 25, 26, 27, 28, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 41, 42, 58, 60, 64, 65, 66^{twice}, 67^{twice}, 69; 8:3, 9, 10, 12, 20, 26; Neh 5:17; 7:10[^], 26[^], 67*, 70*; 11:6, 8, 12, 13, 14, 18, 19; 1 Chr 5:18, 21; 7:2, 9, 11; 8:40; 9:6, 9, 13, 22; 12:25, 26, 27, 28, 31, 36, 38; 15:5, 6, 7, 10; 21:5^{twice}*; 25:7; 26:30, 32; 29:7; 2 Chr 2:16^{twice}; 3:4*; 5:12; 12:3; 14:7; 17:11^{twice}, 15, 18; 24:15; 26:12, 13^{twice}; 28:6; 35:8; 1QM VI 10; 3Q15 III 4.

Decreasing 1s/10s. Gen 4:24; 16:16; 17:1, 24; 18:28; 23:1; 25:7, 17; 46:15, 26; Lev 12:4, 5; Num 2:9; 7:88; 31:32, 36, 43; 35:6, 7; Deut 2:14; Josh 7:5; 12:24; 14:10; 15:32; 19:30; 21:41; 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; 21:20; 23:39; 1 Kgs 2:11; 7:3; 8:63; 10:14; 14:20, 21; 15:10, 33; 16:8, 10, 15, 23, 29^{twice}; 20:1, 16, 30; 22:31, 42^{twice}; 2 Kgs 2:24; 8:17, 26; 10:14, 36; 12:7; 13:1; 13:10; 14:2; 14:2; 14:23; 15:1, 2, 8, 13, 17, 27, 33; 18:2^{twice}; 19:35; 21:1, 19; 22:1; 23:31, 36; 24:18; 25:27^{twice}; Isa 7:8; Jer 52:23, 28, 29, 30; Ezek 8:16; 11:1; 29:17; 40:1, 13, 29; 45:12⁴⁹; Hag 1:15; 2:1, 10, 18, 20; Zec 1:7; Dan 9:25, 26; 10:4, 13; 12:12; Ezra 2:3, 4, 7, 8, 10, 11, 12, 13, 14, 15, 16, 17, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 33, 34, 36, 37, 38, 40, 41, 42, 58, 60, 65, 66^{twice}, 67; 8:11, 35^{twice}; Neh 5:14; 6:15^{twice}; 7:10[^], 26[^], 67*, 71*; 9:1; 11:6, 8^{twice}, 12, 13, 14, 18, 19; 13:6; 1 Chr 2:22; 3:4; 5:18; 7:2, 4, 5, 40; 9:9; 12:29, 35, 36; 16:38; 23:3, 4; 25:7; 26:8; 27:1, 2, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15; 2 Chr 2:16; 3:15; 7:10*; 11:21;

47 1 Chr 19:7 is perhaps based on variant *Vorlage* of Samuel-Kings; cf. the evidence for 2 Sam 10:6 found in 4QSamuel^a.

48 Because the numeral in Num 3:43 has the order 1000s - 1s - 10s - 100s, I include it as a token for decreasing non-1s/10s *and* increasing non-1s/10s.

49 In this instance, the value 15 is created without the use of a teen numeral: עֶשְׂרֵה וְחֲמִשָּׁה שֶׁקֶל (“ten and five shekels”), with two 1s digits. Although עֶשְׂרֵה is technically a 1s digit, it is the larger value and thus resembles decreasing order.

13:21; 15:19*; 16:1, 12, 13*; 21:20*; 3Q15 II 4; IV 4⁵⁰; VII 6; VIII 12-13; X 7.

The distribution of the above data is summarized in the following chart.

Figure 8 - Order of Adding Numerals with 1s/10s Distinguished⁵¹

	Increasing non- 1s/10s	Increasing 1s/10s	Decreasing non- 1s/10s	Decreasing 1s/10s
Siloam Tunnel	1	0	0	0
Gen	32	19	10	10
Toledoth	25	16	4	1
P Gen	5	3	3	7
Exod	7	10	6	0
Num	15	51	69	7
Josh	0	1	1	6
Judg	0	1	7	8
2 Sam	0	0	2	4
1 Kgs	4	1	11	20
2 Kgs	0	0	1	29
Josh-2 Kgs	5	3	22	69
Jer 52 ⁵²	0	1	4	4
Ezek	12	21-22	2	6-7
Hag	0	0	0	5
Esth	4	5	0	0
Dan	0	0	3	5
Ezra	0	2	51	42
Neh	1	0	12	17
Ezra-Neh	1	2	63	59
1 Chr	0	9	27	29

50 The adding numeral in 3Q15 IV 4 is largely reconstructed (אמות ארבע[ין ואח]ת, “forty-one cubits”) and thus uncertain.

51 Where a 1s/10s adding numeral is embedded within a larger adding numeral, there are two tokens although there is only one total adding numeral: one token for the internal 1s/10s order, and one token for the external order.

52 Though the data that I include from Jer 52 do not come from material that parallels 2 Kgs 24-25 (where it does, I have excluded it), the material is likely to be from a similar source, and thus should be distinguished from the rest of Jeremiah; William L. Holladay, *Jeremiah 2* (Hermeneia Commentary; Minneapolis: Fortress, 1989), 439.

2 Chr	0	1	16	10
Chr	0	10	43	39
1QM	1	8	1	0
3Q15	0	0	1	4-5

On the one hand, given the resistance to change and thus variant order of 1s/10s adding numerals, we might focus on the order of non-1s/10s adding numerals as better reflecting the process of change and diffusion.⁵³ On the other hand, the combination of the two gives strong witness, especially in the case of Numbers, which heavily prefers decreasing order with non-1s/10s, but increasing with 1s/10s, suggesting that the language of Numbers fell somewhere in the middle of the transition. Focusing on each type of adding numeral, the texts with five or more tokens pattern as follows (figures 9 and 10).

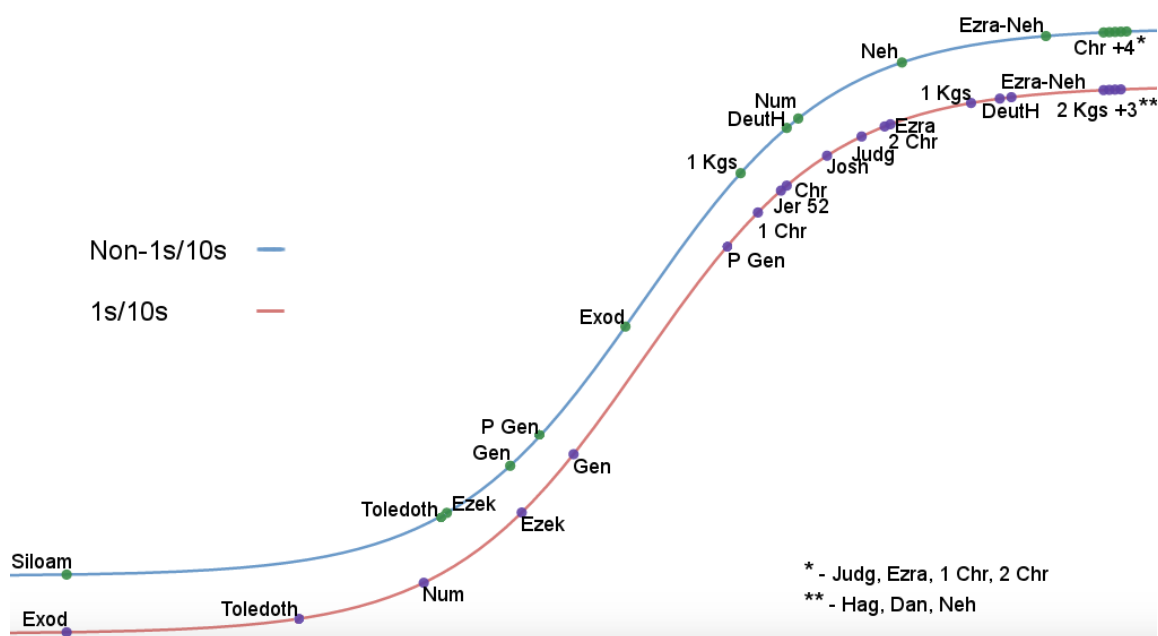
Figure 9 - % Decreasing Order of non-1s/10s and 1s/10s

	% Decreasing order non-1s/10s	% Decreasing order 1s/10s
Siloam	0	–
Esth	–	0
1QM	–	0
Toledoth	14	6
Ezek	14	24
Exod	46	0
Gen	24	34
Num	82	12
P Gen	38	70
Jer 52	–	80
1 Kgs	73	95
Josh	–	86
1 Chr	100	76
Josh-2 Kgs	81	96
Chr	100	80
Judg	100	89
Ezra	100	91

53 In the study of word order, for example, certain clauses are best excluded from consideration for similar reasons; cf. Anna Siewierska, *Word Order Rules* (London: Croom Helm, 1988), 8; Robert D. Holmstedt, “Word Order in the Book of Proverbs,” in *Seeking Out the Wisdom of the Ancients* (eds. Friebel, Magary, and Troxel; Winona Lake, Ind.: Eisenbrauns, 2005).

2 Chr	100	91
Neh	92	100
Ezra-Neh	98	97
2 Kgs	–	100
Hag	–	100
Dan	–	100

Figure 10 - S-curve Models of Change in non-1s/10s and 1s/10s Adding Numeral Order



Given that two distinct but related processes are involved, the diachronic change of adding numeral order cannot be pared down to a simple process of change and diffusion. The book of Numbers, for example, has a high percentage of the new feature in non-1s/10s adding numerals, but a low percentage of the new feature in 1s/10s adding numerals. A one-dimensional account is insufficient. In this case we need to account for both the process of change and diffusion *and* resistance to that process in particular contexts. The transition between majority use of the old feature and majority use of the new feature is marked both by *mixed use* of both features (20-80% new) and by the co-existence of the old feature used in high-use settings and the new feature used elsewhere. When we consider the latter, it is easiest to look again at the actual numbers of occurrences. Older language should use mostly increasing order in both types of phrase, with the potential for the new feature beginning to creep in. Younger language should use mostly decreasing order in both types of phrase, with

the old feature never quite disappearing altogether. Transitional language should have a concentration of increasing order in 1s/10s and decreasing order in non-1s/10s.

Figure 11 - Order of Adding Numerals with Three Phases Highlighted

	Increasing non-1s/10s	Increasing 1s/10s	Decreasing non-1s/10s	Decreasing 1s/10s
	OLDER		YOUNGER	
	TRANSITION			
Gen	32	19	10	10
Toledoth	25	16	4	1
P Gen	5	3	3	7
Exod	7	10	6	0
Num	15	51	69	7
Josh-2 Kgs	5	3	22	69
Ezek	12	21-22	2	6-7
Esth	4	5	0	0
Ezra-Neh	1	2	63	59
Chr	0	10	43	39
1QM	1	8	1	0

The high concentration of older order in Genesis is due mostly to evidence in the Toledoth book. The remainder of the P material in Genesis does not pattern neatly, but there is a somewhat low number of tokens; if we combined this data with P Exodus and P Numbers, the language would pattern as transitional. As noted above, Esther and 1QM are classicizing. Ezekiel may be a statistical outlier, or it may be explained in other ways.⁵⁴ A small level of idiosyncrasy with individual features is to be expected;⁵⁵ this is the very reason we should consider many features and average them, rather than latching onto one or two as independently indicative. Moreover, one statistical outlier does not negate the clear general trend in the evidence. Joshua-2 Kings, Ezra-Nehemiah, and Chronicles fall at the end of the process of change, while Genesis, Exodus, and Numbers fall in the transition. In the case of Chronicles, the recognition that 1s/10s resist the change to decreasing order helps explain the ten

54 We could explain Ezekiel's preference for increasing order as imitation of the language of the Pentateuch or of priestly literature (cf. section five). It is also worth noting that the majority of the evidence from Ezekiel, and all the cases of increasing order, are found in Ezek 40-48.

55 Every language community and even every speaker has their own grammar with unique aspects, particularly if they have interacted with a diverse range of speakers; Hale, *Historical Linguistics*, 3-17.

occurrences of increasing order. As was the case with the structure of adding numerals, the diachronic development of adding numeral order tells us nothing about the language of Joshua-2 Kings relative to Ezra-Nehemiah and Chronicles, because Joshua-2 Kings falls at the end of this process of change-and-diffusion.

The cause for the change from increasing to decreasing order may well stem from contact with Imperial Aramaic. According to Muraoka and Porten, adding numerals in the Old Aramaic material found in Egypt use decreasing order.⁵⁶ This could have begun during the Babylonian exile, but not necessarily, since Hebrew speakers came into contact with Aramaic during many other periods of history.

5 The Data according to Source and Redaction Critical Distinctions

Modern scholarship recognizes the conglomerate nature of our evidence for each book of the Hebrew Bible. While I do not have space to explore the adding numeral data in light of every theory of source and redaction criticism for every book, I will briefly address some particular examples. I leave it to redaction and source critics to fully consider the evidence in light of their texts, and to use the diachronic development of adding numeral features as a tool for further analysis. My point here is to demonstrate that the known textual complexities do not undermine the basic model offered above.

Within the Pentateuch, most of our evidence is found in Genesis, Exodus, and Numbers; Leviticus and Deuteronomy contain just three tokens each. If we were to follow Martin Noth's division of sources,⁵⁷ most of the adding numerals in the Pentateuch would fall within the P source and related material (the Toledoth book and supplements to P). Six tokens in non-P material (only four of which can be analyzed for structure) do not give enough evidence. Thirty tokens in Numbers 25-31 fall within material that Noth does not think can be identified;⁵⁸ others, for example Baruch Levine,⁵⁹ consider this material to be P. Given the high proportion of evidence in Genesis, Exodus, and Numbers that stems from priestly material, the general profile of those three books—that they contain earlier syntax for adding numerals—holds true for P. The data when catalogued according to Noth's sources pattern as follows.

56 Takamitsu Muraoka and Bezalel Porten, *A Grammar of Egyptian Aramaic* (Handbook of Oriental Studies 32; revised edition; Leiden: Brill, 2003), § 21.b; cf. the examples cited in Takamitsu Muraoka, *An Introduction to Egyptian Aramaic* (Lehrbücher orientalischer Sprachen III/1; Münster: Ugarit-Verlag, 2012), § 12.b.

57 Martin Noth, *Überlieferungsgeschichte des Pentateuch* (Stuttgart: Kohlhammer, 1948), 17-19, 29-35, 38-39. Though dated, I use Noth because he presents a clearly defined analysis that is minimally contentious in the context of today's debates.

58 Noth, *Überlieferungsgeschichte des Pentateuch*, 35 n. 126.

59 Baruch A. Levine, *Numbers 1-20* (Anchor Bible 4A; New Haven: Yale University Press, 2008), 68-69.

Figure 12 - Structure of Adding Numerals according to Noth's Source Distinctions

	Multiple Distribution	Deletion/Node-raising	% Deletion/Node-raising
P (including Toledoth and supplements)	51	56	52
J	0	1	–
E	0	3	–
Unknown material in Numbers	1	16	94

Figure 13 - Order of Adding Numerals according to Noth's Source Distinctions

	Increasing	Decreasing	% Decreasing
P (including Toledoth and supplements)	102	76	43
J	0	3	–
E	1	2	–
Unknown material in Numbers	14	16	53

Dividing the material in Genesis-Numbers along source-critical lines does not provide a neat solution to the variety of data found therein—it is not as though P clearly favors multiple distribution and increasing order. All eight cases of deletion/node-raising in Exodus are found in P. Similarly, Numbers has a high proportion of deletion/node-raising in its P material (36 cases). The undesignated material in Numbers clearly patterns with the rest of (P) Numbers, using primarily decreasing order for the larger external numeral and increasing order for internal 1s/10s numerals. In other words, distinguishing P from non-P in these three books does little to change their profile.

The insufficient data in J/E makes it impossible to compare to P; for Driver, the lack of adding numerals in J/E results from J/E's being less concerned with "exact chronological standards" and "statistical data" than P.⁶⁰ In some cases the presence of an adding numeral (which is by nature more precise than simple numerals) may be a determining factor in the material being assigned to P. Since there is essentially nothing *within* Genesis-Deuteronomy with which to compare, we can only compare P to Josh-2 Kgs and other later texts—all of which clearly prefer deletion/node-raising and decreasing order. The distribution of data in P is certainly different than the distribution found in the rest of the Hebrew Bible. The question remains, however, why this should be the case. I see no literary or stylistic features playing a role in this evidence—with the possible exception of the Toledoth book. Similarly, the distribution of data does not line up with the theory of a distinct northern dialect of Hebrew. The

60 Samuel R. Driver, *An Introduction to the Literature of the Old Testament* (Edinburgh: T&T Clark, 1950), 126-27.

best explanation for the data is diachronic, since P does not clearly favor one structure or one order for adding numerals. Frank Polak has suggested a distinct “priestly sociolect” found in P,⁶¹ but even if this notion were correct, we again might appeal to diachronic development as part of this sociolect difference, as it is more likely for a religious class of people to use older features to distinguish their language than to innovate new features. Whether one wants, then, to follow a particular source-critical theory or not, my sense is that diachrony must still be involved as the cause of change.

Within the priestly material itself, we might ask whether further distinctions might correspond with our data. When we distinguish supplementary material (as determined by Noth) and the Toledoth book in Genesis from the rest of P, as well as the legal material in P and H Leviticus, the data are as follows.

Figure 14 - Structure of Adding Numerals within P Material

	Multiple Distribution	Deletion/Node-raising	% Deletion/Node-raising
Toledoth	29	6	17
P	19	35	65
P supplements	3	15	83
P Leviticus	2	0	—
H Leviticus	0	1	—

Figure 15 - Order of Adding Numerals within P Material

	Increasing	Decreasing	% Decreasing
Toledoth	31	4	11
P	45	58	56
P supplements	26	14	35
P Leviticus	0	2	—
H Leviticus	1	0	—

If I am correct to see the changes in adding numeral structure and order as diachronic features of the language, the Toledoth book—when seen as a distinct source that was incorporated into P—would preserve the stage of the language where the older features dominated. These features could also conceivably appear in higher concentration in the Toledoth for literary reasons; if such numeral syntax was

61 Frank H. Polak, “Poetic Style and Parallelism in the Creation Account (Genesis 1.1–2.3),” in *Creation in Jewish and Christian Tradition* (eds. H. Reventlow and Y. Hoffman; London: Sheffield Academic Press, 2002), 12, 27. This notion might help to explain Ezekiel’s use of increasing order if Ezekiel was aware of a unique P source and meant to imitate priestly literature and language.

characteristic of genealogies, it again could stem ultimately from diachrony (with genealogies preserving/using older features of the language).

Looking outside the Pentateuch, redaction and source critical issues appear to have little effect on my analysis. Taking 1-2 Kings as an example, if we consider the adding numeral data in light of potential sources, the compilation of those sources, and later redactional stages, the general picture does not change. This is because the evidence is very nearly monolithic, with only a few traces of old features in 1-2 Kings. Following Mordecai Cogan's general outline of the composition history of 1-2 Kings,⁶² we find new features—node-raising/deletion and decreasing order—dominating in all compositional layers: those that potentially stem directly from an older source, revisions made by the earliest editor(s) (Cogan's "Dtr1"), and later stages of redaction.⁶³ Old features—multiple distribution and increasing order—are similarly present in multiple compositional layers.⁶⁴ Though I have not exhausted this kind of analysis for every proposed composition history of 1-2 Kings, it looks as though all stages of compositional development have the same general character. The widespread presence of new features in earlier compositional stages shows that the latest redactions are not responsible for the new adding numeral features in 1-2 Kings. I suspect that most, if not all, redaction critical analyses of 1-2 Kings would similarly entail new and old adding numeral features in all layers of composition. The character of the data in Joshua-2 Kings described in my model above reasonably applies regardless of one's outlook on the development of these texts.

While the texts of the Hebrew Bible have complicated textual histories, the known complexities do not undermine my basic model offered above. Source criticism of the Pentateuch does not explain away the diachronic trend, and potential sources and stages of redaction do not explain away the new features in Joshua-2 Kings. The ways in which diachronic linguistics ought to participate in a conversation with redaction and source criticism is another question altogether, which I cannot address here. To take one example, recent scholarship views the book of Numbers as very late, some seeing Numbers as nearly contemporaneous with Chronicles because of thematic similarities between the two corpora.⁶⁵ The linguistic evidence from adding

62 Mordecai Cogan, *1 Kings: A New Translation with Introduction and Commentary* (Anchor Bible 10; New York: Doubleday, 2008), 90-100.

63 See, for example, 1 Kgs 7:3 and 2 Kgs 12:7, perhaps reflecting Temple sources; and 1 Kgs 8:63, where an editor exaggerates the number of Solomon's offerings.

64 E.g., increasing order in 1 Kgs 5:12, possibly stemming from a Solomon source; multiple distribution and increasing order in 1 Kgs 6:1, where the ideologically motivated number 480 may indicate editing; and increasing order in an editorial summary in 1 Kgs 9:23. Old features may be completely absent from the latest stages of redaction; examples of adding numerals with new features include 2 Kgs 23:31, 36; 24:18; 25:27. However, old features in 1-2 Kings are, on the whole, very sparse.

65 See Hans-Peter Mathys, "Numeri und Chronik: Nahe Verwandte," in *The Books of Leviticus and*

numerals is incongruous with such an analysis. The question, then, is which type of evidence should take precedence, thematic similarities or linguistic evidence. Whatever the answer, I suspect that linguistic evidence has been underappreciated in recent decades.

6 Conclusion

The results of this study impact the ongoing debate about Hebrew diachrony and the dating of texts in three ways. First, the adding numeral data confirm the idea that the Hebrew found in the biblical texts changed over time, and they cannot be adequately explained by recourse to dialect or stylistics alone. Second, the evidence of adding numerals is compatible with the traditional model of Hebrew diachrony. Third, the diachronic progression of adding numeral syntax argues against a strict periodization of Hebrew into two (or three) chronolects.

The evidence of adding numerals supports the notion that we can track diachronic developments in Ancient Hebrew. For the two main features I reviewed, diachrony is the most powerful explanation for the variation in the data; stylistics and register may possibly help explain some of the deviation from the overall model, but diachrony is the most likely overarching framework for what is happening. A few things are important to keep in mind on this point. First, the use of an old or new feature once or twice in a text does not necessarily indicate that the language of that text is old or new; rather, it means merely that the old or new feature was an available option. Second, this study thinks in terms of the *process of change*, not firm timeframes. In other words, for a text to be earlier or later on the S-curve means that its language occurs at an earlier or later point in the process of change. It is *possible* that the tradents behind Genesis, Exodus, and Numbers were language innovators or early adopters of these particular features, making them earlier in the process of change though temporally around the same time as other texts. To sort out whether this was the case would require the addition of many more features tracked in the same way that I have tracked adding numeral syntax here. What I have sketched here does not, in itself, give the full picture of the relative timeframes of the language in each text; what it does, rather, is contribute more pieces of the puzzle that can be combined with others to say something significant about the relative dates of the language in each text.⁶⁶

The results of my study are compatible with the classic approach to Hebrew diachrony to an extent; the data suggest a diachronic distinction between some biblical texts, and moreover they fit the overall chronology of the traditional approach.

Numbers (ed. Thomas Römer; Leuven: Peeters, 2008), 555-78.

66 And, to be sure, content-based evidence—e.g., clear references to corroborated historical events—is often better than linguistic evidence in terms of dating the texts (as opposed to their language).

The fact that the material in Joshua-2 Kgs, Chronicles, and Ezra-Nehemiah has the same profile does not entail that these texts or their language are even roughly contemporaneous, since the last stage of the process of change will always extend for a long time. Moreover, though the two syntactical features discussed here are not sufficient in themselves to *firmly* date texts, the evidence of adding numerals *supports* a view of the Pentateuchal material (or P at least) as being earlier than Ezra-Nehemiah, Chronicles, and the Deuteronomistic History (Joshua-2 Kings)⁶⁷—including its sources and subsequent redactional layers. If we follow traditional source-critical distinctions, my analysis suggests that language in the Toledoth book falls near the beginning of the process of change, language in P material falls within the transitional stage, and language in the remainder of our ancient Hebrew evidence falls at the end of the process, with the exception of texts that are classicizing.

The evidence of this study runs contrary to a strict periodization of Classical Biblical Hebrew, Late Biblical Hebrew, and Transitional Biblical Hebrew, since some of the Classical Biblical Hebrew texts (Joshua-2 Kings) fall at the end of the process of change and other Classical Biblical Hebrew texts (P, Genesis, Exodus, Numbers) occur at the beginning or in the transition. I find it likely that the diachronic changes to Hebrew occurred at different periods in the history of Hebrew.⁶⁸ Many scholars who adhere to the classic model of Hebrew diachrony, of course, agree that not all features would have changed at the same time.⁶⁹ In the case of each individual feature, there are early, transitional, and late stages in the process of change. And though major social upheaval and intense language contact—of the sort that would have resulted from the Babylonian exile—often bring about widespread change to a language,⁷⁰ I am not yet convinced that a large number of features, under influence of Aramaic, changed *en masse* over a short period of time, nor that we can properly speak of two (or three) distinct temporal dialects or chronolects of Ancient Hebrew.

In conclusion, complex adding numerals are valuable objects of study in two regards. On the synchronic level, their syntax is more complicated than typically assumed. By exploring areas of previously uncharted syntax, this study clarifies the use and shape of adding numerals in their various forms. On the diachronic level, both the structure and order of adding numerals offer ample evidence for tracking processes of change in the history of Ancient Hebrew. Significantly, the relative positions of each text's language in the process of change-and-diffusion coincide for

67 Cf. Joosten, "Diachronic Linguistics," 336-37.

68 Cf. Vincent DeCaen, "Hebrew Linguistics and Biblical Criticism," *JHS* 3 (2001).

69 Joosten, "Diachronic Linguistics and the Date of the Pentateuch," in *The Formation of the Pentateuch: Bridging the Academic Cultures of Europe, Israel, and North America* (eds. Jan C. Gertz et al.; Tübingen: Mohr Siebeck, 2016), 331-32.

70 Compare, for example, the shift from Old English to Middle and Modern English, brought on by the Norman invasion of Britain and increased contact between English and French.

both features. Though inconclusive on their own, the diachronic analyses offered here are important evidence to add to the larger conversation about Hebrew diachrony. In addition to the syntactic and diachronic knowledge afforded by study of adding numerals, we also find in adding numerals a suggestive example of the *potential* of the study of numeral syntax. Adding numerals are but one part of numeral syntax. Teen numerals, multiplying numerals, and number phrases may hide similar secrets of syntactic complexity and diachronic development.