Cambridge Semitic Languages and Cultures

Linguistic Theory and the Biblical Text

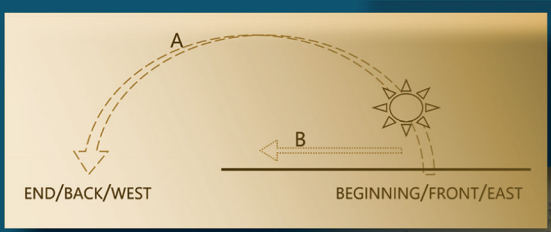
Edited by William A. Ross and Elizabeth Robar

Cognitive Linguistic Theory

Functional Grammar

οὗτος ἦν ἐν ἀρχῇ πρὸς τὸν θεόν. πάντα δι' αὐτοῦ ἐγένετο, καὶ χωρὶς αὐτοῦ ἐγένετο οὐδὲ ἕν ὃ γέγονεν. ἐν αὐτῷ ζωὴ ἦν, καὶ ἡ ζωὴ ἦν τὸ φῶς τῶν ἀνθρώπων· καὶ τὸ φῶς ἐν τῇ σκοτίᾳ φαίνει, καὶ ἡ σκοτία αὐτὸ οὐ κατέλαβεν.

Historical Linguistics



Complexity Theory

Generative Linguistics

This was in the beginning with God. All things through him came to be, and outside of him came to be nothing that came to be. In him was life and the life was the light of people, and the light shines in the darkness and the darkness did not comprehend it (Jn. 1:2–5)

Pragmatics of Information Structure

Computational Linguistic Analysis

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EMERGING FROM SILOS OF ANALYSIS: A COMPLEXITY THEORY APPROACH TO THE STUDY OF BIBLICAL TEXTS

Sophia L. Pitcher

Language is a complex system (Larsen-Freeman 1997; Larsen-Freeman and Cameron 2008; Ellis and Larsen-Freeman 2009a). Together, the many dimensions of language comprise an intricate nexus of heterogenous components that often interact in surprising ways. Some of the dimensions of language—grammar, orthography and the written transmission of texts, language acquisition, and language variation—comprise complex systems in themselves. For example, language acquisition, or more precisely an individual's developing proficiency in a language (see Larsen-Freeman and Cameron 2008, 157; Dörnyei 2009; Ellis and Larsen-Freeman 2009b; Naudé 2012, 64), involves dynamic interactions between multiple agents. Speech communities, in constant flux, are comprised of individuals at various levels of proficiency who exhibit varying patterns of language use (see Mufwene 2008, 3; Beckner et al. 2009, 12–15; Naudé 2012, 67–68, 69). Language variation is similarly complex, as it encompasses variation manifested synchronically and diachronically. Synchronic language variation happens in real time at the level of individual speakers (viz. idiolects) and communities of

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speakers (viz. dialects; see Mufwene 2008, 15–28; Beckner et al. 2009, 7, 9, 12–15; Blythe and Croft 2009, 48; Naudé 2012, 67–68), while diachronic language variation involves the interplay between culturally transmitted linguistic structures that "persist for millennia" (Naudé 2012, 73) and those that do not, resulting in the "renovation of morphosyntactic structure" (Givón 2009, 43; Naudé 2012, 73) over time (see also Beckner and Bybee 2009).

Higher-level dimensions of language can be reduced to reveal complex components at lower levels of organisation. For example, the components of the grammar of a language include syntax, morphology, phonology, semantics, and discourse-pragmatics. These components interface at various levels and to varying degrees, forming dynamic and often nonlinear phenomena. For example, the phonological dimension not only includes a language's sound system as represented by its consonants, vowels, and lexical tones (if present) but also prosodic phonology, with its own array of constituent features that interact with morphological, syntactic, semantic, and discourse-pragmatic domains.

Conceptualised as a complex system, language consists of multi-dimensional layers that are distinct but nonetheless interrelated—each layer influencing the other, while simultaneously shaping the system as a continuously evolving whole. This hierarchical interconnectedness characterises the nature of complex systems. As Baicchi (2015, 10) describes, complex systems are "heterogeneous entities that, interacting with each other and with their environment, generate multiple layers of collective

structure exhibiting hierarchical self-organization without centralized control." Characterising language in such a way encourages analyses that are also multi-dimensional and that seek to account for linguistic phenomena as they exist within the system. Although a complex systems approach may threaten analysis with a bewildering degree of variability, it offers two clear and compelling benefits: (1) an awareness of the empirical nature of the object of study, which includes the presence of other phenomena that share its nexus, and (2) theoretical grounding that aims to provide greater analytical integration of seemingly disparate factors operating within the system.

In other words, a complex-systems approach to language recognises that isolated analyses artificially simplify and often obscure the object of study (see Larsen-Freeman 1997; Larsen-Freeman and Cameron 2008, 9; Schwartzhaupt 2013, 262). Perhaps more fundamentally, it "offers greater coherence in explaining what [is] already know[n]" (Larsen-Freeman and Cameron 2008, 11). It is for these reasons that a complexity approach to language is beginning to influence the way language phenomena are understood within certain subfields of linguistics. This systems view is also beginning to impact the way biblical scholars analyse, teach, and translate biblical texts.

To introduce the merits of a complexity approach to the study of biblical texts, this paper will discuss the origins of Complexity Theory (CT) and its historical development within the field of linguistics (§1), the seven core attributes of complex systems (§2), and the ways in which a complexity approach has been fruitfully applied to biblical scholarship (§3).

1.0. Complexity Theory: Origins and Historical Development

Baicchi (2015, 10) identifies the ancient Greek philosopher Heraclitus (ca 500 BCE) as articulating the earliest philosophical expressions on the dynamism and unity of natural phenomena (see also Larsen-Freeman and Cameron 2008, 6). Heraclitus described the material world as interconnected and in continuous flux. This perspective challenged a static philosophy of the material world, "which described reality as if it were composed of static individuals and the state of being as conceptually 'simple', internally unchangeable and undifferentiated" (Baicchi 2015, 10). Baicchi (2015, 10) also cites the 'process philosophy' of Alfred Whitehead as advancing Heraclitus' notion of dynamicity and originating 'systems thinking' in the early twentieth century. In his essay *Process and Reality*, Whitehead (1929) argues for a philosophical balance between "the metaphysics of substance… and the metaphysics of flux" (1929, 209). Whitehead does this by postulating that a "particular existent" or entity is characterised by the notion of concrescence—a "fluency inherent in [its] constitution" (1929, 210). He argues that "the real internal constitution of a particular existent" (1929, 210) is an interconnected, dynamic process of a larger whole (1929, 211, 214–215):

> 'Concrescence' is the name for the process in which the universe of many things acquires an individual unity in a determinate relegation of each item of the 'many' to its subordination in the constitution of the novel 'one'. The most general term 'thing'—or, equivalently, 'entity'—means nothing else than to be one of the 'many' which find their niches in each instance of concrescence. Each

> instance of concrescence is itself the novel individual 'thing' in question.... The notion of 'organism' is combined with that of 'process' in a twofold manner. The community of actual things is an organism; but it is not a static organism. It is an incompletion in process of production.... In this sense, an organism is a nexus. Secondly, each actual entity is itself only describable as an organic process. It repeats in microcosm what the universe is in macrocosm. It is a process proceeding from phase to phase, each phase being the real basis from which its successor proceeds towards the completion of the thing in question. Each actual entity bears in its constitution the 'reasons' why its conditions are what they are. These 'reasons' are the other actual entities objectified for it.... Thus each actual entity, although complete so far as concerns its microscopic process, is yet incomplete by reason of its objective inclusion of the macroscopic process.

Whitehead understands an individual category or entity to be the perception of a process at a particular moment in time. Furthermore, he concludes that an individual entity or occasion may be analysed, but the analysis is by nature transitory.

While these philosophical antecedents of complexity are noteworthy, Larsen-Freeman and Cameron (2008, 2–3) credit mid-twentieth century scientists with formulating the most influential precursors of CT. They cite Conrad Waddington's description of embryogenesis in 1940 as a pivotal systems description. Within this conceptual framework, an embryo is not fully determined by genetic information, but rather (Larsen-Freeman and Cameron 2008, 2):

> each step in the process of development creates the conditions for the next one. In other words, "the form of the

> body is literally constructed by the construction process itself—and is not specified in some pre-existing full instruction set, design or building plan…" (van Geert 2003, 648–649).

In a similar vein, in 1950, biologist Ludwig von Bertalanffy proposed a general systems theory that described "an entity as the sum of the properties of its parts" (Larsen-Freeman and Cameron 2008, 2). In doing so, he eschewed reducing an entity to any one of its parts, underscoring the importance of the "relationships among the parts which connect them to the whole" (Larsen-Freeman and Cameron 2008, 3).

Over the next three decades, scientists continued to develop a systems approach to natural phenomena (see Larsen-Freeman and Cameron 2008, 3–4).[1] In the 1980s, this field of research culminated in the founding of the Santa Fe Institute. The institute quickly became the hub for exploring the nature of complex adaptive systems, where CT was formalised and multidisciplinary research flourished (Larsen-Freeman and Cameron 2008, 3). The application of CT has been extended to such diverse fields (see Larsen-Freeman and Cameron 2008, 3–7; see also Pearce and Merletti 2006) as business management (Battram 1998), physics (Gell-Mann 1994), epidemiology (Pearce and Merletti 2006), psychology (Spivey 2007), economics (Arthur 2013), and translation and development studies (Marais, 2014).

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[1] Marais (2014, 19) also cites chaos theory as an influential precursor to the development of CT. Chaos theory is a branch of mathematics that explores the underlying order of systems that exhibit random states of disorder and irregular patterns (e.g., the weather as demonstrated by the butterfly effect [Gleick 1987, 9–31; Dooley 2009]).

At the close of the century, Larsen-Freeman pioneered a complexity approach to applied linguistics, exploring the merits of a complexity model for language acquisition and second language instruction. Her primary hope for developing complexity thinking within her field was that "the dynamics of complex nonlinear systems [would] discourage reductionist explanations" (Larsen-Freeman 1997, 142). For Larsen-Freeman, much of the theoretical appeal of CT lies in the dynamic and holistic metaphor that it engenders, enabling researchers to perceive fundamental properties and interactions of language phenomena that remain opaque to traditional theoretical frameworks. She argues that the insights that emerge from a complexity approach are not equally accessible to these frameworks because at their core they reduce or isolate the object of study, and in doing so obscure it.

According to Larsen-Freeman and Cameron (2008, 6), linguists have typically taken a binary approach to the description of language phenomena, as either an inner perspective of the mind (see Chomsky 1965), or an outer perspective of the world (see Weinreich et al. 1968). Linguists who take the inner perspective typically investigate "mental competence rather than performance" (2008, 6), while those who have taken the outer perspective often seek to create "a model of language which accommodates the facts of variable usage" (2008, 6). Larsen-Freeman and Cameron (2008, 6) assess the deficiencies of these polar approaches to language theory in the following way:

> Applied linguists have… preferr[ed] to explain the facts of language… either through an appeal to a mental competence… or by taking language use factors into account, showing patterns in variability…. But mental competence,

> when it is seen to be "irreducibly self-contained, cannot meaningfully relate to the world outside" (Leather and van Dam 2003, 6)—which applied linguists must do—and the hybridity of more socially-oriented approaches have tended to treat the world (context) as an independent variable that influences linguistic form, not as a dynamic system itself. Here, perhaps, Complexity Theory may contribute to a resolution.

A complexity approach to language resolves the tension of this dichotomy by rejecting the view that the environment is "external to and independent from the organism" (Larsen-Freeman and Cameron 2008, 7) and advancing the view that the dimensions of language "emerge from interrelated patterns of experience, social interaction, and cognitive mechanisms" (Beckner et al. 2009, 2).

Perhaps most fundamentally, Larsen-Freeman (2013, 370) understands CT to be a metatheory "still necessitating object theories" (viz. discipline theories). According to Larsen-Freeman, it is precisely this characteristic that endows CT with one of its greatest advantages—transdisciplinarity: CT "avoids the splintering of disciplinary knowledge and creates instead new forms of knowledge, which are thematic, cutting across disciplinary boundaries" (2013, 370). In fact, Marais (2014, 18) considers the trajectory of Western scholarship towards interdisciplinarity and complexity frameworks to be inevitable:

> In a sense, complexity thinking seems to be inevitable. The whole program of Western science has focused on analyzing the parts of reality in order to understand them better…. Now, the realization is dawning on scholars that analysis can only take you so far, because only a small part

> of reality is to be explained by the way parts are, or only a small part of reality can be understood by understanding the parts of it. Much of reality is to be explained not by the parts themselves but by the way in which they relate to one another or by the way in which they are becoming, the way in which constituent parts form wholes… The focus has thus shifted from an analysis of parts to a focus on the relationships and connections between parts and between parts and wholes. Also, the focus has shifted from an interest in phenomena to an interest in processes, that is, the way in which phenomena are the result of the interaction of their constituent parts.

Marais is also quick to point out that while the notions of movement, process, and interdisciplinary synthesis factor into the descriptions of complex systems, they are not of primary importance. For Marais (2014, 18), stasis, being, and disciplinary analysis are equally important notions since they too characterise reality:

> The philosophical problems of stasis and movement, and of how both constitute reality, are within the purview of complexity thinking. Let me hurry to say that I do not suggest replacing analysis with synthesis or being with process. I hope to incorporate these binaries in a complexity view in which both sides of the binary find their rightful place in thinking about a particular phenomenon.

2.0. Seven Core Characteristics of Complex Systems

CT is chiefly concerned with the description and modelling of the relationships between the components of complex systems—particularly, the relationships that emerge from changing and often

unexpected interactions among the components. According to Larsen-Freeman and Cameron (2008), seven core attributes characterise complex systems: 1) dynamism, 2) heterogeneity, 3) openness, 4) interconnectedness, 5) emergence, 6) nonlinearity, and 7) adaptation.

First, complex systems are dynamic. The dynamism of a complex system refers to its non-static nature; it is a system in constant flux (Larsen-Freeman and Cameron 2008, 29–30). In fact, Larsen-Freeman and Cameron assert that dynamism is likely the defining feature of language as a complex system (2008, 25) because "language, language use, and language development are continuously in action" (2008, 29).

Second, unlike simple systems (e.g., a traffic light; see Larsen-Freeman and Cameron 2008, 27) that are comprised of "a small set of similar components… connected in predictable and unchanging ways" (2008, 27), complex systems embody a multiplicity of dynamic, heterogeneous components.

Third, complex systems are open. Unlike closed systems, those that are open allow energy, matter, or other influences to enter from the outside (Larsen-Freeman and Cameron 2008, 32). For example, a closed highway system would be one with a fixed number of vehicles and a fixed road capacity. However, in an open road system (2008, 31) where traffic continually increases but road capacity remains static, the roads will eventually "reach equilibrium in the form of gridlock" (2008, 32). Such a result initiates pressure to add road capacity, thereby influencing the context of the system. So, in an open highway system, free-flowing equilibrium can only be maintained by introducing

additional road capacity to the system. This means that open systems "not only adapt to their contexts but also initiate change in those contexts; these systems are not just dependent on context but also influence context" (Larsen-Freeman and Cameron 2008, 34).

A linguistic example of this attribute is provided in the lexicon—a subsystem of language that exhibits varying degrees of openness. Certain classes of words in the lexicon are more open than others; the addition or attrition of nouns, for example, is greater than that of prepositions. Furthermore, as an open system, the lexicon can undergo transformation generated by the interaction of lexical inputs and other dimensions of language. For example, the loss of case in Biblical Hebrew (see Waltke and O'Connor 1990, §8.1.c), a morphological change, initiated a phonological process that changed the vowel structure of segolate nouns. Specifically, the loss of the vocalic case marker resulted in a consonant cluster, triggering an epenthetic vowel, which then effected vowel harmony in the first syllable (e.g. **malk* > *malek* > *melek* 'king'; see Blau 2010, 54).

This leads to the fourth attribute of complex systems—interconnectedness. Complex systems exhibit interconnectedness between their numerous components, dimensions, and contextual factors. A linguistic example of this attribute is illustrated in the morphophonemics of the Biblical Hebrew conjunction *waw*. As is well known, the coordinating *waw* morpheme has multiple allophones depending on its phonological context. However, Revell (2015, 43; 2016, 75–76) and Scheumann (2020, 58–59) observe that the proclitic allophones of *waw* are also determined

by their prosodic contexts—particularly, the position of *waw* within a phrase segmented by a disjunctive *ṭaʿam*.

> Conjunction *waw* takes a [*qameṣ*] before the second conjunct of each pair that has an initial accent [viz. an accent on the first syllable] [לַיְלָה וָיֹום 1 Kgs 8.29].… Conversely, when a *waw* is attached to the first conjunct in each pair, it takes a schwa, even though these conjuncts also have an initial accent [וְיֹום וָלָיְלָה Gen. 8.22].… The phonetics of the accented syllable do not play a decisive role for this vocalisation of *waw*.… The vocalic change cannot be explained by phonetic assimilation or dissimilation rules. Rather, the distribution of the allophone וְ is determined by prosody (Scheumann 2020, 58–59).

Moreover, scholars have proposed additional factors (see Scheumann 2020, 59–60) that may influence the phonological realisation of the conjunction *waw* with *qameṣ*, including syntactic distribution (see Gesenius 1910; Revell 1981; Waltke and O'Connor 1990; Joüon and Muraoka 2006; van der Merwe et al. 2017), semantics (Waltke and O'Connor 1990; van der Merwe et al. 2017; see also Revell 2015; 2016), and rhythm (Gesenius 1910; Joüon and Muraoka 2006).

The fifth attribute of complex systems is emergence. Complex systems exhibit emergent behaviour when dynamic interactions between lower-level components and dimensions of the system give rise to new phenomena that contribute to the nature of the system (Larsen-Freeman and Cameron 2008, 58–60; Marais 2019b, 47–49). For example, "subatomic particles give rise to atoms, atoms to molecules, molecules to organisms; or phonemes to words, words to propositions, propositions to

discourses" (Reid 2021, 33). In each case, the whole of the system—organism or discourse—is not simply the sum of its parts, but what emerges when the parts of the system interact. Ellis and Larsen-Freeman (2009a, 14–15) describe both idiolects and dialects as characteristically emergent:

> Language exists both in individuals (as idiolect) and in the community of users (as communal language). Language is emergent at these two distinctive but interdependent levels: An idiolect is emergent from an individual's language use through social interactions with other individuals in the communal language, whereas a communal language is emergent as the result of the interaction of the idiolects.

The sixth attribute of complex systems is nonlinearity. Larsen-Freeman and Cameron (2008, 31) define this feature as "change that is not proportional to input" (2008, 31; see also Beckner et al. 2009, 16). An idiom is perhaps a simple example of nonlinearity because it is semantically non-compositional—the meaning of the whole expression (viz. output) cannot be derived from the meaning of its individual parts (viz. input; van den Heever 2013, II:106–110, 178).[2] For example, the input of בקשׁ ('seek') and את־נפשׁ ('the life') yields an semantic output of 'to want or try to kill someone', not 'to look for someone's life' (van den Heever 2013, 189–90).

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[2] Idioms (and their formation) constitute complex phenomena in themselves (see van den Heever 2013). Van den Heever defines semantic non-compositionality as a complex concept "whose global meaning is a semantic extension of the combined meanings of its constituent elements" (2013, 178).

Another illustration of linguistic non-linearity is the process of grammaticalisation whereby a lexical item loses its semantic content and develops a grammatical function. For example, there is abundant cross-linguistic evidence for the diachronic grammaticalisation of the copula into a focus marker (see Heine and Reh 1984; Harris and Campbell 1995; Heine and Kuteva 2002; Lehmann 2015; Khan 2019). One of the pathways to grammaticalisation of the copula (viz. input) begins with cleft sentences, and over time, in some languages, the copula ceases to serve as a verb (viz. output), and instead is interpreted as a particle marking focus.[3] For the languages where this has not occurred, Lehmann (2015, 125) states that the very existence of the "autonomous pattern" of the cleft sentence demonstrates that "the communicative function of focus is already minimally grammaticalized."[4]

Finally, complex systems are adaptive. Larsen-Freeman and Cameron (2008) define adaptation as "the process in which a system adjusts itself in response to changes in its environment"

[3] In many languages, the cleft sentence is the most explicit way of marking focus (Lehmann 2015, 123–24). An example of a cleft construction in English is the sentence 'It is X that Y', where X is the focused NP and Y is the comment regarding the NP: *It is JOHN that loves Mary* (Khan 2019, 14).

[4] In some languages, cleft sentences exhibit evidence of further grammaticalisation as the syntactic complexity of the construction simplifies through the loss of certain morphemes, such as the relativiser introducing the subordinate clause: 'It is X Y' (Khan 2019, 15; see also Lehmann 2015, 124). Khan (2019, 15) provides examples of this type of cleft sentence in Israeli Hebrew and Syriac.

(2008, 33). This attribute is evident in the written transmission of sacred texts, where editors adapt their translations to accommodate a variety of editorial considerations (see Naudé and Miller-Naudé 2019, 201, 182–83; Reid 2021, 38–41). For example, Samaritan scribes chose to continue to use the paleo-Hebrew script instead of adopting the Aramaic square script. By doing so, they created an immediate visual distinctive for readers of the Samaritan Pentateuch (Reid 2021, 53). According to Reid (2021, 53), the social schism between the Judean Jews and Samaritan Jews encouraged the use of a different script, which "transformed the visual impact of the manuscript and gave it a Samaritan identity" (2021, 53).

3.0. Complexity Thinking in Biblical Scholarship

This section provides an overview of complexity thinking as applied to five distinct areas of biblical scholarship. Naudé and Miller-Naudé have pioneered this approach, exploring complexity models for diachrony (§3.1), language pedagogy (§3.2), and the translation of sacred texts (§3.3). This framework has been extended to include a complexity model for the Masoretic accents of the Tiberian Masoretic Reading Tradition (Pitcher 2020; §3.5), a complexity approach to syntactic coordination in Biblical Hebrew (Scheumann 2020; §3.4), and a paradigm for understanding the Samaritan Pentateuch as an intralingual translation (Reid 2021; §3.3).

3.1. Diachrony

Naudé (2012) models a complexity approach to the description of language change and diffusion in Biblical Hebrew. His stated aim for this approach (2012, 61) is to promote "viewing the diverse aspects of language change holistically (that is, understanding the causal dependencies and emergent processes among the elements that constitute the whole system) rather than viewing them partially and in isolation." Naudé enumerates four fundamental dimensions of language change and diffusion that must be accounted for in any substantive systems description of diachrony: (1) the dimension of the individual idiolect, (2) the social dimension within a community of speakers, (3) the dimension of the process of chronological change over time, and (4) the development of written texts. He argues that an understanding of the dynamic interplay between each of these dimensions renders "the simple linear model of Ancient Biblical Hebrew, Early Biblical Hebrew, Late Biblical Hebrew, and Mishnaic Hebrew" untenable, yielding a more accurate and complex model of the language development (2012, 71).

Within his system of diachrony, Naudé (2012, 72) describes the dimension of the individual as a domain where the formation of idiolects arises from the "innate grammar of an individual speaker." He states that language change at this level reflects the differences between the grammar of the individual and "that of the input source (for example, child versus parents)." Change at this level is ongoing throughout the individual's life and "always emergent" (2012, 72) as cognition develops and continues to

shape the individual's competencies in the use of grammar (2012, 70, 72; see also Givón 2009).

The social dimension of diachrony encompasses the changes that emerge within the dialects of communities of speakers. In this dimension, the diffusion of idiolects is at work, as "one differing grammar becomes dominant and gains acceptance by the local speech community and later by society at large" (Naudé 2012, 72). Naudé notes that diffusion always involves multiple idiolects that are at once competing with and being influenced by the standard language.

The dimension of time recognises that language change and diffusion are processes that develop chronologically and often in observable patterns (2012, 72–73; see also Pintzuk 2003). According to Naudé (2012, 73), linguistic structures accumulate through the daily communicative interactions of speakers in a community, many of which are culturally transmitted to future generations in the form of "fossilized linguistic structures." The complex process by which some linguistic structures (e.g., morphological, phonological, syntactic) "persist for millennia," while other structures simplify or completely erode, is called the "diachronic cycle." It is through this cycle that language undergoes "deep structured changes."

The fourth dimension of diachrony is the development of written texts. In order to account for this dimension, Naudé (2012, 73) asserts that the differences between speech and writing must be identified. One fundamental difference is that "writing is secondary to speech and employs special forms… for its unique purposes (for example, the use of devices for the

organization of discourse)." Understanding these differences includes accounting for the use of the text and the context out of which it arises.

For example, for Biblical Hebrew, it is important to understand the context of the Ancient Near East, where the written text was often used as an administrative tool and did not necessarily reflect "a connection with spoken language" (Naudé 2012, 73); this was an "advantage for [outstretched empires] and linguistically unrelated agents." Naudé (2012, 74–75) argues that this contextual description must also consider the socio-cultural nature of the epigraphic and biblical texts, including scribal culture; the political and economic circumstances at the time of composition or redaction; the types of discourses produced (viz. royal, history, law, prophecy) and the audiences they address (viz. the monarchy, the people, personal second person versus impersonal third person). Furthermore, biblical texts have an added layer of complexity because "they were transmitted through multiple editors and copyists, rather than archaeologically excavated straight from their original context" (2012, 74). Naudé maintains that all these factors must be considered when explaining the process of diachrony in biblical languages.

Naudé (2012, 75) illustrates the complexity of the diachronic cycle that "began in Biblical Hebrew, escalated in Qumran Hebrew, and was finished in Mishnaic Hebrew" using data "on the *waw*-consecutive and distribution of the independent personal pronouns in Biblical and Qumran Hebrew." He traces the chronological use of consecutive *waw* with perfective verb forms and notes that this form is statistically more prevalent

in Biblical Hebrew than Qumran Hebrew, and almost completely absent in Mishnaic Hebrew (2012, 76–77). While changes in these verbal forms throughout the various stages of Hebrew have been well-documented (2012, 77, n. 2), the theory of diachrony that Naudé (2012, 77–78) develops explains their significance:

> In the biblical period, the change occurred in one or more idiolects. The change then diffused so that, by the time of Qumran, there were fewer examples of the consecutive form and more examples of conjunctive *waw*. The examples of consecutive forms that remained were stylistic fossils. By the time of the Mishnah, the cycle of change was complete: the consecutive forms occurred only in biblical quotations, and the vernacular language was structurally different from the language in the Bible.

The system of diachrony advanced in Naudé (2012) moves traditional descriptions of language development beyond notions that characterise the various forms and stages of biblical languages according to the "synchronic styles available to biblical authors" (2012, 71).

3.2. Language Pedagogy

Miller-Naudé and Naudé (2014) present a complex systems approach to teaching and learning Biblical Hebrew by *reading* the biblical text—an approach that systematises some of the best teaching practices for Biblical Hebrew instruction. The methodology they employ is based on pedagogical complexity models, which assume a theory of second language development that is multi-dimensional and involves "a process of dynamic adaptation"

(2014, 95; see Larsen-Freeman and Cameron 2008; Ellis and Larsen-Freeman 2009a).[5]

Miller-Naudé and Naudé (2014, 92) select the act of reading as the basis of an effective complexity model for teaching biblical languages because the act of reading requires a range of complex skills ranging from "lower-level visual processing involved in decoding the print to higher-level skills involving syntax, semantics, and discourse, and even to skills of text representation and integration of ideas with the reader's global knowledge" (Nassaji 2009, 173). Furthermore, they argue that the socio-political context of their classroom at a South African university itself provides grounds for developing such an approach. Their description of "the 'new' South Africa (since 1994)" (2014, 92) celebrates a country with twelve official languages and the integration of peoples who were once rigidly separated from one another. Accordingly, one key dimension of their pedagogical approach has been to hire a multi-cultural and multilingual teaching staff that is able not only to teach in multiple languages (viz. Afrikaans, English, Sesotho), but also to provide parallel linguistic examples and explanations of Hebrew linguistic structures in these diverse languages.

Another key contextual dimension that Miller-Naudé and Naudé's (2014) pedagogical model accounts for is the manner in which South Africa's national teaching requirements train

[5] The model of language development proposed here contrasts with models of language acquisition which describe learners accessing a fixed "mental architecture of language" (Miller-Naudé and Naudé 2014, 95).

students to learn new information. They observe that these modes of learning tend to conflict with traditional methods for teaching Biblical Hebrew. Particularly, they have found that South Africa's outcomes-based educational system is focused "too much on the application of knowledge" (2014, 93):

> As a result, students/learners typically have not acquired the skills for memorization. Traditionally, the teaching of Biblical Hebrew has relied upon memorization for the acquisition of vocabulary and verbal paradigms, but this method is almost impossible for students whose previous academic experience has exclusively relied on Outcomes Based Learning (2014, 93).

The six dimensions of Miller-Naudé and Naudé's (2014) complexity model for teaching Biblical Hebrew are as follows: (1) the use of a typological framework for introducing grammatical features, (2) the use of the five complex cognitive skills that must be developed when learning to read, (3) building students' vocabulary, (4) reading, singing, listening, and simplified speaking, (5) increasing students' understanding of the cultural context of the biblical text, and (6) the application of exegesis and theology to the biblical text.

The first dimension of the model involves establishing a typological framework for teaching the grammatical features of the biblical language. A typological framework is particularly suited for this because it classifies languages that are "genetically unrelated and that have no geographical proximity" (2014, 96) according to "shared formal characteristics" (Whaley 1997, 7). Miller-Naudé and Naudé argue that language typology is a key pedagogical feature because it allows instructors "to describe the

grammatical features of [the biblical language] to speakers with different mother tongues" (2014, 96). For example, they observe that English- and Afrikaans-speaking students often find the Hebrew construct phrase more difficult to grasp because in these languages "the genitive precedes the noun… a predominant pattern among the world's languages" (2014, 96). However, speakers of African languages such as Sesotho quickly grasp this concept because the noun-genitive pattern in these languages corresponds to the pattern found in Hebrew. Miller-Naudé and Naudé (2014, 96–97) state that these types of conceptual difficulties with the features of a biblical language can be mitigated by explaining them in terms of the typological differences found among the languages of the world.

The second dimension of the model is quite complex in itself because it incorporates the five following cognitive skills of reading (2014, 97–98): (1) learning to interpret and pronounce the orthography; (2) developing the ability to visually process words (viz. learning to identify a word by recognising the string of consonants); (3) developing reading comprehension skills by learning to "[select] the meaning of the word that is relevant to the context" (2014, 98); (4) learning to identify discourse-level features;[6] and (5) learning to interpret "culturally relevant

[6] According to Miller-Naudé and Naudé (2014, 98), discourse-level features include "compound sentences, identification of the narrative structures of on-line and off-line information, volitive chains, the embedding of direct and indirect speech, and genre-specific features such as poetic lineation and poetic word pairs."

information for processing the pragmatic inferences of biblical texts" (2014, 97).

The third dimension of the model encompasses the teaching of vocabulary. For Miller-Naudé and Naudé (2014, 100), vocabulary instruction includes equipping students with not only sound files for hearing and pronouncing words but also the culturally relevant information needed to understand them in their textual contexts.

The fourth dimension of the model involves several key activities—reading, singing, listening, and simplified speaking—that all reinforce new skills and allow students to integrate and practise the concepts that they are being taught. For example, reading activities include both an intensive and an extensive component. Intensive reading "involves close, deliberate study of short texts with attention to vocabulary, grammar and discourse of the text" (2014, 102), while extensive reading "involves a wide range of texts of different genres, text structures and language patterns." Additionally, students are provided with audio files of their classroom materials, which affords them ample opportunity to listen to the biblical language. Finally, singing biblical verses and performing simplified oral drills and dialogues reinforces "specific morphological forms, syntactic constructions and vocabulary items" (2014, 101) in engaging ways.

The fifth dimension of the model provides students with the necessary cultural information regarding the ancient biblical world so that they can "bridge the gap between their cultural context… and that of ancient Israel" (2014, 100).

Finally, the sixth dimension of the model involves the application of exegesis and theology to the biblical text. For Miller-Naudé and Naudé (2014, 100), this is the "ultimate goal of Biblical Hebrew language teaching" and the reward for students within the religious context of their institution. This dimension enables students to apply and appreciate their growing knowledge of the language and culture of the biblical text.

3.3. Translation Theory

Marais (2019b, 43; see also 2014) describes translation as a complex process that emerges out of cause-and-effect relationships among a variety of dimensions, including "linguistics, pragmatics, culture, society, ideology, power, a brain, a human personality and meaning" (2019b, 46–47). Marais (2019b, 44) argues that the process of translation—that is, "the process of making meaning"—is fundamentally a sign-process (viz. semiosis), entailing the interrelatedness of three elements: (1) the sign, (2) a mental representation of the referent triggered by the sign, and (3) the actual referent, "either an idea of something or the thing itself." Conceptualising translation as a process means that the mental construct is only relevant for "a particular moment in the semiosis"—that is, the mental construct is "not absolutely final, only pragmatically final" (2019b, 44).

Furthermore, Marais (2019b, 43, 46) argues that the incipient text is as much an emergent phenomenon as the subsequent text, and that the process of translating is not linear or binary—there is no direct line from incipient text to subsequent text. For Marais (2014; 2019b, 46), a complexity model for translation not

only means that the translation process is recursive but also that the 'turns' of translation are not mutually exclusive. As such, previous translations of a text are not invalidated by subsequent ones, but instead are viewed as "complementary perspectives that contribute to a fuller understanding of the complexity of translation" (2019b, 46; see also Robinson 2017).

Naudé and Miller-Naudé (2019) explore Marais' complexity model using the Book of Ben Sira in the Septuagint as a case study. Their complexity framework for Ben Sira serves as an alternative to the frameworks that are utilised in two recent modern translations—namely, the *Septuaginta Deutsch* project (LXX.D) and the *New English Translation of the Septuagint* project (*NETS*).[7] Naudé and Miller-Naudé (2019, 181) consider these translations to be reductionist approaches because the former domesticates the text, while the latter renders it foreign to the reader. For example, *NETS* employs a literal translation of the Greek and incorporates transliterated terms. They observe the opposite, but equally reductionist, phenomenon with LXX.D as it veers too heavily in the direction of favouring German culture at the expense of the culture of the incipient text (2019, 181). Marais (2014, 40) describes the pull of these types of reductionist translation models as either being "too strongly biased toward the direction of the target [text]," as in the case of LXX.D, or "too strongly biased toward the source [text]," as in the case of *NETS*.

Naudé and Miller-Naudé argue that their complexity approach to Ben Sira resolves this stark dichotomy by both

[7] See Ross (2021) for an overview of the range of recent Septuagint translation projects.

"respecting its alterity" (2019, 203) and being sensitive to "issues of intelligibility and representation." They accomplish this by identifying two sets of dimensions that are inherent in sacred writings and incorporating them into the production of the translated text, largely in the form of footnotes.

The first set of dimensions characterise the religious nature of sacred texts. These dimensions explore the psychological and sociological aspects of religion, as well as the influence that the oral-writing traditions of the text have wielded over time. The psychological dimension "influences how individuals perceive and react to the environment in which they live," while the sociological dimension encompasses a complex nexus of "intercultural and interlinguistic communication influenced by socio-cultural, organizational, and situational factors that result in self-critical corrections, adaptations, and apologies in religious discourse and practice" (2019, 182). Naudé and Miller-Naudé (2019, 181–182) observe:

> Sacred writings, which are texts beyond everyday life that inspire awe, respect, and even fear, are associated with religion and have various special functions or roles within a religious context (Sawyer 1999). As a complex phenomenon, religion and its sacred writings form an inextricable part of culture. Religion is a central part of human experience, influencing how individuals perceive and react to the environments in which they live (Giddens 1993, 456).

Naudé and Miller-Naudé (2019, 182) describe the oral-writing tradition of sacred texts as the words, texts, and language used in public worship, "which are the result of complex processes of canonization and translation." They also recognise that most

religious communities require translated versions of their sacred texts, and that these texts "quickly assume the status of incipient (source) texts and become central to the religious domain."

> Sacred writings, then, exhibit complex webs of interaction between numerous emergent, complex adaptive systems—the religious communities who produce and use sacred writings, the sacred writings as emergent incipient (source) texts, the sacred writings as emergent subsequent (target) texts, and in some instances, subsequent (target) texts as emergent sacred writings (Naudé and Miller-Naudé 2019, 183).

The second set of contextual dimensions for the complexity model accounts for the complex nature of the Septuagint and the place of Ben Sira within it. According to Naudé and Miller-Naudé (2019, 183–84), the Septuagint is itself a complex adaptive system for the following historical, text-critical, editorial, and socio-cultural reasons: (1) it has a complex history of origin and transmission; (2) the source text(s) for the translated texts of the Septuagint are pluriform and emergent "in that it did not reach its final, canonical form until many centuries later" (see also Ulrich 2015); (3) the Septuagint comprises "multiple translations (e.g., into Latin and Syriac) and revisions (e.g., by Aquila and Symmachus)" that were produced to serve the "needs and concerns of various religious communities, especially since the Protestant Reformation;" (4) although originally produced for Jews, they subsequently rejected it after it was adopted by Christians as their sacred text.[8] Furthermore, according to Naudé

[8] For an alternative view regarding this claim, see De Lange et al. 2009.

and Miller-Naudé, while "research on the Septuagint has been driven primarily by the needs of textual criticism and modern philology, either as a search for the Vorlage or Urtext (earliest) or as a search for the best or most authoritative final text," a new philology approach to the Septuagint views each individual manuscript "as a meaningful, historical artifact, and variants found in these manuscripts are viewed... interesting in their own right."[9]

Naudé and Miller-Naudé argue that a complexity model for Ben Sira, then, considers and incorporates these multiple dimensions. One of their strategies for avoiding foreignising or domesticating the text is by making use of footnotes in order to both provide the modern reader with access to the alterity (viz. foreignness) of the Hebrew incipient text and make this alterity comprehensible.

For example, Ben Sira 24.13–17 depicts Lady Wisdom in terms of "a variety of flora that are mentioned in their ecological contexts" (2019, 189). According to Naudé and Miller-Naudé (2019, 190), since this portion of text lacks a Hebrew incipient text, these terms must be translated with respect to "both the cultural world of ancient Israel and the appropriation of those cultural terms in metaphorical contexts." In this poetic passage, they

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[9] Naudé and Miller-Naudé (2019, 184) state that "new philology as a philological perspective within the larger field of editorial theory provides a model broadly conceived for understanding texts, text production, and transmission—and for exploring texts in their manuscript contexts." Note that Brill's *Septuagint Commentary Series* assumes this approach (see Porter 2021 for a description).

provide three examples where the *NETS* translation chooses an English term whose referent either is not found in Israel or does not fit the metaphorical function of the plant in the passage, or both (2019, 190–93). Furthermore, in instances where additional information is needed to fill out a modern reader's understanding of the term, footnotes "open up the cultural world of the text to the modern reader by indicating both the botanical characteristics and the social functions of the plant. The alterity of the text is retained and respected but without domestication of its foreignness" (2019, 193). For Naudé and Miller-Naudé (2019, 193), footnotes are powerful metatexts that help retain the complexity of text by making the alterity of the incipient text accessible and intelligible to a modern reader.

Following Marais (2014; 2019a; 2019b) and Naudé and Miller-Naudé's (2019) models for translation, Reid (2021) demonstrates a similar use of complexity principles in his analysis of the Samaritan Pentateuch as an intralingual translation—that is, a rewording or reinterpretation of a text in the same language. Reid presents a paradigm for understanding the Samaritan Pentateuch, particularly, the variants found in the text, "the choices made by the editors… the context they worked in, and the reason they embarked on the project" (2021, 2). Unlike interlingual translations that "might be done simply to facilitate communication between speakers of different languages" (2021, 50), Reid argues that "intralingual translations must be done for a particular reason or *skopos*, as the original material is already accessible

in the target language."[10] Reid concludes that the *skopos* for the Samaritan Pentateuch is rooted in a particular set of scribal interventions that emerge from a complex interaction of multiple texts—e.g., proto-Masoretic, pre-Samaritan, Septuagint (2021, 10–22, 71)—and multi-dimensional factors, including (1) the diachronic development of the Samaritan dialect and inter-dialectic variants (2021, 59–60); (2) editorial considerations, e.g., choosing to preserve the paleo-Hebrew script (2021, 53) and substituting archaic grammatical forms for those that were more commonly used (2021, 58); and (3) the "cultural rich points" that differentiate the Jewish and Samaritan traditions, e.g., the correct place of worship, Gerizim versus Jerusalem, (2021, 60–64).

3.4. Syntax

Scheumann (2020) applies complexity thinking to the grammatical feature of phrasal coordination in Biblical Hebrew because he recognises that "semantic observations of clausal coordination" do not yield a comprehensive description of coordination, and that a purely syntactic analysis is equally insufficient (2020, 11). His complexity approach provides a metatheory for the Minimalist Programme (see Chomsky 1995) that undergirds his syntactic analysis, allowing for other relevant dimensions of language to be considered (2020, 6, 10):

[10] In accordance with Vermeer (2004), Reid defines *skopos* as "the aim or purpose of a translation" (Vermeer 2004, 227; see also Reiss and Vermeer 2014; Nord 2018).

> I approach [Biblical Hebrew] language as a connected whole with the interacting levels of syntax, semantics, prosody, morphophonology, and discourse.… Moreover, because coordination is so pervasive in the Pentateuch, it requires a grasp of many areas of [Biblical Hebrew] syntax that intersect with phrasal coordination: prosody, pronoun binding, information structure, word order, null elements, ellipsis, differential object marking, prepositions, negation, markedness, apposition, subordination, and verbal agreement.

Using cross-linguistic data to support his claim for the syntactic structure of coordination in Biblical Hebrew, Scheumann (2020, 30–32, 56) proposes an asymmetric, hierarchical structure based on the following complex features: (1) asymmetric prosodic breaks exhibiting the segmentation between conjuncts at the phrasal and clausal levels (2020, 30); (2) the cliticisation of the coordinating particle to one of the conjuncts (2020, 30–31); (3) syntactic constraints on the locus of a coordinator within a clause (2020, 31); (4) constraints on which conjuncts are able to do the joining or binding within a clause (2020, 32); and (5) asymmetries between verbal agreement and the structure of coordination (2020, 224–25).

Scheumann observes that his hierarchical model for coordination has implications for understanding instances of partial verbal agreement and conjoined subjects (e.g., 2 Sam. 2.12). He concludes that partial agreement is the default pattern when the coordinate complex is post-verbal (e.g., Gen. 33.7), and that "the verb always agrees with the initial conjunct (e.g., Exod. 21.4), whether the coordinate complex is post-verbal or pre-verbal" (2020, 227).

While Scheumann determines that syntax is the primary factor for understanding coordination and verbal agreement asymmetries, he recognises that syntactic analysis alone is insufficient to explain the different types of asymmetries that are found in Biblical Hebrew (2020, 238, 261). Having established the underlying syntactic structure for coordination, he determines (2020, 246–49, 261) that the role discourse plays in the partial agreement of verbs with coordinated subjects is more accurately understood when considered together with other factors such as conjunct word order, conjunct binding (viz. a coreferential pronoun that binds to the second conjunct [2020, 84]), and the subsequent use of pro-drop (2020, 262):

> We have seen that in sentences with a post-verbal coordinate structure headed by a pronoun, the number of the verb is noteworthy. The compound is not the subject, but functions as a [quantifier phrase] that modifies the subject. A singular verb, thus, has discourse significance, because the subject is singular, which is coreferential with the pronoun conjunct. In this way, the pronoun referent is the principal actor because, syntactically, it is the only actor in terms of subjecthood. The prominence of the pronoun is highlighted further with conjunct binding and with a subsequent singular pro-drop verb. Conversely, a plural verb does not mark the conjuncts as equally-prominent actors. While both conjuncts in the [quantifier phrase] explicate the plural pro subject reference, the initial conjunct in the [quantifier phrase] can still be discourse-prominent, much like how the first conjunct in a compound subject can be the principal actor, whether the verb is singular or plural.

3.5. Masoretic Accents of the Tiberian Masoretic Reading Tradition

The current accepted analytical model for the Masoretic accents of the Tiberian Masoretic Reading Tradition is rooted in a nineteenth-century philological algorithm known as the Law of Continuous Dichotomy (LCD, Wickes 1887), which reduces (i.e., artificially simplifies) the accents to a system of pausal segmentation. However, Pitcher's (2020; 2023; see also 2021) model for the accentual system departs from the LCD as a tool of analysis in order to advance a complexity approach that integrates the system's features, structures, and functions within a wholly linguistic framework. Pitcher argues that LCD-based analyses cannot appropriately account for or accommodate the complex linguistic data represented by the accentual system, and should, therefore, be replaced by a cross-linguistic complexity model for six main reasons: (1) LCD-based algorithms were designed to reconstruct the 'correct' sequences of accents in a verse (Wickes 1881, Preface, 5–7; see also Pitcher 2023), not to identify and explain the complex linguistic data that they represent; (2) scholars have long acknowledged the prosodic nature of the system (Spanier 1927; Lazarus 1942; Avenary 1963; Janis 1987; Dresher 1994; Strauss 2009; DeCaen and Dresher 2020; Park 2020), but the LCD does not treat the accents as natural speech phenomena; (3) the LCD is a philological algorithm with no theoretical basis outside of itself; (4) the LCD reduces the accentual system to pausal segmentation; (5) a cross-linguistic complexity model provides a more accurate description of the accentual system, integrating its seemingly disparate features (viz. melody, stress,

prosodic phrase structure, syntax interface, and meaning); and (6) a cross-linguistic complexity model provides the necessary theoretical framework to test and substantiate the complex dimensions of the accentual system's features, structures, and functions. At its core, a cross-linguistic complexity model for the accentual system recognises that the multifaceted dimensions of language—including tonal and metrical structure, syntax, semantics, and discourse-pragmatics—comprise a prosodic system, and this model seeks to account for these dimensions within a comprehensive linguistic analysis.

The basis for this new analysis is partly grounded in the oral orientation of traditional descriptions of the accents and the notion of recitation found therein (see Spanier 1927, 9–17; Crowther 2015, 54–63; Eldar 2018, 53–56; Shoshany 2022, 23–24, 27–28; see also Khan 2013, 37, 43, 47; Khan 2020a, 1–3, 49–53), as well as the system's close association with the vocalic phonology of the orally performed text (Khan 2013, 37–65; Eldar 2018, 85–88; Khan 2020a, 96–97, 2020b, 1–3; Posegay 2021, 25–26, 38–42, 82–84, 131; see also Crowther 2015, 50–51, 62–63). Furthermore, according to Yeivin (1980, 158), the accents are traditionally understood to perform three functions: (1) to represent the melodies that accompany the reading of the text, (2) to mark the locus of lexical stress, and (3) to mark semantic units (1980, 158)—that is, to contribute to the meaning of the text. A cross-linguistic complexity model unifies these functions within the theoretical framework of prosodic phonology. Within this model, the accentual graphemes constitute a prosodic orthography, where conjunctive and disjunctive graphemes are

iconic representations of pitch accents at three levels of contrastive pitch—low, high, and extra high (Pitcher 2023; see also Wickes 1887, 13–14; Lazarus 1942, 283–86; Pitcher 2020, 145–58, 189–92;)—embedded within two domains of prosodic phrase structure. In other words, the orthography of the accents represents pitch fluctuations in the flow of speech that are associated with the locus of lexical stress, with disjunctive accents additionally indicating the locus of two types of cross-linguistically distinct phrasal boundaries—namely, those of the intermediate phrase (φ) and the intonational phrase (ι).

This cross-linguistic complexity model, however, not only identifies the precise nature of the accentual system but also provides a way to assess its functional semantic features. For example, relative clauses, which have attested cross-linguistic prosodic features (Nespor and Vogel 2007, 188), provide an accessible syntactic domain to test how the prosodic system represented by the accents contributes to the meaning of the biblical text. Semantically non-restrictive relative clauses, which provide supplemental information for an already identifiable referent, form intonational phrases separate from their head nouns. Semantically restrictive relative clauses, which modify the head noun by restricting the identification of the referent, form cohesive intonational phrases with their head nouns.[11]

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[11] The prosodic data of relative clauses within the 21 Books of the Hebrew Bible also include prosodic formats that are prosodically ambiguous with regard to restriction (Pitcher 2020, 333–55). Note that this type of prosodic ambiguity has been attested in Birkner's (2012) study on the prosodic realisations of relative clauses in German. Birkner's

These cross-linguistic prosodic features, which distinguish the semantic restriction of relative clauses, are present in the prosodic record of the Masoretic Text. Example (1) illustrates a Tiberian Hebrew relative clause that is semantically restrictive, where the head noun (בְּנָוֹ) shares a cohesive intonational phrase (ι) with its relative clause (אֲשֶׁר־יָלְדָה הָגָר):

(1) ((וּתְלֶד הָגָר)φ (לְאַבְרָם)φ (בֵּן)φ)ι
((וַיִּקְרָא אַבְרָם שֵׁם־בְּנוֹ)φ (אֲשֶׁר־יָלְדָה הָגָר)φ (יִשְׁמָעֵאל׃)φ)ι
((and.she.bore Hagar)φ (to.Abram)φ (son)φ)ι
((and.he.called Abram name.of-his.son)φ (whom-she.bore Hagar)φ (Ishmael)φ)ι
'And Hagar bore to Abram a son. And Abram called the name of his son whom Hagar bore, Ishmael.' (Gen. 16.15)

Example (2) illustrates a Tiberian Hebrew relative clause that is semantically non-restrictive, where the proper head noun (יְהוָה) and relative clause (אֲשֶׁר הוֹצִיאֲךָ) constitute separate intonational phrases (ι).

(2) ((הִשָּׁמֶר לְךָ)φ)ι
((פֶּן־תִּשְׁכַּח)φ (אֶת־יְהוָה)φ)ι
((אֲשֶׁר הוֹצִיאֲךָ)φ (מֵאֶרֶץ מִצְרַיִם)φ (מִבֵּית עֲבָדִים׃)φ)ι
((be.guarded for.yourself)φ)ι
((lest-you.forget)φ (ACC-LORD)φ)ι
((who he.brought.you)φ (from.land.of Egypt)φ (from. house.of slaves)φ)ι

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study demonstrates that these prosodic realisations are "more heterogeneous than... presented in grammar books, complying neither with dichotomous semantics nor with the two postulated formats" (2012, 20).

‘Guard yourselves, lest you forget the LORD, who brought you out of the land of Egypt, from the house of slavery.’ (Deut. 6.12)

Another example of the semantic feature of the Masoretic accentual system involves the disambiguation of tripartite verbless clauses from verbless clauses with left dislocation. Using a cross-linguistic framework, Naudé and Miller-Naudé (2017, 233) note that syntactic left dislocation “involves a gap at the boundary between the dislocated constituent and the matrix sentence,” which can be realised by a pause, interjection (Berman-Aronson and Grosu 1976), or intonational contour (Korchin 2015, 14–15). Naudé and Miller-Naudé use this gap feature to disambiguate the subject NP of a tripartite verbless clause from a left-dislocated NP construction. They observe that a left-dislocated NP in the biblical text is phonologically characterised by a disjunctive accent that separates it from the matrix clause, while the pronoun of a tripartite clause (PRON) is phonologically conjoined to the subject NP. The prosodic formats of these two types of constructions confirm this analysis.

Example (3) exhibits the prosodic format of a left-dislocated verbless construction, where a prosodic phrase boundary separates the 3ms subject pronoun (הִוּא) from the topicalised NP (וְחָם).

(3) ((וְחָם)φ)ι

((הִוּא)φ (אֲבִי כְנָעַן:)φ)ι

((and.Ham)φ)ι

((he)φ (father.of Canaan)φ)ι

‘As for Ham, he was the father of Canaan.’ (Gen. 9:18)

Example (4) exhibits the prosodic format of a tripartite construction, where the 3ms pronoun (הִוּא, i.e., PRON) shares the same internal intermediate phrase with the subject NP (הָאָשָׁם).[12]

(4) ((φ(כִּי) φ(חַטָּאת) φ(הָאָשָׁם הוּא) φ(הַכֹּהֵן)φ)ι

((for)φ (as.the.sin-offering)φ (the.guilt-offering PRON)φ (to.the.priest)φ)ι

'For just like the sin-offering, the guilt-offering belongs to the priest.' (Lev. 14:13)

These examples demonstrate that a cross-linguistic complexity approach to the Masoretic accents can more precisely identify and unify what is already known about the system, while also providing scientific avenues for exploring its semantic and discourse-pragmatic functions.

4.0. Conclusion

This chapter introduced Complexity Theory, a metatheory whose principles provide a framework for understanding language as a complex system, in order to introduce the merits and budding developments of complexity thinking in the study of biblical texts. The core attributes of a complex system were presented along with an overview of the ways in which complexity thinking has been applied thus far to five areas of biblical scholarship: diachrony, language pedagogy, translation theory, syntax, and the Masoretic accents of the Hebrew Bible. These studies have demonstrated the fruitful outcomes of such an approach and

[12] Naudé and Miller-Naudé (2017, 223) describe the pronoun in a tripartite verbless clause as a "last resort syntactic strategy" for disambiguating the subject NP.

provide models for pursuing similar complexity approaches to linguistic research in biblical studies.

Complexity Theory treats an object of study as part of an integrated and dynamic whole, not as an isolated or self-contained phenomenon. Within the domain of language and culture, this metatheory aims to describe the complex nature of linguistic phenomena as shaped by the interaction of multiple internal dimensions and external influences, rather than as contained within a particular autonomous analytical silo. Most crucially, a complexity approach to biblical scholarship provides the researcher with a model for thinking about the impact of adjacent and interrelated phenomena on the object of study, and for understanding how aspects of biblical languages and texts fit into larger systems of language and culture, ultimately offering "greater coherence in explaining what [is] already know[n]" (Larsen-Freeman and Cameron 2008, 11). A complexity approach, then, can serve as a counterbalance to the powerful scholarly inclination to isolate one's object of study, encouraging the development of a research programme that takes into account the larger systems in which the phenomenon occurs.

5.0. Further Reading

5.1. Dynamic Processes, Chaos Theory, and Complexity Theory

1. Gleick (1987)
2. Waldrop (1992)
3. Lorenz (1994)
4. Van Geert (2003)

5. Dooley (2009)

5.2. Complexity Approach to Applied Linguistics

1. Larsen-Freeman (1997; 2013)
2. Larsen-Freeman and Cameron (2008)
3. Ellis (2008)
4. Ellis and Larsen-Freeman (2009a)
5. Beckner et al. (2009)

5.3. Complexity Approach to Translation and Biblical Studies

1. Marais (2014; 2019a; 2019b)
2. Naudé (2012)
3. Naudé and Miller-Naudé (2017; 2019)
4. Miller-Naudé and Naudé (2014; 2020)
5. Pitcher (2020)
6. Scheumann (2020)
7. Reid (2021)

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