

Roles and Relations in Biblical Law: A Study of Participant Tracking, Semantic Roles, and Social Networks in Leviticus 17-26

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4. SEMANTIC ROLES AND DECOMPOSITION OF AGENCY

1.0. Introduction

A social network analysis of a law text like the one undertaken in the present work relies on the analysis of participants within their interactional contexts. Interactions, or transactions, are the means by which individuals attain specific roles, and a careful study of the interactions therefore holds the key to understanding the persons of the implied community of the Holiness Code and their respective roles (see chapter 2, §4.0). The challenge of doing so becomes readily apparent: there are 181 unique verbal predicates in the Holiness Code, corresponding to 181 different events, although some events may be semantically similar. With respect to social network analysis, the pertinent question is how these events can be quantified. For instance, how can a speech event be compared to a transaction event? How do these disparate events contribute to the construction of individual roles? The main argument of this chapter is that the concept of ‘agency’ is one possible measure, because all events naturally invoke some degree of agency. Agency relates to semantic parameters such as activity, volition, causation, and sentience, and each event can be quantified according to those parameters. Agency has received much attention in the linguistic literature, because the feature is quite intuitive but hard to decompose and measure. Scholars have generally been divided over whether verbal arguments and their roles are subcategorised for by the verb, that is, whether the

verbal lexeme puts restrictions on the selection of arguments, or whether semantic roles are more loosely entailed by the verb on the basis of implicit notions of agency. This chapter will briefly discuss these approaches below, but will ultimately argue, with Role and Reference Grammar (RRG), that agency is neither subcategorised for by the verb nor a loose entailment. Rather, agency is compositional in nature and involves both lexical, morphological, syntactic, and pragmatic features. The implication of this is that agency is not subcategorised for by the verb, but that the lexical features of the verb nevertheless inform the agency of the event. As will be shown, the most important verbal features are dynamicity and causation, which will be analysed in turn in the two subsequent chapters.

Role and Reference Grammar is a linguistic theory which views syntax, semantics, and pragmatics as interactional components in language (Foley and Van Valin 1984; Van Valin and LaPolla 1997; Van Valin 2005).¹ While generative grammar views syntax as a self-contained object of study, RRG, like other functional theories, views language as “a system of communicative social action” which employs grammatical structures to express meaning (Van Valin 2005, 1). RRG, then, is a description of how syntax, semantics, and discourse-pragmatics interact, and it offers a ‘linking algorithm’ for representing the bidirectional links between syntax and semantics, including the role that discourse-pragmatic plays in the linking.

¹ A concise introduction to RRG is given in Van Valin (2015), while Pavey (2010) offers a beginner’s introduction.

RRG grew out of an interest in how linguistic theory would look if it were based not merely on an analysis of English but on languages with diverse syntactic structures, such as Lakhota, Tagalog, and Dyirbal (Van Valin 2005, 1). For this reason, the theory is a good candidate for exploring the correspondence of syntax and semantics in an ancient language like Biblical Hebrew.² On the other hand, although RRG was developed for the purpose of describing languages with very diverse structures, for the most part, the languages under consideration were living languages, and the verbal analysis usually depended on the presence of native speakers. The main challenge for exploring the semantics of BH is the absence of native speakers, a challenge obviously shared by other methods used to investigate the semantics of BH. Consequently, the lexical decomposition carried out in the present study will diverge from traditional RRG approaches in the

² Some important work has already been done on describing a Role and Reference Grammar of Biblical Hebrew. The earliest work was Nicolai Winther-Nielsen's (1995) dissertation on interclausal connections in the Book of Joshua. Later works by the same author include studies on RRG decomposition of BH verbs (Winther-Nielsen 2016; 2017), information structure (Winther-Nielsen 2021), and the development of an RRG parser of the BH text (Winther-Nielsen 2008; 2009; 2012). At the time of writing, this work is carried on by Winther-Nielsen and the present author in cooperation with Laura Kallmeyer and her research team at the Heinrich Heine Universität in Düsseldorf on the TreeGraSP project, short for 'Tree rewriting grammars and the syntax-semantics interface: From grammar development to semantic parsing'. Finally, RRG was employed by the present author to explore the rhetorical structure of the book of Zechariah (Jensen 2017).

application of a quantitative corpus-linguistic basis for interpretation. In this chapter, the theoretical implications of applying RRG to the study of BH verbs will be discussed. Three related topics will be addressed in turn: 1) the correlation between lexical decomposition, semantic roles, and agency; 2) the methodological challenge of deriving the lexical aspect of verbs from an ancient corpus; and 3) the semantic representation of verbs in RRG logical structures.

2.0. Semantic Roles and Agency

The term ‘agency’ refers to the intuitive notion that some participants seem to be more controlling, instigating, volitional, and sentient than others. These participants are often labelled ‘agents’. By contrast, non-controlling, non-instigating, and non-volitional participants are usually labelled ‘patients’. A vast number of studies have scrutinised how agency relates to the semantic relationship between the predicate and its arguments, but with mixed results (e.g., Fillmore 1968; Delancey 1984; Talmy 1985; Van Valin and Wilkins 1996; Dowty 1991; Næss 2007; Rappaport Hovav 2008; Croft 2012). Indeed, as David R. Dowty (1991, 553) notes, the agent role “is one of the most frequently cited roles, and it is in some sense a very intuitive role, but it is one of the hardest to pin down.” All agree that the agent role—and other semantic roles for that matter—expresses a semantic relationship between a participant and the predicate. But are semantic roles discrete entities or rather clusters of semantic properties? And moreover, is agency a specific property indexed by the predicate,

or should agency rather be understood as a matter of degree entailed by the predicate?

Charles J. Fillmore (1968), in his classic *The Case for Case*, later published in a collection of his essays (2003), argued for the former position. Verbs, he argued, are related to specific deep cases (semantic roles) according to their inherent semantic properties. That is, verbs are selected according to the semantic environment of the sentence (called a ‘case frame’), as expressed by the cases. A case frame with an agentive case, for instance, accepts only verbs that are subclassified for this feature, that is, the verb is required to accept an agentive case.³ Thus, according to Fillmore’s case system, each verb can be semantically classified according to the case frame(s) by which it is accepted. The strength and lasting influence of Fillmore’s case system was its link between the semantic ‘deep structure’ and the syntactic ‘surface structure’ of a proposition. That is, the role of a participant is not determined by its surface case (be it the subject or object) but by its deep case. In many cases, the subject does indeed have the agent role, but not necessarily, as demonstrated by the following sentences (Fillmore 2003, 47):

- (1) John opened the door.
- (2) The door was opened by John.

It is evident from these examples that the subject need not be the agent. The passive construction in (2) expresses the agent with a prepositional phrase, while the subject is the semantic patient.

³ The agentive case is “the case of the typically animate perceived instigator of the action identified by the verb” (Fillmore 2003, 46).

Thus, the sentences are deep-structurally identical, and the deep case structure determines the roles of the participants.

One of the major obstacles for Fillmore's thesis was the fact that a verb may be accepted by several case frames. For instance, the verb 'open' can, according to Fillmore (2003, 49), occur in at least four different case frames, including case frames with 1) an objective;⁴ 2) an objective + an agent; 3) an objective + an instrument; and 4) an objective, agent, and instrument. To remedy this potential proliferation of case frames, Fillmore suggested that only the simplest frame should be considered obligatory (no. 1), while the remaining are optional extensions. Nevertheless, the approach lacks a controlled way of relating verbs and case frames. Moreover, there is no good reason why Fillmore's list of case roles should not be longer than the six suggested (agentive, instrumental, dative, factitive, locative, and objective), and he admits that additional cases are surely needed (Fillmore 2003, 46). But there does not seem to be an internal, methodological constraint upon the number and definitions of cases.

This lack of methodological control was brought to attention by Dowty (1991), who argued for completely abandoning the notion of discrete deep cases, or thematic roles, to use his

⁴ In Fillmore's Case Grammar, the objective is the semantically most neutral deep case and is "the case of anything representable by a noun whose role in the action or state identified by the verb is identified by the semantic interpretation of the verb itself; conceivably the concept should be limited to things which are affected by the action or state identified by the verb" (Fillmore 2003, 46).

terminology.⁵ In particular, Dowty (1991, 561) objected that existing theories of thematic role determination lacked a principled way to account for what kind of data motivates a thematic role type. For one thing, there was a tendency towards proliferation of lists of thematic roles. In addition, there was (and is) disagreement on the definitions of even the most familiar roles. According to Dowty, the lack of consensus as regards a shortlist of thematic roles seems to discount a view of thematic roles as argument-indexing.⁶ Most important for Dowty's objections, however, are the theoretical and practical limitations of the case role system, because it requires each verb to clearly and definitely subcategorise for a particular thematic role. For the system to work, it cannot allow verbs to "hover over two roles, or to 'fall in the cracks' between roles" (Dowty 1991, 549). The solution to these problems, according to Dowty, is to view semantic roles not as discrete roles but as cluster concepts. That is, a verb does not determine a specific role, but rather imposes entailments on its arguments by virtue of the role the arguments play in the verbal event. Dowty proposed two proto-roles, the proto-agent and the

⁵ Dowty considered Fillmore's case roles a theory among other argument-indexing views of thematic roles, that is, according to these theories, the predicate entails or indexes exactly one case/thematic role to each NP.

⁶ The most common thematic roles are agent, patient, dative, instrument, benefactive, locative, associative, and manner (Givón 2001, I:107). However, in reality, the lists of thematic roles tend to grow wild, and one might want to add at least theme, goal, and source to Givón's list of semantic roles.

proto-patient, which correspond to two extremes of agency property entailment. For instance, the agent proto-role is characterised by volition, sentience, and causation, while the patient proto-role is characterised by undergoing change of state, stativity, and being causally affected. The verb may entail one or more of these properties to its arguments. Thus, in predicates with grammatical subject and object, the argument lexicalised as the subject is the argument for which the predicate entails the highest number of proto-agent features. The argument lexicalised as the object is the argument with the highest number of proto-patient features. As a result, in contrast to Fillmore's Case Grammar, Dowty's system does not depend on a specific list of semantic roles that can account for all kinds of verbal events, with the inherent risk of role proliferation. Rather, the semantic roles are determined on the basis of a more intuitive notion of agency.

One of the critiques raised against Dowty's proto-role theory is that there are no priorities among the entailments (Koenig and Davis 2001, 81–83). While Dowty (1991, 574) himself suggests that causation is the most important entailment for subject selection, in effect, according to his system, it is only the number of entailments that count. Since his lists of proto-role entailments are "preliminary" and not "necessarily exhaustive," the argument selection inevitably becomes a bit fuzzy (Dowty 1991, 572). In fact, Dowty (1991, 577) admits that his proto-roles are indeed "fuzzy" in that they are "higher-order generalization about lexical meanings." Nevertheless, Dowty is right to point out the compositional nature of agency, and in this respect, his work is also relevant for the present study.

More recently, Næss (2007) has offered another profound critique of traditional argument-indexing approaches. Her main objection is worth citing at length (Næss 2007, 107; italics original):

The problem with thematic role theory is the absolute correlation it assumes between a verbal lexeme and the semantic properties of its arguments: a given verb must be taken to always subcategorise for the same set of thematic roles, and this leads to difficulties for verbs which seem to be compatible with several different role-types. A verb such as English *break*, for instance, may take a volitionally instigating subject argument, an agent: *John broke the window (on purpose)*. However, the property of volitionality is not actually required; *break* may equally well take a non-volitional subject argument (*John accidentally broke the window*), an inanimate force (*The bolt of lightning broke the window*) or even an instrument (*The hammer broke the window*). In the light of these data, which thematic role should one postulate for the subject argument of *break*?

Like Dowty, Næss abandons the concept of thematic roles. Rather, in a revision of Paul J. Hopper and Sandra A. Thompson's (1980) classic 'Transitivity Hypothesis',⁷ she offers a 'Maximally

⁷ According to Hopper and Thompson (1980), transitivity is best understood as an exchange or 'transfer' between two participants. The transfer may be more or less effective depending on the type of transfer (the lexical properties of the verb) and the participants involved. The effectiveness of the transfer correlates with an intuitive understanding of agency. A highly efficient exchange, e.g., 'John broke the window', requires a controlling and instigating agent and a totally affected patient. Less efficient exchanges, e.g., 'John sees Mary', imply a less instigating and volitional agent and a non-affected patient (see chapter 6, §4.0).

Distinguished Arguments Hypothesis' which she defines as follows (Næss 2007, 30):

A prototypical transitive clause is one where the two participants are maximally semantically distinct in terms of their roles in the event described by the clause.

The two maximally distinct participants in transitive clauses are labelled 'agent' and 'patient'. That they are maximally distinct means that the properties of the agent are not shared by the patient, and vice versa. Importantly for the present discussion, Næss does not assume these semantic roles to be indexed or selected by the verb. According to Næss, verbs do not subcategorise for specific thematic roles (e.g., agent and patient), but rather for semantic properties (instigation, volition, and affectedness). Therefore, 'agent' and 'patient' are not thematic roles lexicalised by specific verbs, but clusters of properties exhibited by the arguments of the verb (Næss 2007, 37). To illustrate the implications of Næss' approach, compare the sentences with 'break' from the quotation above, repeated here:

- (3) John broke the window (on purpose).
- (4) John broke the window accidentally.
- (5) The hammer broke the window.

In terms of volition and affectedness, the three sentences differ. In the first sentence, John intentionally breaks the window and should be considered an agent. In the second, John is less agentive because he does not want to break the window. And, finally, in the third sentence, a physical object is used as an instrument to break the window. In sum, the subjects in the three sentences

have different roles. Accordingly, Næss argues that ‘break’ does not subcategorise the subject for a certain semantic role, but rather a feature, the decisive feature being ‘instigation’, that is, the subject must be instigator of the event. Apart from verbal semantics, argument NP properties (including animacy, definiteness, and referentiality) and clause-level operators (most importantly negation and aspect) affect the degree of agency (Næss 2007, 111–19). In sum, within this framework, semantic roles are not seen as inherent properties subcategorised by the predicate, but as the relationship a participant has with the predicate.

In many respects a descendant of Fillmore’s Case Grammar, Role and Reference Grammar offers a linking algorithm for deriving semantic roles from a logical decomposition of verbs.⁸ In an early description of the theory, the agent role was considered a thematic relation on a par with relations such as instrument, experiencer, and patient (Foley and Van Valin 1984).⁹ However,

⁸ Fillmore’s Case Grammar and RRG are similar in that they both have direct mapping between syntactic structure and semantic representation. Further, RRG inherited the original Case Grammar’s view on grammatical relations like subject and object as non-universal features of natural language. One difference between Case Grammar and RRG is RRG’s emphasis on the role of discourse pragmatics in the mapping between syntax and semantics (see Van Valin and Wilkins 1996, 305).

⁹ In RRG, there is a significant distinction between ‘thematic relations’ and ‘semantic macroroles’. ‘Thematic relations’ resemble Fillmore’s case roles, but they differ in an important respect, because there is no listing of thematic relations in the lexical entry of a verb. By contrast, the thematic relationship between a verb and an argument is determined on the basis of the position of the argument in the logical structure representation. By implication, the RRG lexical representation of verbs is not

in an important discussion of agency and thematic relations, Robert D. Van Valin Jr. and David P. Wilkins (1996, 289) argued that the agent role is not a lexically determined role, but is compositional, and derived from the interaction of a number of “morpho-syntactic, lexical, semantic, and pragmatic factors which coalesce at the level of the contextualized interpretation of the utterance.” If agency were a lexical property, three different logical structures should be postulated for sentences (3) to (5) above, and that would indeed lead to a proliferation of logical structures, as critiqued by Dowty. Therefore, “while there are arguments which are ‘pure’ effectors, themes, and experiencers, there are no ‘pure’ agent arguments, because agents are always *composite*” (Van Valin and Wilkins 1996, 308; italics original). The RRG conceptualisation of agency was inherited from Dee A. Holisky (1987, 118–19), who argued that the meaning of the agent role is often not a property of the semantic structure of the predicate. Rather, the notion of the agent arises from the semantic intersection of predicate and actor NP. Moreover, she established an important pragmatic principle for interpreting the agent role (Holisky 1987, 119):

Pragmatic principle: You may interpret effectors and effector-themes which are human as agents (in the absence of any information to the contrary).

dependent on a fixed list of thematic relations. For logical structures, see §4.0. There are two ‘semantic macroroles’, actor and undergoer, both of which subsume a number of thematic relations, and which can be considered generalisations of case roles. RRG offers a linking algorithm to derive the semantic macroroles (see Van Valin 2005, 53–67).

In RRG, the effector role is void of features like volition and control, and simply refers to the actor of an activity (represented as **do**). Following Holisky, if the participant is human and the pragmatic context does not provide evidence to the contrary, the effector can be construed as the agent. Accordingly, sentences (3) to (5) all have an effector subject. Whether the effector is an agent depends on the pragmatic context. The first sentence does not provide evidence to the contrary, so John can be construed as an agent. In the second sentence, the adverb ‘accidentally’ cancels the pragmatic implicature of agency, while ‘hammer’ in the third sentence is not animate, so the agency inference is not applicable. Some verbs do in fact subcategorise for the agent role. In English, the verb ‘murder’ requires an agent actor, because the agency inference cannot be cancelled by an agency-cancelling adverb such as ‘inadvertently’ (e.g., ‘*Larry inadvertently murdered his neighbour’), unlike ‘kill’ (Van Valin and Wilkins 1996, 310). While English has a few verbs that subcategorise for the agent role, most verbs do not. Japanese, by contrast, seems to contain many more verbs that subcategorise for the agent role (Van Valin 2005, 56–57; see also Hasegawa 1996). Thus, despite objections to argument-indexing theories, thematic relations are retained in RRG. Importantly, however, the concept of thematic relations in RRG is not dependent upon a specific list or concrete definitions of relations. Rather, the meaning of the thematic relations is their logical positions within the semantic representation of the predicate, irrespective of any label one might postulate. RRG therefore offers a controlled framework for investigating the semantic relationship between predicates and arguments.

The overall purpose of this and the next two chapters is to establish a hierarchy of semantic roles on the basis of a structured verbal analysis. This objective transcends the logical analysis of verbs offered by RRG, because agency is compositional and arises from the intersection of predicate, arguments, and discourse pragmatics, as explained above. However, lexical decomposition of verbs is not irrelevant for an analysis of agency. On the contrary, the thematic relations derived from a semantic representation of the verb constrain the notion of agency, since only the effector role can possibly be an agent. Accordingly, this study will apply the RRG theory of lexical decomposition to derive logical structures and thematic relations from Biblical Hebrew verbs. On top of this framework, Næss' parameters of agency (instigation, volition, and affectedness) will be applied to determine the degree of agency exercised by each participant and to establish a hierarchy of semantic roles.

3.0. Decomposition of Verb Classes

Lexical decomposition is the task of decomposing lexemes into the most general categories possible in order to posit general criteria for how verbs function in the language. Ray Jackendoff (2002) likens lexical decomposition to physicists' quest to explain the composition of substances. A molecule is decomposed into atoms, and the atoms themselves can be decomposed into protons, neutrons, and electrons. Similarly, lexical decomposition is the task of decomposing lexemes into more generic sets of primitives. As with thematic roles, discussed above, there is in lexical decomposition an inherent risk of proliferation. Nevertheless,

lexical decomposition is about positing the fewest and simplest primitives to account for the greatest lexical diversity.

With respect to verbs, Zeno Vendler (1957) famously proposed four verbal classes: states, activities, achievements, and accomplishments. Later, other classes were added, including the semelfactive, that is, a punctual event with no change of state implied (Smith 1991). In canonical RRG, six verbal classes have been proposed (including, apart from Vendler's classes, semelfactive and active accomplishment), each with a causative correspondent, because, as will be shown, causation interferes with the regular verbal classes. In RRG, the verbal classes are called *Aktionsart*, but other terms occur frequently in the literature: 'inherent aspect' (Comrie 1976), 'situation aspect' (Smith 1991), 'lexical aspect' (Olsen 1997), 'event ontology' (Parsons 1979), and 'internal structure of an event' (Goldfajn 1998). One of the main questions to address is where the aspectual meaning is 'located'. While Vendler admitted the possibility that other constituents in the sentence may affect the aspect of the verb, he did not explore this further. However, Henk J. Verkuyl (1972) was soon to argue that the aspect of the verb should in fact be assigned to the entire verb phrase, thus contending that aspect has a composite nature, including both the verb itself and other constituents in the phrase. Carlota S. Smith (1991) also argued for a compositional notion of aspect. For Smith, the verb is important, but it is not the only parameter. Nominals and prepositions also add to the resulting aspect of the sentence. Smith (1991, 54) argued for a set of "compositional rules" that might be used to calculate a "composite value" based on the composition of verb, arguments,

and adverbials. In effect, Smith argued that the “intrinsic aspectual value” of the verb could be overwritten by other elements in the syntax. Accordingly, “Verbs have an intrinsic aspectual value, based on its [*sic*] aspectual contribution to a ‘maximally simple sentence’” (Smith 1991, 54), that is, an intransitive sentence or a sentence with a direct object, and with quantised nominals; compare, e.g.:

(6) Mary walked.

(7) Mary walked to school.

Since the verb ‘walk’ appears meaningfully in the intransitive, atelic sentence (6), the verb is assigned the intrinsic aspectual value ‘atelic’. The addition of the telic prepositional phrase ‘to school’ overwrites the atelic value and renders the sentence telic.

Until then, linguists had thought of aspect as a feature determined by equally valid oppositional components, e.g., the distinction between ‘telic’ and ‘atelic’, or ‘durative’ and ‘punctual’. In other words, a verb was usually seen as either telic or atelic, dynamic or stative, and durative or punctual. Mari B. Olsen (1997, 19), however, argued that there is an intrinsic asymmetry between these components:

[A] careful examination of the features on the basis of the semantic-pragmatic distinction reveals that the features have an asymmetry heretofore unnoticed in the literature: whereas positively marked lexical aspect features ([+telic], [+dynamic], [+durative]) are part of the semantics, interpretations generally attributed to negative features ([-telic], [-dynamic], [-durative]) arise as a result of conversational implicature.

For Olsen, a verb cannot be inherently atelic or inherently punctual, because these features are not lexical in nature, but pragmatic (or “conversational” in the quotation above). By implication, according to Olsen’s theory, a verb need not be marked for telicity at all. In more general terms, Olsen views the semantic oppositions as ‘privative’, that is, the two opposed semantic features are not equally marked. In her semantic analysis, only positive features are marked, while negative features are optional. By contrast, the traditional view on semantic oppositions may be called ‘equipollent’, because the two opposed semantic features have equal weight or are equally marked.¹⁰ The difference between the classical, ‘equipollent’ representation of aspect and Olsen’s (1997, 21) ‘privative’ representation of aspect can be illustrated as follows:

(8) equipollent: run: [-telic, +durative, +dynamic]

(9) privative: run: [+durative, +dynamic]

In the traditional, equipollent analysis (8), the verb ‘run’ is marked atelic, while in the privative representation (9), the verb is simply unmarked for telicity. The equipollent analysis has a serious drawback, because it needs to posit an additional representation of the verb when it occurs with a telic complement, e.g., ‘Mark ran a mile’. In the privative analysis, on the other hand, there is no need to propose a telic variant, since the telic interpretation does not arise from the verb but from the clausal context.

¹⁰ For further explanation, see Olsen (1997, 17–22).

Olsen's 'privative oppositions' pose a fundamental challenge to the classical tests developed for diagnosing the *Aktionsart* of verbs. Dowty's (1979) test questions became a popular tool for decomposing verbs into aspectual classes, and they were later incorporated into RRG (Foley and Van Valin 1984; Van Valin and LaPolla 1997; Van Valin 2005). As an example, a test to distinguish states and activities is the progressive test, because only non-statives can normally occur in the progressive (Dowty 1979, 55):¹¹

(10) *John is knowing the answer.

(11) John is running.

(12) John is building the house.

Similar tests include tests for agency, because states cannot have an agent. Therefore, states cannot occur with verbs such as 'force' and 'persuade', or as imperatives, according to this theory. Van Valin (2005, 36) adds to the pool of non-stative modifiers dynamic adverbs, including 'vigorously', 'gently', and 'powerfully'. If, however, Olsen is right in her claim that the dynamic feature is one of 'privative opposition', the validity of the tests is brought into question. The problem is that dynamicity and stativity are not symmetric. Stativity is a cancellable feature while dynamicity is not, and this asymmetry implies that states may have both stative and dynamic interpretations, in contrast to activities, which are always dynamic. By implication, stative verbs may respond positively to the tests given a pragmatic context that cancels out

¹¹ Some states can occur with the progressive aspect; see Van Valin 2005, 35 n. 3.

the stative interpretation, as in the following quotation from C. S. Lewis' *The Magician's Nephew*: "Digory was disliking his uncle more every minute" (see Olsen 1997, 37). In this example, the presence of the adverbials 'more' and 'every minute' cancels the stativity of the predicate, and the predicate expresses an incremental event. Olsen (1997, 37) adds the otherwise prototypically stative verbs 'know' and 'love' to the group of verbs that can occur in dynamic contexts. Because stativity is a cancellable feature, stative verbs may vary between a stative and a dynamic reading depending on the pragmatic context. A progressive test will therefore yield both states and activities. Obviously, the solution is not to propose opposite test questions, e.g., to test whether a verb can occur in a non-progressive form. Both stative and dynamic verbs can occur in the non-progressive, but the dynamic verb would still be interpreted as dynamic in contrast to the stative verb.

If it is inherently flawed to apply test questions for sorting states and activities in modern languages, it is even more so with respect to ancient languages, where there are no competent speakers to consult. One may be able to identify dynamic contexts, for example dynamic adverbs that suggest a dynamic interpretation of the sentence as whole. However, if Olsen is right, we should expect to find inherently dynamic as well as stative predicates in those contexts. Therefore, a verb is not necessarily inherently dynamic just because it happens to occur in a dynamic context. On the other hand, even if a verb never occurs in a dynamic context, it may still be dynamic, because we cannot as-

sume of a limited corpus that it attests all possible types of construction. In this study, therefore, I shall explore a quantitative method for determining the *Aktionsart*, in particular as regards the dynamicity opposition (see chapter 5).

4.0. Logical Structures

In RRG, verb semantics is represented in so-called ‘logical structures’ according to *Aktionsart* (Van Valin 2005, 45). The purpose of the logical structures is to formally derive semantic roles depending on the *Aktionsart* of the verb. The semantic roles can then be mapped onto the syntax of the clause to determine the semantic roles of the arguments of the verb. There are six *Aktionsart* classes in RRG, each with a causative correspondent. As displayed in Table 3, the basic distinction is between states (represented as **predicate’** or simply **pred’**), and activities (**do’**). As Van Valin (2018, 77) explains, in RRG, “States and activities are taken as the primitive building blocks of the system; they are the only classes which take arguments.” Moreover, unlike in the work of Dowty (1979), activities are not assumed to be derivable from states, but these are, rather, treated as two distinct primitives. The remaining classes are derived from this fundamental distinction. Accordingly, the ingressive aspect, the semelfactive aspect, and the resultative aspect are secondary operators modifying states or activities. The ingressive aspect (INGR) refers to instant change, the resultative aspect (BECOME) captures change over a span of time and a resulting state of affairs, while the semelfactive operator (SEML) denotes punctual iterations (Van Valin

and LaPolla 1997, 104). Finally, CAUSE expresses the causal relationship between two individual logical structures.

Table 3: Logical structures for the *Aktionsart* classes (Van Valin 2005, 45). The variables *x*, *y*, and *z* represent the slots to be filled by lexical items from the syntax.

<i>Aktionsart</i> class	Logical structure
State	pred' (x) or (x, y)
Activity	do' (x, [pred' (x) or (x, y)])
Achievement	INGR pred' (x) or (x, y), or INGR do' (x, [pred' (x) or (x, y)])
Semelfactive	SEML pred' (x) or (x, y), or SEML do' (x, [pred' (x) or (x, y)])
Accomplishment	BECOME pred' (x) or (x, y), or BECOME do' (x, [pred' (x) or (x, y)])
Active accomplishment	do' (x, [pred' ₁ ' (x, (y))]) & INGR pred' ₂ ' (z, x) or (y)
Causative	α CAUSE β , where α and β are logical structures of any type

Later, Van Valin (2018) modified the representation of active accomplishments (most importantly, consumption and creation verbs). Whereas (active) accomplishments were traditionally conceptualised as BECOME **pred'** (x) or (x, y) or BECOME **do'** (x, [**pred'** (x) or (x, y)]) for states and activities respectively, the new representation adds additional nuances to the event structure. As a gradual process towards completion, an (active) accomplishment undergoes a process of change before reaching the point of completion. Accordingly, the BECOME operator has been split into

a process (PROC) and a punctual endpoint (INGR), as exemplified below (Van Valin 2018, 85–86):

(13) Creation of a document: [**do'** (x, [**write'** (x,y)) ^ PROC **create'** (y)] & INGR **exist'** (y)

(14) Motion to a goal: [**do'** (x, [**run'** (x)]) ^ PROC **cover.path.distance'** (x,(y))] & INGR **be-at'** (z, x)

In these examples the ^ means 'and simultaneously', and captures the meaning that when someone writes a letter, the letter is simultaneously undergoing a process of creation.

Aktionsart is often defined as the 'inherent temporal aspect' of a verb. For this reason, it may seem odd that the causative aspect is included in this model. After all, causation is a logical relation rather than a temporal one. However, according to Smith (1991, 21), *Aktionsart* (or, rather, 'situation type' in her terminology) is related to a super-ordinate 'causal chain':

Cause—Subject—Action—Instrument—Object—Result

As Smith (1991, 21) explains, stative situations typically cover only the Object–Result part of the chain, while activities usually cover the first part of the chain. A causative stative can therefore be expected to cover the Cause and the Object–Result parts of the chain. Moreover, causative verbs have an extra argument, namely the causer, and the extra argument has ramifications for the logical structure. When a causer is added, the logical structure must be expanded in order to include the causer, the causee, and the original non-causative object, if any. It is therefore reasonable to include causation in the study of *Aktionsart*.

The purpose of this study is to explore the correlation between Hebrew verbs (primarily those in Lev. 17–26) and agency. For this reason, not all aspects of the RRG logical structure theory are equally important. The two most important aspects are 1) the distinction between states and activities, because they subcategorise for different thematic relations; and 2) the distinction between causative and non-causative events, because causative events add an external causer and, by implication, a new set of thematic relations. The remaining operators add finer distinctions to the logical representation of the verb, but they do not influence the selection of thematic relations; hence, they do not affect the agency of the participants involved.

5.0. Annotation Procedure

Having discussed agency, lexical decomposition, and logical structures with respect to Biblical Hebrew, we are now in a position to sketch the analysis of verbal events to be carried out in the next two chapters. In general, given the obvious lack of native speakers of the language, the analysis will seek to employ quantitative methods as much as possible, without neglecting the importance of qualitative analysis. In chapter 5, dynamicity will be explored, and a quantitative method will be applied to distinguish states and activities. Despite promising results, many verbs are not captured by the quantitative model due to infrequency and low attestation of adverbials. These verbs will be manually annotated. In chapter 6, the Hebrew morphological and lexical causatives will be analysed in turn. A transitivity alternation model will be proposed to identify true morphological causatives

(§3.0). Next, lexical causatives will be analysed with respect to semantic transitivity (§§4.0–5.0). Finally, on the basis of verbal properties as well as argument and clausal features, the semantic roles and their corresponding agency scores will be computed (§6.0). The annotation procedure is sketched in Figure 4.

Figure 4: Annotation procedure

