# Stones on Display in Joshua 6:
The Linguistic Tree Constructor
as a "PLOT" Tool

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STONES ON DISPLAY IN JOSHUA 6: THE LINGUISTIC TREE CONSTRUCTOR AS A "PLOT" TOOL[1]

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The analogy of masonry can illustrate how natural stones of different sizes and shapes are joined together so as to form a new surface and structure, much in the same way as an author constructs a text. Just like it is necessary to perceive the overall design in order to understand an architectural masterpiece, no interpreter can understand the structure of a text without explaining how units are joined into a holistic pattern, shaping the intent and impact of that text. To succeed in this task, however, the interpreter requires appropriate tools, and this is also the case for the texts of the Hebrew Bible. So, we may ask, what tools can (ad)dress these architectural formations that are biblical texts?

This is the issue raised by a new dissertation from the Vrije Universiteit in Amsterdam by Marieke den Braber, *Built from Many Stones* (2010). In her study, den Braber demonstrates how any selection of data for the analysis of biblical texts will necessarily influence the methods used as well as the expected results. More specifically, den Braber uses the account of Jericho's conquest in Joshua 5–6 for a methodological investigation of two neglected exegetical approaches to the book of Joshua. The first approach is that of Graeme Auld, who has crowned 25 years of research on Joshua with a commentary on the Greek Vaticanus edition of the book (Auld 2005). The second approach is from the dissertation written by the author

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[1] The following list presents the main abbreviations used in this article: 3ET = Ezer Emdros-based Exercise Tool (http://ezer.dk/3et/index.php?lang=en [accessed 12/28/2012]), LTC = Linguistic Tree Constructor (http://sourceforge.net/projects/ltc/); PLOT = Persuasive Learning Objects and Technologies (cf. EuroPLOT: www.eplot.eu); RST = Rhetorical Structure Theory; WIVU = Werkgroep Informatica at Vrije Universiteit (https://easy.dans.knaw.nl/ui/datasets/id/easy-dataset:48490 is currently the best link to the database according to Dirk Roorda, personal communication). Excerpts from WIVU reproduced in this article, including excerpts from WIVU in the open-source LTC, are used with permission. See below note 5.

of this article, *A Functional Discourse Grammar of Joshua* (Winther-Nielsen 1995). Both contributions are treated by den Braber as examples of scholarly approaches to the text of Joshua that go against the grain of mainstream diachronic scholarship (Braber 2010:3), but which might be helpful when taken into account by diachronically oriented scholars.

In her dissertation, den Braber uses the complete text edition of the Book of Joshua in Winther-Nielsen and Talstra (1995), and she asks to what extent this sort of display of the text can guide the exegete through the individual stones of the final construct of the Hebrew text. In the end, she concludes that such displays are "too complicated for easy access to the results" (den Braber 2010:222). Due to their complexity, interpreters so far have not used the displays, maybe not so much because of a "certain amount of 'academic laziness'" (159), as den Braber suggests, but more likely because the text was not always presented in the simplest instructive way, which could give the interpreter easy access to the complex linguistic data of the Hebrew Bible. However, the situation has significantly changed in the past years, not least because of the various possibilities now offered by the digitalization of biblical texts. Therefore, the recent dissertation by den Braber provides an excellent opportunity for me to suggest the ways in which new digital solutions may improve on the printed edition we published more than 15 years ago. My contribution will revisit this aspect of my former dissertation (Winther-Nielsen 1995), and trace the potential of new technologies for analyzing biblical texts, as well as for developing methods and models for learning Biblical Hebrew.

More specifically, I will be using the database developed by Eep Talstra and fellow members of the Werkgroep Informatica at the Vrije Universiteit (WIVU) in Amsterdam. Accordingly, I will first introduce the database and the tree constructor tool that I am going to use, and I will explain my use of the term "PLOT" and the theoretical framework that it implies. I will then discuss the WIVU displays of the Book of Joshua, and offer a "relational" interpretation of Josh 6:5. After a discussion of the problems related to the Rhetorical Structure Theory (RST), I will introduce the Connectivity Model proposed by Renkema (2009), a new helpful discourse-based model of relations in texts, and I will exemplify its merits in an analysis of Josh 6:15–20. I will suggest that the constructor tool, as it stands, can be taken as a first step toward the direction that educational technology could take in order to develop new tools for the analysis of biblical texts. In this sense, this paper is the seminal presentation for a new online site at 3BMoodle presenting projects on the construction of interpretations for learning languages.

1. THE "PLOT": PERSUASIVE TECHNOLOGY FOR EMDROS

The first stones that we will select in order to lay a foundation for a new construct will be the raw data of the WIVU database.

Once we understand the structure of the data, we will be in a better position to understand how the database can operate as a resource for new instructional technology.

The PLOT, short for "Persuasive Learning Objects and Technologies," is inspired by a new theory called "persuasive technology" (Fogg 2003), which seeks to take into account the ways in which the computer can act in the role of a human persuader. The aim of this new theory is to understand how technology changes what we think about computers and how we use computers in various contexts to motivate users and to simplify their tasks. This theory about Human-Computer Interaction explains how information and communication technology can serve in various roles as a tool, simulation, and social actor. The theory seeks to optimize "persuasive" elements that enhance behavior change and motivational influence. The first step to apply this theory to corpus-driven, technology-enhanced learning took place at a mini-conference at Aalborg University held on March 30, 2009.[2] The initial idea of the PLOT was to explore to what extent we could use a database with tools that were developed by Sandborg-Petersen (2008). In his dissertation, he analyzed the structure of the WIVU database for the Hebrew Bible and developed the "Emdros" database management system for storing and retrieving annotated text.[3] Sandborg-Petersen has applied Emdros for the corpus of the writings of the Danish poet, playwright, and vicar Kaj Munk. For this project, he also created a database manager, a browser, a website for collaborative annotation, and an algorithm for automated detection of quotations from other sources. We started exploring the potential of Emdros to support new applications for learning and research based on text corpora. For the period between November 2010 and October 2013, we are benefitting from a grant from the Europe Union Lifelong Learning Programme in order to further develop persuasive technology in the EuroPLOT project (www.eplot.eu). In this project, a tool called "PLOTLearner" is now being tested, at the stage of prototype, as we develop the technology into a corpus-driven learner-controlled tool which simplifies and motivates the training of skills for Hebrew language learning in a self-tutoring system.[4]

In this discussion, I will provide an interpretation of the Hebrew lexeme רק *raq* in Josh 6:18a as a case in point. To this end, I will introduce the layout of the Emdros data (below, Table 1). In the particular Emdros database that we use in our

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[2] Except for Tøndering (2009) and Wilson (2009), the other papers given at this conference have not been published.

[3] The dissertation by Sandborg-Petersen (2008) is an in-depth description of this system. Information and download are available at http://emdros.org (accessed 12/28/2012).

[4] See the information on the PLOTLearner site http://eplot. 3bmoodle.dk/ (accessed 12/28/2012) as well as the special seminar on Hebrew language learning at SBL International in London, published at http://www.youtube.com/user/nicolaiwn (accessed 12/28/2012).

project, the WIVU database, the category called "object" has a unique number which is called a monad (368869–75 in the following Table). An Emdros object can be a word, a sequence of monads such as a phrase or a clause, as illustrated in Table 1, but it can also be an archive, a collection of texts, a book, a chapter, a segment, a quotation, or any other unit requiring annotation for a corpus. Each object can have any number of defining features: for instance, a word may have a feature called "surface" which differs from the feature called "lexeme." Also, monads can combine to one object with a new function as in our case where the three monads *min ha=ḥērem* group together to form the prepositional phrase. There are no limits to the annotations that researchers can attach to the different hierarchical objects created for the database, which range from the smallest morpheme to the highest level of the corpus.

Table 1. EMdF-Model of Josh 6:18a from the WIVU Database[5]

"Word" objects

Monad	368869	368870	368871	368872	368873	368874	368875
Surface	וְ	רַק־	אַתֶּם	שִׁמְרוּ	מִן	הַ	חֵרֶם
Part of speech	Conjunction	Adverb	Pronoun	Verb	Preposition	Article	Noun
Lexeme	וְ	רַק	אַתֶּם	שׁמר	מִן	הַ	חֵרֶם
Transliteration	wᵊ=	raq	ʔattem	šimr-û	min	ha=	ḥērem
Gloss	And	only?	You	guard	from	the	ban

Phrase objects

Monad	368869	368870	368871	368872	368873–75
Phrase type	CP	AdvP	PPrP	VP	PP

Clause objects

| Monad	368869–75
Clause type	Impv

Using the WIVU Emdros database, Winther-Nielsen (2008, 2009) and Wilson (2009) worked within Role and Reference Grammar, as formulated by Van Valin (2005), and applied this grammar to their Role-Lexical Module for parsing, lexicon building, and representation.[6] This project shows how we could

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[5] All excerpts from the WIVU database in this article are used with permission from Eep Talstra, Director of the Werkgroep Informatica, and the German Bible Society. This also applies to excerpts from WIVU used in the open-source LTC which are reproduced in this article.

[6] I coordinated this project with Chris Wilson as designer and programmer between 2005 and 2009. The text of Genesis 1–3 is available for online inspection at http://lex.qwirx.com/lex/clause.jsp (accessed 12/28/2012). Den Braber (2010:13 n. 3) refers to this new

exploit the database in a web application for displaying Hebrew in the linguistic format as illustrated in example (1) below.[7] Skovenborg (2011) has recently proposed a new design for a learner-centered use of a curriculum with a top-down approach to the text which displays the Role and Reference Grammar and the text interpretation, but there is currently no funding for the implementation of this particular system. Meanwhile, and as a result of constructing the Role-Lexical Module, the database was used at the core of a self-tutoring technology called 3ET, short for the Ezer's Emdros-based Exercise Tool (Tøndering 2009), following the proposal in Winther-Nielsen (2009:14, 49). This tool was developed in order to help learners improve their morphological skills of Biblical Hebrew by means of persuasive exercise technology (Winther-Nielsen 2011). It is this tool that we are now redesigning as the PLOTLearner tool, using the WIVU Emdros database for Biblical Hebrew language learning in the EuroPLOT EU project.

(1) Display of Josh 6:18 in the Role-Lexical Module

The basic linguistic data of the WIVU database was from 2003 and was marketed by the Deutsche Bibelgesellschaft in a commercial software product known as the Stuttgart Electronic Study Bible, or SESB (Hardmeier, Talstra, and Salzmann 2009), but as of 2012 it is only available as a new software bundle for

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work, but does not discuss it.

[7] The standard conventions for grammatical terms in these glossing displays are CLM = clause linkage marker, ADV = adverb, PRON = Pronoun, IMP = Imperative, Qa = Qal, the most frequent Hebrew stem form, M = masculine, pl = plural, CLT = Clitic, P = Preposition, ART = definite article, u = unknown, sg = singular, AB = Absolute, the final, unmodified form of the noun in Hebrew. In the Role-Lexical Module we used the King James translation, because it was one of the free digital versions without copyright (for details see Winther-Nielsen 2009:19).

Logos 5.[8] Because it is a Logos resource, it is integrated with thousands of high-quality digital resources for scholars and serious learners. From both personal experience and feedback from students, I can confirm that the former SESB 3.0 served as a very useful tool for teaching and learning. Students reacted well to the high academic standards of the information and to the user-friendly interface, but some complained about the high cost of the software when compared to other Logos resources. Fortunately, however, for schools in the Majority World there are multiple user-friendly solutions available for computer labs, and for countries with a low average gross domestic product (GDP) per capita, the German Bible Society is setting a commendable example by donating software.[9]

Unfortunately, the Logos software architecture does not allow for the adaptation of data to new learning tasks in the program interface. Morphological tags and syntactic trees cannot be changed according to personal preferences. In this regard, Logos 5 is no different from other Bible software programs that are built on the concept of Just-press-this-button-and-get-THE-solution. However, we believe that adaptability could enhance constructive and interactive learning, and should be offered by learner-controlled software. This problem is pointed out in the conclusion of a major review of information systems for the Hebrew Bible:

> Systems that integrate the results of divergent computational linguistic projects in Biblical Hebrew could promote the use of electronic data and analyses, providing a solution for the under-utilization of existing tools. New developments that tend to make use of more flexible functionalities and user-friendly visualizations may facilitate the creation and use of advanced Biblical Hebrew information systems in the next decade (Kroeze, Matthee and Bothma forthcoming).

Therefore, developers and users of new tools need to address the objection of den Braber and others who suggest that the data should be displayed in a more useful fashion for biblical interpreters. Unfortunately, however, the development of digital resources for academic biblical studies is costly, and new technology can only be developed by individual researchers working without payment or by funded academic projects like the Werkgroep Informatica. Successful businesses like Logos Bible Software are an exception to the rule, but even they can rarely finance large-scale scientific research projects. With decreasing access to multi-million dollar funding, new tech-

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[8] See the German Bible Society Bundle (= http://www.logos.com/product/18617/german-bible-society-bundle [accessed 12/28/2012]) and Logos Bible Software (www.logos.com).

[9] The funding would be arranged through the scholarly Editions Grant by contact to Ilona Raiser (so Markus Hartmann, private communication). For GDP, see also: http://en.wikipedia.org/wiki/List_of_countries_by_future_GDP_%28PPP%29_per_capita_estimates.

nology can therefore often only be developed by dedicated, self-supported developers who produce digital resources under an open source license.

The PLOT therefore depends heavily on open source development. The WIVU database of Biblical Hebrew supports research cooperation for the creation of more effective theory, tools, and training. This database is already available commercially in Logos, and new digital applications could enhance the use of this database as support for learning and interpretation. The EuroPLOT project is designed to contribute to a wider usage of Emdros. On this foundation stone for theory and design of persuasive technology, I will now lay the next stone, which is the adaptation of a tool for text construction.

2. THE TOOL: THE LINGUISTIC TREE CONST-RUCTOR

By using stone imagery in the previous section, I have already emphasized the multifaceted nature of text. The cornerstone of my argument rests on the fact that elements of texts can be compared with "stones" requiring new tools that can be manipulated through technology, replacing the static display of printed text, as targeted in the critique of den Braber.

I am now going to introduce a new tool that will help the interpreter shape the structure of the stones of the Hebrew Bible and rearrange the surface structure.
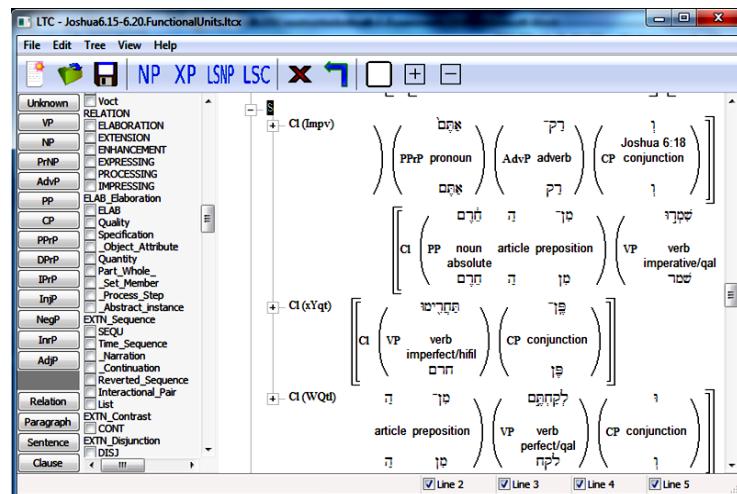
Fig. 1. Josh 6:18a displayed with WIVU tags in the LTC

In order to make a quick start, I will use and adapt an existing program which I believe enhances learning from Logos with the WIVU database. The Linguistic Tree Constructor (LTC) commends itself for this purpose as a free, flexible, and functional tool to retrieve word, phrase, clause, and sentence from the WIVU database in the format illustrated in Figure 1.[10] For

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[10] The Linguistic Tree Constructor (LTC) is an open source program which can be downloaded at www.ltc.sourceforge.net. The texts

our database example from Josh 6 in Table 1, the tool can display the linguistic data for the learner who can expand or collapse the nodes and inspect the text at the appropriate level of sentence, clause, phrase, or word. For the first Hebrew lexeme וֹ in this figure, the user of the LTC can see the Hebrew form in the first line and in the second line the Hebrew Bible reference "Joshua 6:18." Below is a third line which specifies that the lexical category of the lexeme וֹ is "conjunction" and "CP" is used in the WIVU database as a label for a conjunctional phrase. The fourth line displays the form of the lemma, or dictionary word, which in this case is identical with the text form. At the bottom of the screen, the user can choose which of these lines he or she wants to display. Furthermore, the program has a feature called "Open horizontal tree," which displays any node or sentence as a tree with constituent projection as illustrated in Figure 2. This kind of display is similar to a conventional linguistic tree drawing. The constructor program can also display complex sentences, and thus larger segments of texts. This supports the ability to engage with the text through the interactive interface, zooming in and out of the nodes (cf. Winther-Nielsen 2009:6–7).
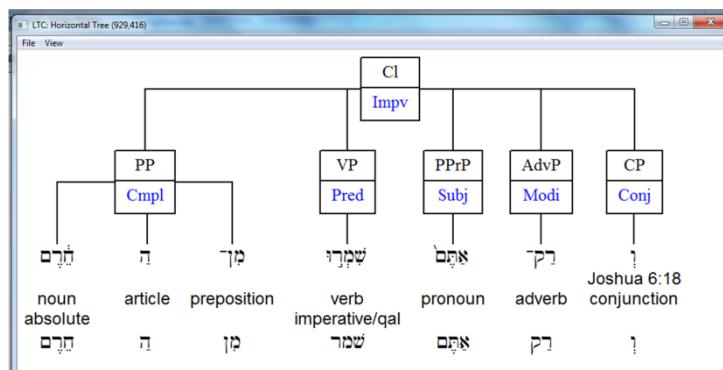
Fig. 2. Josh 6:18a displayed as horizontal tree
with WIVU tags in the LTC

As already illustrated in Figure 1, the LTC program can show a sidebar for labeling texts with grammatical and rhetorical terms. A text can be analyzed with these labels, and the text can then be exported to other users of the LTC in order to allow the user to share his preferred interpretation with instructors or fellow learners. Furthermore, and crucial for the solution proposed here, the user can customize the labels in the sidebar and adapt them to his or her preferred model of interpretation, discourse analysis, or poetics.[11] Other interested

discussed and illustrated in the displays can be downloaded as data files from 3BMoodle (http://3bmoodle.dk/) on the language project platform Connectivity Model Resources - Guest Access (= http://3bmoodle.dk/course/view.php?id=9 [accessed 12/28/2012]).

[11] In 2010, Daniel Lundsgaard Skovenborg developed a forked version of the LTC displaying the relations suggested in this paper as tips. On November 1 2011, Ulrik Sandborg-Petersen released LTC 3.1.0 with this tool tips function and this author's definition of rela-

users can download the customized interface, explore it, and improve the labels. In a learning process, the learner uses the tree construction program to import its linguistic information from the database, giving him or her access to the text in the same constituent projection as the one available as a Logos resource. Instructors or learners can import a file with the text information from the WIVU database and then inspect existing interpretations, and subsequently edit them or create their own brand new interpretation.[12] Another option is to use a feature available in the Role-Lexical Module allowing one to export clauses with glossing and then use the Hebrew or glossed text for instructional purposes in the LTC (Winther-Nielsen 2009:39–41), or in the RRGBuilder (Skovenborg 2011).

This flexible and creative interaction with the text is an example of the kind of tools that we had in mind when we proposed persuasive technology as PLOT exemplars for learning and teaching. Persuasive Technology was originally formulated as a broad framework to employ technology under the three functional aspects of *tool*, *medium*, and *social actor* (see Fogg 2003:32). The tree constructor is a tool to simplify the task of interpretation, but some features are similar to how a medium can simulate the cause-and-effect when the interpreter proposes a certain interpretation, helping him or her to visualize his or her understanding and improve his or her analytic skills. The LTC as a social actor also offers the possibility for peers, coaches, and fellow learners to exchange interpretations in an open learning environment, but this aspect of the tool is not prominent. Above all, it is a tool motivating the student to engage in deep learning by rearranging the "stones" to illustrate the construction of a new interpretation of the text.

With this background, the LTC may help us experiment with the ways in which PLOT technology can enable and motivate textual analysis, interpretation, and sharing. Interpretation will be more effective with an interactive and adaptable tool like the LTC, because it can be customized to solve particular technological tasks that enhance the interpretive faculty of learners, while also supporting instructors. When the interpretative task is simplified, it enhances the motivational attitude of learners and removes the cumbersome cut-and-paste task of reproducing a text, hand-coding, and sharing it with teachers or fellow learners. The core idea of this proposal is that data that are commercially available for Logos can be reused and repurposed in an open educational resource tool for text analysis.

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tions in the Connectivity Model (cf. https://sourceforge.net/p/ltc/news/2011/10/linguistic-tree-constructor-310-released [accessed 12/28/2012]). Also, this version included the interclausal node type "Relation" ("R").

[12] The Bible software company 3BM (http://3bmoodle.dk/) funded Ulrik Sandborg-Petersen to develop an extraction program to export from the WIVU database to .ltxc-files which can be loaded into LTC. 3BM has permission from Eep Talstra and the German Bible Society to use the Amsterdam database for restricted text selections.

To sum up, I have introduced this LTC tool to display the WIVU database and draw syntax trees. I have also argued that it is a simple exemplar of a tool with some PLOT qualities as well as limited simulation features and support for interaction. LTC will enable a user to interact with the WIVU database, any other imported database, or data built from scratch, and it will encourage the learner to construe creative interpretations and simulate trial and error experimentation in text analysis.

3. THE RST: A CONSTRUCTOR OF RHETORICAL STRUCTURE ANALYSIS

Having so far explained the structure of the WIVU database and the LTC in relation with persuasive technology, we can now apply it to the theory and practice of interpretation. In terms of our stone imagery, the main issue is how to decode the structure that was applied when the stones were laid, and how we can display them through educational technology. In other words, the issue is whether the new tools available to us can overcome the problems of a printed edition which, as pointed out by den Braber, "will not be frequently consulted by occasional readers of Joshua" (den Braber 2010:68).

The case in point is the new condensed displays used for the Book of Joshua. My dissertation (Winther-Nielsen 1995) discussed the full text of Joshua 2 at length. For the rest of the Book of Joshua, the dissertation only quoted selected texts, but Winther-Nielsen and Talstra (1995) published the complete analysis in a companion volume. Each individual clause unit was associated with columns incorporating several levels of discourse-pragmatic analysis. One column presented the Amsterdam database codes for syntactic clause linkage, speci-fying the coreference between verbs and conjunctions in clauses which were related as pairs. An adjoining annotated column contained grammatical and interpretive labels.[13]

For this interpretive column, den Braber (2010) discusses the exegetical relevance of the Rhetorical Structure Theory (RST) which was proposed by prominent linguists in the latter part of the 1980s (Mann and Thompson 1987; Mann, Matthies-sen and Thompson 1992). The RST theory is a pragmatic approach to discourse structure, offering a valuable and realistic explanation of how writers and readers construe texts to com-municate (Winther-Nielsen 1995:20). Computer specialists also wanted to explore discourse connectivity in texts beyond mor-pho-syntactic and propositional semantic analysis (Winther-Nielsen 1995:31). Later versions of the RST theory are dis-cussed in Toboada and Mann (2006) and in the textbook of Taboada (2009). Recently, studies have focused on the role of

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[13] The column used Role and Reference Grammar (RRG) labels to interpret the syntactic linking, and Rhetorical Structure Analysis (RST) labels to explain inter-clausal relations beyond the level of grammatical linkage of clauses. Other labels covered discourse anal-ysis, but labels for narrative analysis like setting, episode, and climax were not used.

implicit marking of coherence (Taboada 2004; 2009) and on formulating a new cognitive framework (Sanders and Spooren 2009). Originally, a number of 25 RST relations were applied in the complete analysis of the Book of Joshua in Winther-Nielsen and Talstra (1995). In later studies of rhetorical structure, the number of relations has ranged from only two to a total of some 400 relations (Renkema 2009:114). Mann and Taboada (2007) give online access to vast material on 187 relations.

Only a few Hebrew Bible scholars have used the RST-theory since Winther-Nielsen (1995, 2005). However, an excellent recent study by Lyavdansky (2010) uses the RST framework to explain the difference between a temporal adverbial use and a "discursive" textual use of the וְעַתָּה *wᵊ=ʕattāʰ*, "and now," in Biblical Hebrew, Egyptian Aramaic and Old Babylonian. Lyavdansky takes the RST framework as point of departure for his discussion of comparative linguistic data.

Den Braber (2010:63) questions whether displays with columns for RST interpretation as elaborate as those published by Winther-Nielsen and Talstra (1995) for Joshua are really necessary for the synchronic reading.[14] Part of the problem is the complexity of the displays, since they combine and condense two kinds of approaches into one. In Winther-Nielsen and Talstra (1995:17–21), the phrase structure analysis practiced by Talstra and his team and encoded in the WIVU database was listed in one column, and an adjoining column listed the functional interpretation of relations by this author. Thus, it was possible to compare the structural description stored in the database with a reader-oriented interpretation which uses RST-relations in order to explain connections in the texts regardless of genre and scope. This approach made it possible to explore the structure and function of the text beyond the more syntactic focus of Talstra, as carefully explained in the preface to the text edition (Winther-Nielsen and Talstra 1995:vi). These displays therefore offered a consistently database-*independent* proposal next to, and complementary with, the computer-assisted description. As such, they provided a user-centered and independent interpretation of what this author believed the writer of Joshua intended to communicate to his readers in the text.[15]

In passing, it should be noted that the main critique of den Braber is that these text displays leave out a text's "diachronic progression" (68). However, to add both the full witness from the history of the textual transmission as well as all the emendations and interpretations of modern critical scholars would have made the displays even more complex and far

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[14] Due to the technical notations in the Amsterdam database, the display can be misunderstood, such as when den Braber (2010:177, 209) misinterpreted brackets used to mark appositional constituents as if this author used them for text-critical purposes.

[15] This solution intended to "balance the inherently formal data obtained by computational procedures" (Winther-Nielsen 1995:26), and RST served as "an independent, user-oriented and descriptive basis for the analysis of clause combining and textual coherence" (88).

beyond the task of displaying a simple reading of the extant text. This kind of historical-critical annotation would therefore present a challenge for textual display of still a different sort.
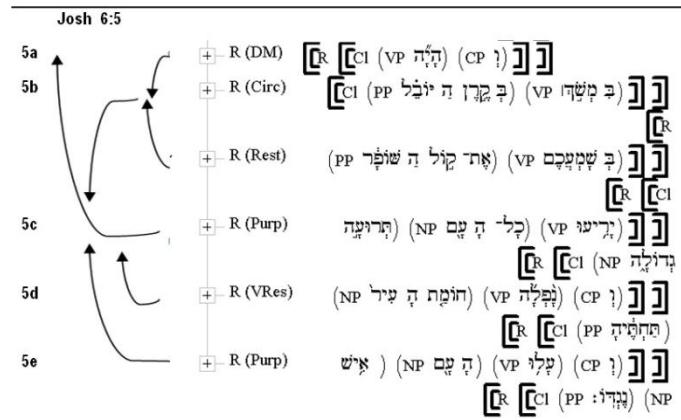
Fig. 3. The WIVU text of Josh 6:5 in the LTC,
with RST relations and hierarchy

Another problem raised by den Braber is how to convey a computer-assisted interpretation of inter-clausal relations which can simultaneously display a representation of syntax, semantics, pragmatics, and discourse structure (Hardmeier 2003:15; Renkema 2009:87; Wardlaw 2010). It requires a strategy for analysis that, by definition, will not identify grammatical codes with rhetorical labels, but rather will keep the grammatical codes distinct from the RST and other functional labels, because this is the only way to avoid a simplified assumption of one-form-to-one-function.[16] An additional issue is whether rhetorical relations really are "far more subjective than the analysis of the grammatical hierarchy and cannot be consistently deduced from the syntax," as argued by den Braber (2010:186). In our approach, we will assume that the regularities of discourse-pragmatic features can be accounted for in part by the syntax-semantics-pragmatics interface (Winther-Nielsen 1995: 101). We will furthermore introduce an alternative theory of relations in a given text that addresses the issue of the ambiguity in discourse, and seeks to offer an answer to this problem.

However, as a first step toward a solution, we will explore how the interpreter can use the LTC to add RST labels for any structural unit in the text, including the levels beyond the sentence. In Figure 3 below, I will first illustrate how I reproduced the text-analysis of Josh 6:5 from Winther-Nielsen (1995:205) or Winther-Nielsen and Talstra (1995:38–9).[17] The point of

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[16] Contrast den Braber (2010:38), who objects to interpretations without grammatical marking (ibid.:173–4) and jumps from linguistics to rhetoric (ibid.:63), though she fortunately agrees that relations are helpful for synchronic labelling when they are assigned independently of syntax (ibid.:187).

[17] I have not used the RSTTool of Mick O'Donnell (http://www. wagsoft.com/RSTTool [accessed 12/28/2012]), because I wanted to

providing this particular figure is not to argue in detail for the way the displays were set up in the dissertation, nor in any way to discuss how den Braber critically analyzes the displays produced for print in 1995. My goal is only to show to the users of the Joshua display that the displays could be reproduced for print with the use of the LTC. For this particular display, I removed all sentence nodes from the WIVU database, and then tagged all clauses with the labels suggested in 1995. I copied-and-pasted this analysis as a screen-shot into a word processing document, and then manually added a graphical representation. The most illustrative solution was to hand-code a connectivity graph similar to Renkema (2009:136–40), and to place this graphical representation of the text structure next to the labels of the text display at the left side. This experiment proved that a learner can load the WIVU text and tag it in LTC, and then manually indicate the relative scope and depth of the relations visually by arrows pointing to the clauses for which they serve as relations. An illustration of connections by arrows is arguably a graphically better visual solution than the computer-generated nodes used in the printed displays of the book of Joshua. Unfortunately, inserting arrows by hand-coding is only of limited interest, as long as we do not have a program which can insert them into displays of the text.

The next step was to explore the full potential of the hierarchical labelling system of the tree constructor program. I used the customized labels to construe a complete rhetorical analysis for all relations above the syntactic level in Josh 6:5, as illustrated in Figure 4 below. In this analysis, I combined two adjacent clauses or segments by labelling the node as a relation with the label "R." A relation consists in most cases of a main part and a modifying part, the nucleus and the satellite, and it is crucially the modifying member which determines the function of the relation (Winther-Nielsen 1995:88). I therefore opened this modifying node and inserted the RST relation name as a label on the satellite branch. In this way, I could indicate that any unlabeled "R" branch would be dominant in the structure of the text and modified by a rhetorical relation. Following the dissertation, the main text element in 6:2b–4 leads up to a Volitional Result relation (VRes) in 5a, describing how the Israelite groups are to circumvent the city in order to shout and ascend into it.

explore the integration of the WIVU corpus with the LTC tool.
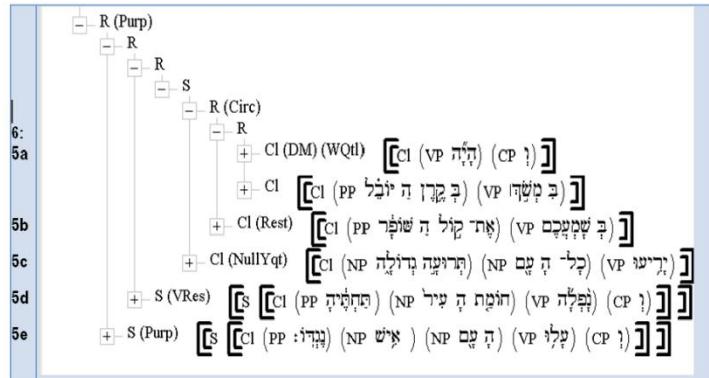
Fig. 4: RST analysis of Josh 6:5 in LTC

The dissertation of den Braber (2010:177–8) discusses Josh 6:5 at some length. In her interpretation of rhetorical relations, she considers it problematic that the same form which is annotated as a WQtl form in the database has different relation labels in the two occurrences of 5d and 5e. However, this is really a point in favor of doing RST analysis, because relations help the learner to distinguish between multiple functions of a single grammatical form, as in this case when a WQtl form can have both a predictive and a hortatory function. Rhetorical analysis assists the interpreter in clarifying the conditions under which there are two different outcomes of the people's shouting: the intended result of the collapse of the wall (5d) as against the intentional purpose for the people to act and ascend into the city (5e). As such, RST analysis helps the interpreter to label multi-functional grammatical items, and also to perceive similar cases elsewhere.

This example has illustrated how a user of the LTC can have access to a morpho-syntactic display of phrase, clause, and sentence information. Moreover, it shows how the displays in Winther-Nielsen and Talstra (1995) can now be technologically implemented through an existing open source tool. The new solution automatically lists labels like WQtl (see v. 5a in Figure 4), which the user may know from his or her work with the WIVU database for the Logos Bible software.

However, we have still not answered another objection of den Braber and others: Namely, why bother to display so much information in the first place? To what extent is it relevant for interpreting the text, and how useful can it be for researchers and learners? Addressing such issues will be the next stone to pick up along our path.

4.   THE CONNECTIVITY MODEL: THE GRANULATION OF THE STONES

To return to the stone imagery, we still need to look at how we can best use the tools for our work on the stones in order to optimize the display of surface structure. To this end, I am now going to explore the assumptions, layout, and practice in Renkema's (2009) new "Connectivity Model," as a potential contemporary framework to be implemented in the LTC.

Renkema gives several good reasons why we need a newer and more adequate framework. For one, the old canonical version of RST defines all relations as interpersonal (Renkema 2009:95–6), and intention is specified in the definition of every relation (ibid.:106); however, such information is not always accessible or even relevant. Another more serious point is that the RST relations were cognitively defined, but "[t]he status of nucleus and satellite can better be accounted for by looking at the discourse context" (ibid.:110). Finally, RST does not handle the degree of relative importance of segments well because it does not take nested and parenthetical information into account (ibid.:132).

To solve these problems, Renkema proposes a new model with a well-structured taxonomy, which he designates as "Connectivity Model" (ibid.:114). He brings new precision to the stone imagery by viewing discourse as masonry rather than uniform bricks (ibid.:34). Discourse is made up by building segments of different sizes which come in two varieties (ibid.:20): adjunctive relations are about how stones of different material are linked in the wall, while Interjunction is about how stones project to form an artistic composition of the wall. The first type is the *in-formative* linking which must always be present in a text, but some linkings also serve an additional *in-formational* role by means of their interactional qualities (ibid.:60).[18]

Table 2: General Structure of the "Connectivity Model" (Based on Renkema 2009)[19]

ADJUNCTION		
Family	**Category:** Type	Sub type
ELAB	**Elaboration:**	1 Specification
	1 Quality	1.1 Object-Attribute
1. ELAB	2 Quantity	2 Part-Whole
		2.1 Set-Member
		2.2 Process-Step
EXT	**Sequence:**	1 Time Sequence
	1 Time	1.1 Narration
2. SEQU	2 Interactional Pair	1.2 Continuation

[18] Adjunction links text units ("stones") of relative size and nature (Renkema 2009:51), in contrast to Interjunction which is "the images that are outlined on the wall by the composition of the stones, in order to express something which has a certain impression on the person who looks at the wall" (ibid.:60).

[19] See the overview in Renkema (2009:65–6), which is also available for download at http://www.benjamins.com/jbp/series/Z/151/study-aid.pdf (accessed 12/28/2012). The abbreviations used in the table and in the text are ACCP = Acceptance; ACTN = Action; ATTN = Attention; CAUS = Cause; COMM = Commentary; CONT = Contrast; DISJ = Disjunction; ELAB = ELABORATION; ENH = ENHANCEMENT; EXPL = Explanation; EXPR = EXPRESSING; EXT = EXTENSION; IMPR = IMPRESSING; MANN = Manner; META = Metatext; PRES = Presentational; PROC = PROCESSING; QUOT = Quote; SEQU = Sequence.

	3 List	1.3 Reverted Sequence
3. CONT	**Contrast**	
4. DISJ	**Disjunction**	
ENH **5. PLAC**	**Place:** 1 Spot 2 Distance	
6. TIME	**Time:** 1 Absolute 2 Relative 3 Simultaneous 4 Duration 5 Frequency	4.1 Terminus ad quem 4.2 Terminus post quem
7. MANN	**Manner:** 1 Circumstance 2 Comparison 3 Restriction	1.1 Instead 2.1 Analogy 2.2 Proportion 2.3 Degree 2.31 Degree Indicating Cause 3.1 Exception
8. CAUS	**Causation:** 1 Cause 2 Reason 3 Means 4 Condition 5 Concessive	4.1 Negative Condition 4.1.1 Otherwise

INTERJUNCTION		
Family	**Category:** Type	Sub type
EXPR **9. PRES**	**Presentation**: 1 Solutionhood [2 Instruction]	
10. COMM	**Comment:** 1 Interpretation 2 Evaluation 3 Conclusion	1.1 Generalization
PROC **11. EXPL**	**Explanation:** 1 Background 2 Clarification	2.1 Exemplification 2.2 Illustration
12. META	**Metatext:** 1 Restatement 2 Organizer 3 Summary	1.1 Correction 1.2 Definition 2.1 Advanced Organizer 2.2 Heading 2.3 Orientation 2.3 Digression Indicator

13. QUOT	Quote (Attribute): 1 Source 2 Thought Incorporation	1.1 Indirect Citation 1.2 Anonymous 1.3 General Source
IMPR 14. ATTN	Attention 1 Climax 2 Antithesis	
15. ACCP	Acceptance 1 Evidence 2 Justification	
16. ACTN	Action 1 Enablement 2 Motivation	

The general structure of the Connectivity Model is set out in Table 2. In this model, the two main levels of Adjunction and Interjunction are subdivided into increasingly finer granulated relations of six families, 16 main categories, and more specialized types and sub types. The families constitute three functions for each of the two levels and they are conceptually major distinctions within the informational segments or intentional interaction. The 16 categories, on the other hand, are the finer-grained distinctions that the analyst will often need in order to label the text with a specific interpretation. In our implementation of the Connectivity Model, we propose to use four letter abbreviations in capital letters because of the difficulty involved in handling long names inserted as labels in the text display. Only the names for types and sub types are given in full because it will be difficult to remember a large number of abbreviations.

The informational level of Adjunction has the ELABORATION family (*ELAB*) as a single broad group of functions within the general category of Elaboration (ELAB), linking a segment into a concept which is expressed in the preceding segment. The second family of EXTENSION (*EXTN*) is a link which adds a new event to the preceding segment and thus extends this segment with a new predication. It is divided into categories for (2) Sequence (SEQU), (3) Contrast (CONT) and (4) Disjunction (DISJ). The final adjunction family ENHANCEMENT (*ENHN*) has the four members of (5) Place (PLAC), (6) Time (TIME), (7) Manner (MANN), and (8) Cause (CAUS). Enhancements all frame an event structure with new setting information.

The Interjunction level is often built from Adjunction categories, but their hallmark is that they serve an interactional function. The first family of EXPRESSING (*EXPR*) conveys the intention of the writer through the categories (9) Presentation (PRES) or (10) Comment (COMM). The second interactional family of PROCESSING (*PROC*) is meant to guide the reader or listener through the communication in the text which is processed in relation to the three categories of (11) Explana-

tion (EXPL), (12) Metatext (META), and (13) Quotation (QUOT). The third and final family is EXPRESSING (*EXPR*), aiming specifically to influence the addressee through the three categories of either (14) Attention (ATTN), (15) Acceptance (ACCP) or (16) Action (ACTN).

Renkema offers his taxonomy as a "starting point" to illustrate "the overwhelming variety of possibilities in discourse continuation" (2009:99), but the Connectivity model has the advantage of a clear architecture and straightforward criteria (comp. ibid.:117, 121). Renkema assumes that there will be ambiguity in texts, because "different categories and types can simultaneously play a role in interpreting a segment combination" (2009:78), but he proposes procedures for disambiguation of multiple interpretations (ibid.:150–62). The two relational levels of Adjunction and Interjunction are tied into a basic line of textual connectivity which is called the Conjunction level. Relations are formed by segments of different shapes and forms according to three different criteria. The first is about what stone is cemented to which one, and at which part; this corresponds to the "Location" of the relation. The second is the relative size and sequence of the stones, which is called the "Ordination." The third is the different kinds of mortar, which is the "Combination." An interesting feature of Renkema's proposal is that he also uses the stone imagery to explain the textual features at this third level: referential cohesion is like pin-hole or screw connections, relational coherence like mortar, and an additional unmarked type is like stapling (2009:29).

Even if relations are by nature formulated independently of any particular grammar, Renkema claims that "the Connectivity Model is the only model that is based so heavily on a broad range of grammatically and semantically based discourse phenomena" (93). In our view, it would not be difficult to tie the Role and Reference Grammar of Van Valin (2005) and Winther-Nielsen (2008; 2009) into the Conjunction level with its anchoring point, direction of flow and kind of linkage (Renkema 2009:24–34). The Connectivity Model includes Elaboration, Extension, and Enhancement in much the same way as Systemic Functional Grammar. For Biblical Hebrew, it would therefore be possible to compare this approach with Bandstra's (2008:23–6) Systemic Functional Grammar analyses of Genesis 1–11. In addition, we expect that the Connectivity Model may help us in avoiding an artificial distinction between textual, experiential, and interpersonal levels (Renkema 2009:88).

Finally, as a case for the use of the Linguistic Tree Constructor, Daniel Lundsgaard Skovenborg developed a function with tool tips, and this function has now been implemented by Ulrik Sandborg-Petersen in his release of LTC 3.1 (November 1, 2011).[20] The following is a list of the most general relations, as defined in the tool tips from the Connectivity Model:

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[20] For more details on the history of the development of the LTC 3.1 with Renkema's labels see http://3bmoodle.dk/mod/page/

Table 3: The Six Families as Defined in Tool Tips.

ELABORATION adds information for CONCEPT from encyclopaedic knowledge (constituent~ argument focus?) – First family of Adjunction

EXTENSION supplements the information on EVENT (core level proposition~predicate focus) – Second family of Adjunction

ENHANCEMENT expands the information in FRAME (periphery adjunct~sentence focus) – Third family of Adjunction (in ADJUNCTION)

EXPRESSING of addresser influence: Speaker-originating personal communication of intention – First family of Interjunction

PROCESSING in the structure of discourse: Texture-based structural packaging for cognitive processing – Second family of Interjunction

IMPRESSING for the addressee persuasion: Hearer-targeted attempt to change attitude or action – Third family of Interjunction

I have slightly revised these definitions to tailor them to a theory of functional grammar, even though this is not the intention of Renkema. In this way, the taxonomy can form a bridge between annotations on the output of linguistic parsing and representation from a database and literary and philological interpretations.[21] The list also illustrates the granularity in the system. The interpreter can work on this general level when constructing his or her interpretation of the text, or s/he can choose the finer-grained relational distinctions which are more revealing, and they will be illustrated in the following interpretation of Joshua 6:15–20 which exemplifies this approach.

In conclusion, the Connectivity Model appears to be a viable contemporary framework for analysis of discourse relations. The model appears to be an improvement over the canonical RST model because it has a more satisfactory information architecture in its hierarchical theory of text, supporting granularity in the analysis of level, family, category, and type. Relations are defined in terms of concepts and events as well as in terms of interpersonal relationships.

view.php?id=55 (login "som gæst"/as guest [accessed 12/28/2012]).
    [21] We offer this suggestion for the project "Data and Tradition. The Hebrew Bible as a linguistic corpus and as a literary composition" (http://www.poac.nl/projecten.nsf/pages/2300159387_Eng [accessed 12/28/2012]). The PLOT framework is relevant, as "the PC3 tries to put the bridge into use" and applies them "into systems of retrieval and presentation."

5. JOSHUA 6:15–20: CONSTRUCTING DISCOURSE RELATIONS

My final move in response to *Built From Many Stones* by den Braber (2010) is to give an interpretation of Joshua 6:15a–20b in order to show how the LTC can use the Connectivity Model. In this analysis, I will not link relations at the clause level (Renkema 2009:8), nor will I link relations for every non-embedded clause (Winther-Nielsen 1995:62). Instead, I will display sentences as they are imported from the WIVU database, and evaluate in the course of this process the pros and cons of that database. In contrast to Renkema, I will consistently mark a relation on the dependent or the parallel modifying branch. The following list quotes the tool tips for the relations that will be discussed in the interpretation:

Table 4: Sorted List of Tool Tips of Categories and Types Used in the Analysis.

Absolute is a specific dating (type < category Time)

Acceptance (ACCP) convinces the hearer by argument to increase belief (15th category < family IMPRESSING)

Action (ACTN) motivates the hearer to do something despite the lack of ability or of specific trigger to perform action (16th category < family IMPRESSING)

Advance Organizer: Heading is a preview of the content (subtype < type Organizer < category Metatext)

Background improves understanding by known content (type < category Explanation)

Causation (CAUS) is all subtypes of P implies Q (8th category < family ENHANCEMENT)

Cause is force without will and cannot be prevented, it is the source of an effect (~why etc.) (type < category Causation)

Circumstance covers all sorts of non-temporal, non-locational, and non-causational adverbial manners (type < category Manner)

Citation is the source for reported dialogue or printed matter (type < category Quote)

Clarification improves understanding by new content (type < category Explanation)

Climax focuses on the last part in list (type < category Attention)

Comment (COMM) expresses the speaker's own thinking about a topic (10th category < family EXPRESSION)

Conclusion is a final, closing subjective reasoning after a set of arguments or observations (type < category Comment)

Elaboration (ELAB) expands quality or quantity of nominal constituent, e.g. aspects, details, features or properties (1st category < family ELABORATION)

Evidence is objective support for a statement or to increase belief in a claim (type < category Acceptance)

Exception is always a quantitative part-whole restriction between two states of affairs, not a contrast for concepts (subtype < type Restriction < category Manner)

Explanation (EXPL) facilitates the content in order to improve understanding (11th category < family PRCOCESSING)

Manner (MANN) is pace, speed, and similar adverbial mode that is not place, time, and cause (~how etc.) (7th category < family ENHANCEMENT)

Metatext (META) guides how the wording of the message is understood (~how) (12th category < family PROCESSING)

Motivation triggers the desire to perform an action (type < category Action)

Narration is the time sequence in story or report (subtype < type Time Sequence < category Sequence)

Process-Step, e.g. do – do x (subtype < subtype Part-Whole < category Elaboration)

Quote (QUOT) is an attribution of the source of the message (~who) (13th category < family PROCESSING)

Sequence (SEQU) adds a state of affair as new event (~and etc.) (2nd category < family EXTENSION)

Simultaneous marks a second event occurring at the same time (type < category Time)

Time (TIME) is a temporal adverbial expansion of a constituent (~when etc.) (6th category < family ENHANCEMENT)

The full interpretation of the text is displayed in Figures 5A and B. The Sequence (SEQU: v. 20a) after the Quote (QUOT: v. 16c) is the most important relation in the text, but there is another dominant Sequence relation (SEQU: v. 16b) within the first part of the narrative segment in 6:15a–16c. The reader can follow the most central sentence in the entire text through the nuclear R sentences which are not modifying branches, and thus trace the central element all the way down to the unmodified terminal branch (S: v. 15c). This sentence is the foundation stone of the text which narrates that the Israelites walked around the city seven times on the seventh day. The next most important corner stone in the structure of the text is the account of the trumpeting of the priests at the seventh round in the Sequence sentence (SEQU: v. 16b).

Dramatically, two more corner stones are added to the structure. The first is the Quote with the Citation of Joshua's order for the people to shout (S: v. 16d). Right away follows the immediate execution of this order in a Sequence (SEQU: v. 20a). For the sake of coherence, the writer has added a modifying Elaboration (ELAB: v. 20b). The elaborative nature of this sentence is marked by its repetition of the reference to the process of continued trumpeting and by a pronominal reference to the activated noun phrase, the priests (S: v. 16b). A new text segment will often open with temporal and other circumstantial information. In this narrative, the nuclear branch (S: v. 15c) is preceded by an Absolute dating in (Time: v. 15a) because we are approaching the climax of shouting followed by the miraculous collapse of the walls. Functional grammarians would probably analyze this "Sentence" differently, as a discourse marker *wayᵉhî* followed by a prepositional phrase, i.e., "and then, on the seventh day, they…" The following sentence is a description of the people getting up early in the morning, and therefore corresponds to a Circumstance which, in a preparatory Manner, explains what is occurring prior to the real action of walking around the city this day (MANN: v. 15a). Arising in the morning is temporal adverbial setting information. These relations are all informative Adjunctions.

R (SEQU) (__Narration)
  S   [S [Cl (NP הָ עָם) (VP יָרַע) (CP וְ)]]
S (ELAB) (__Process_Step_)
  Cl (Way0)   [Cl (PP בַּ שֹּׁפָרוֹת) (VP יִתְקְעוּ) (CP וְ)]]
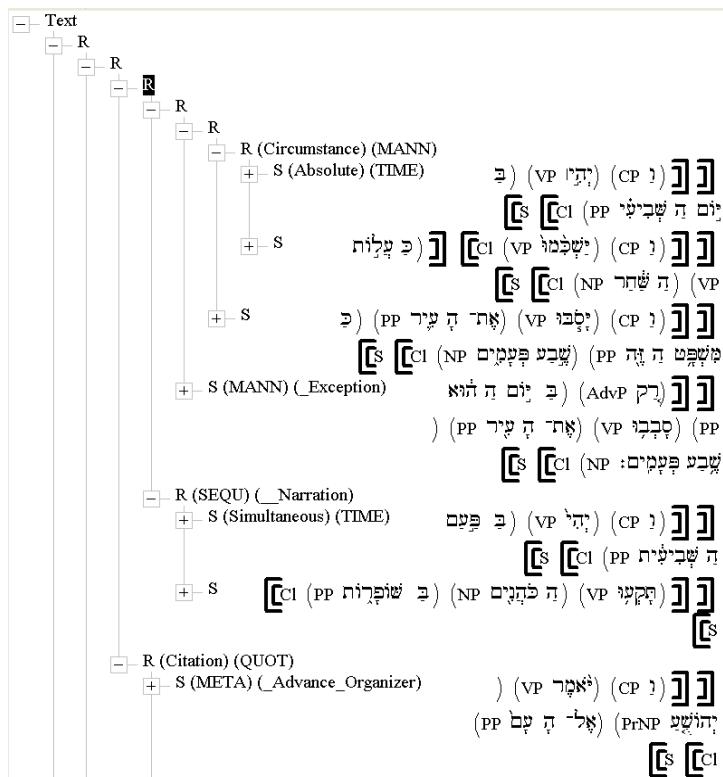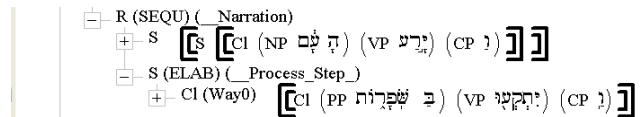
Fig. 5A. Josh 6:15–16c.20a–b Narration, from the LTC

R (ACTN) (Motivation_)
  R
    S   (PPrP אַתֶּם) (AdvP רַק־) (CP וְ)]]
      (VP שִׁמְרוּ) [Cl (PP מִן־ הַ חֵרֶם) [CP (פֶּן)]]
      תַּחְרִימוּ (VP) [Cl (וְ CP)]
      (מִן־ VP לְקַחְתֶּם) [S [Cl (PP הַ חֵרֶם)]]
R (Clarification) (EXPL)
  S   (אֶת־ מַחֲנֵה יִשְׂרָאֵל VP שַׂמְתֶּם) (CP וְ)]]
    [S [Cl (PP לְ חֵרֶם) (PP)]
S (ATTN) (Climax)
    (VP עֲכַרְתֶּם) (CP וְ)]]
    [S [Cl (PP אוֹתוֹ)]
S (COMM) (Conclusion)
    (כֹל כֶּסֶף וְ זָהָב וּ CP) (וְ)]]
    כְלֵי נְחֹשֶׁת וּ בַרְזֶל) [Cl (NP)]]
    קֹדֶשׁ (NP) (הוּא PPrP) (לַ יהוה)
    (אוֹצַר יהוה NP) [Cl (PP)]]
    [S [Cl (VP יָבוֹא)]
R
  R
    S   [S [Cl (VP הָרִיעוּ)]]
    S (ACCP) (Evidence) (נָתַן VP) (יְהוָה CP) (כִּי־)]]
    (לָכֶם PP) (אֶת־ הָ עִיר PrNP):
    [S [Cl (PP)]
R (Clarification) (EXPL)
  S   (הָ עִיר הִיא וְ כָל־ VP הָיְתָה) (CP וְ)]]
    חֵרֶם (NP) (לַ יהוה PP) [Cl (NP)]]
    [S [Cl (PP בָּהּ) (אֲשֶׁר־ CP)]
R (COMM) (Conclusion)
  S   (רָחָב הַ זּוֹנָה הִיא וְ כָל־ AdvP רַק)]]
    (תִּחְיֶה VP) [Cl (אֲשֶׁר CP)]] (אִתָּהּ PrNP)
    [S [Cl (PP בְּ בַיִת) (PP)]
S (Background) (EXPL) (הֶחְבְּאָתָה CP) (כִּי)]]
    (אֶת־ הַ מַּלְאָכִים PP) (VP)
    [Cl (אֲשֶׁר CP)]]
    [S [Cl (VP שָׁלָחְנוּ):

Fig. 5B. Josh 6:16c–19 Quote, from the LTC

With this background, we can explain the embedded Citation (6:16–19). We will expect to find Interjunctions addressing both the listeners and the readers of the story. The central nuclear element is the command to shout (S: v. 16d). It is followed by a clause that could be interpreted as a Cause, but we suggest that the clause is intended to impress the listeners, forcing them to an Acceptance of the order (ACCP: v. 16e). If this pragmatic function is granted, the writer is promising the listeners future objective Evidence to assure them that they will

conquer the city. The next sentence is even more difficult to interpret. The least controversial interpretation is perhaps that the process of communication is an Explanation for the listeners (EXPL: v. 17a). If so, this sentence is predictive information. However, if the sentence impresses a future action on the listeners, the clause would have a directive speech function and serve as a Motivation relation, despite the total absence of grammatical features for a second person address.

It is now possible to investigate relations marked by the particle רַק *raq* "only" in Josh 6:15–20. In Winther-Nielsen (1995:208), *raq* is interpreted as a focus-particle with the restrictive force *only on this day* (v. 15d). It then refers to seven rounds on the seventh day instead of once only on the previous days. The same force is claimed for *raq* in *only Rahab* (v. 17c), because the group of survivors are now restricted to Rahab and her family. Den Braber (2010:181) objects to the use of the RST relation name Concession in both cases. However, these labels can be defended by canonical RST definitions. Both clauses express an incompatibility about only going around the city once a day, and about killing everyone. If the reader accepts that there are restrictions for the seventh day and for the killing of Rahab and her family, both relations fulfill the intention of the writer to remove an incompatibility in the interpretation. The first case is straightforward within an analysis based on the Connectivity Model because a Manner Relation is added in order to explain the Exception for the seventh day (MANN: v. 15d). This could also be argued for the second instance, and Rahab is then mentioned with Restrictive Focus. However, because the text is now expressed as an Interjunction, it can be argued that Joshua in his interaction with the people is expressing an important Comment just as in his final Conclusion (COMM: v. 17b). This ambiguity in interpretation is resolved by the Connectivity Model by assuming that an interpersonal address always supersedes Adjunction. Accordingly, the function is to address the Israelites and make sure that they spare Rahab and her family.

The third and final case of *raq* in (v. 18a), presented in Example 1 above, is much more difficult. The restrictive focus interpretation is in agreement with van der Merwe et al. (1999:314), who define the force of the particle as limiting something in relation to the preceding. They suggest a second function as a modal word referring to a speaker's understanding of the utterance (ibid.:309), and in this case *raq* expresses "conviction as to the correctness of an observation" (ibid.:311). The display of the book of Joshua used the label Evaluation (Eval) for this occurrence, but how can this be argued? First we need to observe that this *wᵊ=raq* in Example 1 is used in front of the second plural person pronoun *ʔattem,* fronted for focus. The imperative form of the verb *šimr-û* combined with the preposition *min* has the sense of "keep yourselves (away) from." However, the connective *wᵊ=raq* does not seem to be used in the same way as the preceding instances of *raq* without the Clause Linkage Marker *wᵊ=*, because it shifts to a new

address, and the restrictive force on *ʔattem* seems implausible in the discourse context. The story at this point is not at all about any kind of exception or restriction for an argument as in the preceding two cases of the focus particle, because now the point is that everyone in Israel, without restriction, must refrain from looting the *ḥērem* lest they receive death, and they all must dedicate spoils to the treasury at the shrine of Yahweh. Some translations apparently sense a special meaning for *raq*, as in the case of the rendering "As for you" offered by the New Revised Standard Version, which would mean that the fronting was used as a Left-Detached Position. It appears that *raq* sometimes introduces hortatory segments which focus on tasks to be performed first and foremost (e.g., Deut 4:9; Josh 1:7, 18, 13:6).[22] How often the 108 occurrences of *raq* have this non-restrictive discourse function is not my point, but rather that its precise interpretation arguably can only be decided on the basis of a careful investigation of discourse relations. In terms of the Connectivity Model, this interpretation would be labeled as a Motivation for Action (ACTN: v. 18a). Hence we can formulate as our working hypothesis that when the particle *raq* is used within a direct address, it may have the force of a Motivation and it can be classified as a discourse marker rather than a focus particle.

To sum up, this case shows how the constructor tool is useful for a linguistic interpretation that takes discourse relations into account. A text imported from the WIVU database enables the interpreter to interact with the data, and to explain them in a more satisfactory way than when merely resorting to a syntactic concordance resource for Logos. The LTC simplifies the construction of interpretations by reducing some of the tedious work of manual handling and display of data for discourse analysis. In my view, a tool supporting these basic skills for analysis of discourse relations, or for other analytic frameworks, is important to use in order to cultivate interpretative skills among learners.

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[22] Alexey Lyavdansky has very kindly pointed out to me (private communication) that "the clause after *raq* looks like an emphatic restatement of the previous order 'the city shall be devoted.' The example of Josh 1:7 supports it: Josh 1:6, 'be strong and stand firm,' in 1:7 there is an emphasized restatement of the same injunction." The strength of the Connectivity Theory is that it can analyze this clause first within the three families of Adjunction, and more precisely the Elaboration category. But then, in addition to this, the theory offers one of the Interjunction family relations as an option, e.g., a Processing function to clarify the text for the addressee, or an Impressing function to motivate the addressee to engage in action. In the Connectivity Model it is even permissible to choose *both* interpretations, if the interpreter believes the data warrant this solution. The ability to incorporate several possible interpretations is an advantage of this theory over the old RST framework.

6. CONCLUSIONS

The point of departure for this stony path leading into the construct of a text was den Braber's (2010) new discussion of rhetorical relations. I recommended a new and updated way to use the Emdros database and the corpus of the Hebrew Bible built by the Werkgroep Informatica at the Vrije Universiteit in Amsterdam. In response to den Braber's call to improve the modes of display for Biblical exegesis, I offered the linguistic constructor tool LTC as a useful technology. I illustrated how a scholar can manually produce the RST analyses in Winther-Nielsen (1995), but then argued that the new Connectivity Model proposed by Renkema (2009) has a better display of information architecture, and improves the definitions of relations through granulation and context. This was demonstrated in analyses of Josh 6:5, 15–20.

This discussion has illustrated how an existing open source tool like the Linguistic Tree Constructor can display relations in texts. The constructor tool can manipulate texts for interpretative purposes and it supports the ability to exchange displays between fellow readers. Using an adaptable tool will allow researchers, teachers, and learners to construct interpretations from texts. Learners and their instructors can use this tool to include interpretative tasks into educational frameworks and digital technology for display that will be very useful both for online courses and for collaboration in networks. This discussion is offered as the seminal launch paper for other projects at [Connectivity Model Resources - Guest Access](http://3bmoodle.dk/course/view.php?id=9) (= http://3bmoodle.dk/course/view.php?id=9 [accessed 12/28/2012]) which explore how this new theory of connectivity in text can be used for computational linguistics and applied linguistics focusing on language learning.

With this background, I believe that experimentation with the LTC can tell us something about what next generation persuasive learning technology should look like. To be sure, I do not claim that this tagging of the text is user-friendly, but it is the best open source solution available at the moment. Nor do I claim that the Connectivity Model is the only solution, because there are many other ways to tag a text for interpretation, but I do contend that this model is a very helpful improvement over RST, and that it answers some of the recent critique raised by den Braber. We are currently exploring how this tool may help researchers to make further progress in computer-assisted text display and what the requirements are on the development of new technology. One of the goals of the new EuroPLOT project is to build better technology for learning and interpretation from texts, and the LTC is a first step to help us experiment with new learning environments and persuasive engagement in the text for deep learning, enabling and motivating learners and their instructors to explore interactive simulation and creative construction.

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