Ravid, Dorit. 2013. Syntactic complexity in discourse production across different text types. In Catherine Bolly & Liesbeth Degand (eds), *Across the Line of Speech and Writing Variation*. Corpora and Language in Use – Proceedings 2. Louvain-la-Neuve: Presses universitaires de Louvain, 51-66.

Syntactic complexity in discourse production across different text types

Dorit Ravid

Tel Aviv University

Abstract

Syntactic acquisition is at the very heart of child language development and a main focus of research on early language attainment. This study focuses on continuing syntactic development in later childhood, adolescence, and adulthood, targeting the emergence of complex structures in written discourse, at both the levels of grammar and discourse. The current paper reports on *conjunct constructions*, a specific coordination device particularly prominent in both Classical and Modern Hebrew writing, which may be considered as a 'syntactic typological imperative' of Hebrew.

Keywords: first language development, (rhetorical) syntax, writing, conjunct construction, Hebrew

1. Introduction

Syntactic acquisition is at the very heart of child language development and a main focus of research on early language attainment. This is because the study of syntax in infancy and early childhood can tell us much about the most fundamental questions regarding how children 'break into the grammar' and how they gain command of grammatical categories and sentence structure. The proliferation of psycholinguistic research on the early years of syntax reflects the major theoretical divide between a nativist view of a hard-wired language-dedicated module (Crain *et al.* 2006; Fernandes *et al.* 2006) and usage-based or emergentist accounts of language learning (Dittmar *et al.* 2011; Kidd 2012). These studies typically focus on the second and third years of life, as researchers are in agreement that by age three, typically-developing children have active command of basic syntax and morpho-syntax in their language (Brandt & Kidd 2011). Robust evidence from several different languages indicates that children growing up in a monolingual environment have access to the majority of morphological and syntactic structures of their language before they reach school age (Slobin 1985-1995). Syntactic acquisition, however, is certainly not over by that time: A five-year-old hardly matches an adult or even a twelve-year-old in linguistic proficiency (Berman 2005a), especially in the context of gaining command of written language skills during the school years (Ravid & Tolchinsky 2002; Berman & Ravid 2008). Thus, across adolescence, language use diverges markedly from what has been observed for young children, while not yet reaching the level of educated adult usage (Nippold 2007). One significant aspect of later language development in the school years is the ability to recruit different lexical, morphological and syntactic resources and to use them flexibly for diverse communicative purposes (Nir-Sagiv *et al.* 2004; Ravid 2004; Ravid & Berman 2009).

These linguistic developments are accompanied by expanded metalinguistic abilities and access to higher-order, non-literal language (Karmiloff-Smith 1992; Nippold & Duthie 2003; Berman & Ravid 2010), and by increasing text-production abilities (Berman 2008; Nippold & Scott 2009). The current study focuses on continuing syntactic development in later childhood, adolescence, and adulthood, targeting the emergence of complex structures in written discourse.

2. Syntactic complexity in development

An interesting question is how one goes about investigating complex syntax using psycholinguistic methods – that is, not as a general linguistic phenomenon but rather as characterizing the changing linguistic abilities of naïve speaker-writers. Surprisingly few studies have investigated syntactic knowledge in older, school-aged populations, compared with the abundance of research on early syntactic attainments. Of these, several studies targeted syntactic performance as a developmental yardstick (Ravid & Saban 2008; Friedmann & Costa 2010; Ravid & Schiff 2012) or as a diagnostic tool separating atypically developing (*e.g.* language disordered, hearing impaired or low-SES) from typically developing populations (Friedmann & Novogrodsky 2011; Schiff & Ravid 2012). These studies share three features – they were all experimental tasks focusing on vulnerable sites in syntactic comprehension and production, such as relative clauses, embedding, coordination, or long-distance, irregular agreement, and they also all shared the *sentence* as an upper boundary of analysis (Carroll & Ruigendijk 2013). The problem is that as much as investigating specific structures experimentally may reveal developmental trends and differences among populations, it does not involve truly complex syntax.

The current paper demonstrates how syntactic complexity emerges in the context of text production, playing a role in both grammar and discourse (Berman & Ravid 2008; Bybee & Noonan 2001). In this view, complex syntax is rhetorical syntax, serving discourse functions in organizing the flow of information in a piece of discourse. Thus, complex syntax extends beyond sentence-boundary, and is realized at the intra-clause level, within and between phrases. In fact, according to Ravid and Berman (2010: 4):

> Research on the text construction abilities of adolescents suggests that no experiment can capture the full richness and diversity of syntactic constructions speaker-writers recruit to meet the needs of different communicative settings.

Moreover, the written mode promotes the creation of complex syntactic units, as constructing a piece of written language imposes cognitive demands on memory, executive functions, and top-down processing that are not readily met before adolescence. This is because the written mode of expression occupies a privileged cognitive position for maturely literate individuals - "thinking for writing" (Chafe 1994; Slobin 2003), involving the ability to control and shape the flow of information in discourse through linguistic means, while viewing the text as a whole. This paper takes as a departure point Givón's (2009) conceptualization of syntactic complexity as an advanced form of phylogenetic and ontogenetic organization, whereby several

individual units cohere under a single abstract node. According to Givón (2001, 2005), mature human communication is overwhelmingly concerned with coding multi-propositional, cross-clausal coherence in representing relevant information about displaced referents and in the contextual construction of efficient mental models of other minds (2009: 321). Complex syntax thus arises with the need and ability to express complex ideas and information across wide stretches of context (Kärkkäinen *et al.* 2007). The question is of course what exactly constitutes "complex syntax". In Givón's (2009) terms, complex syntax is the structural consequence of the adaptive need for complex Theory of Mind (ToM) operations. Thus, for "well-coded communication" grammar uses two major devices - clause union (the embedding of one clause into the VP of another) in the expression of tense-aspect-modal perspectives assigned to propositions; and complex noun phrases (especially relative clauses) in guiding interlocutors through the labyrinth of complex reference (p. 322).

Against this background, the focus on discourse (especially written texts) as the natural habitat of complex syntax seems well-motivated. The analysis of narrative and expository texts by school-aged participants has indeed served to highlight differences in the syntactic skills of disordered or deprived and typically developing children and adolescents (Gillam & Johnston 1992; Scott & Windsor 2000; Nippold *et al.* 2008; Berman *et al.* 2011). But beyond the obvious advantages of examining discourse syntax in the service of clinical diagnosis and remedial teaching, studying how syntactic structures develop in written text production can open the door to a new understanding of text-embedded syntactic complexity. Thus, in a developmental perspective, the texts that school-goers construct provide optimal hunting grounds for unveiling their linguistic abilities, in a period when command of written language is opening up new avenues to linguistic knowledge (Berman & Nir 2009). Moreover, the examination of text-embedded syntax can offer new insights on the genre-specific construction of different text types (Jisa & Tolchinsky 2009).

One venue in this context has been the study of noun phrase structure as a marker of lexical and syntactic density, especially in the subject position (Ravid *et al.* 2002), and of the factors contributing to noun phrase complexity such as NP length, syntactic depth, structural and functional variability, and abstractness of head (Ravid & Berman 2010). Another path pursued in the search of syntactic complexity in discourse involves “clause-linkage”, “clause combining” (Haiman & Thompson 1988; Longacre 2007), or “syntactic packaging” (Berman & Slobin 1994) – studying how clauses combine together in the expression of complex ideas in different genres (Berman & Nir-Sagiv 2009; Nir & Berman 2010). In both cases, subordination or *hypotaxis* – embedding dependent clauses to main or independent clauses – is a major device promoting syntactic complexity (Matthews 1981). In fact, according to Culicover (2010) *parataxis* – clause coordination – is merely a form of 'simpler syntax' in comparison with subordination.

3. Conjunct constructions

One aim of this paper is to point out coordination – in addition to subordination – as another major device participating in the creation of rhetorical syntax in texts (Haspelmath 2007), especially in the context of typological considerations. It seems that the distribution of clause combining devices across languages is affected by typological tendencies, brought about by competing forces in the history of each language, which result in characteristic patterns of conceptual categorization and organization, lexicalization and grammaticization (Slobin 2003). As language users are attuned to typological underpinnings of their language from early on and employ appropriate strategies in linguistic problem-solving (Berman 1986; Slobin 2003), frequently encountered syntactic constructions are expected to affect their productions. Thus, Classical Hebrew has been shown to favor paratactic means for combining clauses, with coordination constituting a major device in Hebrew verbal style across its long history (Ben David 1967). Hauser (1980) lists several devices which together contribute to rendering Classical Hebrew style distinctively paratactic yet syntactically dense while serving discursive functions. One is *chiasmus*, a pattern similar to a palindrome, as in example (1) from Exodus 15:15, *then troubled were the leaders of Edom, the chieftains of Mo'ab seized by trembling*. According to Hauser, chiasmus can be applied to whole discourse pieces, highlighting intensification and narrative progression. Another is *hendiadys*, in which a complex idea is expressed by coordination rather than by a modifying another unit, as in example (2) *with fear and terror* in place of *terrible fear* [Psalm 6:55]. A third Classical coordinating device is *merismus or denumeration*, whereby a unit is referred to by a phrase that enumerates several of its parts, or which lists several synonyms. *Merismus* divides information into parts, usually by starting with a general fact or statement and then itemizing specific points, as in example (3) *the sons of Aharon, Nadav and Avihu* [Leviticus 10:1].

The current paper reports on ***conjunct constructions***, a specific coordination device particularly prominent in both Classical and Modern Hebrew writing, which may be considered as a 'syntactic typological imperative' of Hebrew. This is a coordination structure that has been long known in Hebraist literature (Tsadka 1978), but has not received particular attention in the general linguistic literature. Conjunct constructions (henceforth *c-constructions*) are clusters of two or more syntactically parallel elements – words, phrases, or clauses – sharing the same syntactic position and role, combined together by being attached to, hence "anchored by" a shared head. Conjunct constructions abound in all historical periods of Hebrew. Consider example (4), an excerpt from the Passover *Haggadah*, translated from Mishnaic Hebrew (well known to anybody who has participated in the *Seder* celebration). The *anchor* (or head) structure is underlined, while the *c-constructions* attached to it are double-underlined.

(4) Thus it is our duty to thank, to laud, to praise, to glorify, to exalt, to adore, to less, to elevate and to honor the One who did all these miracles for our fathers and for us. He took us from slavery to freedom, from sorrow to joy, and from mourning to festivity, and from deep darkness to great light, and from bondage to redemption.

To take one example, consider the second c-construction in the text, where the coordinated set of 5 oblique objects *'from NP to NP'*, each designating a motion from a negative to a positive state of being, is attached to the verb *took* which serves as the head, or anchor. While not a subordinating construction, c-construction is not a merely linear juxtaposing of a series of syntactic units: by attaching several parallel constructions to the same anchor unit, a hierarchy is obtained between a head and the clustered parallel elements under its scope.

Consider example (5), taken from one of the most popular children's storybooks, *Dira Le-haskir* 'An apartment for rent' by poet Leah Goldberg. This rhymed story about different animals living in the same building, which first appeared in print in 1948, has retained its popularity across the last 60 or so years, with a new edition in 1970 and consistent top ranking in children literature listings ever since. The excerpt is freely translated from Hebrew, retaining its original word order.

(5) Wrote the tower residents a sign, stuck a nail above the door, and placed a sign on the wall: an apartment for rent. And lo and behold in the paths, in the roads, in the streets – to the house come new residents.

This excerpt, too, contains two c-constructions – the first attaching three verb predicates to the same grammatical subject (note the first one precedes the subject), and the second one attaching three source adverbs to the same verb predicates.

In labeling this particular form of coordination a 'construction' I rely on Goldberg's (2003) theory of Construction Grammar, viewing all linguistic items - morphemes, words, idiomatic structures, and all syntactic units – as constructions, i.e., stored pairings of form and function, learned on the basis of the input and general cognitive mechanisms which vary cross-linguistically. This means that frequency and variety of occurrence in texts would establish c-constructions as a favored device in Hebrew syntax. The current paper is a first attempt to characterize the c-construction phenomenon in written Hebrew text production across development.

3.1. Method

The texts analyzed in the current paper originate in an international research project concerning the text production abilities of schoolchildren and university graduate students in different countries (Berman & Verhoeven ;2002Berman 2005b(. The broad goals of this project were first, to shed light on the way in which schoolchildren of different ages and adults construct texts as monologic pieces of discourse; second, to examine the linguistic, cognitive, and communicative resources that speakers deploy in adapting their texts to different circumstances in expository discourse versus narrative discourse and in writing versus speech; and third, to uncover shared or different trends depending on the particular target language. Participants in the study, native speakers of seven different languages, were asked to tell and write a story about a situation of interpersonal conflict, in which they had been involved, and to give a talk and write an essay discussing the topic of interpersonal conflict. The study thus involved the following independent variables: language (Californian English, Dutch, French,

Hebrew, Iberian Spanish, Icelandic, and Swedish); age and schooling (grade-schoolers aged 9–10 years, junior-high-schoolers aged 12–13 years, high-schoolers aged 16–17 years, and graduate level university students in their 20s and 30s); genre or text type (personal experience narratives compared with expository discussions) and modality or medium (writing *vs*. speech).

Participants were shown a three-minute wordless video clip depicting different conflict situations in a school setting, involving unresolved, so non-narrative, scenes of interpersonal conflict in a school setting – for example, a moral conflict of whether to cheat in an exam or return a purse someone dropped, a social conflict of how to treat a new student who interfered in a conversation, and a physical conflict of fighting during recess. After watching the video clip, each participant was required to produce four texts in randomly balanced order. They were asked to write and tell a story about an incident where they had been involved in a situation of 'problems between people' (a personal experience narrative) and to write a composition and give a talk in which they discuss the topic 'problems between people' (an expository discussion).

This elicitation yielded a total of 320 texts for each and every language, since each of the 80 subjects produced four different texts: a spoken and written narrative and a spoken and written expository. This methodology allowed us to control the variables of age, genre, and modality – because the same subjects produced each of the four texts. Moreover, these were all authentic texts elicited from naïve speaker-writers without any editing or revision on the part of the investigators. And they were elicited from speaker-writers who were non-specialist in language and non-experts in writing (excluding, for example, teachers, lecturers, journalists, authors) but well educated and 'mainstream' in social class and literacy background.

3.2. Materials

For the current study, 80 written narrative texts about a personal experience were analyzed, produced by 4th graders (9-10 years old), 7th graders (12-13 years old), 11th graders (16-17 years old), and University students aged 25-35. All c-constructions were identified and analyzed in each text. The initial prediction underlying this study was that c-constructions would appear in 7th graders as 'the gate to complex syntax', and would decline in older writers to make way for other complex syntactic devices such as subordination.

As an opening presentation, here are four examples (6-9) of the c-constructions in three full texts (4th, 7th and 11th grades), and an excerpt from an adult text. Since our interest in the current paper is in syntactic structures, texts are freely translated from the original Hebrew into English, with occasional adherence to Hebrew-specific word order and structure when relevant. A glance at the types of syntactic constructions involved shows that they all serve classical narrative functions. The 4th grade c-construction provides descriptive information (Ravid & Berman 2006) about the contents of the fight in two complement clauses attached to a single verb; the two 7th grade c-constructions list the actions of the two protagonists, a girl and her mother, in a series of verbs, each attached to a single grammatical subject; and the 7th grade c-construction delineates the two

subjects performing the same action. The adult text has three c-constructions, one of which embedded within another c-construction, marked by curly braces. The first c-construction reports the contents of Paul's actions in two clauses attached to a single infinitive verb; the second one is a verb series (Givón 2009), the first of which having a rhetorical value, attached to a single subject; and the third c-construction, embedded within the second one, conveys the contents of Paul's report in a heavy NP and a clause both attached to the same mental verb dicendi *explain.*

Note, however, that a marked difference between the two younger and the two older texts is the degree of complexity of the structure within which the c-construction is contained: the c-constructions in the 4th and 7th grade narratives appear in simple clauses conjoined to each other, whereas the 11th grade and adult c-constructions are embedded in complex constructions. The c-construction in the 11th grade text is attached to the content noun *fact* which serves as an object within a relative clause. The first c-construction in the adult text is doubly embedded within two verb dicendi (*ask* and *tell*); the second serves a complex rhetorical device and has another c-construction embedded to it; and the third is nested within a higher c-construction node and is composed of two complex structures.

(6) I fought with my friend in class because the teacher gave us something to do together and we fought who will draw and who will write and then we didn't talk for a couple of days. 4th G

(7) In 2nd grade I was a friend who got ostracized no one talked to her me neither (not I started the ostracism) I only got dragged into it. The girl cried and did not want to go to school and her mother intervened and came and threatened us and was angry and screamed. It did not help. 7th G

(8) An incident that happened to me is an incident that derives from the following fact – I and my friend have been dancing the ballet in the same group and at the same place for several years and there has always been very competitive tension among the girls in the group that implies in a double way (at least) on tension among good friends. 11th G

(9) …The next week Paul arrived in class and with him 5 jars with praying mantises that he showed proudly to his classmates. I asked Paul to tell how he had caught these insects and how he got their food. Paul stood and explained to the class for 20 minutes the hunting methods he was using and where he hunted. {explained to the class for 20 minutes the hunting methods he was using and where he hunted.} Adult

3.3 Quantitative analyses

To begin with, several calculations were conducted, as shown in the following charts. First, Figure 1 shows the number of narrative texts in each group which contained at least one c-construction. According to this figure, 11th graders have the most texts with at least one c-construction – 95% of their texts.

Figure 2 shows the percentage of narrative texts having at least 3 c-constructions. Here, the picture changes, with a dramatic increase from 4th to 7th grade followed by smaller increments for each age group, up to the adults, where 65% of the narratives contain 3 c-constructions and more.

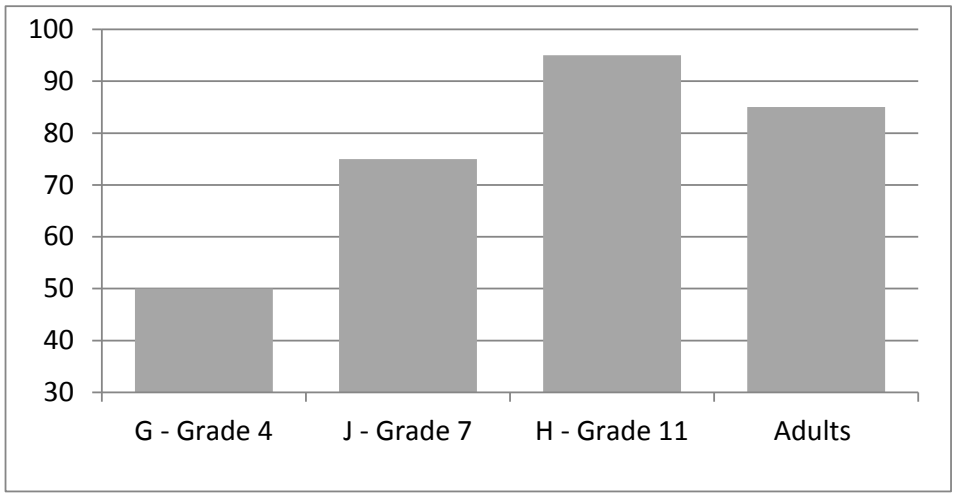

Figure 1. Percentage of narrative texts containing at least one c-construction, by age group

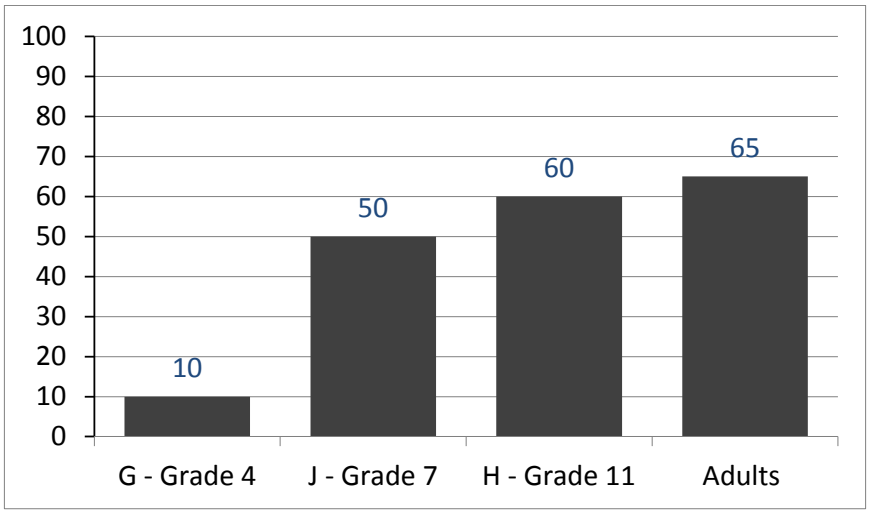

Figure 2. Percentage of narrative texts containing at least three c-constructions, by age group

Figures 3 and 4 show the developmental progression of numbers of c-constructions in the narrative texts under analysis from two different perspectives: dividing the number of c-constructions in each text by 20, the total number of texts (Figure 3); and adding up all c-constructions in the texts of the whole group (Figure 4). Though depicting different pictures, the two curves are very similar, showing that 4th grade narratives contain a mean of one c-construction per text, with 20 c-constructions produced by the whole group, going up to a mean of 4.5 c-constructions per text in the adult group, making up together 90 c-constructions produced in the narratives of the adult group.

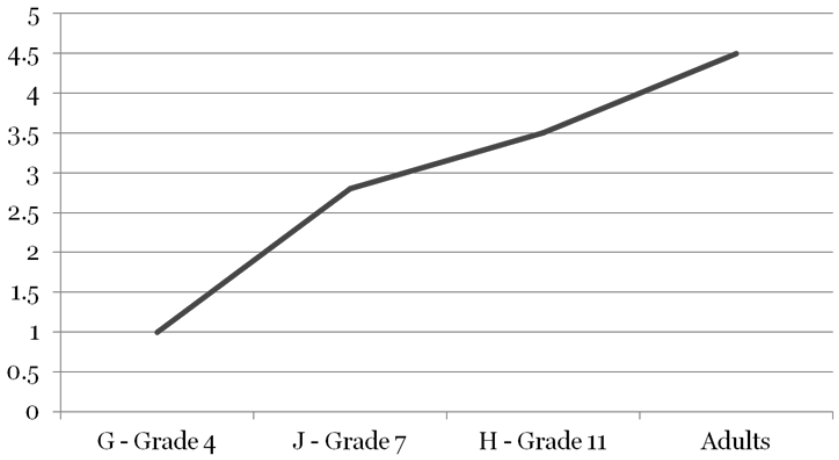

Figure 3. Mean number of c-constructions per text, by age group

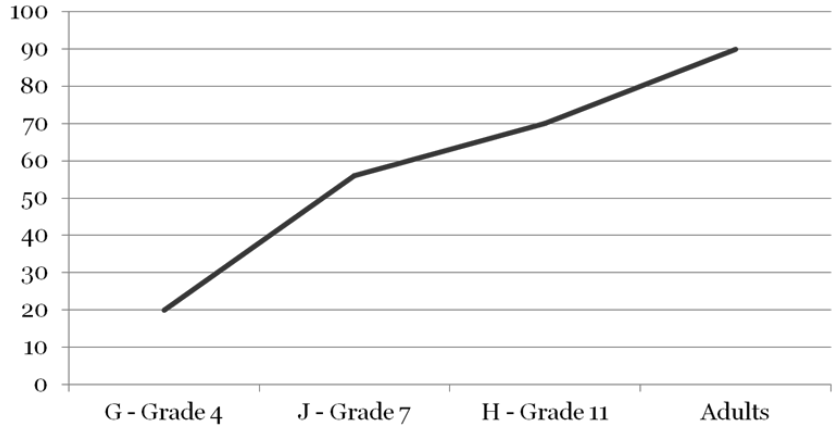

Figure 4. Total number (Σ) of c-constructions in texts, by age group

These numbers so far do not take text length into consideration, and given that older participants usually write longer texts, the next two figures (5 and 6) depict the evolution of c-constructions in texts while neutralizing text length. This is done in Figure 5 by calculating the percentage of words participating in c-constructions in texts, yielding conjunct volume – that is, what is the ratio of words participating in c-constructions compared to the rest of the words in the text: There is a gradual increase in this ratio from about 20% in 4th grade texts to over 40% in the older age groups.

Figure 6 shows conjunct depth and variety by dividing the number of c-constructions by the number of clauses in each text, showing to what extent c-constructions occupy whole clauses or small syntactic units contained within the clause. Here, too, there is an increase in the mean number of c-constructions per clause, from about a tenth of a construction in the younger group to 2.5 times as many in the older groups.

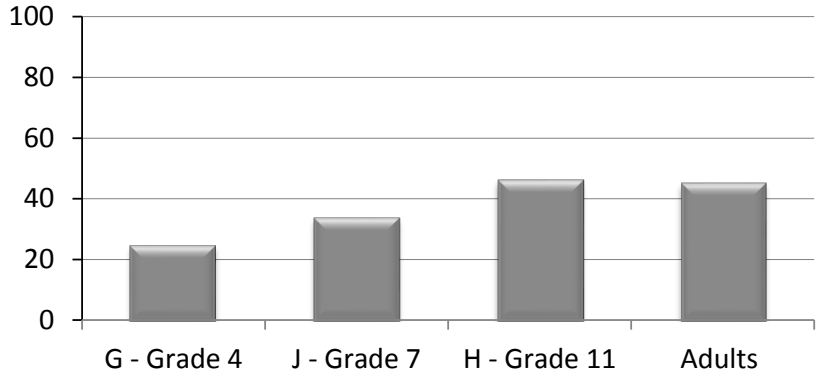

Figure 5. Conjunct volume: Mean percentage of words in c-constructions out of all words in the texts, by age group

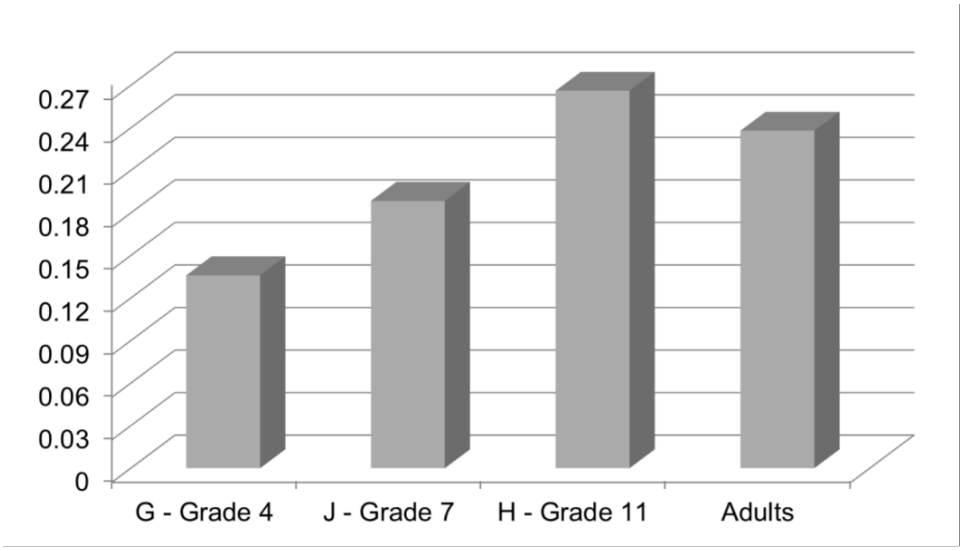

Figure 6. Conjunct depth and variety: Mean number of c-constructions per clause, by age group

To summarize the quantitative analyses presented so far: Viewed from six different perspectives, no U-shaped curve has been found. Based on all measures, the finding is that conjunct constructions continue to increase from 4th grade until adulthood. Thus, counter to the prediction, c-constructions are not the gate to complex syntax in Hebrew narratives – rather, they constitute an important part of the complex rhetorical syntax of discourse. It now remains to be seen to what extent these quantitative increments are accompanied by qualitative changes in syntactic and discursive complexity.

3.4 Qualitative analyses

The opening presentation of c-constructions in texts from four age groups (see the Methods section above) has already indicated two ways in which c-constructions participate in complex discourse syntax: One, they are either embedded within or embed subordinating constructions; and two, they are nested within each other. In fact, what

we see in the texts is the division of participants into two distinct groups – the two younger 4th and 7th narrative texts, and the two older 11th grade and adult texts. On the one hand, it is already clear that the younger set already make use of c-constructions as narrative devices in the representation of events and protagonists, as demonstrated in examples (10-13) from 4th and 7th grades:

(10) …Suddenly he was my friend and not his. 4th G

(11) There are some kids in my class that bully me, curse me, laugh at me. 4th G

(12) My best girlfriend one day stopped talking with me and did not tell me the reason. 7th G

(13) I and the girlfriend fought. 7th G

Moreover, these c-constructions serve thematic roles, as demonstrated by examples (14-16) indicating synonymy, contrast and merismus (denumeration) respectively.

(14) My girlfriends decided to be with me at-fight and not to talk with me. 4th G

(15) We fought who will draw and who will write. 4th G

(16) We got fed up (me and another girl from class). 7th G

But on the other hand, 4th and 7th grade c-constructions all represent foregrounded plot-advancing narrative elements. 4th grade c-constructions occur in largely linear, additive structures, with little or no modification and few examples of internal reference, with connectives confined almost only to the conjunction *and*. 7th graders' c-constructions are much the same, with some minor transitions. Development from 4th to 7th grade demonstrates a broadening of pre-acquired knowledge, but little qualitative change in the functions that are met by these constructions.

The picture changes in the older groups, with the launching of proficient, literacy-based complex syntax based on diversifying linguistic means and syntactic functions. Syntactically speaking, conjunct constructions cluster together and nest within other c-constructions, as shown below by examples (17-18) from 11th grade texts and example (19) from an adult text.

(17) The teacher was new and did not know me or him {did not know me or him}

(18) It is preferable to give up and reach a compromise rather than to reach an argument.

(19) During the whole period I have been working with him I have felt on his side jealousy (and there's nothing to be jealous about) and a meager eye, indeed not only towards me, also towards others.

In 11th grade texts, c-constructions are used not only for the depiction of eventive information units (Ravid & Berman, 2006), but also as descriptive and interpretative units (example 20) using internal reference between the two parallel constructions as a cohesion device (example 21).

(19) We'd do everything together, if it was to go to school, to come back, to go play outside and in the evening to hold some activity.

(20) because she was very sorry about **the theft** and wanted to "redeem" **it**.

Adults use c-constructions to depict foregrounded narrative elements (protagonists and events) embedded in a network of attendant circumstances, hence contributing to syntactic depth, especially in favored discourse sites such as codas. Consider the following examples, all coda excerpts from adults' narratives.

(21) Today Paul serves as a sort of assistant in my instructions and also hushes other kids who interrupt him, and me, in my lectures {who interrupt him, and me}. The problem that had been between us and his disordered behavior have not recurred since then, and as I already noted Paul has even started helping me.

(22) There were harsh exchanges of words, high tones, and eventually I decided that there would be no more laughs with him and my relationship with him will be only correct and thus it would be best for me.

(23) But if this involved a student who to begin with did not even try to listen and summarize, and simply relied on me letting him have the notes at the end of the lesson – I refused to let him have the notes {did not even try to listen and summarize}.

It is not only the general forms and functions of c-constructions that become more complex in the older age groups, but also, and specifically, the verbs that participate in these structures. Younger age groups use simplex single verbs in the service of the major narrative functions – protagonists, events, and reporting of how events transpired, as illustrated in examples 24 - 25.

(24) we fought who will draw and who will write 4th G

(25) I and my friend cleaned up, and the other kids decided that it disgusted them and they did not agree to clean up. So what happened was that not only did we clean up, they didn't, they also rested on the bench and told us to start working and laughed at us and that also made us feel like suckers. 7th G

In contrast, high schoolers use verbs in c-constructions which are more complex from various points of view. They are modified by modal and aspectual forms, often further modified by adverbial phrases, occurring in transposed pre-subject positions, and expressing narrative descriptions and the interpretation or evaluation of internal states, as shown in examples (26 – 27).

(26) She was not willing to listen at all and certainly not to help 11th grade

(27) Last year started a kid from my class to pick on me and to say all kinds of very 'amusing' things (in his opinion) about kibbutzniks and since then he hasn't really stopped. 11th grade

A final note in the current analysis relates to the increased complexity of c-constructions in adults' narratives, which occupies less volume in words, given that the same words function in double and even triple c-construction roles. Example (28), taken from a narrative by an adult, illustrates this point: Two of the four c-constructions are nested within the two other c-constructions, with verbs taking complex parallel complementation and modifications.

(28) It was expressed in that he made sure to represent himself as more successful and better than me {to represent himself as more successful and better than me}, to treat me as a little boy that it is necessary to take care of him and to worry about him {it is necessary to take care of him and to worry about him}, things that were expressed both in talk and in actions.

4. Summary and conclusions

This initial foray into the developmental changes in c-constructions as a syntactic device in written Hebrew narratives shows two kinds of increments in their use. One is the gradual increase in the amount of c-constructions occurring in texts from mid-grade school to adulthood, and another is the increase in their syntactic and discursive complexity. Not only do older narrators make use of many more c-constructions than do younger ones, conjunct types diversify and multiply, their internal complexity, including recursive nesting, grows, and they participate in increasingly more sophisticated discursive structures.

What are the specific syntactic-discursive functions of c-constructions? Relative clauses, to take an example of a subordinating construction, clearly provide information about nominal referents and serve to background information in discourse. Other subordinating constructions such as complement clauses mainly report the contents of thoughts and verbal interaction, while adverbial clauses provide supporting information about temporal, locative, causal and other factors surrounding predicates. So far we have seen that c-constructions serve major narrative functions regarding events, descriptions and interpretations. Future research is necessary to examine their distributions and functions in expository texts and to determine the specific components that contribute to their complexity.

Conjunct constructions thus constitute one of the two major devices contributing to syntactic complexity in Hebrew – subordination, which is a general syntactic device, and parallel syntactic units conjoined to a single component, which is Hebrew-specific. The Hebrew specificity of c-constructions might be questioned at this point, given that conjoined syntactic structures, including those attached to a single head, occur in other languages as well. This is of course conceded, however, my claim is that the Hebrew typological imperative in syntax is c-constructions, in much the same way that Semitic roots and patterns constitute the Hebrew typological imperative in morphology. They are ubiquitous and variegated, they form a consistent component of syntactic complexity, and they have been around in Hebrew texts for thousands of years.

References

Ben David, Abba. 1967. *Leshon mikra ve-leshon xaxamim* (*Biblical and Mishnaic Hebrew).* Tel Aviv: Dvir in Hebrew

Berman, Ruth A. 1986. A step-by-step model of language learning. In Iris Levin (ed.), *Stage and Structure: Re-opening the Debate.* Norwood, N.J: Ablex, 191-219.

Berman, Ruth A. 2005a. Between emergence and mastery: The long developmental route of language acquisition. In Ruth A. Berman (ed.), *Language Development across Childhood and Adolescence.* Amsterdam: John Benjamins, 9-34.

Berman, Ruth A. (ed.). 2005b. Special Issue on *Developing Discourse Stance across Adolescence. Journal of Pragmatics*, 37(2).

Berman, Ruth A. 2008. The psycholinguistics of developing text construction. J*ournal of Child Language,* 35(4), 735-771.

Berman, Ruth A. & Bracha Nir-Sagiv. 2009. Clause-packaging in narratives: A crosslinguistic developmental study. In Jiansheng Guo, Elena Lieven, Nancy Budwig, Susan Ervin-Tripp, Keiko Nakamura, Seyda Ozcaliskan (eds), *Crosslinguistic Approaches to the Psychology of Language: Research in the tradition of Dan I. Slobin*. New York, NY: Psychology Press/Taylor & Francis, 149-162.

Berman, Ruth A. & Bracha Nir. 2009. The language of expository texts: Developmental perspectives. In Marylin A. Nippold & Cheryl M. Scott (eds), *Expository Discourse in Children, Adolescents, and Adults: Development and disorders*. New York, NY: Psychology Press/Taylor & Francis, 101-23.

Berman, Ruth. A. & Dorit Ravid. 2008. Becoming a literate language user: Oral and written text construction across adolescence. In David. R. Olson & Nancy Torrance (eds), *Cambridge Handbook of Literacy.* Cambridge: Cambridge University Press, 92-111.

Berman, Ruth A. & Dorit Ravid. 2010. Interpretation and recall of proverbs in three pre-adolescent populations. *First Language*, 30, 155-173.

Berman, Ruth A. & Dan I. Slobin. 1994. *Relating Events in Narrative: A crosslinguistic developmental study.* Hillsdale, NJ: Lawrence Erlbaum.

Berman, Ruth A. & Ludo Verhoeven. 2002. Crosslinguistic perspectives on developing text-production abilities in speech and writing. *Written Language and Literacy*, 5(1), 1–44.

Berman, Ruth A., Ronit Nayditz & Dorit Ravid. 2011. Linguistic diagnostics of written texts in two school-age populations. *Written Language and Literacy,* 14(2), 161-187.

Brandt, Silke & Evan Kidd. 2011. Relative clause acquisition and representation: Evidence from spontaneous speech, sentence repetition, and comprehension. In Doris Schoenefeld (ed.), *Converging evidence – discussing and extending the methodological tool-kit of the linguist*. Amsterdam: John Benjamins, 273-292.

Bybee, Joan L. & Michael Noonan (eds). 2001. *Complex Sentences in grammar and Discourse: Essays in honor of Sandra A. Thompson*. Amsterdam: John Benjamins.

Carroll, Rebecca & Esther Ruigendijk. 2013. The effects of syntactic complexity on processing sentences in noise. *Journal of Psycholinguistic Research,* 42 (2), 139-159.

Chafe, Wallace. 1994. *Discourse, Consciousness, and Time: The Flow and Displacement of Conscious Experience in Speaking and Writing.* Chicago, IL: University of Chicago Press.

Crain, Stephen, Takuya Goro & Rosalind Thornton. 2006. Language acquisition is language change. *Journal of Psycholinguistic Research*, 35, 31–49.

Culicover, Peter W. 2010. Parataxis and simpler syntax. In Marie-José Béguelin, Mathieu Avanzi & Gilles Corminboeuf (eds), *Actes du 1er Colloque International de Macrosyntaxe*, Vol. 2. Oxford: Peter Lang.

Dittmar, Miriam, Kirstin Abbot-Smith, Elena Lieven & Michael Tomasello. 2011. Children aged 2 ; 1 use transitive syntax to make a semantic-role interpretation in a pointing task. *Journal of Child Language*, 38, 1109-1123.

Fernandes, Keith J., Gary F. Marcus, Jennifer A. Di Nubila & Athena Vouloumanos. 2006. From semantics to syntax and back again: argument structure in the third year of life. *Cognition*, 100(2), B10-20.

Friedmann, Naama & João Costa. 2010. The child heard a coordinated sentence and wondered: On children's difficulty in understanding coordination and relative clauses with crossing dependencies. *Lingua*, 120(6), 1502-1515.

Friedmann, Naama & Rama Novogrodsky. 2011. Which questions are most difficult to understand? The comprehension of Wh questions in three subtypes of SLI. *Lingua*, 121(3), 367-382.

Gillam, Ronald B. & Judith R. Johnston. 1992. Spoken and written language relationships in language/learning-impaired and normally achieving school-age children. *Journal of Speech and Hearing Research*, 35, 1303–1315.

Givón, Talmy. 2001. *Syntax: An introduction.* Amsterdam: John Benjamins.

Givón, Talmy. 2005. *Context as other minds.* Amsterdam: John Benjamins.

Givón, Talmy. 2009. *The genesis of syntactic complexity*. Amsterdam: John Benjamins.

Goldberg, Adele E. 2003. Constructions: a new theoretical approach to language. *Trends in Cognitive Sciences*, 7(5), 219-224.

Haiman, John & Sandra A. Thompson (eds). 1988. *Clause combining in grammar and discourse*. Amsterdam: John Benjamins.

Hauser, Alan J. 1980. Judges 5: Parataxis in Hebrew poetry. *Journal of Biblical Literature*, 99, 23-41.

Haspelmath, Martin. 2007. Coordination. In Timothy Shopen (ed.), *Language Typology and Syntactic Description. Vol II: Complex Constructions.* Cambridge: Cambridge University Press, 1-51.

Jisa, Harriet & Liliana Tolchinsky. 2009. Developing a depersonalised discourse stance through linguistic means in typologically different languages: Written expository discourse. *Written Language and Literacy*, 12(1), 1-25.

Kärkkäinen, Elise, Marja-Leena Sorjonen & Marja-Liisa Helasvuo. 2007. Discourse structure. In Timothy Shopen (ed.), *Language Typology and Syntactic Description. Vol II: Complex Constructions.* Cambridge: Cambridge University Press, 301-371.

Karmiloff-Smith, Annette. 1992. *Beyond Modularity: a Developmental Perspective on Cognitive Science*. Cambridge, MA: MIT Press.

Kidd, Evan. 2012. Implicit statistical learning is directly associated with the acquisition of syntax. *Developmental Psychology*, 48, 171 - 184.

Longacre, Robert E. 2007. Sentences as combinations of clauses. In Timothy Shopen (ed.), *Language Typology and Syntactic Description. Vol II: Complex Constructions.* Cambridge: Cambridge University Press, 372-420.

Matthews, Peter H. 1981. *Syntax.* Cambridge: Cambridge University Press.

Nippold, Marylin A. 2007. *Later language development: School-age children, adolescents, and young adults*. Austin, TX: Pro-Ed.

Nippold, Marylin A. & Jill K. Duthie. 2003. Mental Imagery and Idiom comprehension: a Comparison of School-Age Children and Adults. *Journal of Speech, Language, and Hearing Research*, 46, 788-799.

Nippold, Marylin A. & Cheryl M. Scott. Editors. 2009. *Expository discourse in children, adolescents, and adults: Development and disorders*. New York, NY: Psychology Press/Taylor & Francis.

Nippold, Marylin A., Tracy J. Mansfield, Jesse L. Billow & J. Bruce Tomblin. 2008. Syntactic development in adolescents with a history of language impairments: a follow-up investigation. *American Journal of Speech-Language Pathology*, 18, 241-51.

Nir, Bracha & Ruth A. Berman. 2010. Complex syntax as a window on contrastive rhetoric. *Journal of Pragmatics*, 42, 744-765.

Nir-Sagiv, Bracha, Laly Bar-Ilan & Ruth A. Berman. 2004. Vocabulary development across adolescence: Text-based analyses. In Anat Stavans & Irit Kupferberg (eds), *Studies in language and language education: Essays in honor of Elite Olshtain.* Jerusalem: Magnes Press, 47-74.

Ravid, Dorit. 2004. Later lexical development in Hebrew: derivational morphology revisited. In Ruth A. Berman (ed.), *Language development across childhood and adolescence: Psycholinguistic and crosslinguistic perspectives*. Amsterdam: Benjamins, 53-82.

Ravid, Dorit & Ruth A. Berman. 2006. Information density in the development of spoken and written narratives in English and Hebrew. *Discourse Processes,* 41, 117-149.

Ravid, Dorit & Ruth A. Berman. 2009. Developing linguistic register in different text types. *Pragmatics & Cognition,* 17(1), 108–145.

Ravid, Dorit & Ruth A. Berman. 2010. Developing noun phrase complexity at school age: a text-embedded cross-linguistic analysis. *First Language***,** 30(1), 3–26.

Ravid, Dorit & Ronit Saban. 2008. Syntactic and meta-syntactic skills in the school years: A developmental study in Hebrew. In Anat Stavans & Irit Kupferberg (eds), *Studies in language and language education: Essays in honor of Elite Olshtain.* Jerusalem: Magnes Press, 75-110.

Ravid, Dorit & Rachel Schiff. 2012. From dichotomy to divergence: Number/gender marking on Hebrew nouns and adjectives across schoolage. *Language Learning*, 62(1), 133-169.

Ravid, Dorit & Liliana Tolchinsky. 2002. Developing linguistic literacy: A comprehensive model. *Journal of Child Language*, 29, 419-448.

Ravid, Dorit, Janet G. van Hell, Elida Rosado & Anita Zamora. 2002. Subject NP patterning in the development of text production. *Written Language and Literacy*, 5, 69-94.

Schiff, Rachel & Dorit Ravid. 2012. Linguistic processing in Hebrew-speaking children from low and high SES backgrounds. *Reading & Writing*, 25, 1427-1448.

Scott, Cheryl M. & Jennifer Windsor. 2000. General language performance measures in spoken and written narrative and expository discourse of school-age children with language learning disabilities. *Journal of Speech, Language, and Hearing Research*, 43, 324–339.

Slobin, Dan I. (ed.) 1985-1995. *The crosslinguistic study of language acquisition*. Hillsdale, NJ: Erlbaum.

Slobin, Dan I. 2003. Language and thought online: cognitive consequences of linguistic relativity. In Dedre Gentner & Susan Goldin-Meadow (eds), *Language in mind: Advances in the study of language and thought*. Cambridge, MA: MIT Press, 157-192.

Tsadka, Yitzhak 1978. *Hebrew sentence structure*. Jerusalem: Akademon.