Verb movement to C: From agrammatic aphasia to syntactic analysis

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1. INTRODUCTION

Agrammatism is a highly selective syntactic deficit that occurs following a damage to the frontal part of the left hemisphere. The selective pattern entails, for example, a deficit in the production of Wh-questions but not yes/no questions (in some languages, Friedmann 2002), a deficit in the comprehension of object relatives but not subject relatives (Grodzinsky 1989; Grodzinsky, Piñango, Zurif, & Drai 1999; Friedmann, Reznick, Dolinski-Nuger, & Soboleva, 2010; Friedmann & Shapiro 2003), a deficit in the production of tense inflection but not of agreement (Friedmann & Grodzinsky 1997; Friedmann 2001, 2006), and a deficit in the activation of the antecedent at the trace/copy position but intact activation of predicate argument structure (Shapiro & Levine 1990, Shapiro, Gordon, Hack & Killackey 1993, Zurif, Swinney, Prather, Solomon, & Bushell 1993, Swinney, Zurif, Prather & Love 1996). Studies of the selective patterns of loss and sparing in agrammatism are important for the accurate description of the syntactic deficit and consequently for the proper treatment of this aphasia but they can also shed light on open questions in syntactic theory. Such contributions from agrammatism to linguistic theory were suggested, for example, in the case of verbal vs. adjectival passives. Grodzinsky, Pierce, and Marakovitz (1991) showed that whereas verbal passives are impaired in agrammatic comprehension, adjectival passives are not. Grodzinsky et al. took this finding to support – together with the theory of an impairment in phrasal movement in agrammatism (Grodzinsky 1990, 1995, 2000) – the notion that verbal, but not adjectival, passives involve phrasal movement. Another type of corroboration from agrammatism for a syntactic theory was suggested in the domain of verbal inflection. Tense, but not agreement, was found to be impaired in Hebrew- and Palestinian-Arabic-speaking agrammatics (Friedmann & Grodzinsky 1997, 2000, Friedmann 2001) and this, together with other functions of TP that were found to be impaired, and the syntactic repercussions of tense node impairment to higher phrasal nodes, was taken to support the Split Inflection

Hypothesis (Pollock 1989) and subsequent accounts according to which tense and agreement are checked (or affixed) in separate nodes. Yet another evidence from agrammatism for an open syntactic question was suggested from the pattern of Wh question production in agrammatism. Friedmann (2002) reported that subject- and object-questions are similarly impaired in speech production in agrammatism. Given that individuals with agrammatism are unable to construct sentences with movement to CP, but are able to produce simple SVO sentences that do not involve movement to CP, the finding that they had difficulties producing subject question and the similar difficulties in subject and object questions was taken to support the analysis of vacuous movement in subject questions (Friedmann 2002).

Thus, the characterization of the syntactic deficit in agrammatism may be seen as a useful tool for the diagnosis of structural analysis. It can be used to decide between competing syntactic analyses, and can be used to diagnose syntactic structures.

The study reported in the current paper was designed to diagnose another structure and provide evidence in another syntactic debate in the light of neurolinguistic findings from agrammatic aphasia. It was constructed to provide a critical test to decide between two syntactic theories for the representation of Triggered Inversion in Hebrew, by exploring the ability of Hebrew-speaking agrammatic aphasics to produce sentences that involve verb movement to the second sentential position, before the subject.

The deficit in agrammatic production is related, according to the Tree Pruning Hypothesis (Friedmann 1998a, 2000, 2001, 2005, 2006; Friedmann & Grodzinsky 1997, 2000), to an impairment in the highest nodes of the syntactic tree or in accessing them. This leads to a deficit in the production of structures that include constituents that are base-generated in the high nodes, but also constituents that move to these nodes. Thus, movement itself is not taken to be affected under this account, but movement to inaccessible nodes is impaired.[1]

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[1] Other approaches to the deficit in production assume a more general movement deficit in production, in which all types and lengths of movement are impaired in production (Gavarró 1993, Thompson & Shapiro 1995). This description is probably too general, as some types of movement such as the movement of the argument of unaccusative verbs to preverbal position were shown to be unimpaired, at least for some individuals with agrammatism (Biran & Friedmann, 2008). These approches are also too weak, as they cannot account for the deficit in embedded sentences that do not include movement (sentences with sentential complements), or for the dissociation between tense and agreement inflection impairment.

According to the Tree Pruning Hypothesis, any type of movement to inaccessible nodes should be hampered, and therefore both phrasal movement and verb movement are expected to be impaired (see also Friedmann, Gvion, Biran, & Novogrodsky 2006). In order to directly assess whether verb movement to second position is impaired in agrammatic production, and to further allow for the decision between competing syntactic analyses of this structure, we used minimal pairs of sentences with and without such movement. We used the fact that verb movement to second position in Hebrew is optional in most contexts. This allowed us to create minimal pairs of sentences that are identical in all aspects except for whether or not they include movement to second position.

1.1. Triggered Inversion in Hebrew

In Modern Hebrew, the base-generated word order is SVO, as in (1).

(1) etmol ha-yalda axla xumus.

    yesterday the-girl ate hummus

    The girl ate hummus yesterday.

However, it is also possible in Hebrew, in some respects similarly to Verb Second in Germanic languages, to move the verb to the second position of the sentence, immediately after a non-subject phrasal constituent (Borer 1995).[2] This movement creates an XVSO structure as in (2). This structure was termed *Triggered Inversion* (Shlonsky 1987, 1997; Shlonsky & Doron 1992) or *Stylistic Inversion*.

(2) etmol   axla ha-yalda xumus.

    yesterday ate   the-girl   hummus

    The girl ate hummus yesterday.

According to Shlonsky and Doron (1992) and Shlonsky (1997), this XVSO structure in Hebrew is created by a non-subject constituent at spec-CP, which triggers the movement of the verb to C^0 (through T^0, see (3)). Borer (1995) has a different analysis for this structure. According to her, the verb moves only up to I^0 and the first constituent is in spec-IP (under a split inflection analysis as was adopted here, her account can be cast in

terms of movement to T^0 and spec-TP respectively, see (4). See, e.g., pages 569-570 in Borer's article for her discussion of why she believes V-to-I account for Hebrew XVSO structures is preferred over a V-to-I-to-C account).

(3)

(4)
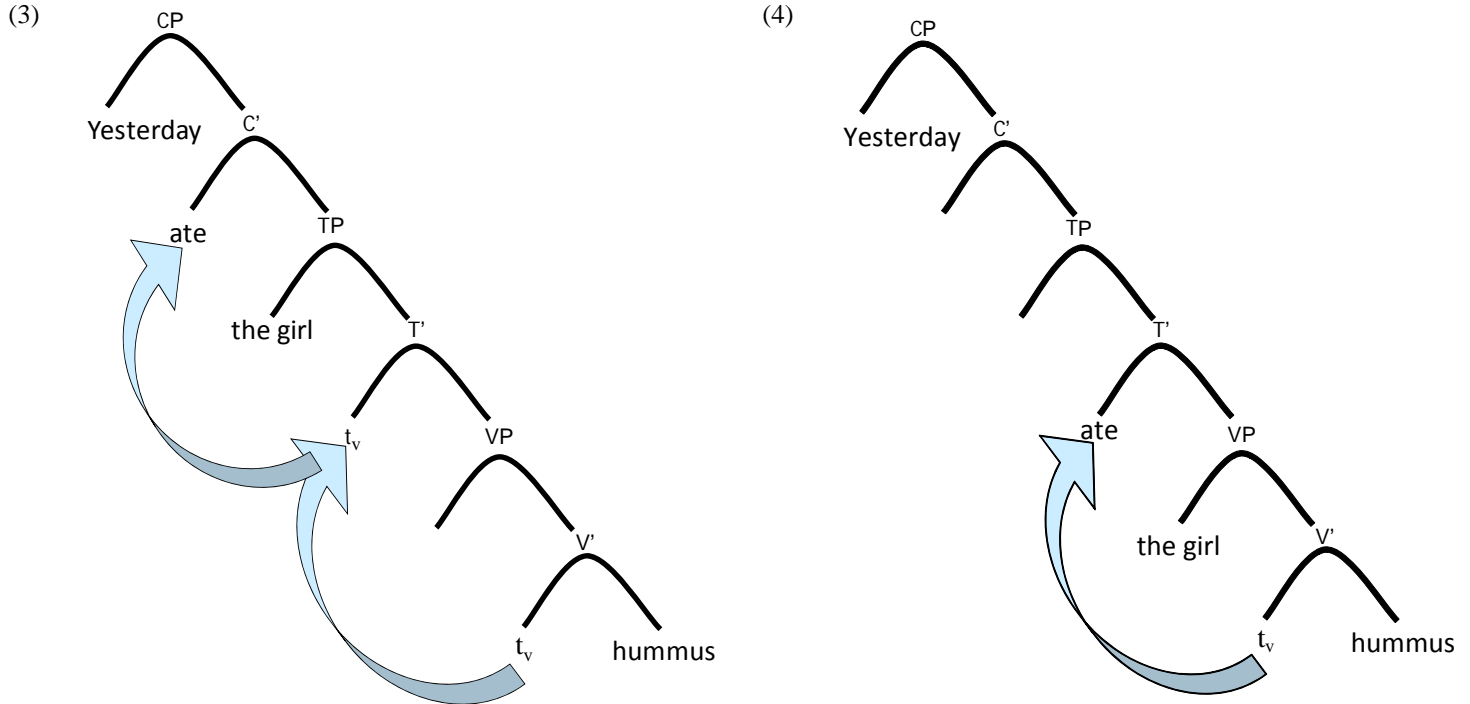
Thus, XSVO and XVSO structures in Hebrew form a minimal pair with respect to verb movement to second position. If indeed agrammatic aphasics are unable to access the high nodes of the syntactic tree, they are expected to fail on structures that involve movement to these nodes. The comparison of the two structures and specifically the performance on the triggered inversion structure can serve as a critical test to determine between the syntactic accounts – between movement to C and movement to T. Here is how: Agrammatic aphasia can have different degrees of severity that can be characterized by the different sites of tree pruning. Individuals who have milder agrammatism are impaired only in CP, whereas the more severely impaired individuals with agrammatism are also impaired in TP (see Friedmann 2001, 2005).

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[2] Notice that we only discuss here VS orders that involve unergative or transitive verbs, as VS orders with unaccusative verbs can be base-generated structures without movement (Friedmann & Costa, 2011).

For the more severely impaired patients, who can access neither CP nor TP, both Shlonsky (1997) and Borer (1995) predict failure in the production of XVSO. The accounts differ, however, with respect to their predictions regarding the milder impairment. Shlonsky's account predicts a failure in XVSO structures even for the milder patients because the verb has to move to CP, and the milder patients are impaired at CP. In contrast, Borer's account predicts that the milder patients will be able to produce XVSO because the verb under her analysis moves only up to TP, which is unimpaired in these patients. Thus, the performance of the milder patients on the XVSO sentences might indicate whether the verb moves to C or only up to T in this structure.

We therefore compared XSVO to XVSO structures, and the performance of CP-pruned patients to that of TP-pruned patients.

2. EXPERIMENT

2.1. Participants

Five individuals with agrammatism, two women and three men, participated in this study. They were aged 19-33 years (mean age 28), and all were native speakers of Hebrew. They had a lesion in the left hemisphere, in or involving the frontal lobe. Three of them (GR, HY, and RN) had experienced left hemisphere stroke, and two had left hemisphere damage following head trauma (RA and AL), they were all premorbidly right-handed, and suffered from right hemiplegia or hemiparesis. They had 12–15 years of education.

They were diagnosed as having Broca's aphasia with agrammatism using the Hebrew versions of the WAB (Kertesz, 1982; Hebrew version by Soroker, 1997) and the BAFLA—a test battery for agrammatic comprehension and production (Friedmann, 1998b).

In comprehension they all showed the characteristic agrammatic pattern, failing to understand reversible object relative clauses and topicalized OSV and OVS structures, and succeeding in subject relatives and simple active SVO sentences, as shown in Table 1 (see also Friedmann & Shapiro 2003 and Friedmann 2008 for detailed profile of the comprehension pattern of 4 of these participants).

Table 1

Sentence picture matching - percentage correct

Participant	Simple SVO	Subject relative	Object relative	OSV	OVS
GR	97	87	57	70	30
RA	100	79	59	66	33
HY	93	86	56	37	33
AL	100	97	77	60	60
RN	90	87	43	47	53
Average	**96**	**87**	**58**	**56**	**42**

In production, all patients had characteristic agrammatic speech: short, nonfluent, with ungrammatical utterances, use of mainly simple sentences, and ungrammatical production of complex sentences and wh-questions.

An extensive battery of morphosyntactic tests was administered to all patients before the study (BAFLA, Friedmann 1998b, see Friedmann, 2001, 2005, 2006 for a description of the tests and the diagnosis of impairment on the syntactic tree). This assessment indicated that all five participants were impaired in the production of Wh-questions in Wh question elicitation and repetition tasks ((all below 24% correct see Friedmann 2002 for details). They were also very impaired in the production of embedded sentences, as assessed by relative clause elicitation, repetition of embedded sentences with sentential complements to verbs (all performing poorer than 10%). Their poor repetition of sentences with sentential complements of verbs, i.e., of sentences that include overt elements in CP but do not involve movement to CP, which was also found in their poor production of such embedded sentences in spontaneous speech, indicate that their deficit was in CP itself rather than in movement to it. Namely, the impairment involved not only movement to CP but also elements that are based-generated there.

Importantly for the current study, on the basis of their performance in the BAFLA, the participants were divided into patients with a milder impairment, who were impaired in wh-questions and embedding, but performed above 95% in tense inflection completion and repetition and the production and repetition of subject pronouns, and severely impaired patients, who were impaired in the production of wh-questions and embedding as well as in tense inflection and subject pronouns, scoring only 26%–52% correct on tense inflection

completion tasks. According to this classification, RN and AL had milder agrammatism, and HY, GR, and RA had severe agrammatism. Accordingly, RN and AL were diagnosed as impaired only at CP, whereas HY, GR, and RA were diagnosed as suffering impairment at the level of both the Tense Phrase (TP) and Complementizer Phrase (CP) (or, put differently a deficit that did not allow them to access TP and the nodes above it).

In addition, ten psychology students, native speakers of Hebrew without language impairment, participated in the experiment as a control group.

2.2. Method

The production of Triggered Inversion structures was assessed using a delayed sentence repetition task. The sentence repetition task has been consistently proving itself as a reliable method to assess syntactic abilities in various populations. When a speaker repeats a sentence, she is not just passively copying it, but rather actively reconstructing it (Lust, Flynn, and Foley 1996, Friedmann and Lavi 2006, Friedmann 1998a, 2007, Potter and Lombardi 1998). Research with individuals with agrammatism, as well as with children acquiring language, and children with language impairments, indicated that speakers can only repeat structures they master, and therefore the comparison of sentences that are repeated correctly and sentences that are repeated with structural errors can indicate syntactic abilities in various structures. Indeed, if the participant repeats all the sentences correctly, we cannot draw any definitive conclusion about her syntactic abilities, because the correct repetition might have merely been verbatim. But if we compare two sentences that are equal in length and constituents, and minimally differ with respect to the structure that is evaluated, as we do in the current study, and the participant has difficulty with only one of them, it will be possible to conclude that the problematic structure is unavailable to her.

For the administration of the task, a native speaker of Hebrew read the sentence, and the participants were asked to count to three and then repeat the sentence as accurately as they could. Each sentence was repeated as many times as the participant requested, and no time limit was set. For each sentence it was assessed whether the repetition was correct or not. When the word order that the participant produced matched the target order, the repetition was scored as correct. Sentences that were repeated in the correct order but with inflection substitutions, lexical errors that preserve the syntactic structure of the sentence,

or preposition errors were regarded as correct. Structural errors were classified into four types: verb-subject inversion, verb omission, subject omission, and other. In addition, the tense inflection of the verb in each sentence was assessed, and the number of tense errors was compared between sentences in which the verb was produced correctly in second position (successful XVSO) and sentences in which it did not necessarily raise (i.e., responses in which the participant was not able to raise the verb to second position although the target sentence included verb movement, and sentences in which the target was without verb movement and the participant repeated it without verb movement).

2.3. Sentences

Each participant repeated 40 Hebrew sentences. Half of the target sentences were XVSO, i.e., structures with verb movement to a position after a trigger and before the subject, and the other half were XSVO. The first constituent in the two sentence structures was always a temporal adverb, of either a single word (*etmol* = yesterday) or two words (*ba-shana ha-ba'a* = next year). The XSVO and XVSO sentences were matched for length (average of 4.4 words per sentence in each of the sentence types, case markers and prepositions were counted with the attached noun). All the sentences included a 3rd person subject, half of the sentences of each type included a feminine subject, and half included a masculine subject. The verbs were in all three Hebrew tenses – past, present, and future - distributed evenly across the two sentence types. All verbs were transitive, some with a DP complement and some with a PP complement. The sentences were randomly ordered and no more than two sentences of the same type appeared consecutively.

3. RESULTS

The repetition of sentences that include verb movement to the position after the trigger and before the subject was profoundly impaired for all agrammatic participants, as shown in Table 2. Repetition of the XVSO structures was significantly worse than that of the XSVO structures (for the group, t (4) = 12.17, p = .0001; and for each individual participant, Fisher's exact $p < .002$).

The most crucial findings for determining whether the verb in second position in Hebrew raises to C or to T comes from the performance of the participants who could access TP but not CP. As shown in Table 2, not only the patients with severe agrammatism

(GR, RA, and HY, who had impairment at TP and above) but also the patients with milder agrammatism (AL, RN, who are impaired at CP) showed inability to produce the XVSO sentences.

Table 2

Percent correct repetition of sentences with and without Triggered Inversion

	Patient	XSVO	XVSO
TP-pruned	GR	75%	10%
	RA	95%	25%
	HY	65%	15%
CP-pruned	AL	90%	45%
	RN	90%	25%
	Mean	**83%**	**24%**

Table 3

Number of inversion errors in repetition with and without verb movement

Patient	Inversion errors in XSVO SV →VS	Inversion errors in XVSO VS →SV
GR	1	18
RA	0	12
HY	0	14
AL	1	9
RN	0	3
Total	**2**	**56**

The two most common error types in repeating XVSO sentences were inversion of verb-subject order to subject-verb order, and verb omission. As shown in Table 3, Subject-verb inversion errors were far more frequent in XVSO than in XSVO (t (4) = 4.43, p = .005).

The repetition of the two sentence structures differed also with respect to the rate of verb omission. Verb omissions occurred more frequently in XVSO sentences than in XSVO sentences: There were 17 verb omissions in the sentences containing verb movement, and

only 6 verb omissions in the sentences without verb movement. Subjects were omitted 10 times in the XVSO sentences and only once in the XSVO.

The participants produced 33 tense errors while repeating the sentences. Crucially, no tense error occurred in successful repetitions of XVSO (as shown in Table 4). Namely, whenever the verb was successfully raised, tense was correct. In marked contrast, when the verb did not raise to second position, namely when the patients produced XSVO order, either as a repetition of an XSVO sentence or after inversion of a XVSO sentence, which indicates failure to raise the verb, 33 tense errors occurred.

Table 4

Number of tense errors in sentences that were repeated correctly with the verb in second position vs. tense errors when the verb did not reach second position.

Patient	Tense errors in correct XVSO	Tense errors in XSVO Target XSVO	Tense errors in incorrect XVSO (Inversion or subject omission)
GR	0	11	10
RA	0	3	3
HY	0	0	3
AL	0	1	0
RN	0	1	0
Total	**0**	**17**	**16**

The participants in the control group performed well on both XSVO and XVSO, and with no significant difference between the sentence types (average performance for the control group was 98.5% correct on the XSVO and 100% correct on the XVSO). Hebrew-speaking second-grade children (seven-year-olds), who were tested with the same test, already repeated both types of sentences very well (even when they counted to ten before repeating the sentence), and showed no significant difference between XSVO and XVSO (94% on XSVO and 89% correct on XVSO, Novogrodsky & Friedmann 2002).[3] An error that

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[3] A similar impairment in the production of sentences with triggered inversion was found in 10-15 years old Hebrew-speaking children with developmental syntactic Specific Language Impairment (Novogrodsky & Friedmann 2002). Younger Hebrew-speaking children before age 6 still encounter difficulties in the repetition of this structure (Costa & Friedmann, in press; Friedmann & Costa, 2011; Fattal, Friedmann, Fattal-Valevsky, in press).

emerged almost only in the control group (and in the children's repetitions) but not in the agrammatic group was inversion of the XSVO to XVSO. This might be taken as further evidence for the inclusion of the Triggered Inversion structure in the syntax of the control group participants.

4. DISCUSSION

The aim of this study was to use data from neurolinguistics to diagnose head movement, and specifically, to diagnose the landing site of the verb movement that creates verb-second sentences in Hebrew, using results from agrammatic aphasia.

The main finding of this experiment was that the Hebrew-speaking agrammatic aphasics could not produce sentences with verb movement to second position, even in a simple task like sentence repetition. This pattern is consistent with descriptions of agrammatism that attribute the deficit in production to the inaccessibility of the high syntactic nodes – due to pruning at TP for the severe agrammatic aphasics and at CP for milder agrammatism (Tree Pruning Hypothesis, Friedmann & Grodzinsky 1997, Friedmann 2001, 2005).

The finding that even the milder agrammatic aphasics failed to produce triggered inversion structures bears upon a point of controversy in syntactic theory. Two analyses have been proposed for Hebrew Triggered Inversion structures. Borer (1995) suggested that in these structures the first constituent is in spec-IP, and the verb moves only up to I^0 (or spec-TP and T^0). Shlonsky and Doron (1992) and Shlonsky (1997) suggested a different analysis according to which the first constituent is in spec-CP, and the verb moves to C^0. Our results support Shlonsky and Doron's analysis, as two of the participants, AL and RN, were impaired only in CP, and showed relatively normal functioning of TP (as evinced by their above 95% correct tense inflection in inflection completion tests, and by their good production of subject pronouns), but still showed impaired production of Triggered Inversion[4]. Their errors included inversion of VS order to SV order. Given that these individuals were impaired in CP and not in TP, the finding that they were still impaired in Triggered Inversion suggests that the verb in Triggered Inversion sentences moves to an impaired node, namely to C, and not to T (see also

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[4] The *comprehension* of such sentences with verb movement to second position was also tested for RN (as reported by Friedmann et al. 2006), and the results indicated that not only his production of this structure is impaired: his comprehension was also severely impaired.

Goldberg 2001 for linguistic arguments in support of Shlonsky's analysis and against a movement-to-T analysis as suggested by Borer).

Within the framework of Shlonsky's analysis and the Tree Pruning Hypothesis, the success in producing XSVO structures and difficulty in the production of XVSO are readily explained. If CP is inaccessible to agrammatic aphasics, they cannot move the verb to C^0, to a position before the subject.[5] However, they are still able to produce a smaller tree in which the subject and the verb are located in lower nodes, in VP, with the subject in spec-VP and the verb in V, in their base-generated positions (or possibly in another phrasal node above VP and below CP). As a result, they can produce XSVO but not XVSO.[6]

The error pattern follows from this too: because they cannot produce XVSO but can produce XSVO in lower nodes, they produce XSVO instead of XVSO, and hence the inversion errors. The findings regarding tense errors are explained along similar lines. Tense errors never occurred when the agrammatic participants succeeded to move the verb to a position before the subject (to raise the verb to C). A verb that has managed to get all the way up to C would have had to move through a preserved T, and therefore its tense would be correct. However, in most cases agrammatics are unable to raise the verb because their TP is impaired, and these are the cases in which the verbs are incorrectly inflected. This, in turn, offers a corroboration for the psychological reality of the hierarchical order of CP above TP.[7]

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[5] Even if one assumes AgrP above VP and below TP, they cannot move the verb only up to Agr and leave the subject in situ in VP because if AgrP is accessible and functioning, the verb and the subject need to be checked in spec-head configuration, so if the verb moves to AgrP, so would the subject.

[6] Notice that the deficit in the production of V2 sentences the patients exhibited cannot stem from a general deficit in movement or in head movement. The two mildly impaired participants showed intact tense inflection, indicating that at least their ability to move heads to T was unimpaired. In addition, some of the participants were tested on the production of unaccusative verbs in SV order, which involve A-movement, and produced them correctly (Biran & Friedmann 2008), indicating that they do not have a general problem with movement, but rather a specific problem with movement to impaired nodes, in this case -- to CP.

[7] Interestingly, this asymmetry also suggests a further support for the V-C analysis of V2 in Hebrew. Whereas the production of tense errors when the patient fails to move the verb to second position, as well as the correct tense inflection in sentences with the verb in second position are also expected under a V-T accounts of Hebrew V2, correct tense inflection in sentences in which the patient was unable to place the verb in second position can only be accounted for under V-C accounts, but not under V-T accounts.

These results are consistent with findings from verb-second languages like German and Dutch (Kolk & Heeschen 1992, Bastiaanse & van Zonneveld 1998), in which approximately half of the sentences in agrammatic spontaneous speech are produced with the verb in sentence-final, rather than second, position (See Friedmann & Grodzinsky, 2000 for a summary). This is a different manifestation of exactly the same deficit – agrammatic aphasics cannot move their verbs to C, so they produce them where they can – at a lower position, possibly within VP.[8]

The results also have an implication for the source of verb omissions in agrammatism. Many studies have reported that agrammatic aphasics have difficulties in verb production (Luzzatti et al. 2002, Bird, Howard, & Franklin 2000), difficulties that yielded various explanations. Some researchers hold that agrammatic aphasics have a selective deficit in the lexical retrieval of verbs (Zingeser & Berndt 1990; Kim & Thompson 2000), whereas others have suggested that the source of this deficit is syntactic rather than lexical (Friedmann 2000). The results of the current study support the approach according to which the syntactic deficit is involved in verb omissions, as sentences that were similar in all but the movement of a verb yielded different rates of verb omission. Verbs were omitted three times more from target sentences with verb movement to C than from sentences without verb movement. These results are similar to those of Bastiaanse and van Zonneveld (1998), Zuckerman, Bastiaanse, and van Zonneveld (2001) and Bastiaanse & Thompson (2003) in Dutch, who used a verb completion test and found a clear difference between verb retrieval in verb-second position and sentence-final position. Their patients retrieved significantly fewer verbs in second position (when the verb was to be positioned in C) than when they had to complete a sentence-final verb. Moreover, data from treatment studies indicate an improvement in verb retrieval following treatment of syntactic domains such as movement to CP (Friedmann, Wenkert-Olenik, & Gil 2000) and tense inflection (Weinrich, Shelton, Cox, & McCall 1997). For example, the patients in Weinrich et al.'s study had severe tense inflection deficit before treatment: they inflected only 5%-22% of their verbs correctly for tense. At that stage, their patients also had verb-retrieval deficit: they produced only 36%-53% of the required verbs. After treatment of

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[8] Similar errors occur also when Wh-movement is blocked: one of the errors individuals with agrammatism produced in sentence repetition and question elicitation tasks were the production of the wh moephene in situ, rather than in spec CP. This is an option that is available in other languages and in echo questions, but is not grammatical in such questions in Hebrew.

tense inflection, when their tense inflection has improved significantly (to 64%-92% correct), their verb omission dramatically decreased, with 83%-89% correct verb retrieval.

These results support the idea that verb retrieval failure in agrammatic aphasia can have syntactic underpinnings. When, due to syntactic tree pruning, agrammatic aphasics fail to raise their verbs to inaccessible nodes in the tree, they either drop them or leave them unraised in a low node. When the accessibility of high nodes is improved following treatment, verb retrieval improves as well.

We have previously noted that individuals with agrammatism can use options that are available to healthy speakers in other structures (such as the use of Wh in situ). Jochen Zeller (p.c.) pointed out that the phenomenon of verb omission in agrammatism when verb movement is not available might also be a phenomenon of this type. According to Lasnik (1999), both the verb and its object move out of the VP in English SVO sentences, a movement that is triggered by a feature on the verb. If the verb does not move, the verb's strong feature produces a PF-crash - unless the verb is deleted by VP-ellipsis in pseudogapping construction. Thus, healthy speakers either have to move the verb, or elide the VP, in order to avoid a PF-crash. The omissions of verbs when verb movement is blocked in agrammatism can be taken as another instance of the same strategy. Individuals with agrammatism who cannot move the verb might be using this option of verb deletion to avoid a PF-crash. This account has another interesting implication: if the participants omit the verb for the structure not to crush, it indicates that the feature that triggers the verb movement is in fact not in CP (where it would be inaccessible, and hence would not require any avoid-crash actions), but lower on the tree, most probably on the verb itself.

To conclude, Hebrew-speaking agrammatic aphasics cannot produce Triggered Inversion sentences. The pattern of performance of patients who can access TP but not CP indicates that Triggered Inversion in Hebrew should be analyzed as a trigger in spec-CP which triggers movement of the verb to C^0.

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