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The sentence repetition task: A powerful diagnostic tool for French children with specific language
impairment

Anne-Lise Leclercq¹, Pauline Quémart², David Magis³, & Christelle Maillart¹

¹University of Liège, Department of Psychology: Cognition and Behaviour

²University of Poitiers and Centre National de la Recherche Scientifique

³University of Liège, Department of Education

Corresponding author:

Anne-Lise Leclercq, PhD

Speech Therapy Unit, University of Liege (Belgium)

Department of Psychology: Cognition & Behaviour

30 rue de l'Aunaie, B38, 4000 Liege, Belgium

Phone: +32 4 366 57 78

Email: al.leclercq@ulg.ac.be

Abstract

This study assesses the diagnostic accuracy and construct validity of a sentence repetition task that is commonly used for the identification of French children with specific language impairment (SLI). Thirty-four school-aged children with a confirmed, diagnostically based diagnosis of SLI, and 34 control children matched on age and nonverbal abilities performed the sentence repetition task. Two general scoring measures took into account the verbatim repetition of the sentence and the number of words accurately repeated. Moreover, five other scoring measures were applied to their answers in order to separately take into account their respect of lexical items, functional items, syntax, verb morphology, and the general meaning of the sentence. Results show good to high levels of sensitivity and specificity at the three cut-off points for all scoring measures. A principal component analysis revealed two factors. Scoring measures for the respect of functional words, syntax and verb morphology provided the largest loadings to the first factor, while scoring measures for the respect of lexical words and general semantics provided the largest loadings to the second factor. Sentence repetition appears to be a valuable tool to identify SLI in French children, and the ability to repeat sentences correctly is supported by two factors: a morphosyntactic factor and a lexical factor.

1. Introduction

Diagnosing language impairment is a complex endeavor. Some tasks are considered to be useful tools for identifying children with specific language impairment (SLI), given that these children consistently perform at a lower level than their chronological age- (or even language age-) matched peers. These tasks include finite verb morphology (e.g., Conti-Ramsden, 2003; Oetting & McDonald, 2001; Rice & Wexler, 1996), nonword repetition and sentence repetition (e.g., Archibald & Joanisse, 2009; Conti-Ramsden, Botting, & Faragher, 2001; Stokes, Wong, Fletcher, & Leonard, 2006). Among them, sentence repetition is the most useful clinical marker of SLI in the English language, with high levels of overall accuracy (88%), specificity (85%) and sensitivity (90%) (Conti-Ramsden et al., 2001) even when language difficulties are associated with working memory impairments (Archibald & Joanisse, 2009). In Cantonese, sentence repetition, but not nonword repetition, discriminates between children with SLI and their typically developing peers, with a specificity of 97% (Stokes et al., 2006). Sentence repetition has also proved to be a good clinical marker of SLI in young adults (Poll, Betz, & Miller, 2010). Moreover, sentence repetition could be specific to the kind of language difficulties encountered by children with SLI, as compared to other language-impaired children. Sentence repetition is indeed an efficient tool to differentiate children with SLI from children with language problems due to hearing loss (Briscoe, Bishop, & Norbury, 2001), resolved late talkers (Petruccelli, Bavin, & Bretherton, 2012) or children with an autism spectrum disorder without language problems (Taylor, Maybery, Grayndler, & Whitehouse, 2014).

Sentence repetition can thus be considered as a powerful clinical psycholinguistic marker of SLI. Consequently, this task is of particular interest for speech-language pathologists (SLPs) to diagnose SLI. However, only two French standardized test instruments commonly used by SLPs include such a task for school-age children: the NEEL battery for children between 4 and 8 years old (*Nouvelles Epreuves pour l'Examen du Langage*, Chevrie-Muller & Plaza, 2001), and the L2MA2 battery for children between 7 and 12 years old (*Langage Oral, Langage Ecrit, Mémoire et Attention* [2nd Edition], Chevrie-Muller, Maillart, Simon, & Fournier, 2010). Moreover, data related to their

identification accuracy has not been reported to date. As far as we know, only one study assessed the identification accuracy of a sentence repetition task in French (Thordardottir et al., 2011). This task proved to be a sensitive (86%) and specific (92%) clinical marker of French 5-year-old children with SLI, confirming its potential power as a diagnostic tool in French, like it is in English. However, the task that Thordardottir and colleagues describe was adapted for the purpose of their study and is thus not available to French SLPs. In the present study, we assessed whether a diagnostic tool commonly used by French SLPs could be of particular interest for detecting language problems, and also if it could offer a first valid glimpse of the linguistic problems encountered by children with SLI.

1.1. Sentence repetition: a multi-determined task

Over and above the working memory resources recruited, performance on a sentence repetition task is highly dependent on linguistic abilities. When recalling sentences, long-term syntactic and semantic knowledge is recruited, enabling the binding of words into larger chunks, and the accurate recall of sentences whose length exceeds the subject's span (Allen & Baddeley, 2009). The significantly large dependence of this task on linguistic abilities was confirmed by Archibald and Joanisse (2009), who indicated a lower task sensitivity for children with working memory impairment than for language-impaired children.

Various studies showed that linguistic knowledge has a significant impact on sentence recall. Comparing sentence recall to that of word lists, Jefferies, Lambon Ralph and Baddeley (2004) classified error types as phonological, lexical, morphological, repetition and unrelated errors. They observed a larger amount of semantic substitutions and a lower amount of phonological errors during the recall of sentences, showing that semantic coding played a greater role, and phonological coding a lesser role, in this task as compared to word lists. Moreover, fewer order and morphological errors occurred when recalling sentences than when recalling word lists, revealing the impact of morphosyntactic knowledge on sentence retention. Finally, sentence repetition has been used to investigate morphosyntactic abilities both in typically developing and in language-impaired children (Christensen & Hansson, 2012; Komeili & Marshall, 2013). For example, Devescovi and Caselli (2007)

showed that sentence repetition is a reliable measure of morphosyntactic development between 2-4 years of age, since it correlates with the mean length of utterance and mirrors the qualitative production pattern in spontaneous speech.

Morphological, syntactic, and lexical abilities have a significant impact on sentence repetition performances. Yet, many studies reported that children with SLI demonstrate significant difficulties in producing grammatical morphology (e.g., Conti-Ramsden, 2003; Oetting & McDonald, 2001; Rice & Wexler, 1996) and accurate (complex) sentence structure (e.g., Novogrodsky & Friedmann, 2006; Pizzioli & Schelstraete, 2008), as well as weaknesses in lexical-semantic processing (e.g., McGregor, Oleson, Bahnsen, & Duff, 2013). The reason why sentence repetition has proved to be especially challenging for children with SLI is probably because it heavily recruits many linguistic processing abilities that correspond to weaknesses in these children.

1.2. Construct validity

Construct validity is a measure's ability to accurately reflect what it was designed to measure. Given all the processes at play in sentence repetition, there is a 'potential of sentence repetition to investigate language profiles' (Riches, Loucas, Baird, Charman, & Simonoff, 2010, p. 48). Performances in sentence repetition are mainly affected by morphosyntactic and lexical-semantic abilities. If this task is well designed to diagnose linguistic problems in children with SLI, performances of this task should be significantly affected by the morphosyntactic abilities on the one hand, and the lexical-semantic abilities on the other hand. Such an investigation requires first, to differentiate performance scores depending on the kinds of errors children make, and second, to attest that these various performance scores are indeed measuring the abilities that they were designed to measure.

Most standardized tasks propose a correct/false scoring procedure for the complete sentence, leading to a loss of important qualitative information about linguistic errors (e.g., Redmond, 2005). The coding procedure could indeed be a key factor to take into account when considering the diagnostic power of a test. According to Riches and colleagues (2010), the coding for

different kinds of errors has the best potential to identify differences in language phenotypes across different groups. In some tasks, the scoring procedure is somewhat more precise. For example, Archibald and Joanisse (2009), as well as Redmond, Thompson, and Goldstein (2011), administered the task developed by Redmond (2005), but adapted the scoring procedure so that it enabled a performance score of 2 (correct), 1 (up to three errors), or 0 (no response or more than three errors) for each sentence. The scoring procedure used in Thordardottir and Brandeker (2013) is slightly more precise, reflecting the percentage of words accurately repeated. However, to the best of our knowledge, no scoring procedure in a standardized diagnostic sentence repetition test integrates the analysis of the linguistic errors made by the children.

1.3. Aim

The first aim of the present study was to measure the identification accuracy of a sentence repetition task in identifying French children with SLI. The second aim was to assess the construct validity of the task. To this end, we examined whether multiple scoring measures separately reflect the dimensional properties of the task (i.e., the distinct linguistic abilities at play when repeating sentences).

2. Methods

2.1. Participants

Thirty-four French-speaking children with SLI aged 7 to 12 (8 girls; mean age = 9.11 years; $SD = 1.2$), 34 typically developing children (15 girls; mean age = 10.2 years; $SD = 1.4$) participated in the study. The SLI group and the age control (AC) group were comparable in age ($t < 1$). Children were recruited from schools in the city of Liege (Belgium). Informed consent was obtained from the parents. All children came from families with low or middle-class socioeconomic backgrounds, as determined by their parents' profession. All of the children were French native speakers, had no history of psychiatric or neurological disorders, and no neurodevelopmental delay or sensory impairment. Children with SLI were recruited from language classes in special needs schools. They

were diagnosed as children with SLI by certified speech-language pathologists. Moreover, by using standard clinical tests, we ensured that all of the children with SLI:

(1) scored more than 1.25 SD below expected normative performance in two language areas (Leonard et al., 2007). Their phonological abilities were assessed using the nonword repetition task of the *L2MA2* (Chevrie-Muller et al., 2010), their lexical abilities were measured by the French adaptation of the Peabody Picture Vocabulary Test (Echelle de Vocabulaire en Images Peabody; Dunn, Thériault-Whalen, & Dunn, 1993), their receptive grammatical abilities were measured by the sentence comprehension task of the *Evaluation du Langage Oral*, and their productive grammatical abilities were measured by the sentence production task of the *Evaluation du Langage Oral* (Khomsî, 2001);

(2) demonstrated normal-range nonverbal IQ (≥ 80) on the WISC-IV (Wechsler, 2005);

(3) showed normal-range hearing thresholds, as determined by audiometric pure-tone screening at 20dB HL at 500, 1000, 2000, & 4000 Hz.

Control children scored within the normal range on all language tests.

2.2. Procedure

Children performed the sentence repetition task of the *L2MA2*. This task consists of 13 to 15 sentences (depending on school-level) increasing in length (6 to 17 words, 11 to 24 syllables) and grammatical complexity. Each production is scored depending on seven scoring methods.

2.2.1. Correctness of the sentence (*SENT*). The sentence is scored 1 if it is exactly the same as the one heard. Otherwise it is scored 0, whatever the error.

2.2.2. Number of words (*NBR*). Each word accurately repeated is scored 1, whatever its place in the sentence.

Moreover, three scoring methods were designed especially to assess the morphosyntactic abilities: use of complex syntax, of functional words and of verb morphology.

2.2.3. Syntax (*SYNT*). The production is scored 1 if it is grammatically correct, and if it contains two verbs and a connecting word (not necessarily the expected ones). Otherwise, it is scored 0.

2.2.4. Verb morphology (*MORPH*). Each verb inflection is given 1 point if it is conjugated with the expected number (singular-plural), person (first, second, or third) and tense (past, present or future), even if it is not the expected verb (i.e., not the same stem). Given that sentences contain 1 or 2 verbs, each production can be scored 0, 1, or 2.

2.2.5. Functional words (*FUNC*). Number of functional words (pronouns, possessives, relatives, conjunctions, prepositions, determiners) accurately repeated.

Finally, two further scoring methods targeted the lexico-semantic abilities of the children

2.2.6. Lexical words (*LEX*). Number of content words (mainly nouns and verbs) accurately repeated.

Only the verb stems are taken into account in this scoring method: a verb is given 2 points if it is the target stem, even if it is not inflected as expected. Moreover, synonyms are taken into account.

While target words receive 2 points, synonyms of the target words (as defined in a list) receive 1 point.

2.2.7. Semantic (*SEM*). For each sentence, a list is given with the main one, two, or three ideas that must appear in the production to assign the semantic point (scored 0-1). If two main ideas are required and only one is produced, the production is scored 0.

This task was standardized on a normative sample of 455 children, including 90 children per school-age subgroup (from grade 2 to grade 6). Since the number of sentences varied depending on school level, we converted the raw scores into standard scores for each participant. The participants were asked to repeat exactly the same sentence that they heard.

3. Results

All test scores were converted to z-scores, based on the mean and standard deviation for each age group provided by the test manual, in order to be able to compare the same score across age groups. The statistical analyses were computed using z-scores. Descriptive statistics are shown in z-scores in Table 1.

3.1. Identification accuracy

First, we conducted discriminant analyses to assess the ability of the sentence repetition task to distinguish typical from atypical language functioning. Given that our seven measures were not independent, we conducted independent analyses for each scoring measure. The usual scoring procedure (correct/false; the SENT score) was entered into the discriminant analysis. Wilk's Lambda was significant ($\lambda = 0.30$; $F(1,66) = 153.89$, $p < .001$): all but one children with SLI were correctly classified (97.1%), and the majority of the control children (30) were also correctly classified (88.2%). The second scoring procedure, taking into account the number of words accurately repeated (the NBR score), also showed a significant Wilk's Lambda ($\lambda = 0.35$; $F(1,66) = 122.42$, $p < .001$). The classification power was only slightly lower: 29 children with SLI were correctly classified (85.3%) and 32 controls were also correctly classified (94.1%). Table 2 shows a high classification power for each scoring measure.

Second, we examined the sensitivity and specificity of the seven scoring measures at three different cut-off points: -1 SD (the 16th percentile in a normal distribution), -1.28 SD (the 10th percentile), and -2 SD (the 3rd percentile). The first two cut-off scores are often used in research, but are generally viewed as too lax in clinical practice, while -2 SD is the criterion officially recommended for SLI diagnosis in French-speaking countries (Thordardottir et al., 2011). The standardized scores were calculated for each participant and for each measure based on the initial standardization sample. Sensitivity and specificity scores at each cut-off score, as well as the associated likelihood ratios, are shown in Table 3. Sensitivity was high to very high for all scoring measures at the three cut-off points. Points of maximal sensitivity and specificity for each measure were identified from ROC (receiver operating characteristic) curves (Hastie, Tibshirani, & Friedman, 2009). This cut-off point varies between -1.31 SD and -2 SD depending on the measure. It is close to the cut-off score generally used in research for the two global scoring procedures, while it is more stringent for the SYNT, FUNC, and MORPH measures, probably revealing a locus of weakness in these children.

3.2. Construct validity: Investigation of underlying mechanisms

First, we assessed the extent to which the general scoring measure (the SENT score) reflects the more specific scoring measures. In order to do so, we performed correlational analyses. As shown in Table 4, correlations were high to very high between the SENT score and each specific score. The global scoring procedure thus accurately reflects more detailed performance scores. Highly similar correlational patterns were observed between the two groups, except for the correlations between the SENT scoring measure and the other measures in children with SLI. This is probably due to floor scores in the sentence scoring measure, with most of SLI children being unable to repeat one single sentence verbatim. We will explore this suggestion further in the discussion section.

Second, the specific measure scores were initially designed to reflect the morphosyntactic abilities on the one hand, and the lexico-semantic abilities on the other hand. The factorial structure of the scoring measures was thus analyzed with a principal component analysis, using a Varimax normalized rotation. Two principal components were obtained; their loadings are presented in Table 5. The FUNC, SYNT, and MORPH variables provided the largest loadings to the first factor, whereas the LEX and SEM variables provided the largest loadings to the second factor, with up to 96.48% of the variance explained. As expected, the performances seem to be related to two distinct linguistic abilities, the first one being related to morphosyntactic abilities and the second one being related to lexico-semantic abilities. This analysis thus provides evidence towards the construct validity of the scoring procedures.

4. Discussion

The first aim of the present study was to assess the specificity and sensibility of sentence repetition in the diagnosis of French-speaking school-age children with SLI. Results showed high levels of diagnostic accuracy for all measures, revealing that this task discriminates accurately between children with and without language problems. The second aim of this study was to assess the construct validity of the task, by investigating whether specific scoring procedures could help in characterising the distinct dimensional properties of the task. A principal component analysis

revealed that measures designed to assess performances in syntax, verb morphology, and functional words were loaded in one factor, while measures designed to assess performances in lexical and general semantics were loaded in another factor. These results attest the construct validity of the task by corroborating a distinct impact of lexical and syntactic abilities on performances.

4.1. Identification accuracy power

Our results show large group differences in performances for all the calculated scores: most of the children with SLI performed well under the expected scores, while most of the control children performed within the average expected scores. Sentence repetition appears to be a very complex task for children with SLI, whatever the scoring measure. Their mean performance on the usual correct/false scoring method (the SENT score) was 2.36 SD under the expected mean, with no SLI children performing better than 1.13 SD under the mean. The sensitivity of the task is perfect at the -1SD cut-off point, and is still high (.82) for a cut-off of -2SD, revealing very poor performances in children with SLI. The discriminant analysis showed a very high level of sensitivity (97.06 of SLI children accurately classified) and a high level of specificity (88.24 of control children accurately classified) for the performances with this scoring method. Thus, sentence repetition could be a good clinical marker of SLI in French, as has been established in other languages: English (Conti-Ramsden et al., 2001; Poll et al., 2010) and Cantonese (Stokes et al., 2006). It also corroborates previous results by Thordardottir et al. (2011) that were obtained with a sentence repetition task not available to SLPs. The present study confirms these results by giving credit to a sentence repetition task that is frequently used in clinical practice.

4.2. Optimal cut-off levels

Points of maximal sensitivity and specificity for global measures (SENT and NBR) were close to the cut-off score generally used in research (i.e., -1.28 SD, -1.31 SD, and -1.38 SD respectively). However, the optimal cut-off scores for the three more specific scoring measures – SYNT, FUNC and MORPH – were more stringent, revealing a specific locus of weakness in children with SLI. A specific deficit in producing complex syntax is in line with previous studies showing problems when

coordinating the production of more than one clause, including relative clauses, causal sentences, and full prepositional clauses (Donaldson, Reid, & Murray, 2007; Riches et al., 2010; Schuele & Dykes, 2005). The FUNC score was calculated using the number of pronouns, possessives, relatives, conjunctions, prepositions, and determiners that were accurately repeated. Specific difficulties in this area are in line with previous studies, revealing omissions of obligatory relative markers (Schuele & Dykes, 2005), causal connectives (Donaldson et al., 2007), clitic pronouns (Hamann et al., 2003; Jakubowicz, Nash, Rigaut, & Gerard, 1998), and prepositions (Grela, Rashiti, & Soares, 2004). Finally, results showed very frequent verb inflection errors in children with SLI, with no child performing better than -1.22 SD under the expected norms. Once more, this is in line with a number of studies documenting difficulties in verb, person and tense marking, even in French (Franck et al., 2004; Paradis & Crago, 2001).

4.3. Construct validity: The dimensional properties of the task

The second aim of this study was to assess the construct validity of the task by testing whether the morphosyntactic (SYNT, MORPH and FUNC) and lexical (LEX, SEM) scoring procedures were indeed able to separately reflect the dimensional properties of the task. A principal component analysis revealed two main factors. The first one was loaded by performances in respect of functional words, verbal morphology and complex syntax. The second one was loaded by performances in respect of lexical words and the general semantic meaning of the sentence. These data thus support the construct validity of the scoring procedures. Consequently, a systematic application of various scoring measures to sentence repetition performances could offer a valid first glimpse into the linguistic difficulties of children with SLI. Future research should endeavor to corroborate this proposal by assessing the concurrent validity of the task.

4.4. Differences between SLI and controls

Correlational analyses revealed a slight difference in the scoring measures' association pattern between children with and without language impairment. Regarding the correlations between the SENT score and other scoring measures, lower correlations were observed in children

with SLI than in the control group. However, this was not the case for the other general scoring procedure (i.e., the NBR score). Our main explanation for this is that the SENT scoring measure discriminates between children with and without language problems, but within the SLI group it lacks some discriminative power. Indeed, most children with SLI are not able to repeat even a single sentence verbatim. Raw scores show that among the 34 children with SLI, 16 children did not repeat one single sentence accurately, seven children succeeded in only one sentence, seven succeeded in two sentences, three succeeded in three sentences and only one child succeeded in four sentences (the maximum sentence score being either 13 or 15 depending on the child's school level). By taking into account the number of words repeated accurately, it better reflects the differences between a child who fails at verbatim repetition of sentences because he/she changes only one or two words and a child who fails because he/she is unable to repeat most of the sentence. The SENT score and the NBR score could thus be applied depending on the purpose of the assessment: if the main purpose of the assessment is to discriminate between children with and without language impairment, then a general 1/0 scoring procedure is valid. However, if the goal is to determine the severity of children's language impairment, then more precise measures are required.

To conclude, our study reveals high levels of diagnostic accuracy and construct validity for a French sentence repetition task used to differentiate children with and without language disorders. Future studies should investigate the concurrent validity of such a task and its ability to determine the severity of the language impairment.

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Table 1

Descriptive Statistics in Z-Scores for All Scoring Measures in Children with Specific Language Impairment (SLI) and Age Controls (AC)

		SLI	AC
SENT	<i>Mean (SD)</i>	-2.36 (0.55)	0.07 (1.00)
	<i>Range</i>	-3.28 – -1.13	-1.76 – 1.8
NBR	<i>Mean (SD)</i>	-3.86 (1.80)	0.07 (1.02)
	<i>Range</i>	-8.56 – -0.57	-2.8 – 1.28
SYNT	<i>Mean (SD)</i>	-4.93 (2.05)	-0.23 (1.09)
	<i>Range</i>	-10.2 – 0.07	-2.24 – 0.83
MORPH	<i>Mean (SD)</i>	-4.10 (1.92)	-0.07 (1.02)
	<i>Range</i>	-7.87 – -1.22	-2.21 – 1.3
FUNC	<i>Mean (SD)</i>	-4.28 (1.74)	0.03 (1.03)
	<i>Range</i>	-7.59 – -0.67	-2.38 – 1.6
LEX	<i>Mean (SD)</i>	-3.97 (2.20)	0.15 (1.07)
	<i>Range</i>	-10.02 – -0.31	-3.14 – 1.39
SEM	<i>Mean (SD)</i>	-3.22 (1.93)	0.03 (1.04)
	<i>Range</i>	-7.89 – 0.52	-2.48 – 1.32

Note. SENT, sentence: number of entirely correct sentences; NBR, number: number of words accurately repeated; SYNT, syntax: respect of the sentence syntax; SEM, semantic: respect of the general meaning of the sentence; FUNC, functional words: number of functional words accurately repeated; LEX, lexical words: number of content words accurately repeated; MORPH, verbal morphology: respect of the verb morphology

Table 2

Classification Power for Each Group in the Discriminant Analysis

	SENT	NBR	SYNT	SEM	FUNC	LEX	MORPH
SLI	97.06	85.29	88.24	82.35	88.24	82.35	82.35
AC	88.24	94.12	100	91.18	97.06	94.12	94.12
Total	92.65	89.71	94.12	86.76	92.65	88.24	88.24

Table 3

Sensitivity (Sens), Specificity (Spec), Positive Likelihood Ratio (PosLH) and Negative Likelihood Ratio (NegLH) for All Scoring Measures at Three Cut-Off Points and Optimal Cut-Off for Each Scoring Measure

		SENT	NBR	SYNT	SEM	FUNC	LEX	MORPH
-1 SD	Sens	1.0	.94	.97	.97	.97	.97	1.0
	Spec	.85	.82	.71	.82	.79	.85	.79
	PosLH	6.67	5.22	3.34	5.39	4.62	6.47	4.76
	NegLH	0.00	0.07	0.04	0.04	0.04	0.04	0.00
-1.28 SD	Sens	.97	.94	.97	.88	.97	.91	.97
	Spec	.88	.88	.76	.85	.82	.85	.85
	PosLH	8.08	7.83	4.04	5.87	5.39	6.07	6.47
	NegLH	0.03	0.07	0.04	0.14	0.04	0.11	0.04
-2 SD	Sens	.82	.85	.94	.74	.97	.82	.82
	Spec	1.0	.97	.88	.97	.97	.94	.94
	PosLH	-	28.33	7.83	24.67	32.33	13.67	13.67
	NegLH	0.18	0.15	0.07	0.27	0.03	0.19	0.19
TOTAL	Sens.	.97	.94	.94	.88	.97	.91	.88
	Spec.	.91	.91	.91	.88	.97	.91	.94
	Optimal cut-off	-1.31	-1.38	-2	-1.57	-1.92	-1.43	-1.7

Table 4

Correlations Between All Scoring Measures in the SLI Group (Age Control Group in Parentheses)

	SENT	NBR	SYNT	SEM	FUNC	LEX	MORPH
SENT	-	.38*	.59***	.17	.42*	.32	.54**
		(.81***)	(.72***)	(.68***)	(.77***)	(.74***)	(.80***)
NBR		-	.81***	.86***	.89***	.96***	.86***
			(.84***)	(.79***)	(.90***)	(.97***)	(.85***)
SYNT			-	.63***	.76***	.77***	.81***
				(.82***)	(.80***)	(.83***)	(.76***)
SEM				-	.76***	.89***	.75***
					(.82***)	(.79***)	(.71***)
FUNC					-	.86***	.84***
						(.85***)	(.70***)
LEX						-	.82***
							(.79***)
MORPH							-

* $p < .05$ ** $p < .01$ *** $p < .001$

Table 5

Factor Loadings for Principal Component Analysis with Varimax Rotation of Syntax (SYNT), Semantic (SEM), Functional Words (FUNC), Lexical Words (LEX) and Verb Morphology (MORPH) scoring measures.

	Factor 1	Factor 2
SYNT	0.85	0.49
SEM	0.51	0.85
FUNC	0.76	0.61
LEX	0.66	0.73
MORPH	0.79	0.56
Variance explained	52.56%	43.92%

Note. Factor loadings > .70 are in boldface