

AN INTRODUCTION TO THE RUSSIAN ADAPTATION OF THE BATTERY FOR THE ASSESSMENT OF LANGUAGE IN CHILDREN (BVL_RU)

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ABSTRACT

Introduction. A significant percentage of children (i.e., 5 to 8%) may present a significant language delay and/or impairment (Tomblin et al. 1997) which is not directly linked to any intellectual or cognitive disability. In such cases, children receive a diagnosis of Primary Language Impairment (PLI). Considering these numbers, it is extremely important to have reliable batteries of tests suitable to characterize and quantify such linguistic impairments in affected children. To the best of our knowledge, however, there is a need for such diagnostic tools for Russian speaking children. The majority of the existing language assessment procedures is based on qualitative evaluations and lack modern validating and standardizing procedures. The current study aims to describe the Russian adaptation of the “Batteria per la Valutazione del Linguaggio in bambini dai 4 ai 12 anni” (BVL_4-12; Marini et al., 2015). This is a comprehensive battery of tests with solid theoretical and psychometric properties that has been designed to assess comprehension, oral production, and repetition skills in children aged 4 through to 12. Most importantly, it is now being adapted also to other languages (e.g., Spanish, Slovenian, and German) ensuring the possibility to compare the linguistic performance of bilinguals and children with different languages from a cross-linguistic perspective.

Materials & Procedures. The Russian adaptation of the BVL_4-12 (BVL_RU) has paid particular attention to the specific features of Russian language (e.g., lexical frequencies as well as its phonological and grammatical properties). It has been administered to a cohort of preschool children from Omsk and Kursk, Russia. All children performed within normal range on the Raven's Progressive Matrices and on tasks designed to assess their phonological short-term and working memory.

Results & Discussion. After describing the tasks that form the BVL_4-12, we outline the performance of 2 children with diagnosis of PLI by calculating z-scores for each measure of the Battery. This analysis confirmed the presence of significant impairments in such children and suggested that the Battery is a valuable diagnostic tool to characterize their linguistic profile.

Keywords: Language assessment, Russian language, Primary Language Impairment

INTRODUCTION

Language development is a complex cognitive process that develops through childhood. A variable percentage of children might not develop language skills as expected even in the absence of relevant cognitive impairments or mental retardation. Such children might receive a diagnosis of Primary Language Impairment (PLI) (e.g., [1]). According to [2] approximately 7% of preschool children might be diagnosed with PLI. Similar figures have been reported also for school-age children [3]. Recent estimates on the Russian population suggest that the percentage of children with linguistic delay and/or impairment might be even higher than this (e.g.,[4]). Considering these numbers, it is extremely important to have reliable batteries of tests suitable to characterize and quantify such linguistic impairments in affected children. To the best of our knowledge, however, there is a need for such standardized batteries of tests for the assessment of language in Russian speaking children.

In a recent review on the existing neuropsychological diagnostic tools for Russian speaking children ([5]) Russian and non-Russian clinical testing traditions were compared. The authors of the review concluded that, across these diagnostic tools, stimuli presentation procedures are not always well described (sometimes missing), the psychometric properties, including their reliability and validity, of the normative values of these tests are not always adequately described.

One of the most interesting diagnostic tools available in Russian is the Russian Language Development Assessment (RLDA), a new diagnostic tool for children aged from 3 to 9 that was ideated as a compilation of 7 subtests from 3 different assessing tools originally developed for English native speakers [6]. This Battery includes tasks assessing also Sentence Comprehension (“Passive Vocabulary”), Naming skills, and phonological awareness. Unfortunately, the normative sample is quite limited (N=86 children) and the internal consistency is extremely variable (ranging from .46 to .81) with the vast majority of the tasks having a Cronbach’s alpha lower than .76. Furthermore, to the best of our knowledge, such tasks have been translated from English but have not been adequately adapted to the specific characteristics of Russian language (e.g., lexical frequencies, articulatory features, and the like). As a last remark, even in this interesting assessment tool there is a lack of standardized procedures for the assessment of pragmatic and narrative discourse generation skills.

The current study aims to simply outline the general characteristics of the Russian adaptation of the “Batteria per la Valutazione del Linguaggio in bambini dai 4 ai 12 anni” (BVL_4-12; [7]), a comprehensive battery of tests with solid theoretical and psychometric properties. It was originally developed to assess language development and detect potential language disorders in Italian speaking children and consists of tasks assessing oral production, comprehension and repetition across a number of linguistic skills. A pilot study on its reliability and effectiveness of the Russian adaptation with the inclusion of 63 participants is described elsewhere [8]. For the purposes of this short article, we will outline the main features of the Russian adaptation of the BVL_4-12 (BVL_RU) and will show its utility in the assessment of linguistic skills in two children with diagnosis of PLI.

METHODS

PARTICIPANTS

Case 1 is a 5.10-year-old girl. Case 2 is a 6.03 male. Both children come from Omsk, Russia and were born in monolingual Russian-speaking families with a good level of instruction (their fathers received both 14 years of formal education, while their mothers received 16 and 14 years of formal education, respectively). Both children had normal non-verbal intelligence as measured by the Raven's Colored Progressive Matrices (Case 1: 22 [raw score]; Case 2: 27 [raw score]). Both children had previously received a diagnosis of PLI (Russian – OHP 2\3). Furthermore, both of them have recently begun to receive a standard language treatment in their group in kindergarten.

Materials & Procedures

The BVL_RU assesses oral production, comprehension and repetition in children aged 4 to 12.

Tasks assessing oral production skills

Oral production is assessed by administering a cohort of tasks designed to evaluate phonetic, lexical, sentential and narrative discourse production. Lexical production skills are assessed by administering a task of Naming and Articulation for children aged 4 to 6.11 years old and a Naming test for older children. Both tasks allow clinicians to estimate the children's ability to select a target lexical item in their mental lexicon, as well as their lexical access and production skills. Namely, the **Naming and Articulation task** for younger children is composed by a set of 77 images that children are required to name. Each target item has been controlled in terms of lexical frequency (Low=16; Medium:34; and High:27; [9]), semantic category (different categories such as animals, tools, vehicles, body parts, colors, action verbs, and so on) and morphological class (70 nouns and 7 verbs) in Russian. Furthermore, for this task, each target item was selected to present the whole inventory of Russian phonemes in different positions in the word. The administration of this task allows clinicians to derive two separate scores: one Naming score (which assesses lexical selection skills and is calculated by summing all correct responses [Max: 77]) and one Articulatory score (which assesses articulation and is calculated by giving 2 points if the target word has been correctly uttered by the child at the first presentation of the image or 1 point if the child managed to articulate it correctly in a repetition trial provided by the clinician [Max: 154]). The **Naming task** for older children is formed by a total of 67 images depicting an equal amount of target lexical items controlled for frequency, semantic and morphological category. It does not include an articulatory score but just a Naming Score (Max: 67). A **semantic fluency test** allows to determine the child's ability to select target words which belong to specific semantic categories in the mental lexicon. The examiner asks the child to produce as many words as possible belonging to a specific semantic category over a 1-minute time span: 1 minute for the ANIMALS category; 1 minute for the OBJECTS category. In each of the two parts of the test 1 point was scored for every correctly produced word. Repetitions and words that do not pertain to the target category are ruled out by the count. Similarly, a **phonological fluency test** allows to determine the child's ability to access to words in the mental lexicon by using a phonological strategy. It is, thus, possible to evaluate not only his/her lexical abilities but also the ability to focus on the task, inhibiting inadequate words and selecting only those compatible with the instructions provided by the examiner. The examiner asked a child to produce the highest possible number of words beginning with a specific phoneme over a 1-minute time span: 1 minute for the /p/ sound; 1 minute for

the /s/. For each of the two conditions the examiner scored 1 point for every correctly produced word. This is obviously a test which relies heavily on executive function skills and on metaphonological awareness. It is therefore not a good task to administer to children younger than 7 years of age. A **sentence completion task** allows to evaluate the child's ability to elaborate aspects linked to the derivational and inflective morphology of the verb in a completion task which includes a total of 14 sentences of increasing length and grammatical complexity. The examiner asks children to listen to a given sentence (the prime) and then to complete a second sentence for which only the beginning has been provided by the examiner (target). One point is assigned for each correctly completed sentence. As the focus is on verb inflection, the way in which the child re-elaborates the other components of the sentence was irrelevant. Therefore, phonological or articulatory mistakes were not sanctioned. The final score was obtained by the sum of correct answers. The highest possible score is 14. A **narrative discourse production task** allows clinicians to obtain a sample of the child's narrative speech which can be analyzed with a Multilevel Procedure for the Assessment of Narrative Discourse [10]. The child is asked to produce a story under the presentation of a vignette composed by 6 colored scenes (The Nest Story by Paradis [11]). The analysis allows having information about the child's productivity (in terms of *Produced words*; *Narrative fluency*; *Mean length of utterance* – MLU), **lexical processing** (*% of Phonological Errors*; *% of Semantic Errors*; *% of Paragrammatic Errors*), **grammatical production** (*% of Complete Sentences*), **discourse processing** (*% of Cohesion Errors*; *% of Local Coherence Errors*; *% of Global Coherence Errors*) and **functional informativeness** (*% of Lexical Informativeness*).

Tasks assessing oral comprehension skills

Oral comprehension is assessed by administering a cohort of tasks designed to evaluate metaphonological, lexical, grammatical, pragmatic and prosodic comprehension. A **phonological discrimination test** aims at evaluating the child's ability to recognize phonologically identical words and discriminate between minimal pairs, i.e. words that only differ in one single phoneme. This test permits to extrapolate a % of Phonological Discrimination. The stimuli were selected so to present a child with 10 pairs of identical words and 20 minimal pairs. Overall, a list of 30 pairs of words was read out loud to a child during the task. Children were supposed to respond “yes” each time they heard identical pairs. The maximum possible score for this task is 100%. Lexical comprehension is assessed with two tasks with different levels of difficulty: A **Lexical Comprehension Task** for Children aged from 4 to 5.11 years old and on for older children (from 6.00 to 11.11 years of age). The former task consists of 18 target words checked for their frequency of use in Russian (high: 10; Medium: 7; Low: 1 [13]). After hearing the target word, the child is required to select which of 4 pictures best represents the meaning of the heard word. Of the 4 pictures, one is a target image whereas the remaining three images represent one semantic, one phonologic and one unrelated distractor, respectively. Particular attention was paid to the need to select for each target word in Russian an appropriate distractor (especially considering the need to select appropriate phonological distractors for Russian target words). This way, this test also allows to determine if the child does not manage to comprehend the meaning of the perceived word because (s)he confuses phonologically similar words (choosing phonological distractors), because (s)he is not able to inhibit words that belong to a similar semantic field (choosing semantic distractors), or because (s)he has general lexical comprehension difficulties (chaotically choosing the target or one of the three

distracting stimuli). The maximum possible score is 18. For older children, the task has the same architecture but is longer (42 items) and more difficult (more semantic categories and more words with low frequency) with a maximum score of 42. A **grammatical comprehension** task assesses the ability to understand the meaning of several sentences with varying length and syntactic organization. It is, thus, possible to establish the maturation level of the receptive grammatical system achieved by the child. A series of 40 sentences was read out loud to children. For each sentence, they were required to indicate a target image among four images (one target and three distractors containing modified elements of inflectional morphology and syntactic organization). The maximum total score is 40. The qualitative aspect, on the other hand, derives from the possibility to know if a possible lower-than-expected performance at this test stems from difficulties in discriminating between specific distractors and the target picture. A **grammatical judgment** task allows to evaluate the child's ability to make judgements of grammatical acceptability on a total of 18 sentences of variable length and syntactic complexity. A poor performance on this test might indicate a problem in the development of the child's metagrammatical abilities. Overall, 9 grammatically unacceptable sentences and 9 grammatically well-formed sentences have been created with a maximum score of 18. A **comprehension of idiomatic expressions** task evaluates the child's ability to understand the indirect meaning conveyed by 10 idioms by choosing the correct one among various alternatives. The task consists in reading the idiom to the child and then providing three possible alternative interpretations: one is correct; one is semantically close to the meaning of the target idiom but pragmatically inappropriate; the last one coincides with the literal meaning of the very idiom. The maximum score at this test is 10. A **comprehension of linguistic prosody** task evaluates the child's ability to perceive and interpret the linguistic prosody of a sentence by determining if it is a question, an order or a statement. The examiner played one by one 12 prerecorded items on the laptop. Twelve simple sentences composed of an independent clause without dependent clauses. Each sentence's prosody has been modulated in order to produce a statement, an order or a question. The examiner asked a child to establish whether the heard sentence is a question, a statement or an order for a maximum score of 12. Similarly, a **comprehension of emotional prosody** task evaluates the child's ability to perceive and interpret the emotional connotation of a sentence by determining if a sentence was produced with a happy, sad or angry intonational contour. The procedure is similar to the Linguistic prosody test. Twelve declarative affirmative sentences in the active voice whose prosody has been modulated in order to convey different emotional states: happy intonation, sad intonation or angry intonation. The examiner also showed children 3 pictures, each depicted a sad face or child, a happy face or child and an angry face or child and then asked a child to establish whether the heard sentence was pronounced happy, sad or angry for a maximum score of 12.

Tasks assessing oral repetition skills

Oral repetition is assessed by administering a cohort of tasks designed to evaluate the child's ability to repeat a list of existing words, legal non-words and sentences. The **word repetition** task allows to evaluate the children's ability to correctly perceive and repeat a list of 15 words (14 nouns and 1 adjective) with increasing syllabic length (from 1 to 4 syllables). If the word repeated by the child presented additions, replacements and/or omissions of phonemes, (s)he did not receive a point. The

maximum score is 15. The **non-word repetition** task allows to evaluate the children's ability to correctly perceive and repeat some simple sequences of phonemes that do not form words that actually exist in their language even if they present a legal phonotactic organisation. An online survey of 617 adult native speakers of Russian and a pilot study with 34 children let us select 15 sequences of phonemes of increasing length (from 1 to 4 syllables) plausible for Russian language. If the sequence repeated by the child presented additions, replacements and/or omissions of phonemes, (s)he did not receive a point. The maximum score is 15. Finally, a **sentence repetition** test allows to evaluate the ability of children to correctly perceive and repeat a series of 20 sentences of increasing length and grammatical complexity. A sentence is considered correctly repeated when its words have been reproduced in the correct order. If the sentence repeated by the child presents additions, replacements, omissions or reformulations, (s)he did not receive a point. The maximum score is 20.

Results

For this study, we compared the Z-scores of two Russian-speaking participants with diagnosis of PLI. The z-scores were calculated by deriving the mean and standard deviations of the scores obtained by a group of 18 Russian-speaking children with typical development and with the same age as the two participants with PLI. The cutoff score for normality for each measure was set at 1.5 SD below the mean or over it for errors. Tasks assessing phonological fluency, narrative production, comprehension of linguistic prosody and comprehension of idiomatic expressions were not administered to these children as they tap abilities that are not fully-fledged at this young age.

Case 1 scored within 1.5 and 2 SDs below the mean in both Naming (-1.94) and Semantic Fluency (1.70) while performing within normal range in Articulation (-.33) and Sentence Completion (-.86). Case 1 demonstrated profound difficulties on phonological discrimination (-4.00), Grammatical comprehension and grammatical judgment (-2.81, -3.99 and -3.07, respectively). On the contrary, she scored low but within normal range on the task assessing the Comprehension of Emotive prosody (-1.37). Finally, Case 1 scored within normal range on tasks assessing the repetition of words and non-words (.56 and -.54, respectively), but had important difficulties on the task assessing sentence repetition (-2.38).

Case 2 scored lower than normal in Articulation (-1.80), Naming (-2.11), and Sentence Completion (-1.81) but had normal Semantic Fluency (-0.78). His Phonological Discrimination skills were low but within normal range (-0.97). On the contrary, he performed very low on lexical (-4.49) and grammatical comprehension (-1.83). He scored normally at the grammatical judgement task (.55), but low on the *Comprehension of emotive prosody* task (-3.44 SD). Finally, he scored significantly lower than normal on the three tasks assessing repetition skills: Word repetition (-4.49), Non-word repetition (-2.16) and Sentence Repetition (-2.98).

Discussion

This brief report aimed to describe the features of a comprehensive battery of linguistic tasks that has been recently adapted into Russian language (i.e., BVL_RU). Notably, here we also provide two examples of its potential usefulness to detect and characterize linguistic impairments in children with delayed and/or impaired language development. As shown in the Results' section, the BVL_RU allowed us to describe the linguistic profile of these two children. Indeed, it 1) confirmed the presence of linguistic

impairments in both of them, 2) captured the different gravity levels of their impairments across different linguistic domains, and 3) allowed us to quantify such impairments in order to plan future intervention programs whose efficacy might be quantified with follow-up assessments.

As to the first issue, we would like to stress that such a comprehensive and quantitative assessment allows clinicians to perform accurate diagnoses. As shown by their profile, both children were presenting a mixed expressive-receptive impairment (International Classification of Diseases_10th Edition code: F80.2) which was not limited to their lexical skills but extended also to other domains, such as grammatical and, for Case 2, even prosodic processing. As for the second point outlined above, the analysis of **Case 1**'s production skills revealed a weakness in lexical production. Indeed, she scored within 1.5 and 2 SDs below the mean in both Naming and Semantic Fluency. The fact that she performed within normal range in Articulation and Sentence Completion suggests that her production disturbance is limited to processes of lexical selection whereas her phonetic (i.e., articulatory) and morphologic skills were not affected. Case 1 demonstrated profound difficulties also in comprehension. Her impaired phonological discrimination skills may have significantly contributed to her lower lexical repertoire (as indirectly measured by the Semantic Fluency task) but also to the low skills of lexical and grammatical comprehension as well as grammatical judgment. **Case 2** had a different linguistic profile than Case 1 and the BVL_RU managed to capture such differences. His production skills were severely impaired and not limited to lexical selection processes as shown by his performance on Articulation, Naming, and Sentence Completion. Interestingly, his performance on the Semantic Fluency task was within normal range. As for comprehension, his Phonological Discrimination skills were low but within normal range, whereas his lexical comprehension and grammatical comprehension skills were severely to moderately impaired. Even if he had normal grammatical judgement abilities, Case 2 was significantly impaired at the *Comprehension of emotive prosody* task. Finally, he scored significantly lower than normal on the three tasks assessing repetition skills: Word repetition (-4.49), Non-word repetition (-2.16) and Sentence Repetition (-2.98).

Conclusion. This study shows that the BVL_RU is a valuable tool for the assessment of language skills also in Russian-speaking children. As mentioned in the Discussion, it not only confirmed the former diagnosis of language impairment, but allowed also capturing the different gravity levels of such impairment across different linguistic domains. Finally, the BVL_RU provided a way to quantify such impairments in order to plan future intervention programs whose efficacy might be quantified with follow-up assessments. As it is under adaptation to several other languages (e.g., German, Slovenian, Spanish) we hope that colleagues throughout Russian will be interested in joining us in the next step of the standardization of this Battery, i.e., its administration to a large cohort of children aged 4 to 12 so to have reliable normative data for the pediatric population of Russia. This will allow clinicians and researchers to have a reliable way to quantify their patients' linguistic difficulties and to compare their observations with those of colleagues in other countries in a crosslinguistic perspective.

ACKNOWLEDGEMENTS

This work was supported by the Russian Government Program of Competitive Growth of Kazan Federal University and by a grant from Erasmus Mundus Action 2 Program

("International Academic Mobility Network with Russia - IAMONET-RU" project) to N.E. The authors are grateful to Prof. Elena N. Guts (Omsk State F.M. Dostoevsky University) and Tatiana A. Druzhinina for their kind assistance during data collection process. Thanks to all our young participants and their parents.

References

- [1] Bishop, D.V.M., Ten questions about terminology for children with unexplained language problems, *International Journal of Language and Communication Disorders*, vol. 49, pp. 381–415, 2014.
- [2] Tomblin, J.B., Records, N.L., Buckwalter, P., Zhang, X., Smith, E. And O'Brien, M. Prevalence of specific language impairment in kindergarten children, *Journal of speech and hearing research*, vol. 40, pp. 1245–1260, 1997.
- [3] Reilly, S., Tomblin, B., Law, J., McKean, C., Mensah, F.K., Morgan, A., Goldfeld, S., Nicholson, J.M. & Wake, M. Specific language impairment: a convenient label for whom?, *International Journal of Language & Communication Disorders*, vol. 49(4), pp. 416-451, 2014.
- [4] Vishnjova, E.A. Osobennosti formirovaniya zritel'no-verbal'nyh funkciy u detej s narushenijami rechi. *Vestnik Moskovskogo gosudarstvennogo lingvisticheskogo universiteta*, 7 (640), 2012
- [5] Astaeva, A.V., & Berebin, M.A. Comparative analysis of Russian and foreign systems for the neuropsychological diagnosis of children from the standpoint of the psychometric approach and its limitations when used in clinical practice, *Psychology in Russia: State of the art*, 5, 2012.
- [6] Prikhoda N.A. Russian Language Development Assessment as a Standardized Technique for Assessing Communicative Function in Children Aged 3–9 Years, *Psikhologicheskaya nauka i obrazovanie (Psychological Science and Education)*, vol. 21, no. 3, pp. 25–33 (In Russ., abstr. in Engl.), 2016.
- [7] Marini, A., Marotta, L., Bulgheroni, S., Fabbro, F. *Batteria per la Valutazione del Linguaggio in Bambini dai 4 ai 12 anni*. Firenze, Italy: Giunti O.S., 2015.
- [8] Eliseeva, N., Marini, A., Gorobets E. (submitted). Russian adaptation of the Battery of tests for language assessment in children from 4 to 12 years old.
- [9] Ljashevskaja, O. N., & Sharov, S. A. Chastotnyj slovar' sovremennogo russkogo jazyka (na materialah Nacional'nogo korpusa russkogo jazyka), 2009. URL: <http://dict.ruslang.ru/freq.php>.
- [10] Marini, A., Andreetta, S., Del Tin, S. & Carlomagno, S. A multi-level approach to the analysis of narrative language in aphasia. *Aphasiology*, 25(11), pp 1372-1392, 2011.
- [11] Paradis, M. *The assessment of bilingual aphasia*. Hillsdale, NJ: Erlbaum, pp 260, 1987.