Factor structure of the Serbian version of the Children's Communication Checklist-2

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ABSTRACT

Keeping in mind that traditional tests were largely insensitive to pragmatic impairment, Bishop (2003) created a second version of the *Children's Communication Checklist* (CCC-2) in order to identify pragmatic deficits in children with communication problems. Unfortunately, it was revealed that certain subscales of the Serbian version of the CCC-2 have unacceptably low internal consistency. Because dividing the test into original subscales did not apply for the Serbian population, the aim of this paper was to determine the factor structure of the CCC-2. The sample consisted of 1344 typically developing, monolingual participants of both sexes, aged from 4 to 17 (M=9.52; SD=2.72). Participants were recruited from three statistical regions in Serbia. All participants attended regular kindergarten, elementary or secondary schools. CCC-2 factor analysis was determined by using the principal component method, with Varimax rotation of principal axes. A factor analysis showed that the CCC-2 had three factors (General Communication Ability, Pragmatics and Structural Language Aspects), which accounted for 29.39% of the total variance. A three-factor solution should be further confirmed in the course of a clinical validation of the CCC-2.

Keywords: pragmatics, language, autism, impairment

1. Introduction

The lack of diagnostic instruments for specific language impairment, adapted for Serbian speakers, is further complicated by the fact that great attention must be paid to the assessment of pragmatic competence in the differential diagnosis of specific language impairment and autistic spectrum disorders. Traditional tests are usually directed towards structural language aspects and are thus insensitive to problems in the area of pragmatic functioning. All attempts to create tests for assessing pragmatic competence have been unsuccessful so far. The reasons for failure, in some cases, can be found in inadequate test sensitivity and the assessment limitation to superficial aspects of pragmatic functioning (*Test of Pragmatic Language*, Phelps-Terasaki & Phelps-Gunn, 1992). Additionally, tests that have never been standardized, such as the *Pragmatic Protocol* (Prutting & Kirchner, 1983), were used for the assessment. In addition to these limitations in assessing pragmatic functioning, Bishop believes that pragmatic competence, as an ability to use language in a social context, can be appropriately assessed only in that same context (Bishop & Adams, 1991). Thus, we cannot have realistic insight into the pragmatic abilities of a child by administering the test in artificial surroundings. Hence, Bishop proposed the idea of a checklist that would be completed by parents, special educators, or teachers, i.e., people who observe a child's behaviour in different social contexts for a longer time period.

The first version of the *Children's Communication Checklist* (CCC; Bishop, 1998) consisted of 70 items grouped into nine subscales. The pragmatic composite, which was calculated by adding up the scores of five "pragmatic subscales", was the only composite score in this scale. Based on the pragmatic composite scores, children with pragmatic deficits were clearly distinguished from the students with normal speech and language development. However, subtypes of communication disorders could not be determined. Certain limitations were determined in responding, the order of items and single scale usability, which is why the

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second version of the *Children's Communication Checklist* (CCC-2; Bishop, 2003) was created.

Table 1. *Subscales included in the second version of The Children's Communication Checklist – CCC-2.*

Subscale	Title	Items	Assessment area
A	Speech	2, 24, 29, 38, 44, 51, 58	
B	Syntax	1, 17, 27, 36, 43, 55, 69	Structural language aspects
C	Semantics	4, 6, 12, 32, 46, 64, 66	
D	Coherence	10, 25, 40, 48, 50, 53, 68	
E	Inadequate Initiation	5, 21, 35, 37, 45, 59, 70	
F	Stereotypical Speech	11, 18, 23, 30, 42, 61, 62	Pragmatic abilities
G	Using Context	15, 19, 28, 34, 41, 54, 60	
H	Nonverbal Communication	8, 14, 20, 31, 39, 56, 65	
I	Social Relations	3, 7, 13, 16, 33, 57, 67	Reciprocal social relations; unusual interests
J	Interests	9, 22, 26, 47, 49, 52, 63	

The checklist consists of 70 items grouped into 10 subscales, each containing seven items. Five out of seven items in each subscale refer to disorders, while the remaining two items describe speech and language abilities. The CCC-2 comprises 50 items that refer to disorders and 20 items that refer to abilities. To avoid the examiner's confusion, all of the items that assess disorders are presented in the first part, while all the items relating to abilities are presented in the second part of the CCC-2. The first four subscales (A–D) assess different aspects of language structure, vocabulary and discourse. The next four subscales (E–H) assess pragmatic deficits, while the remaining two subscales assess communication disorders characteristic of children with autism (Table 1).

Raw scores are obtained by adding up the single scores of each item in a specific subscale. Thus, obtained raw scores are transformed into scaled scores with an arithmetic mean of 10 and a standard deviation of 3. The *General Communication Composite* (GCC) is obtained by adding the scaled scores of the first eight subscales. The second composite score, *Social Interactions Deviance Composite* (SIDC), which indicates deviant social interactions, is obtained by subtracting the total of the scaled scores on the first four subscales from the total of the scaled scores on subscales E, H, I and J. This composite score should point to a possible discrepancy between structural language aspects and social interactions in the tested children.

The lack of assessment tools for the evaluation of pragmatic aspects of language was the motivation for the translation and adaptation of the original CCC-2 to several other languages. Re-examination of the reliability measures in Dutch-speaking, typically developing children revealed that the internal consistency (α) of the CCC-2 scales in Dutch adaptation ranged from .53 to .75, while the test-retest reliability (q) ranged from .49 to .77 (Geurts, 2007). It was also found that the internal consistency in clinical samples (α) ranged from .48 to .88. The Dutch version of the CCC-2 was used in the determination of language profiles of the children with autism spectrum disorders, specific language impairment and attention deficit hyperactivity disorder (ADHD; Geurts & Embrechts, 2008).

The first evaluation of the psychometric qualities of the Norwegian adaptation of the CCC-2 indicated reasonable internal consistency, with Cronbach's alpha values ranging from 0.73 to 0.89. The Norwegian version of the CCC-2 successfully differentiated between a group of language-impaired and non-language-impaired children (Helland, Biringer, Helland, & Heimann, 2009).

The Quebec French version of the CCC-2, complete with rigorous methodology, incorporated qualitative analyses, which confirmed the conceptual equivalence of the

American and Quebec French versions of the CCC-2 (Vézina, Samson-Morasse, Gauthier-Desgagné, Fossard, and Sylvestre, 2011).

Since it was published, the CCC-2 has been widely used, primarily for the purpose of identifying distinctive communication profiles in children with specific language impairment, ADHD and autism spectrum disorders (Bignell & Cain, 2007; Bishop & McDonald, 2009; Geurts & Embrechts, 2010; Grzadzinski et al., 2011; Norbury, Nash, Baird, & Bishop, 2004; Volden & Phillips, 2010; Volden, Coolican, Garon, White, & Bryson, 2009; Whitehouse, Barry, & Bishop, 2008). It was also demonstrated that the CCC-2 may be used as a quick screening device for the broader autism phenotype in typically developing siblings of children with autism (Bishop, Maybery, Wong, Maley, & Hallmayer, 2006). In several studies, the CCC-2 was successfully used for identification of language impairment in children with sex chromosome trisomies (Bishop et al., 2011), auditory processing disorder (Dawes & Bishop, 2010; Ferguson, Hall, Riley, & Moore, 2011), schizophrenia (Solomon et al., 2011), sleep problems (Quach, Hiscock, Canterford, & Wake, 2009) as well as in deaf children with cochlear implants (Ramirez-Inscoe & Moore, 2011).

Unfortunately, there was no factor analyses of the CCC-2 published in peer-reviewed journals until now.

Research carried out in Serbian-speaking areas showed that internal consistency reliability of single subscales in the Serbian translation of the CCC-2 is unacceptably low because the Cronbach's alpha coefficient was from 0.46 on subscale *Syntax* to 0.75 on subscale *Speech* (Glumbić, Brojčin, and Đorđević, 2010). The low internal consistency should not come as a surprise because there were only seven items in each scale of the CCC-2. In addition, it is reasonable to expect rather low internal consistency of the CCC-2 scales in a population of typically developing children, keeping in mind that neither the CCC nor the CCC-2 were developed to assess normal communication competence. Similar results were obtained by using the CCC in a Dutch sample of typically developing children. The internal consistency of the CCC scales ranged from 0.02 to 0.68. On the contrary, alpha indices of internal consistency in the clinical sample were quite acceptable, ranging from 0.58 to 0.86 (Geurts et al., 2009).

The GCC had acceptable internal consistency reliability. Based on this composite score, children with specific language impairment were clearly distinguished from the control group (Glumbić & Brojčin, 2010).

The original subscale division of the Serbian version of the CCC-2 is rather questionable; however, virtually nothing is known about its factor structure. Hence, the objective of this study was to determine the factor structure of the CCC-2 adapted for Serbian-speaking areas. Based on the original model (Bishop, 2003), it is reasonable to expect that factor analysis would produce at least two reliable factors for the structural and pragmatic aspects of communication.

2. Method

2.1. Participants

Our aim was to include children of all age groups encompassed by the CCC-2, which is between the ages of 4 and 16 years and 11 months. Children were recruited from kindergarten, elementary and secondary schools. Only those children who, according to their parents and teachers, had no signs of developmental problems were admitted. In addition, the sample consisted exclusively of native Serbian speakers.

In this way, the sample of 1344 participants was formed. The sample consisted of 603 (44.87%) boys and 741 (55.13%) girls, with an average age of 9.52 (SD=2.72). Table 2 shows the participants' distribution according to their age and gender.

Table 2. *The participants' distribution according to their age and gender.*

	Boys		Girls		∑	
Age categories	*N*	%	*N*	%	*N*	%
4-4,11	28	4.64	21	2.83	49	3.65
5-5.11	12	1.99	33	4.45	45	3.35
6-6.11	57	9.45	54	7.29	111	8.26
7-7.11	81	13.43	100	13.50	181	13.47
8-8.11	95	15.75	120	16.19	215	16.00
9-9.11	95	15.75	117	15.80	212	15.77
10-10.11	90	14.93	115	15.52	205	15.25
11-11.11	44	7.30	55	7.42	99	7.37
12-12.11	25	4.15	32	4.32	57	4.24
13-13.11	25	4.15	32	4.32	57	4.24
14-14.11	14	2.32	25	3.37	39	2.90
15-15.11	29	4.81	22	2.97	51	3.79
16-16.11	8	1.33	15	2.02	23	1.71
∑	603	100	741	100	1344	100

The poor cooperation among kindergarten teachers compared to primary and secondary school teachers is the reason for the unequal number of participants in each age group in the tested sample.

Children from three statistical regions were included in the research: Vojvodina, Belgrade and Šumadija and Western Serbia. The residences of the tested children were divided into four categories according to the population from the last census. Three hundred and forty one (25.54%) participants lived in regions with a population of up to 5000. Most participants, 507 (37.98%), lived in regions where the population was between 5000 and 20000, while the fewest participants, 167 (12.51%), lived in cities with the population between 20 000 and 50 000. Almost a quarter of the sample, 320 (23.97%) participants, lived in big cities with a population of over 50 000. The cities of residence for nine of the children (0.70% of the sample) were not known to us.

Of the 1344 participants, the authors obtained information on the education level for 1277 (95%) fathers and 1292 (96.1%) mothers. Seventy-seven (6.03%) fathers and 87 (6.73%) mothers completed elementary school; 90 (7.05%) fathers and 42 (3.35%) mothers finished a vocational school; 854 (66.87%) fathers and 739 (57.20%) mothers completed a four-year secondary school; and 256 (20.05%) fathers and 424 (32.82%) mothers had a college or a university degree. The term college was reserved for the purpose of gathering and presenting data because schools of vocational studies are new in our educational system, introduced by the Law on Higher Education in 2005 ("Official Gazette RS", 2005).

Most parents of the tested children completed a secondary school, followed by those with a college or a university degree, while the number of parents who finished a two- or three-year secondary school and those who finished elementary school were disproportionally lower. These data do not reflect the distribution of the general population according to education and gender. According to the 2002 census, only 12.27% of men and 9.87% of women had a college or a university degree. However, 39.03% of men and 51.92% of women were uneducated or had completed a maximum of eight grades of elementary school (Statistical Office of the Republic of Serbia, 2003). We assume that parents with a lower level of education refused to cooperate more often or were not available to us if their children did not attend the educational institutions where the research was conducted.

2.2. Measures

One of the authors of this paper translated the CCC-2 into Serbian. Then, a graduate English teacher translated the Serbian version of the CCC-2 into English. After that, two teachers of English Language and Literature were asked to compare the two texts in English (the original scale and translation of the translation). Minor changes in the content of certain items were made by their suggestion.

With regard to the fact that the CCC-2 standardization is encompassed within a bigger project, we obtained parents' informed consent for the complete research. Based on a general questionnaire completed by parents and teachers, bilingual children and those suspected of having hearing impairments or intellectual disabilities were excluded from the sample.

In addition to written instructions for completing the scale, the item grading technique was orally explained to each informant. Informants were teachers with at least a bachelor degree, who were very familiar with the children being evaluated. For children aged 4 to 6, the respondents were kindergarten teachers who had daily contact with the student for at least six months, and for older participants, the respondents were teachers of core academic subjects.

2.3. Factor Analysis

The raw scores for all 70 items were used for factor analysis. While observing the CCC-2 factor structure, some authors (Christensen, 2007) excluded all items from the subscales of *Social Relations* and *Interests* from the analysis, primarily because the aforementioned scales test neither structural nor pragmatic language aspects. Because pragmatic competence is not limited only to language resources, we believe that a priori exclusion of the aforementioned items would reduce the usability of the CCC-2, especially in detecting autistic spectrum disorders.

The Kaiser-Meyer-Olkin indicator was 0.924, which exceeds the recommended value of 0.60, while Bartlett's Test of Sphericity is statistically significant ($p < 0.001$). The data obtained support the correlation matrix factorability. Factor analysis was determined using the principal component method, with Varimax rotation of principal axes.

3. Research results

Based on Kattel's scatter diagram criterion, three factors, which account for 29.39% of the total variance, were extracted. Table 3 shows the percentage variance values that could be explained by the extracted components.

Although the analysis of the main components revealed the presence of a large number of components with eigenvalues larger than one, Cattell's scree test requires dropping all further components after the one starting at the elbow. The first component accounts for 18.2%, the second for 6.4%, and the third for 4.8% of the variance. All other components account for an insignificant variance percentage.

A rotated solution indicated the existence of a simple structure, with all of the variables having significant loadings on only one of the components. Table 4 reviews the factor loadings.

Three variables, items 50 *(It is hard to make sense of what s/he is saying - even though the words are clearly spoken)*, 16 *(Is left out of joint activities by other children)*, and 27 *(Produces utterances that sound babyish because they are just two or three words long, such as "me got ball" instead of "I`ve got a ball" or "give dolly" instead of "give me the dolly")* had low correlations (less than .30) with only the second latent dimension. Due to a

low factor loading, we believe that the aforementioned items should be excluded from the Serbian version of the CCC-2.

Should the extracted factors be accepted as the subscales of the CCC-2 Serbian version, it would be necessary to determine the internal consistency reliability of the given factors.

Data from Table 5 indicate that potential CCC-2 subscales have a relatively high level of internal consistency reliability, regardless of the applied method.

4. Discussion

By analyzing the results in Table 4, we can see that the first factor consists of 21 items. Apart from item 13 *(Is babied, teased, or bullied by other children)*, which has a relatively low correlation with the extracted factor, all other items from this group point to communication abilities. This factor equally comprises items which assess structural language aspects, pragmatic competence, social relations and interests. Because all twenty items that test communication capabilities have loadings only on the first factor, this component could be called *General Communication Ability*.

Table 3. *The percentage of variance explained by the extracted components.*

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Components	Total	Variance %	Cumulative %	Total	Variance %	Cumulative %	Total	Variance %	Cumulative %
1	12.738	18.197	18.197	12.738	18.197	18.197	7.520	10.743	10.743
2	4.504	6.434	24.631	4.504	6.434	24.631	6.699	9.570	20.313
3	3.332	4.761	29.392	3.332	4.761	29.392	6.355	9.079	29.392

Table 4. *Structure matrix for extracted components.*

Factor 1		Factor 2		Factor 3	
p070	0.665	p035	0.632	p038	0.654
p056	0.655	p026	0.626	p002	0.627
p062	0.652	p037	0.592	p029	0.577
p067	0.619	p021	0.583	p006	0.527
p055	0.612	p022	0.572	p032	0.516
p068	0.607	p023	0.568	p044	0.511
p065	0.606	p042	0.528	p012	0.511
p057	0.602	p018	0.503	p040	0.511
p061	0.597	p047	0.497	p017	0.497
p053	0.588	p045	0.480	p004	0.490
p054	0.566	p025	0.475	p034	0.461
p060	0.525	p020	0.472	p046	0.456
p052	0.524	p011	0.461	p019	0.456
p066	0.499	p005	0.441	p043	0.442
p059	0.497	p009	0.422	p024	0.435
p051	0.492	p049	0.405	p010	0.425
p069	0.473	p039	0.400	p036	0.401
p063	0.466	p041	0.400	p028	0.350
p064	0.447	p031	0.384	p001	0.338
p058	0.445	p048	0.348	p003	0.322
p013	0.306	p030	0.331	p015	0.310
p035		p033	0.313		
p026		p008	0.312		
p037		p007	0.306		
p021		p014	0.306		
p022		p050	0.269		
p023		p016	0.253		
p042		p027	0.220		

Table 5. *Internal consistency reliability of the potential subscales.*

Extracted factors	Cronbach's Alpha	Spearman-Brown	Guttman split-half
I factor	.895	.857	.856
II factor	.860	.839	.834
III factor	.844	.834	.825

Although the first four items with the highest factor loadings belong to "pragmatic" subscales, the correlation level of the two items testing structural language aspects is somewhat lower. Furthermore, low scores on typically "pragmatic" items could, in addition to pragmatic deficits, point to a general delay in the development of communication skills. For example, low scores on items 62 *(You can have an enjoyable, interesting conversation with him/her)*, 67 *(Talks about his/her friends; shows interest in what they do and say)*, or 56 *(Makes good use of gestures to get his/her meaning across)* could indicate a possible pragmatic disorder or specific language impairment.

This factor is apparently similar to the *General Communication Composite* from the original CCC-2 version, which results from proportional representation of items from different subscales. Contrary to the GCC score, the items that have loadings on the first factor of the Serbian version of the CCC-2 are almost exclusively those pointing to communication abilities, including the items from the subscales of *Social Relations* and *Interests*.

The structure of the second factor explicitly addresses the area of pragmatic competence. From the total of 25 items with loadings on the second factor, 16 items belong to the "pragmatic subscales". This factor includes five items from each of the following subscales: *Stereotypical Speech* (e.g., theatrical or excessively accurate speech, non-critical usage of "favorite" phrases in different contexts, echolalia), *Nonverbal Communication* (e.g., regulating interpersonal space, inability to make eye contact, not expressing personal emotions and not recognizing the emotions of others, ignoring potential interlocutor's attempts to communicate), and *Inadequate Initiation* (e.g., a child asks questions to which he/she already knows answers, says things that are already familiar to others or things others are not interested in, starts conversation with strangers without a reason). One item belongs to the *Using Context* scale (literally understanding speech), and items from the subscales *Stereotypical Speech* and *Inadequate Initiation* have the highest factor loadings on the second factor.

Items from the assessment area related to autism also have significant loadings on this factor. Five items from the *Interests* subscale are mainly directed towards the selection of activities that are characteristic for persons with autistic spectrum disorders and also towards an unusual and limited choice of topics and vocabulary in communication, which relates them to pragmatic abilities. Pragmatic disorders are inherent in all autistic spectrum disorders. Atypical interests in certain subjects in persons with autism disorder (DSM-IV-TR; *American Psychiatric Association*, 2000) are equivalent to limited interest in certain topics and facts in persons with Asperger's syndrome (Twachtman-Cullen, 2000, as cited in Johnson & Myers, 2007). Although clinical characteristics of persons with autistic spectrum disorders cannot be fully explained by their pragmatic deficits, those features of autism that could be related to pragmatic deficits have significant loadings on the second extracted factor.

Two items from the *Social Relations* subscale also have somewhat lower loadings on the second factor. Item 33 *(Hurts or upsets other children without meaning to)* indicates the possible lack of theory of mind, i.e., the ability to understand the mental states of oneself and others. Theory of mind has a significant role in moral judgment and establishing cooperation among people (Waytz, Gray, Epley, and Wegner, 2010) and, as such, represents an important component of pragmatic competence. Item 7 *(With familiar adults, seems inattentive, distant or preoccupied)* points to behavioural characteristics of children with autism.

Two variables that belong to the coherence area also loaded on the second factor. In the first version of the *Children's Communication Checklist,* this scale was an integral part of the pragmatic composite. Although coherence can also be seen as a part of language structure, theories of discourse regarding coherence are more often studied in the context of pragmatic competence (e.g., Kehler, 2004).

We can conclude that this factor points to pragmatic abilities. It is clear that even a part of those items that are originally intended for testing characteristics related to autistic spectrum disorders actually test some aspects of pragmatic competence. Therefore, the second extracted factor could be called *Pragmatics*. Items included in this factor, to a great extent, match the items included in the pragmatic composite score from the first version of *Children's Communication Checklist* (Bishop, 1998). This score was left out from the current scale version, both because of poor validity and because of a low reliability based on interrater agreement. It successfully distinguished children with a clinical diagnosis from the children without one, but it failed to recognize certain subtypes of communication disorders, especially when the parental form was used (Bishop, 2003). Nevertheless, some authors still use the CCC-2 on clinical samples to calculate the pragmatic composite score (Bignell & Cain, 2007).

In the same way the second factor can be considered pragmatic, the third factor is undoubtedly structural. Out of 21 variables that load on the third factor, 16 variables directly assess structural language aspects. Five variables that assess articulation errors (substitution and omission) and five variables from the *Semantics* subscale that relate to difficulties in remembering and choosing appropriate words have the highest factor loadings on the third factor. Four variables from the *Syntax* subscale that assess correct word declension according to gender and case, adequate formation of perfect forms, and the usage of auxiliary verb "be" in its enclitic form have somewhat lower loadings on the third factor (from 0.34 to 0.50).

Two variables from the *Coherence* subscale are also included in this assessment area: item 40 *(Gets the sequence of events muddled up when trying to tell a story or describe a recent event)*, and item 10 *(Uses terms like "he" or "it" without making it clear what s/he is talking about)*. The fact that mentioned variables load on the third factor does not have a significant influence on the conclusion that the component in question is one that mainly assesses structural language aspects. The original purpose of the subscale *Coherence* was to identify children with poorly organized discourse regardless of preserved structural language skills. However, research has shown that children with specific language impairment have significantly lower scores on this scale than typically developing children (Bishop & Baird, 2001). Because children with limited abilities in using complex syntactic structures also have less coherent discourse, this subscale can also be used for the assessment of structural language aspects (Bishop, Laws, Adams, and Norbury, 2006).

Four variables from the *Using Context* subscale load on the third factor as well. When we analyze the content of the mentioned items, it is clear that they point to possible weaknesses in structural language aspects, mainly in semantic organization *(Takes in just 1-2 words in a sentence, and therefore misinterprets what has been said; Gets confused when a word is used with a different meaning than usual; Misses the point of jokes and puns - though may be amused by nonverbal humour such as slapstick)*.

However, it is difficult to explain loading of one of the variables from the *Social Relations* subscale on the third factor within the context of structural language aspects *(Appears anxious in the company of other children)*. Because this variable has a low factor loading (0.32), the obtained result does not significantly influence the decision to mark the third factor as *Structural Language Aspects*.

Based on these results, it appears that the three-factor solution, with the stated loadings of certain variables on appropriate factors, corresponds to the theoretical concept that is the basis of the scale creating process.

The Serbian version of the CCC-2 consists of three subscales: *General Communication Ability*, *Pragmatics*, and *Structural Language Aspects*. Table 5 shows the reliability of each scale. An internal consistency method was used to check reliability. Bearing in mind that developmental changes could influence the participants' results on repeated tests, the test-retest method was avoided. The obtained results indicate a relatively high reliability level of all three subscales. The low level of internal consistency reliability of the original subscales can, to some extent, be explained by the fact that each of the given scales includes only seven items. That was most likely the reason why Bishop (Bishop, 2003) claimed that a Cronbach's alpha coefficient of above 0.60 indicates acceptable CCC-2 reliability. While creating the original CCC-2 version, Cronbach's alpha coefficient was not under 0.65 for any subscales. The CCC-2 subscales in the Norwegian version have an even higher internal consistency level (Cronbach's alpha coefficient of between 0.74 and 0.89) (Helland, 2009). Therefore, British and Norwegian authors obtained acceptable internal consistency coefficients despite the small number of items. In the Serbian version of the CCC-2, interrelations between the items are unacceptably low if we accept the division into ten subscales. However, the division into three subscales can be regarded as a plausible solution, at least from this aspect.

5. Conclusion

Three factors, which account for 30% of the variance, were obtained in the Serbian adaptation of the CCC-2. The three-factor solution, to some extent, corresponds to theoretical expectations based on the model of the scale author (Bishop, 2003). In other words, instead of the expected factors that differentiate between structural and pragmatic language aspects, and the third one which describes behaviours characteristic for autistic spectrum disorders, the obtained factors distinguish general communication abilities, pragmatic communication and structural language levels. Variables that belong to the autistic spectrum assessment area in the original scale have factor loadings on the first or the second factor. Three variables with low factor loadings (under 0.30) should be left out of the Serbian version of the CCC-2.

Thus, by reconstructing the CCC-2, we obtained three subscales: *General Communication Ability*, *Pragmatics*, and *Structural Language Aspects*. Clinical validation of the scale, which is in progress, can verify the expectations that the obtained subscales will differentiate between children with specific language impairment and children with difficulties in pragmatic communication, regardless of pragmatic deficit origin. Applying the Serbian version of CCC-2 to clinical samples (autistic spectrum disorders, specific language impairment, ADHD, intellectual disability) could lead to specific communication profiles of children with the aforementioned disorders.

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