

Factor Structure of the Bulgarian Version of FOCUS on the Outcomes of Communication Under Six

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Abstract: The aim of this paper is to present the Factor structure of the Bulgarian version of FOCUS on the Outcomes of Communication Under Six. The instrument is based on the World Health Organisation's (WHO) International Classification of Functioning, Disability and Health – Children and Youth (ICF-CY), and it aims at tracing the effect of therapy on the child's communication and participation in the real world. Our research is focused on the factor structure and reliability of the Parent's form. The participants formed two samples, the main one consisting of 272 (mostly preschool children), males and females. The age of the subjects varied between 2.17 and 7.25 years, with a mean age of $M = 4.91$ years and $SD = 1.10$.

The latent structure of the questionnaire was examined in five phases – 1-test of the assumption of one-dimensionality; 2-exploratory factor analysis was applied to establish the factor model, based on data from an empirical study; 3-three possible factor models with a fixed number of factors were analyzed; 4-the factor models were compared through confirmatory factor analysis. The aim of the analyses was to select the most appropriate final model for the Bulgarian version of the questionnaire. The reliability analysis of the scales in the two-factor model was conducted through testing their internal consistency.

The two-factor model of the FOCUS questionnaire in Bulgarian shows a good orientation towards two specific functions – 'capacity for communication', and 'performance' or 'communicative performance'. Due to its stable measurements related to functioning, this tool could be effectively used to practically assess the effect of therapy on children with development disorders.

Keywords: FOCUS, factor structure, children, communication skills.

INTRODUCTION

Focus on the Outcomes of Communication Under Six (FOCUS) is an instrument specifically designed for parents or professionals to assess the effects of therapy for language and speech disorders. The main component that is measured is related to communicative participation, and the tool is applied to preschool children.

FOCUS is a valid and reliable outcome measure based on the World Health Organization's (WHO) International Classification of Functioning, Disability, and Health – Children and Youth (ICF-CY), and it aims to trace the effect of a therapy on the child's real communication and participation in the real world [1]. The instrument aims to assess improvements in general performance. It not only enables the tracking of improvement because of language and speech therapy in children with developmental disorders but also assesses changes in general functioning rather than only the learning of specific components. Thus, a more general and complete picture is given of the effect of the applied interventions on functioning, rather than on the correction or restoration of a specific function, filling

of specific gaps, or remembering and reproducing information.

FOCUS has two versions, for parents and professionals, respectively, each containing 50 questions. Completing the questionnaire is easy and takes only 10 minutes [2]. The instrument was prepared based on initial data collected from 210 parents who observed the effect of language and speech therapy on their children, namely changes in socialisation, independence, speaking skills, and being better understood [1]. FOCUS's construct validity was checked by comparison with the Pediatric Quality of Life Inventory (PedsQL) and health-related quality of life measures [3]. These comparisons have shown the applicability of this tool. FOCUS applies to measuring therapeutic effects in children with speech impairments and language disorders and tracking changes in independent communication, intelligibility of speech, socialisation, and play [1].

The instrument was translated into and tested in Italian with acceptable internal consistency for most subscales and, for the overall score, excellent internal consistency [4]. The German version of the instrument also showed high values for internal consistency, test-retest reliability, and split-half reliability [5].

In terms of content, the questionnaire is based on the framework for describing human health and related

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conditions set by the WHO [6] in the International Classification of Functioning, Disability and Health (ICF). A few years later, the WHO introduced a derived version intended for children and youth (ICF-CY) [7]. The use of ICF-CY is indicated as a good option to better describe children's functioning in detail [8-10], and its use is recommended, especially in the context of inclusive education [11, 12] because to assess real change from interventions, it is beneficial to track improvements in performance level [13]. As the ICF-CY follows the same taxonomic principles as the ICF; the merger of the two classifications was approved at a WHO meeting in Toronto in 2010.

In the application of the ICF-CY, some challenges are also described, such as the need for more advanced tools and collaboration between specialists [14]. In this sense, although the trends in Bulgaria are towards the application of complex assessments of children with developmental disorders by a team of professionals [15], the lack of sufficiently standardized instruments, particularly those focused on the assessment of functioning rather than the detection of disorders, should be noted.

MATERIAL AND METHODS

The FOCUS questionnaire gives us an idea of how the child communicates in different environments—at home, in kindergarten, and when playing with friends. It is administered at regular intervals to measure progress or identify areas and skills that need to be developed. The tool consists of two parts [1]:

Part 1. ICF-CY body function/capacity items – describe the child's communicative behaviour at a certain moment with subscales:

- 1.1. Speech
- 1.2. Expressive language
- 1.3. Pragmatics
- 1.4. Receptive language/attention

Part 2. ICF-CY performance items – assessment of the transition from capacity to performance by measuring the level of assistance needed to perform a given task with subscales:

- 1.1. Intelligibility
- 1.2. Expressive language
- 1.3. Social/play

1.4. Independence

1.5. Coping strategies/emotions

The questionnaire was developed in four stages, and at each stage, the authors sought to improve it. During the first stage, the authors collected and subjected content analysis to detailed observations of parents and clinicians on the results of interventions in 210 preschool children attending speech–language therapy. Thirty-eight percent of the children in this sample had specific medical diagnoses. Communication disorders followed the International Classification of Diseases Ninth Revision, clinical modification (ICD-9-CM), and the authors define the most common disorders as developmental speech disorders (41%), followed by developmental language production (22%), and developmental language comprehension disorders (16%) (Thomas-Stonell, 2009).

Content analysis was used to establish the frequency of observed changes as a result of speech–language therapy. The analysis shows that parents' and therapists' observations agree with several ICF-CY domains, such as body functions, activities, participation, and personal factors. The observations were categorised, and 200 items were formulated on this basis. After a thorough review of the items, those with similar content were removed; as a result, the original form of the FOCUS had 103 items. The authors emphasize that the main indicator of change in children's communicative behavior is the difference between scores at the beginning and end of therapy [2].

The next three phases of the actual pilot testing were conducted in collaboration with four organizations that offer speech–language therapy to preschool children in several provinces in Canada, with the participation of professionals from these organizations and 165 families of the children involved in the therapies. The sample subjected to the pilot testing included children with typical development and children with medical diagnoses of ASDs, cerebral palsy, Down syndrome, etc. Among the most common communication disorders were developmental speech disorders, developmental language production disorders, and developmental language comprehension disorders. The professionals, as well as the parents, noted the presence of behavioral problems in 18% of the children.

At each stage of the pilot testing of the questionnaire, the authors analyzed the results to assess its psychometric qualities. Successive assessments of its reliability were made of both the individual parts and the questionnaire as a whole, as well as analyses of its factor structure. The final revised version of FOCUS has 50 items. The results of the reliability analysis of the questionnaire during the last phase of the pilot testing show high levels of internal consistency. There is now a 34 item English FOCUS.

To assess the construct validity of FOCUS, the authors used data from the Pediatric Quality of Life Questionnaire, albeit with a significantly smaller sample – 22 parents who filled out the questionnaire twice – at the beginning and after the completion of therapy. The results show the construct validity of FOCUS: high communicative scores are associated with a better quality of life. Moreover, the quality of life is related to positive changes in communicative behavior as a result of applied speech–language therapy [2].

RESULTS

Development of the Bulgarian Version of the FOCUS Parent Form

Translation of the Questionnaire

The questionnaire was translated according to the recommendations of the International Test Commission for the application of good practice in the adaptation of tests [16]. According to these recommendations, three translations into Bulgarian of the original questionnaire were made by three independent translators, the best one was selected, and the items were back-translated. The following forms were translated:

1. FOCUS Parent form
2. FOCUS Clinician form
3. FOCUS Parent instructions
4. FOCUS Scoring sheet

The back translation into English was provided to the authors of the questionnaire for review and approval for the use of the Bulgarian version of the questionnaire. The authors made some remarks and recommendations to improve the Bulgarian translation. The main difficulties were related to the precision of choice of the Bulgarian equivalents of verbs and names related to language, speech, and communication (e.g., talking, telling, speech, and words) in two groups of

items: body function/capacity items and performance items.

Latent Structure Analysis of the FOCUS Parent Form

The latent (factorial) and scale structure of the questionnaire was examined in five phases. In the first phase, the assumption of unidimensionality of the questionnaire was tested by confirmatory factor analysis. In the second phase, exploratory factor analysis was applied to establish the factor model of the Bulgarian version based on the real data from the empirical study. In the next phase, three possible factor models with a fixed number of factors were analyzed to establish the orthogonality of the factors and the factorial affiliation of the items. In phase 4, through confirmatory factor analysis, the factor models were compared and the most adequate to the empirical data was selected. During the final phase, more in-depth analyses of the latent structures of two competing models were performed to select the most appropriate final model for the Bulgarian version of the questionnaire.

Phase 1. Verification of the Assumption of One-Dimensionality of the Latent Structure of the Questionnaire

During the pilot testing of FOCUS, the authors [2] analyzed the factor structure of the questionnaire at each stage of the process. According to the results of the first two phases, the questionnaire measures one latent construct. Although for the third (last) phase of the pilot testing such information was missing, we assume that in its final version, the questionnaire preserved this structure.

To see if the assumption that the questionnaire's factor structure was one-dimensional was true, a confirmatory factor analysis was done on a first group of 93 children. The age of the children in this sample was between 2.17 and 7.08 years, with a mean age of $M = 4.73$ years ($SD = 1.07$). We assumed that the test score should be able to reflect different psychological processes adequately, and its items should measure these processes to the same extent. It was not proposed to apply the interpretation of the test result to a single dimension without such verification. This check also provided the next step, namely answering the question of whether the test results should be divided into several groups.

Five indices were used as measures of the adequacy of the unidimensional model, which belong to

two categories, namely absolute and comparative (relative) [17, 18].

Chi-square was selected as a representative of the first category of measures, which value and statistical significance ($\chi^2(1175.00) = 3157.71, p = 0.00$) led to the rejection of the hypothesis of the adequacy of the unidimensional model. Two other widely used measures from this group – SRMR, with a value of $0.11 > 0.08$, and RMSEA index, with a value of 0.13 (90% CI $0.13 - 0.14$) > 0.06 , also testify to the low adequacy of the tested model. As comparative adequacy measures, the Bentler comparative fit index (CFI), with a value of $0.42 < 0.95$, and the Bentler–Bonett non-normed fit index (NNFI), with a value of $0.40 < 0.90$, were applied (threshold values are according to Hu & Bentler [18]).

All of the applied indices show that among the Bulgarian population, the latent structure of FOCUS cannot be considered as unidimensional and that another, more adequate solution to this question should be sought. Although it was expected not to confirm the unidimensionality of the latent structure of the questionnaire, this check made it possible to assume the distribution of the results into groups, as in the original questionnaire. From a clinical point of view, the grouping of the results will allow the comparison of data from different groups and the examination of the levels of different characteristics within the same individual. Since the questionnaire is not screening, this could facilitate clinicians' reasoning about the information obtained on individual characteristics and the relationships between them.

Phase 2. Determination of the Factor Model of the Questionnaire Based on Data from a Bulgarian Sample

To determine the factor structure of the questionnaire, an exploratory factor analysis using the principal axis method was applied to the data from a sample with $N = 272$ subjects, which differs from that used in the first phase. Children in this sample ranged in age from 2.17 to 7.25 years, with a mean age of $M = 4.91$ years and $SD = 1.10$. In clinical terms, this method can reveal the organization of a large number of variables and the relationships between them, and in fact, this serves to develop scales. In this case, the method is applied under the assumption that we have no a priori hypothesis about the factor model to test how the individual variables will interact. The scales are essential for the practical use of the instrument, as

usually the interpretations of the results in individuals or groups are oriented around the scores on the scales. It is often possible to report only a single scale or to check how the scores on the individual scales correlate.

The initial iteration was performed assuming a maximum number of factors equal to the number of variables (items) in the questionnaire (50) and a minimum eigenvalue of 0.00. The number of factors extracted under these conditions was 42, with a strong first factor with an eigenvalue of 17.79 accounting for 35.59% of the total variance, followed by seven weak factors with eigenvalues between 2.79 for the second factor (5.57%) and 1.02 for the eighth factor (2.04%). The remaining factors had eigenvalues below 1.00 and explained below 1.72% of the total variance. The cumulative explanatory power of all extracted factors was 78.54% of the total variance.

A methodology combining Cattell's (1966) graphical test and Horn's (1965) parallel analysis was applied to determine the optimal number of factors, as presented in Figure 1.

The two dotted lines in the figure represent (1) the actual eigenvalues of the factors extracted in the initial iteration as suggested by Cattell's test and (2) the 95th percentiles of the distribution of simulated eigenvalues according to Horn's parallel analysis (see Figure 1 legend). The graph of actual eigenvalues is a dotted line with a steep left part that abruptly transitions to a smoother and more horizontal section. Each point along it represents another factor, with its eigenvalue. The high eigenvalues of the first factor and the significantly lower eigenvalues of the remaining factors are visible. According to Cattell's rule, the existence of a single relevant factor should be decided based on its test alone.

Horn's parallel analysis involves simulating a series of random data with a dimensionality equivalent to the actual empirical data. For this particular study, 1 000 samples of size 50 variables X 272 subjects were simulated. Each simulated dataset was subjected to factor analysis to extract the factors and their eigenvalues. In Figure 1, the 95th percentiles of the distribution of eigenvalues of each simulated factor are displayed. According to Horn's rule, those factors whose actual eigenvalues exceed the corresponding simulated values (or the 95th percentile) should be retained in the factor model. These factors lie above the intersection of the two broken lines in Figure 1.

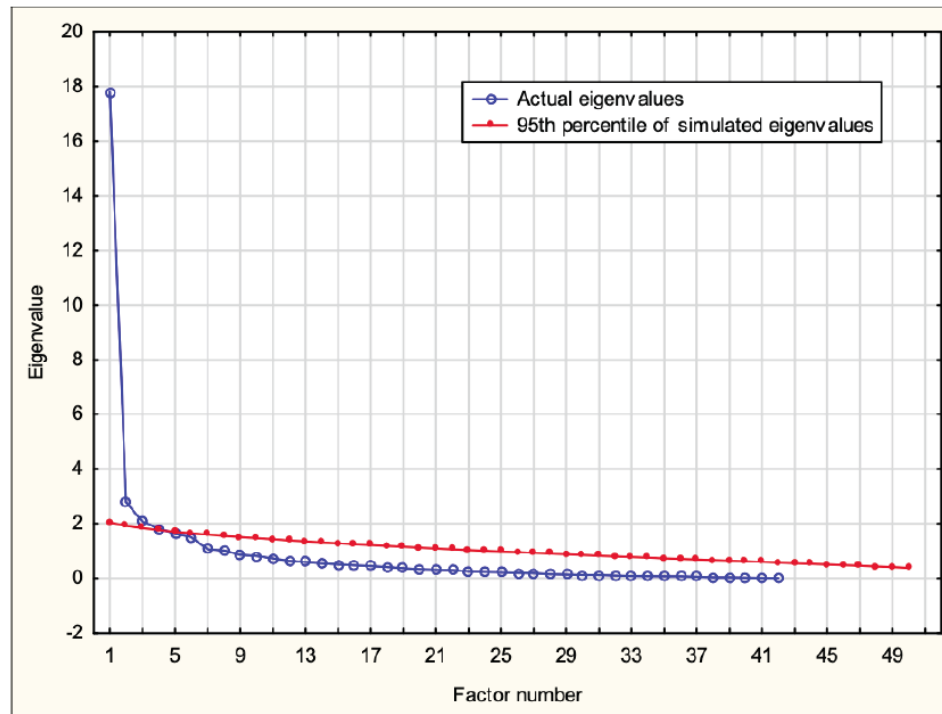


Figure 1: Cattell's graphical test and Horn's parallel analysis.

In this case, the number of actual factors that should be retained in the factor model of the questionnaire is four, since the fourth factor is the last one that has an actual eigenvalue (1.82) exceeding the 95th percentile of the corresponding simulated factor (1.77). However, we should note that factors 2, 3 and especially 4 have low actual eigenvalues lying close to the borderline of the simulated factors and therefore may be weak and marginal.

Phase 3. Analysis of Four-, Three-, and Two-Factor Models

In the third phase, a series of hierarchical factor analyses were performed on three possible factor models with a fixed number of factors (four, three, and two, respectively), to establish their orthogonality and the factorial affiliation of the items in each of the

models. Analyses were performed on data from the sample used in the previous phase (N=272).

In the basic four-factor model, the eigenvalues of the factors slightly decreased their levels compared to those of the initial iteration. The total cumulative variance explained by the factors in this model was 46.63%, as can be seen from the data presented in Table 1.

The factors were not orthogonal and moderate to high positive correlations were observed between them, ranging from $r = 0.53$ between factors 2 and 4 to $r = 0.79$ between factors 1 and 3, according to the data in Table 2.

The items are unevenly distributed among the factors, with the largest number of items having high

Table 1: Eigenvalues of the Factors in the Four-Factor Model

Factor	Eigenvalue	% of total variance	Cumulative Eigenvalue	Cumulative %
1	17.50	34.99	17.50	34.99
2	2.53	5.05	20.02	40.04
3	1.77	3.54	21.79	43.58
4	1.52	3.05	23.31	46.63

Table 2: Correlations between Factors in the Four-Factor Model

Factor	1	2	3	4
1	—			
2	0.65	—		
3	0.79	0.69	—	
4	0.64	0.53	0.67	—

factor loadings on factor 1 (20 items) and the smallest number on factor 4 (3 items). The distribution of the items is as follows:

Factor 1 (20 items): 1-11, 1-14, 1-15, 1-17, 1-20, 1-21, 1-22, 1-23, 1-26, 1-27, 1-28, 1-33, 2-2, 2-8, 2-9, 2-10, 2-11, 2-12, 2-14, 2-16 /ex. "My child can string words together."; "My child's speech is clear."; "My child speaks in complete sentences."; "My child conveys her/his ideas with words."; "My child uses correct grammar when speaking."/ "My child uses new words."/ This factor relates to language understanding and language production, the use of language as a communication tool and speech intelligibility.

Factor 2 (8 items): 1-1, 1-7, 1-8, 1-31, 2-5, 2-6, 2-13, 2-15 /Ex. "My child makes friends easily."; "My child is willing to talk to others."; "My child is confident communicating with adults who do not know my child well."; "My child can communicate independently with adults who do not know my child well."; "My child will try to carry on a conversation with adults who do not know my child well."/ This element is related to communication and the desire to take part on social interactions, mainly with adults.

Factor 3: (17 items) 1-2, 1-3, 1-4, 1-6, 1-10, 1-12, 1-13, 1-24, 1-25, 1-29, 1-30, 1-32, 1-34, 2-1, 2-3, 2-4, 2-7 /Ex. "My child is included in play activities by other children."; "My child is comfortable when communicating."; "My child is confident communicating

with adults who know my child well."; "My child talks while playing."; "My child talks a lot."; "My child gets along with other children."/ The clinical significance of this element regards mainly the social communication skills, mainly with children.

Factor 4 (3 items): 1-5, 1-18, 1-19 /Ex. "My child takes turns."; "My child uses communication to solve problems."; "My child waits for her/his turn to talk."/ The final factor in this group has to do with social functioning and the ability to take turns.

Two items had approximately the same loadings on two or more factors and were therefore not assigned to any of them; these were the items numbered 1-9 "My child can communicate independently." (with high loadings on factors 1, 2, and 3) and 1-16 "My child speaks slowly when not understood." (with high loadings on factors 1 and 4).

In the three-factor model, the factor eigenvalues further decreased their levels compared to those of the initial iteration and the previous four-factor model. The total cumulative variance explained by the factors in this model is also slightly smaller (43.38%), as can be seen from the data in Table 3.

The factors in this model were also oblique, with moderate to high positive correlations which were generally higher than in the previous model: correlation coefficients range from $r = 0.67$ between factors 1 and

Table 3: Eigenvalues of the Factors in the Three-Factor Model

Factor	Eigenvalue	% of total variance	Cumulative Eigenvalue	Cumulative %
1	17.47	34.94	17.47	34.94
2	2.49	4.97	19.96	39.91
3	1.73	3.47	21.69	43.38

2 to $r = 0.79$ between factors 1 and 3, as shown in the data presented in Table 4.

Table 4: Correlations between Factors in the Three-Factor Model

Factor	1	2	3
1	—		
2	0.67	—	
3	0.79	0.76	—

The items are distributed among the factors as follows:

Factor 1 (24 items): 1-9, 1-11, 1-14, 1-15, 1-16, 1-17, 1-18, 1-20, 1-21, 1-22, 1-23, 1-24, 1-25, 1-26, 1-27, 1-28, 1-33, 2-2, 2-8, 2-12, 1-19, 2-14, 2-16 /Ex. "My child can communicate independently."; "My child can string words together."; "My child's speech is clear."; "My child is understood the first time when s/he is talking with other children."; "My child speaks slowly when not understood."; "My child speaks in complete sentences."; "My child uses communication to solve problems."; "My child conveys her/his ideas with words."; "My child uses correct grammar when speaking."; This factor represents the language comprehension and language production abilities, communication comprehension and some social aspects of communicating to adults and children.

Factor 2 (8 items): 1-7, 1-8, 1-31, 2-3, 2-5, 2-6, 2-13, 2-15 /Ex. "My child is willing to talk to others."; "My child is confident communicating with adults who do not know my child well."; "My child can communicate independently with adults who do not know my child well."; "My child can communicate effectively with adults who know my child well."; "My child will try to carry on a conversation with adults who do not know my child well."; "My child will ask for things from adults s/he knows well."; "My child can communicate effectively with adults who do not know my child well."; "My child can talk about what s/he is doing with adults

who do not know my child well."/". This factor is specifically connected to the child's communication skills towards adults.

Factor 3 (15 items): 1-1, 1-2, 1-3, 1-4, 1-5, 1-6, 1-12, 1-13, 1-19, 1-30, 1-32, 1-34, 2-1, 2-4, 2-7 /Ex. "My child makes friends easily."; "My child is included in play activities by other children."; "My child is comfortable when communicating."; "My child is confident communicating with adults who know my child well."; "My child takes turns."; "My child talks while playing."; "My child gets along with other children."; "My child can communicate independently with other children."; "My child waits for her/his turn to talk."/ The factor deals mainly with social behavior, which includes communication but primarily as a means of performing social activities.

Three of the items had approximately equal factor loadings on two or more factors and were therefore removed from the model: 1-10 "My child talks a lot." (with high loadings on factors 1, 2, and 3), 1-29 "My child needs help to be understood by other children." (with high loadings on factors 1 and 3), and 2-10 "My child will ask for things from other children." (with high loadings on factors 1 and 2).

In the case of the two-factor model, the same tendency to a slight decrease in the eigenvalues of the factors compared to their levels in the previous models was observed, as is evident from the data presented in Table 5. The share of the total cumulative variance also decreased (39.75%).

On the other hand, this model maintained a high correlation between the factors (reaching $r = 0.78$), which were also non-orthogonal.

The distribution of items between the two factors is uneven, with a preponderance in the leading first factor:

Factor 1 (28 items): 1-11, 1-13, 1-14, 1-15, 1-16, 1-17, 1-18, 1-19, 1-20, 1-21, 1-22, 1-23, 1-24, 1-25, 1-26, 1-27, 1-28, 1-29, 1-33, 1-34, 2-2, 2-8, 2-9, 2-10, 2-11,

Table 5: Eigenvalues of the Factors in the Two-Factor Model

Factor	Eigenvalue	% of total variance	Cumulative Eigenvalue	Cumulative %
1	17.43	34.87	17.43	34.87
2	2.44	4.88	19.87	39.75

2-12, 2-14, 2-16 /Ex. “My child can string words together.”; “My child can communicate independently with other children.”; “My child’s speech is clear.”; “My child is understood the first time when s/he is talking with other children.”; “My child speaks slowly when not understood.”; “My child speaks in complete sentences.”; “My child uses communication to solve problems.”; “My child waits for her/his turn to talk.”; “My child conveys her/his ideas with words.”/ This factor includes questions related to language development, the use of language as a communicative tool, speech comprehension and production.

Table 6: Correlations between Factors in the Two-Factor Model

Factor	1	2
1	—	
2	0.78	—

Factor 2 (19 items): 1-1, 1-2, 1-3, 1-4, 1-5, 1-7, 1-8, 1-10, 1-30, 1-31, 1-32, 2-1, 2-3, 2-4, 2-5, 2-6, 2-7, 2-13, 2-15 /Ex. “My child makes friends easily.”; “My child is included in play activities by other children.”; “My child is comfortable when communicating.”; “My child is confident communicating with adults who know my child well.”; “My child takes turns.”; “My child is willing

to talk to others.”; “My child is confident communicating with adults who do not know my child well.”; “My child talks a lot.”; “My child becomes frustrated when trying to communicate with other children.”; “My child can communicate independently with adults who do not know my child well.”; “My child is reluctant to talk.”; “My child plays well with other children.”; “My child can communicate effectively with adults who know my child well.”/ This factor refers to the social aspects of communication and the child's ability to develop and maintain social contacts using language as a tool.

Three items (1-6, 1-9, and 1-12) /“My child talks while playing”; “My child can communicate independently.”; “My child gets along with other children.” had approximately equal factor loadings on both factors and were therefore removed from the model.

Phase 4. Comparing Factor Models

During the previous phase of the analysis, the factorial affiliation of the items to three possible models was established: with four, three, and two factors. The results of the analyses demonstrated two features of the investigated factor structures, similar in all models: (1) the presence of a strong, dominant first factor and significantly weaker subsequent factors, and (2) non-orthogonality of the factors and high correlations between them.

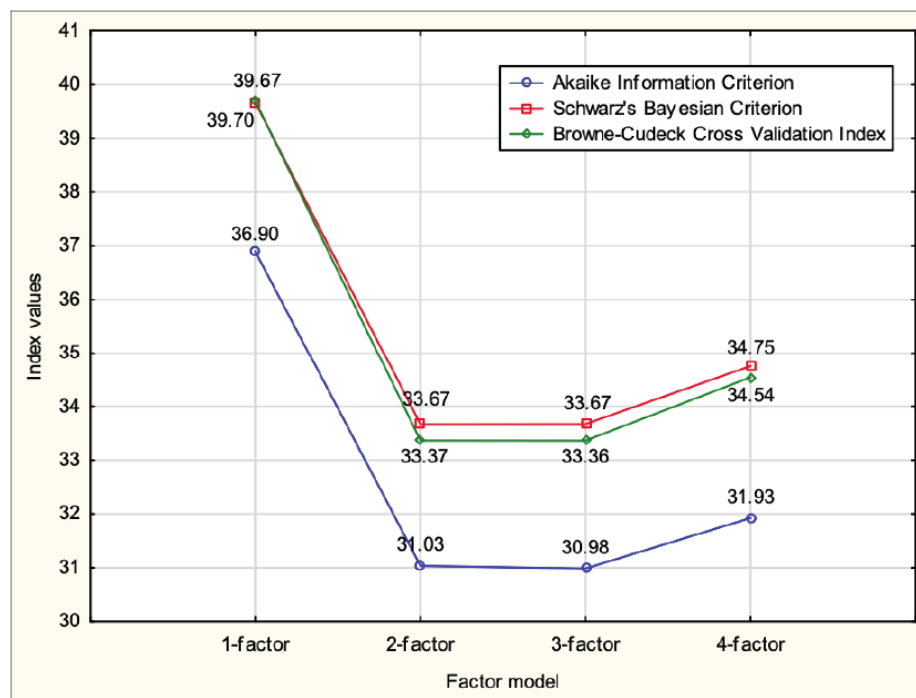


Figure 2: Comparison of AIC, SBC, and BCCVI values.

The purpose of the analysis during this phase is to select the most adequate among the factor models discussed above, including the one-factor model, by comparing several appropriate measures of model adequacy.

For this purpose, confirmatory factor analysis was performed on the sample data used in the first phase (N=93). According to the results of the previous analyses, the tests for the adequacy of the models were carried out assuming the presence of correlation between the factors and zero correlation between the residuals. Three indices (criteria) were applied, two of which were from the group of comparative indices that enable comparison of the adequacy of different models to the empirical data: Akaike Information Criterion (AIC), Schwarz's Bayesian Criterion (SBC), and the Browne–Cudeck cross-validation index (BCCVI) [17-19]. The results of the performed analyses are visualised in Figure 2.

The figure represents the profiles of the indices whose values were calculated for each of the tested models. The high degree of consistency between the profiles (especially between SBC and BCCVI, which have similar values) is noticeable, which facilitates joint interpretation of indices. Since the indicator of higher adequacy of the model in each of the criteria is its lowest level, undoubtedly, the one-factor model is the least appropriate, which confirms the results of the first phase of the study. Among the remaining three models, the four-factor is in the weakest position, although the differences between the index values for this and the other two are not large. Due to the lowest values of the indices, the two- and three-factor models are found to be more adequate. However, for both of them, the indices have almost equal values, which makes it difficult to make the final choice of a model at this stage of the analysis.

Phase 5. Selection of Final FOCUS Model

During the last stage of the research, more in-depth analyses of the latent structures of the two- and three-factor models were carried out to select the most appropriate final model for the Bulgarian version of the questionnaire. Data from the same sample used in phase 3 (N=272), as well as some results from the same phase, were used as the basis for these analyses.

Splitting of the items between the factors in the two models was carried out in phase 3 based on their factor

loadings obtained by orthogonal rotation of the oblique factors using the varimax normalized method, which is the final stage of the hierarchical factor analysis.

As noted, in the two-factor model, the items were divided into two unequal groups of 28 and 19 items, respectively, three of which were removed from the model. The levels of the factor loadings are acceptable, varying between 0.30 (for items 1–5 “My child takes turns.” and 1–30 “My child becomes frustrated when trying to communicate with other children.” on factor 2) – probably due to the strong behavioural component in these questions and 0.81 (for items 1–17 “My child speaks in complete sentences.” on factor 1). Communication-wise, it is likely for this question to be easily evaluated and used by parents as a measure of communicative competence. In general, the loadings of the items on factor 1 are higher than those of the items on factor 2.

The following items are characterized by the highest factor loadings on factor 1: 1-17 “My child speaks in complete sentences.” (loading 0.81); 1-14 “My child's speech is clear.” (0.79); 1-11 “My child can string words together.” (0.74); 2-8 “My child can tell stories that make sense.” (0.73); 1-20 “My child conveys her/his ideas with words.” (0.71); 1-21 “My child uses correct grammar when speaking.” (0.69); 1-28 “My child uses language to communicate new ideas.” (0.65), etc.

All items on this factor, with perhaps one exception (1-34 “My child has difficulties changing activities.” 0.35) are related to the child's verbal communication capacity. This implies mastering the rules of language (‘uses grammatical rules correctly’, ‘speaks in complete sentences’, ‘can combine words’); producing clear and understandable spoken messages (‘can tell meaningful stories’, ‘expresses ideas with words’, ‘the child's speech is understandable’); decoding verbal messages (‘can answer questions’, ‘can sit and listen to stories’), and in general to use language (speech) to carry out successful verbal communication (‘can communicate effectively’, ‘can maintain a conversation’, ‘uses words to ask for things’, ‘engages in conversations’). All this leads us to interpret this factor as ‘Verbal communication’.

The following items have the highest factor loadings on factor 2: 2-05 “My child will try to carry on a conversation with adults who do not know my child well.” (0.75) as well as several other items with similar wording (2-13 “My child can communicate effectively with adults who do not know my child well.” (0.73); 2-15 “My child can talk about what s/he is doing with adults

who do not know my child well.” (0.66); 1-08 “My child is confident communicating with adults who do not know my child well.” (0.66) related to the child’s desire to communicate with older (other) people and confidence in doing so, especially when those people do not know her/him well. Another group of items reflects more on the child’s social skills supported by her/his verbal skills, for example, 1-02 “My child is included in play activities by other children.” (0.54); 2-01 “My child plays well with other children.” (0.53); 2-04 “My child is included in games by other children.” (0.52); 1-01 “My child makes friends easily.” (0.52); 2-07 “My child participates in group activities.” (0.52), etc. In general, the items in this factor refer to the motivation, confidence, and skills of children to communicate when placed in some type of situation (with an adult who does or does not know them, with other children or with peers, with other people). Based on this, this factor can be defined as ‘Social communication’.

In the three-factor model, the first factor again has the largest item size (24), the remaining two have eight and 15 items respectively, and three items were removed from the model. The levels of the factor loadings are also acceptable, varying between 0.29 (for item 1–25 “My child’s communications skills limit her/his independence.” on factor 1) and 0.82 (for items 1–17 “My child speaks in complete sentences.” on factor 1 and 2-13 “My child can communicate effectively with adults who do not know my child well.” on factor 2). In general, the factor loadings of the items on factors 1 and 2 are comparable to and, at the same time, higher than those of the items on factor 3.

Factor 1, in its content, is a replica of factor 1 of the previous model. Its items, due to their smaller number, represent a subset (except item 1-9 “My child can communicate independently.”) of the items in factor 1 in the two-factor model. Moreover, the levels of the factor loadings of the corresponding items in the first factors of the two models are very similar. For example, the leading item in the first factors of both models is 1-17. “My child speaks in complete sentences.”, with a factor loading of 0.81 in the two-factor model and 0.82 in the three-factor model. Obviously, this is a factor with a stable presence in the latent structure of the questionnaire, and its interpretation in the three-factor model should be identical to that in the previous model, as ‘Verbal communication’.

The items in factor 2 of the two-factor model are split into two unequal parts. One includes eight items that form factor 2 in the three-factor model. They

manifest the child’s desire to communicate with adult (other) people, especially those who do not know them well, and their confidence in doing so. Factor 2 can be defined as ‘Social communication with adults’. The other part of 15 items, which form factor 3 in the three-factor model, manifests the same type of skills, but in communicating with other children (peers). Therefore, factor 3 can be defined as ‘Social communication with children’.

The key to solving the problem with the availability of two formally equal models of the questionnaire is in the stable conduct of a broad group of 10 items, relating to the typical way a child communicates with adults. Two of the items in this group (1-26 “My child is understood the first time when talking with adults who do not know my child well.” and 1-27 “My child can tell adults who do not know my child well about past events.”) on the verbal language side of communication fall under factor 1 “Verbal communication” in both models. With the rest of the items in that group, communication is understood in broader terms, in typical life situations underlining the child’s motivation, confidence and independence in the communicative process. These items either fall under factor 2 in a two-factor model, along with another large group of items, relating to this kind of communication skills, or are grouped in a separate factor in a 3-factor model. This gives us reason to conclude that the child’s skills communicating with adults do not form a stable latent variable and thus take the 2-factor model as most adequate.

Reliability of Scales in the Two-Factor Model

In Phase 3, the data suggested an uneven distribution of items between the two factors, with items falling predominantly under the leading factor 1 (28 items), a lesser number of items in the 2 factor (19 items) and three items were excluded due to relatively equal factor loadings in both factors. The reliability analysis of the scales that the items formed, was conducted through testing their internal consistency.

The first scale ‘Verbal communication’ seems to have a high index of reliability ($\alpha = 0.94$), which is attributed not only to the large number of items but also to the high rates of inter-item correlation (0.41). Item-total correlations were also high, between 0.35 for items 1-25 and 0.80 for items 1-17. The deletion of either item in the scale does not lead to significant changes in its reliability score and thus all the items were kept.

The reliability level of the second scale 'Social communication' is also high ($\alpha = 0.90$) albeit slightly lower than the previous one. This can be partly due to the smaller size of the scale, as well as the larger divergence of items, represented in the lower correlation rates between the items (0.34). The correlation rates of the items and the scale score are comparable to the ones in the first scale and vary between 0.33 for items 1-5 and 0.72 for items 1-3. All the items in that scale contribute almost equally to its reliability level and are thus kept in the scale.

CONCLUSIONS

Provided the two factorial groups are followed in the detailed profile of the questionnaire results, ICF-CY body functions/capacity components and ICF-CY activity performance components, the two-factor model meets the expectations of separating questions that are more related to skills and abilities and those that are more related to performance and/or performance in life situations. The three-factor model can be seen as a division of performance into communicative situations with children and those with adults.

The two-factor model of the FOCUS questionnaire in Bulgarian shows a good orientation towards two specific functions – 'capacity for communication' (verbal and, in some aspects, use of non-verbal communication), and 'performance' or 'communicative performance', namely the application of the skills in practice in real situations and meeting the expectations of social communication, which is the meaning of communication in general. The two-factor model follows the structure of the first part – capacity components (of communication) and the second part – performance components (of communication activities).

The verification of the factor structure of FOCUS has a significant role in the use of the instrument in the Bulgarian context.

RECOMMENDATIONS

Based on the result of the study, the researchers made the following recommendations:

1. Tools that measure change and target functioning rather than specific skills are needed, because they can show the effect of interventions and the benefit of new therapies.
2. Such studies are very few in our practice, and they are important so that professionals can

choose those methods that have proven effective and leverage their benefits in the future.

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ETHICAL APPROVAL

The research has been approved by the Research Ethics Committee of the Department of Health Care and Social Work, New Bulgarian University, Ref. No: FM-DHSWNBU-80/14 January 2020.

CONSENT

Informed consent was obtained from all subjects involved in the study.

RESEARCH ETHICS AND POLICIES

The presented study was developed and conducted per Bulgarian law and international requirements for studies involving people.

CONFLICT OF INTEREST

The authors confirm that there is no conflict of interest with respect to the data presented in this paper.

APPENDIX 1

Four-Factor Model items

Factor 1:

"My child can string words together.";

"My child's speech is clear.";

"My child speaks in complete sentences.";

"My child conveys her/his ideas with words.";

"My child uses correct grammar when speaking.";

"My child uses new words.";

"My child uses words to ask for things.";

"My child is understood the first time when talking with adults who do not know my child well.";

"My child can tell adults who do not know my child well about past events.";

"My child uses language to communicate new ideas.";

"My child can talk to other children about what s/he is doing.";

"My child will sit and listen to stories.";

"My child can tell stories that make sense.";

"My child can respond to questions.";

"My child will ask for things from other children.";

"My child can carry on a conversation with other children.";

"My child can communicate effectively with other children.";

"My child can be understood by other children.";

"My child joins in conversations with her/his peers."

Factor 2:

"My child makes friends easily.";

"My child is willing to talk to others.";

"My child is confident communicating with adults who do not know my child well.";

"My child can communicate independently with adults who do not know my child well.";

"My child will try to carry on a conversation with adults who do not know my child well.";

"My child will ask for things from adults s/he knows well.";

"My child can communicate effectively with adults who do not know my child well.";

"My child can talk about what s/he is doing with adults who do not know my child well."

Factor 3:

"My child is included in play activities by other children.";

"My child is comfortable when communicating.";

"My child is confident communicating with adults who know my child well.";

"My child talks while playing.";

"My child talks a lot.";

"My child gets along with other children.";

"My child can communicate independently with other children.";

"My child's communication skills get in the way of learning.";

"My child's communications skills limit her/his independence.";

"My child needs help to be understood by other children.";

"My child becomes frustrated when trying to communicate with other children.";

"My child is reluctant to talk."; "My child has difficulties changing activities.";

"My child plays well with other children.";

"My child can communicate effectively with adults who know my child well.";

"My child is included in games by other children.";

"My child participates in group activities."

Factor 4:

"My child takes turns.";

"My child uses communication to solve problems.";

"My child waits for her/his turn to talk."

APPENDIX 2

Three-Factor Model items

Factor 1:

"My child can communicate independently.";

"My child can string words together.";

"My child's speech is clear.";

"My child is understood the first time when s/he is talking with other children.";

"My child speaks slowly when not understood.";

"My child speaks in complete sentences.";

"My child uses communication to solve problems.";

"My child conveys her/his ideas with words.";

"My child uses correct grammar when speaking.";

"My child uses new words.";

"My child uses words to ask for things.";

"My child's communication skills get in the way of learning.";

"My child's communications skills limit her/his independence.";

"My child is understood the first time when talking with adults who do not know my child well.";

"My child can tell adults who do not know my child well about past events.";

"My child uses language to communicate new ideas.";

"My child can talk to other children about what s/he is doing.";

"My child will sit and listen to stories.";

"My child can tell stories that make sense.";

"My child can communicate effectively with other children.";

"My child waits for her/his turn to talk.";

"My child can be understood by other children.";

"My child joins in conversations with her/his peers."/.

Factor 2:

"My child is willing to talk to others.";

"My child is confident communicating with adults who do not know my child well.";

"My child can communicate independently with adults who do not know my child well.";

"My child can communicate effectively with adults who know my child well.";

"My child will try to carry on a conversation with adults who do not know my child well.";

"My child will ask for things from adults s/he knows well.";

"My child can communicate effectively with adults who do not know my child well.";

"My child can talk about what s/he is doing with adults who do not know my child well."/.

Factor 3:

"My child makes friends easily.";

"My child is included in play activities by other children.";

"My child is comfortable when communicating.";

"My child is confident communicating with adults who know my child well.";

"My child takes turns."; "My child talks while playing.";

"My child gets along with other children.";

"My child can communicate independently with other children.";

"My child waits for her/his turn to talk.";

"My child becomes frustrated when trying to communicate with other children.";

"My child is reluctant to talk.";

"My child has difficulties changing activities.";

"My child plays well with other children.";

"My child is included in games by other children.";

"My child participates in group activities."

APPENDIX 3

Two-Factor Model items

Factor 1:

"My child can string words together.";

"My child can communicate independently with other children.";

"My child's speech is clear.";

"My child is understood the first time when s/he is talking with other children.";

"My child speaks slowly when not understood.";

"My child speaks in complete sentences.";

"My child uses communication to solve problems.";

"My child waits for her/his turn to talk.";

"My child conveys her/his ideas with words.";

"My child uses correct grammar when speaking.";

"My child uses new words.";

"My child uses words to ask for things.";

"My child's communication skills get in the way of learning.";

"My child's communications skills limit her/his independence.";

"My child is understood the first time when talking with adults who do not know my child well.";

"My child can tell adults who do not know my child well about past events.";

"My child uses language to communicate new ideas.";

"My child needs help to be understood by other children.";

"My child can talk to other children about what s/he is doing.";

"My child has difficulties changing activities.";

"My child will sit and listen to stories.";

"My child can tell stories that make sense.";

"My child can respond to questions.";

“My child will ask for things from other children.”;
 “My child can carry on a conversation with other children.”;
 “My child can communicate effectively with other children.”;
 “My child can be understood by other children.”;
 “My child joins in conversations with her/his peers.”/

Factor 2:

“My child makes friends easily.”;
 “My child is included in play activities by other children.”;
 “My child is comfortable when communicating.”;
 “My child is confident communicating with adults who know my child well.”;
 “My child takes turns.”;
 “My child is willing to talk to others.”;
 “My child is confident communicating with adults who do not know my child well.”;
 “My child talks a lot.”;
 “My child becomes frustrated when trying to communicate with other children.”;
 “My child can communicate independently with adults who do not know my child well.”;
 “My child is reluctant to talk.”;
 “My child plays well with other children.”;
 “My child can communicate effectively with adults who know my child well.”;
 “My child is included in games by other children.”;
 “My child will try to carry on a conversation with adults who do not know my child well.”;
 “My child will ask for things from adults s/he knows well.”;
 “My child participates in group activities.”;
 “My child can communicate effectively with adults who do not know my child well.”;
 “My child can talk about what s/he is doing with adults who do not know my child well.”

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