

We are IntechOpen, the world's leading publisher of Open Access books Built by scientists, for scientists

4,800

Open access books available

122,000

International authors and editors

135M

Downloads

Our authors are among the

154

Countries delivered to

TOP 1%

most cited scientists

12.2%

Contributors from top 500 universities

**WEB OF SCIENCE™**Selection of our books indexed in the Book Citation Index
in Web of Science™ Core Collection (BKCI)

Interested in publishing with us? Contact book.department@intechopen.com

Numbers displayed above are based on latest data collected.

For more information visit www.intechopen.com

The Role of Speech and Language Therapist in Autism Spectrum Disorders Intervention – An Inclusive Approach

Kateřina Vitásková and Lucie Kytarová

Additional information is available at the end of the chapter

<http://dx.doi.org/10.5772/intechopen.70235>

Abstract

The chapter describes the possibilities of involving a speech-language therapist in the assessment of the pragmatic level of communication in autism spectrum disorders (ASD), where one of the most frequently impaired areas is communication pragmatics. These difficulties lead to a disruption of social interaction, which might be one of the obstacles to speech-language intervention in these children. The text is based on an originally developed testing material aimed at selected pragmatic-oriented communication situations relating to everyday activities and real life. Based on a comparison of domestic and international resources in this area, as well as mediated and own empirical experience, our assessment approach is based on the conclusion that pragmatics can be understood in different contexts and perspectives. The text presents the results of a partial survey comparing the performance of children with ASD and children with typical development. The assessment focused on the children's election of the correct picture of a pair of pictures that represent usual communication and social situations. The results of the research suggest fewer incorrect responses in children with ASD and in different areas compared with children with typical development. However, the results of a qualitative analysis indicate a necessity to expand the assessment of communication pragmatics by adding an individually specific qualitative analysis of children's performance.

Keywords: autism spectrum disorders, pragmatic language level, speech and language therapist, inclusive approach, assessment, evaluation

1. Introduction

The pragmatic level of language is one of the language levels that underpin human communication abilities [1, 2]. This might also be the reason why the pragmatic level of language is a

widely discussed topic in modern speech-language therapy (see for example [3–5]). However, it represents a fairly complex issue involving not only the psychological and linguistic area [6], but from an inclusive perspective also educational sciences and special or inclusive education. In many countries, speech-language therapy is classified under special education sciences (see for example [7]), and currently, in the context of the so-called support educational inclusive measures, speech-language therapists represent significant experts who contribute to successful inclusion.

The link between educational and speech-language therapy (albeit clinical) approaches to diagnoses and interventions aimed at variations in the pragmatic level of language in children with autism spectrum disorders (ASD) is considered a significant determinant of the effectiveness of a comprehensive pro-inclusive approach. It is because these disorders involve impaired communication behaviour falling within the area of both communication and social interaction [8, 9].

Autism spectrum disorders (ASD) are lifelong, neurodevelopmental disorders. The symptoms include deficits in reciprocal social interaction and the imagination with presence of behavioural manifestation and impaired communication ability. Symptoms of communication disability, including non-verbal communication abnormalities, are usually the primary indicators of the child's impaired development and significant determinants of his/her socialisation, together with abnormalities in the characteristics of the child's play and delayed imitation (see for example [10–12]).

Although simulation of the pragmatic level of language is possible in persons with ASD, it must be preceded by targeted diagnostics and assessment of individual components of the pragmatic level of language (for example [13]). For these purposes, it is necessary to verify appropriate materials that focus on specific areas directly affecting the course of speech-language intervention (see for example [11]) but not only from a quantitative perspective. According to our empirical experience, it is necessary to combine the application of performance test materials with an individual qualitative analysis.

Ramberg et al. [14] emphasise the fact that despite a possible absence of difficulties concerning the phonetic-phonological area of language and active vocabulary, communication pragmatics in persons with Asperger syndrome is affected by significant features that adversely influence their social interaction. The authors focused on the presence of differences in vocabulary (lexical-semantic language level), understanding and pragmatics in three heterogeneous groups of participants. The results of the study confirm that the group of individuals with Asperger syndrome has significantly higher values of verbal IQ compared with the group of individuals with high-functioning autism (HFA) and specific language disorder (SLD). This higher verbal intellectual performance may be a reflection of good active vocabulary, verbal memory and engagement of the imitation ability in persons with this disability. On the other hand, however, these features are not homogeneous with deficits detected in social communication aspects, i.e. concerning the pragmatic level of language. Similar conclusions were also formulated by Stefanatos and Joe [15, 16] and others.

2. Principles of assessment of the pragmatic level of language in children with autism spectrum disorders by speech-language therapist

Communication pragmatics is affected by mutual interaction of the language and cognitive abilities and the quality of the sensorimotor integration (see for example [3]). We believe that the pragmatic level of language in persons with ASD needs to be considered not only in the context of social behaviour but also motor performance as well as imitation processes and perceptual determinants—sensory skills including orosensory abilities (see for example [17]). Variations in the perception of the pragmatic-oriented communication behaviour can affect the final child assessment in terms of the child's prognosis and functional communication parameters, which are to be stimulated or compensated for in the course of speech-language intervention. The principle of specific speech-language intervention is based on the processes of learning through imitation. Regarding the use of the elements of alternative or augmentative communication (AAC), it is also based on functional communication behaviour, i.e. pragmatic language skills [18].

In terms of inclusive practice, it needs to be emphasised that the symptoms of impaired communication pragmatics are specific not only in children with ASD but also those with specific language impairment or mild intellectual development. Although ultimately they may manifest in an identical or very similar way, in specific individual cases, they may be conditioned by different determinants. In this context, a child may be indicated a different therapeutic or educational procedure, which does not correspond to the child's real abilities and level of pragmatic communication skills, especially in cases of insufficient diagnostic assessment in this area. The cause is misinterpretation of the child's communication behaviour. However, given the importance of communication pragmatics in evaluating the child's school performance (link), its variations represent a high risk of inclusion failure or academic failure of a child with autism spectrum disorders.

Difficult assessment of the pragmatic level of language is also caused by the scarcity of research-based results on communication behaviour in specific groups of children with special educational needs and children with typical development, who may include children with impairment of the socially pragmatic communication ability [9, 19, 20].

2.1. Speech-language therapists' attitude to pragmatic language level assessment and therapy in children with autism spectrum disorders: situation in the Czech Republic

Regarding our previous research studies conducted in the Czech Republic (representing one of the Central Europe countries with very strong and developed special education counselling care and education systems) assume that the main emphasis in speech-language therapists' work with ASD clients is put on the assessment of activities, especially in those working in clinical settings. Although a focus on pragmatic language level is considered as significant by 87% of the addressed respondents, in practice, they still focus primarily on active and passive vocabulary development and pronunciation, i.e. on the phonetic-phonological language level [21]. Nevertheless, only 40% of the respondents apply specific assessment tools for evaluating communication disorders in individuals with ASD; specifically, only 58% of the respondents

focus on the diagnosis of pragmatic language level with regard to this. Although we did not find any significant difference between the knowledge of pragmatic language level problematics and the length of their professional practice, the speech-language therapists who perceive PLL as deficient in clients with ASD also focus on the development and improvement of the pragmatics in them. Additionally, a result that we did not expect was that speech-language therapists, working in health institutions (clinical speech-language therapists), in comparison with speech-language therapists working at schools or social institutions, meet clients with ASD in the Czech Republic more often. This fact calls for a deeper reflection of problems in ASD treatment and assessment in speech-language therapy and for a much more intensive and frequent sharing of interdisciplinary knowledge and services (compare for example with [22]).

Finally, we can emphasise, and especially in the context of the situation in the Czech Republic where there is lack of relevant or even standardised diagnostic tools for providing speech and language therapy in general, the importance of working on new, culturally and linguistically adapted materials for assessing pragmatic language level abilities and practical skills from the specific speech and language therapy view. Although working on these materials could be inspired by existing publications and assessment tools, it is reasonable to mention that sometimes the creation of a new, original material bring much plausible effect than the adaptation of an existing one. This implication may be concluded from similar attempts to adapt existing diagnostic tools to the regional conditions and speech and language therapists work standards in a specific country (see for example [5]). Nevertheless, the inspiration for assessing the pragmatics in autism spectrum disorders may be found in works of Fernandes et al. [23] or Mohammadi [24].

In our opinion, the new or adapted materials should reflect the new diagnosis of social (pragmatic) communication disorder (or pragmatic language impairment) and focus much more on specifics in oral motor imitation (see also [25]) and on the impact of changes in diagnosis and classification of ASD due to DSM V [26].

2.2. Introduction to the assessment material for evaluating pragmatic language level in children with ASD

For these reasons, the authors of the present study decided to develop an original material for the assessment of selected aspects of communication pragmatics in children with ASD, which would allow a comparison with the performance of children with specific language impairment, mild intellectual disability and children with typical development. The developed diagnostic material with a working title 'Assessment of the pragmatic level of language in persons with ASD: potential barriers to speech-language intervention' focuses on the assessment of children's pragmatic communication behaviour based on individually focused direct observation and performance testing. The basic assumption is that numerous abilities and practical skills related to the pragmatic level of language might be assessed based on the method of observation. Observation is performed without assigning complex tasks, in a natural environment of the child or in the environment of a counselling or therapeutic speech-language centre that the child knows. The objective of formal testing is in a more objective way to detect any difficulties in the respective area, adequacy of task fulfilment, peculiarities of task fulfilment, etc.

The diagnostic material is primarily intended for children and adolescents aged 5–18 years with autism spectrum disorders. It is also suitable for individuals with intellectual disorders, individuals with developmental dysphasia, individuals with behavioural and attention disorders and individuals with anxiety and emotional disorders. A precondition for the application of the material is an undisrupted ability to understand instructions. A speech expression disorder is not an exclusion criterion.

The diagnostic material was developed specifically for the purposes of a speech-language therapist. The whole conception of the assessment tool will be published in a separate book as the final result of the grant project of the Czech Science Agency. Therefore, for the purpose of this chapter, we would like to introduce only the main concept of the tool. Each diagnostic area is assessed on the basis of observation (O); the subjective perspective is examined by means of a set of pictures presented to clients with ASD, the purpose of which is to distinguish between visual diagrams (VD). The basic areas of assessment by visual diagrams include problem behaviour, eye contact, social interaction and behaviour (greeting, addressing, paring, changing communication roles and rules of communication). Other part of the assessment material focuses on sensory integration, motor imitation and facial expressions. The purpose of the developed diagnostic material is to perform assessment based on observation (O) and testing (T). The results are recorded into separate record sheets.

Observation (O): many abilities and skills related to the pragmatic level of language can be assessed by means of observation, e.g. observation of a child during a game allows study of establishing interactions with others, asking questions, imitation, etc. This method detects any spontaneous communication and verbal or non-verbal communication. Observation is performed without assigning tasks, in a natural environment of the child or in the environment of a speech-language therapy centre that the child knows. An advantage is the possibility to make a video recording.

Testing (T): the goal of formal testing is to assess in a more objective way whether a child has some problems in the monitored areas.

Description of the basic assessment areas:

- Problem behaviour—the area of social behaviour in persons with autism spectrum disorders is extensively analysed by psychological testing, and the pragmatic level of language is often combined with social behaviour. The assessment of problem behaviour was intentionally included in the diagnostic material because problems in social behaviour lead to problems in communication and might interfere with speech-language intervention. However, this is only a part of the assessment of communication pragmatics, which objectifies the subjective perspective of a speech-language therapist or parent concerning social behaviour of an individual with ASD.
- Eye (visual) contact—in relation to the development of children's linguistic skills, eye (visual) contact determines the acquisition of new vocabulary (through combined and later joint deliberate attention), both in terms of quantity and speed of learning and the quality verifiable by adequate understanding of concepts learned; children with autism spectrum disorders might suffer from disrupted initiation of joint attention (ability higher in terms of quality) but might be capable of a response to joint attention, although it may not be

executed completely as among the typical population because this ability is adversely affected by impaired movement coordination (eye contact level) primarily conditioned by dyscoordination between a gesture and visual contact [27].

- Sensory integration—this section focuses on individual differences and peculiarities of children, which need to be considered during speech-language intervention. The area of sensory integration is believed to be crucial for effective speech-language intervention. For this reason, the following material was developed: ‘screening assessment of perceptual-sensory integration’ [28], which is recommended in case any difficulties in the child’s sensory system are observed. This instrument focuses on the assessment of the sensory system (auditory perception, visual perception, tactile perception, gustatory and olfactory perception, proprioceptive system and vestibular system). ‘Screening assessment of perceptual-sensory integration’ [28] should inform the speech-language therapist what needs to be strengthened and what needs to be avoided (touching, speaking loudly or quietly, etc.). Every child has a unique sensory-motor profile.
- Social interaction and social skills—subtest aimed at greeting, addressing another person, changing communication roles and rules of communication.
- Motor imitation—this subtest cannot be assessed on the basis of visual diagrams but is of vital importance to speech-language intervention. The subtest assesses the ability of motor imitation of the upper and lower extremities with an object, without an object and oromotor imitation.
- Facial expression—facial expressions, direction of eye movements, movements of the head, body and hands in various situations:
 - Expressing interest in an activity, shared attention
 - Expressing joy, positive excitement
 - Expressing overload by stimuli, need for relaxation

The selection of visual diagrams (VD), which is part of the formal testing procedure, is assessed using the following scale: 0 = correct answer, 1 = incorrect answer. The number of points scored suggests the seriousness of a problem in a particular area.

The observed degree of seriousness of a problem in the observation part of the testing is administered in the following way: 0 = no problem, symptoms, 1 = mild/occasional disorder, differences from other children, 2 = moderate disorder (effects on learning and social interaction), 3 = severe disorder (negative effects on learning and social interaction), 4 = profound disorder (almost impossible learning and social interaction). The number of points scored suggests the seriousness of a problem in a particular area.

This chapter discusses partial outcomes of a research study aimed at children with ASD and children with typical development, specifically the results of assessment performed by means of the newly developed material—specifically the main part including model situations by means of visual diagrams. We believe it is important to use these results to demonstrate the differences in children’s performance in the area of communication pragmatics, which also

show individual peculiarities and to briefly discuss their confrontation with a qualitative analysis of relevant communication situations including explanation of children's correct answers.

3. Methodology of the research study and description of the assessment tool

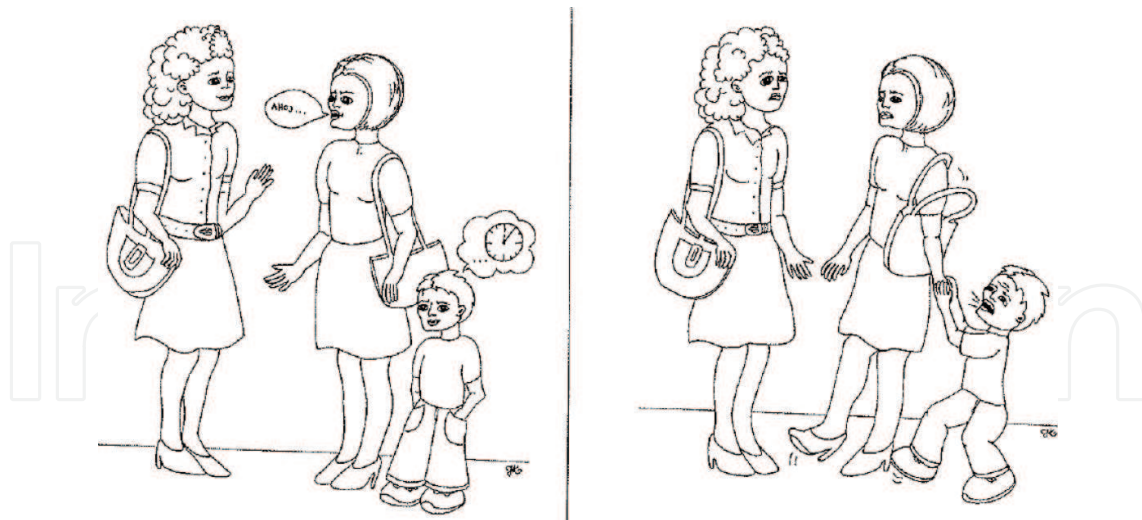
The assessment capacity of the developed diagnostic material is illustrated using the partial results based on a comparison of the performance of 10 children of a typical population and 10 children with ASD of school age and older preschool age. The relative age variance reflects the broad age structure of children in establishments for children with ASD and a degree of heterogeneity of the research sample. Originally, the research was supposed to include only preschool children, which eventually turned out to be impossible due to the development of pragmatic skills and the ability of children to explain their performance. The intention was also to monitor a relatively usual structure of the sample of children that speech-language therapists encounter; these are older preschool children but mainly school-aged children.

In terms of methodology, the research was of a mixed design; children's performance was assessed by means of testing. The test assessment tool was developed using original illustrations demonstrating pragmatic-oriented communication situations based on everyday life and usual social interactions in relation to the narrowest social group.

As it was mentioned above, the visual diagram tasks always include two pictures representing opposite (adequate and inadequate) pragmatic communication situation. The child is instructed to choose one of the two pictures that represent the correct alternative of the communication situation. The task included a total of ten pairs of pictures related to the following assessment categories: 1. eye contact, 2. greeting, 3. parting, 4. want something, 5. proxemics in communication, 6. expressing displeasure, 7. waiting for communication, 8. changing communication roles, 9. behaviour in a shop and 10. response to loss. The test administration was designed to ensure simplification and clarity (see **Picture 1**).

The evaluator use the following scale: 0 = correct answer, the child chose the correct picture and adequately explained the reasons for the choice; 1 = incorrect answer, the child chose the incorrect picture or did not adequately explain the reasons for choosing the correct picture. There are more acceptable answers to the question which picture is correct, e.g. thumbs up, thumbs down, happy or sad smiley. The testing time usually does not exceed 15 min. The testing time depends on the needs of every individual.

Our aim is to highlight the considerable variance of the results and the resulting disproportion, which might result from the absence of subsequent qualitative performance characteristics of a child in the assessment of the child's performance in the pragmatic level of language, in case that speech and language therapist would use only the quantitative assessment form (with dichotomic option related to the visual schemes, for example).



Picture 1. The example of the visual diagram—VD7. ‘Waiting for communication’.

4. Partial results of the research study

Table 1 shows the distribution of the assessment results of a pair of visual diagrams. The results suggest that in the group of children with typical development the pair of pictures that was most frequently (four times) incorrectly identified was visual diagram (VD) VD2 ‘greeting’, three times VD3 ‘parting’ and VD1 ‘eye contact’, twice VD5 ‘proxemics’ and once VD7 ‘waiting for communication’. In the other parts, the communication situations were assessed adequately by choosing the correct answer. An interesting finding is the identical result achieved by boys 7 and 8 (see C7 and C8 in **Table 1**), who gave incorrect answers in eye contact, greeting and parting. The worst result was scored by client C3, who had 4 incorrect answers (C3). An absolutely error-free result was achieved by four children.

The results in **Table 2** relating to the assessment of visual diagrams in children with ASD suggest that, paradoxically, children in this sample made fewer mistakes, specifically in nine cases; their worst result is lower than in the group of children with typical development. Most incorrect answers occurred in the areas represented by VD2 ‘proxemics’, VD7 ‘waiting for communication’ and VD8 ‘changing communication roles’. On the contrary, error-free areas were ‘want something’, ‘expressing displeasure’, ‘behaviour in a shop’ and ‘response to loss’. The worst results were achieved by client K5A; this was a girl with child autism aged 6 years and 6 months. An absolutely error-free result was achieved by half of the children, although their diagnosis involved impaired social interaction and communication, apparently in the pragmatic area.

The research assumption was that children with typical development will achieve better results than children with autism spectrum disorders. The results suggest that the difference between the compared groups of children is negligible. To verify the initial hypotheses, the Mann-Whitney U test was selected for larger groups (group size 9–20):

- H0: there is no statistically significant difference between the two groups.
- HA: there is a statistically significant difference between the two groups.

For comparison the results of both groups are arranged in order (**Table 3**).

Client	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	Total n
Gender	Boy	Girl	Boy	Girl	Boy	Boy	Boy	Girl	Boy	Boy	
Age	6;0	6;6	5;8	6;10	4;9	6;10	5;2	6;4	5;7	5;11	
Area of evaluation											
1. Eye contact	0	0	1	0	0	0	1	1	0	0	3
2. Greeting	0	1	1	0	0	0	1	1	0	0	4
3. Parting	0	0	0	1	0	0	1	1	0	0	3
4. Want something	0	0	0	0	0	0	0	0	0	0	0
5. Proxemics	0	0	1	0	0	0	0	0	0	0	1
6. Expressing displeasure	0	0	0	0	1	0	0	0	0	0	1
7. Waiting for communication	0	0	1	0	0	0	0	0	0	0	1
8. Changing communication roles	0	0	0	0	0	0	0	0	0	0	0
9. Behaviour in a shop	0	0	0	0	0	0	0	0	0	0	0
10. Response to loss	0	0	0	0	0	0	0	0	0	0	0
Wrong responses (n=)	0	1	4	1	1	0	3	3	0	0	13

C_{number} = client's code; area of evaluation = the name of the item of evaluation material; age = the age of the assessed children with ASD.

Table 1. Assessment using visual diagrams in children with typical development.

Client	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	Total n
Gender	Boy	Boy	Boy	Boy	Girl	Girl	Girl	Boy	Boy	Boy	
Age	9;0	5;0	13;0	14;0	6;6	7;8	4;9	5;6	8;2	6;4	
Area of evaluation											
1. Eye contact	0	0	0	0	1	0	0	0	0	0	1
2. Greeting	0	0	0	0	1	0	0	0	0	0	1
3. Parting	0	0	0	0	0	0	0	0	1	0	0
4. Want something	0	0	0	0	0	0	0	0	0	0	0
5. Proxemics	0	0	0	0	0	1	0	0	1	0	0
6. Expressing displeasure	0	0	0	0	0	0	0	0	0	0	0
7. Waiting for communication	0	0	0	0	1	1	0	0	0	0	2
8. Changing communication roles	0	0	0	0	0	0	1	0		1	2
9. Behaviour in a shop	0	0	0	0	0	0	0	0	0	0	0
10. Response to loss	0	0	0	0	0	0	0	0	0	0	0
Wrong responses (n=)	0	0	0	0	3	2	1		2	1	9

C_{number} = client's code; area of evaluation = the name of the item of evaluation material; age = the age of the assessed children with ASD.

Table 2. Assessment using visual diagrams in children with autism spectrum disorders.

Intact	Rank order	ASD	Rank order
6	1	7	3
7	3	8	5.5
7	3	8	5.5
9	9	9	9
9	9	9	9
9	9	10	16
10	16	10	16
10	16	10	16
10	16	10	16
10	16	10	16
$n_1 = 10$	$R_1 = 98$	$n_2 = 10$	$R_2 = 112$
$U = n_1 * n_2 + \frac{n_1 * (n_1 + 1)}{2} - R_1 = 43$			
$U' = n_1 * n_2 + \frac{n_2 * (n_2 + 1)}{2} - R_2 = 57$			
$U_{0.05}(10, 10) = 23$			

Table 3. U test calculation.

Regarding the fact that the calculated value $U = 43$ is greater than the critical value $U_{0.05}(10, 10) = 23$, the null hypothesis is accepted. There is no statistically significant difference between the two groups of children.

5. Discussion of partial results

The diagnostic material entitled 'Assessment of the pragmatic level of language in persons with autism spectrum disorders: potential barriers to speech-language intervention' brings a new perspective of the issue of the pragmatic level of language in persons with ASD, not only in the context of social behaviour. The purpose of the material is not only to react to the absence of a method of diagnosing communication pragmatics in terms of speech-language therapy but also to make speech-language therapy more efficient and to show professionals how speech-language therapy aimed at persons with ASD should be developed, which individual peculiarities should be considered and which potential barriers pose a threat.

We are aware of the possible limitation of the visual schemes (graphic illustrative demonstration) form of the presentation of the social communication pragmatic real-life situation. This graphic version could appear maybe more symbolic than realistic; nevertheless, we were working on the presumption that in ordinary speech and language therapy or special education sessions professionals or parents very often use visual schemes to assess or enhance pragmatic language level, regarding the iconic way of thinking and "inner speech" related to ASD [29, 30]. Moreover, to find out and discuss the possible limits of using such visually symbolic

schemes was also one of the primary goals of our research, because finally, we would like to create a material which can bring the speech and language therapist the partial picture of the child ability to work and benefit from such type of material during the intervention. Also we can consider that both, the pro-inclusive, as well as traditional special education systems are full of illustrated textbooks, books and picture didactic materials, so educators or speech and language therapists should know how children with ASD are able to benefit from such graphic demonstrations. Similarly we can mention that intervention in terms of developing communication competence strategies in ASD primarily use AAC, any mostly visually presented picture as pictograms, PECS etc. The research findings proved that such AAC-based strategies using visual picture-based communication during speech therapy have even moderate positive effect on functional and social communication but must be individualised and multimodal [31].

Regarding the limitations mentioned above, we suggest that the combination of assessment using, for example, visual schemes should be accompanied with other ways of evaluating pragmatic communication in natural settings (see for example [23; 27]). On the other hand, the methods of evaluation such observation of children behaviour during play, social communication situation and others may be very demanding in terms of time and personal engage of the speech and language therapist, who must usually deal with a great number of various diagnoses and age variation within the group of his/her clients (and the length of the therapy session per client is limited by the insurance company groups in the Czech Republic).

However, a qualitative analysis of partial results suggests that in each group of children, incorrect responses were indicated in different areas of pragmatic communication skills. The only areas with correct answers in both groups were 'Behaviour in a shop', 'Response to loss' and 'Want something', which we believe require further research. A paradoxical fact is the overall better result of children with ASD. This might however be explained by more frequent training of communication situations shown on pictures. Looking at children's age and performance, surprisingly, some younger children showed better results than older children, although they have the same diagnosis. This finding is similar to previous studies (for example [32]). Nevertheless, this "paradoxical" performance during the pragmatic level of language assessment could be partially related to the form of the evaluation process or tool used [33]. In general, the formal, standardised assessment is problematic as the performance of the child misses the advantage of the natural setting observation analysis. The influence of the examiner's instruction or contextual cues and the structuring of the environment t may have also a specific effect [34, 35]. The other explanation could be a much more intensive focus on linguistic than nonlinguistic context of the pragmatic situation and the verbal instruction given by the evaluator during testing. Finally, the development and stronger engagement of the cognitive aspect of the pragmatic language information may have some significant effect on the children performance.

In our opinion, these results support the trends aiming at changes in ASD classification in the 11th Revision of the International Classification of Diseases by the World Health Organization. The document better reflects the differences in communication, communication functionality and pragmatics in children with ASD and is therefore better applicable in speech-language therapy for the purposes of planning the communication procedure and development of functional communication or its compensatory function.

This preliminary research suggests that the assessment of communication pragmatics should not be carried out only according to quantitative indicators. It should rather involve a combination of performance testing and a detailed qualitative description with a subsequent analysis or confrontation with the results of process assessment of the course of testing and comments or behaviour of the child during the testing procedure. We believe that the assessment should include or be primarily based on the developed audio-visual recordings that would be used for an analysis of communication behaviour. At the same time, however, it should be mentioned that this procedure has some limitations. The legal guardians' consent must be obtained to make and store recordings, technical and organisational measures are required for recording, and extra time is needed for analyses and special training in analysing pragmatic communication behaviour.

The preliminary research also suggests that the testing procedure is affected by the preparation taken before testing. Some recommendations need to be observed prior to the testing procedure or observation. It is for example advised to take a comprehensive family history, which should include information about the interests of the child, favourite activities, songs, films, food, pets, family members, etc. It is also necessary to establish a positive relationship with the client based on trust. The speech-language therapist should become thoroughly familiar with the testing material, questions and assessment, prepare all required items and check the audio/video equipment. In the course of assessment, adequate facial expressions and verbal praise should be used. The activities should be appropriate to the age of the child; adequate child motivation should be used. Each question should be repeated twice or three times, and time of 3–5 s should be provided for a response.

In the preliminary research, the group of children with ASD included 10 children diagnosed with child autism (according to WHO classification ICD 10 still valid in the Czech Republic). The material is also applicable for children with the Asperger syndrome. With regard to the changes in the assessment criteria of ASD in the context of DSM 5 of APA classification and with regard to the 11th WHO revision, we believe that in future, the diagnoses of some children will be changed at a younger age. Moreover, the diagnoses might be considerably influenced by the diagnostician or the diagnostic department, and the resulting diagnosis might correspond with another level or type of ASD also because this is a developmental disorder whose symptomatology changes with age and as a result of specific interventions. These assumptions are also confirmed in the course of other research studies performed by the authors of the present study in the area of assessment of oral stereognosis, etc., in which children with more severe degrees of disability achieved better values than children with less severe ASD or even combined with intellectual (mental) disability (for example [36]).

6. Conclusion

The assessment of the pragmatic level of communication is a very difficult yet socially significant component of the diagnostic process in the area of both physiology and communication disorders. It is because the process of assessment is dependent on many factors, which result both from the individual personality characteristics of the individual and the examiner and

external conditions. Another important aspect is the nature of the communication environment, communication partners and experience of the individual with pragmatically oriented tasks. From a speech-language therapy perspective, in the assessment of the pragmatic level of communication, it is necessary to consider not only the communication performance or nature of non-verbal or co-verbal behaviour, because the components of pragmatic behaviour such as facial expressions and gestures are influenced by motor performance and neuromotor activity, which can be, particularly in persons with health disability, primarily specifically determined by a number of variations and disorders with a secondary effect on the performance in the area of pragmatic communication components.

The preliminary research suggested a paradoxical finding—non-affected areas of communication pragmatics assessed by means of visual diagrams in half of children with ASD and worse performance in the group of children with typical development. Some of the areas were assessed correctly, where the result was not affected by age—on the contrary, younger children diagnosed with severe autism achieved better performance than older children with the same diagnosis. However, the differences between the two groups were not statistically significant.

Another significant finding is that child performance need not necessarily reflect the real mastery of pragmatic communication in a specific situational context, but rather an effort to express a correct response, which according to a qualitative analysis does not match the real response selection by the child or the essence of the communication situation. The pragmatic explanation elicited from children after the testing procedure often suggests that the content of the functional pragmatic behaviour was understood in a completely or partially different way. We believe that this is something like a ‘pragmatically oriented analysis’ of the child’s pragmatic communication behaviour.

Acknowledgements

The research results constitute partial results of the specific research “The research on impairment and deviations of communication ability and orofacial system in a speech and language therapy perspective” IGA_PDF_2017_026 and GAČR GA 14-31457S. 2014–2016 “Pragmatická jazyková rovina u osob s poruchami autistického spektra”, principal researcher: Assoc. Prof. Kateřina Vitásková.

Author details

Kateřina Vitásková* and Lucie Kytarová

*Address all correspondence to: katerina.vitaskova@upol.cz

Faculty of Education, Department of Speech and Language Pathology and Communication Ability Studies, Palacký University, Olomouc, Czech Republic

References

- [1] Lechta V, et al. *Terapie narušené komunikační schopnosti*. 2nd ed. Praha: Portál; 2011. 392 p
- [2] Perkins MR. Clinical pragmatics: An emergentist perspective. *Clinical Linguistics & Phonetics*. 2005;**19**(H.5):363-366
- [3] ASHA. American Speech Language Hearing Association. Social Language Use Pragmatics [Internet]. 2016. Available from: <http://www.asha.org/public/speech/development/Pragmatics/> [Accessed: 2 May 2016]
- [4] Hwa-Froelich DA. Social communication theoretical foundations and introduction. In: Hwa-Froelich DA, editor. *Social Communication Development and Disorders*. 1st ed. New York and London: Psychology Press. 2015. pp. 3-19
- [5] Košťálová M, Poláková B, Ulreichová M, Šmíd P, Janoušová E, Kuhn M, Klenková J, Bednařík J. Dotazník funkcionální komunikace (DFK): Validace originálního českého. *Česká a slovenská neurologie*. 2015;**78/111**(2):188-195
- [6] Zufferey S. *Acquiring Pragmatics: Social and Cognitive Perspectives*. 1st ed. New York: Routledge; 2015. 202 p
- [7] Georgieva D, Woźniak T, Topbaş S, Vitaskova K, Vukovic M, Zemva N, Duranovic M. Education of speech and language therapists/logopedists in selected central and southeastern European countries: Challenges and new horizons. *Folia Phoniatica et Logopedica*. 2014;**66**(4-5):183-196
- [8] Thorová K. *Poruchy autistického spektra*. 1st ed. Praha: Portál; 2012. 465 p
- [9] Vitásková K, Říhová A. Speech and language therapy in the context of autism spectrum disorders assessment and intervention: Professional undergraduate and graduate approach. In: Gómez Chova L, López Martínez A, Candel Torres I, editors. *ICERI2015 Proceedings*; 18-20 November, 2015; Sevilla. IATED. 2015. pp. 4484-4491
- [10] Toth K, Munson J, Meltzoff AN, Dawson G. Early predictors of communication development in young children with autism spectrum disorder: Joint attention, imitation, and toy play. *Journal of Autism and Developmental Disorders*. 2016;**36**(8):993-1005
- [11] Říhová A, Vitásková K. *Logopedická intervence u osob s poruchami autistického spektra: odborná publikace pro logopedy*. 1st ed. Olomouc: Univerzita Palackého v Olomouci; 2012. 126 p
- [12] Yoder P, Watson LR, Lambert W. Value-added predictors of expressive and receptive language growth in initially nonverbal preschoolers with autism spectrum disorders. *Journal of Autism and Developmental Disorders*. 2015;**45**(5):1254-1270. DOI: 10.1007/s10803-014-2286-4
- [13] Boyd B. *Výchova dítěte s Aspergerovým syndromem*. 1st ed. Praha: Portál; 2011. 128 p.

- [14] Ramberg C, Ehlers S, Nydén A, Johansson M, Gillberg, C. Language and pragmatic functions in school-age children on the autism spectrum. *International Journal of Language and Communication Disorders*. 1996;**31**(4):387-413. DOI: 10.3109/13682829609031329
- [15] Stefanatos GA, Joe WQ. Autistic disorder. In: Morgan JE, Ricker JE, Morgan JE, Ricker H, editors. *Textbook of Clinical Neuropsychology*. New York, NY, US: Psychology Press; 2008. pp. 185-260
- [16] Reboul A, Manificat S, Foudon N. Autism from a cognitive-pragmatic perspective. In: Foudon N, Manificat S, Reboul A, editors. *Cognitive Pragmatic*. Berlin: Mouton de Gruyter; 2012. pp. 317-344
- [17] Miller M, Chukoskie L, Zinni M, Townsend J, Trauner D. Dyspraxia, motor function and visual-motor integration in autism. *Behavioural Brain Research*. 2014;**269**:95-102. DOI: 10.1016/j.bbr.2014.04.011
- [18] Vitásková K, Říhová A. Komparativní studie aplikace Výměnného obrázkového komunikačního systému u osob s poruchami autistického spektra. In: Vitásková K, et al, editors. *Vybrané typy narušené komunikační schopnosti v interdisciplinárním přístupu*. 1st ed. Olomouc: Univerzita Palackého; 2013. pp. 13-38
- [19] Buntová D, Mikulajová M. Sémanticko-pragmatický deficit u dětí s narušeným vývinom řeči. *Československá psychologie*. 2012;**56**(4):343-352
- [20] Norbury CF, Sparks, A. Difference of disorder? Cultural issues in understanding neurodevelopmental disorders. *Developmental Psychology*. 2013;**49**:45-58
- [21] Vitásková K, Říhová A. Trans-disciplinary cooperation in children with autism spectrum disorder intervention with emphasis on the speech and language therapist's important role. *Procedia—Social and Behavioral Sciences*. Vol. 132 (6th International Conference on Intercultural Education ĀEducation and Health: From a transcultural perspectiveĀ). 2014. pp. 310-317. DOI: 10.1016/j.sbspro.2014.04.315
- [22] Defense-Netrval DA, Fernandes FM. The provision of speech-language therapy in services destined to individuals with Autism Spectrum Disorder (ASD). *CoDAS*. 2016;**28**(4):459-462. DOI: 10.1590/2317-1782/20162015094
- [23] Fernandes FDM, Barbosa MRP, Santos THF, Amato CAH. Speech-language pathology in the assessment and diagnosis within the autism spectrum. In: Fitzgerald M, editor. *Autism Spectrum Disorder—Recent Advances*. Rijeka: InTech. 2015. Available from: <https://www.intechopen.com/books/autism-spectrum-disorder-recent-advances/speech-language-pathology-in-the-assessment-and-diagnosis-within-the-autism-spectrum>. DOI: 10.5772/5940
- [24] Mohammadi M-R, editor. *A Comprehensive Book on Autism Spectrum Disorders*, New York: InTech, 2011. 488 p. Available from: <https://www.intechopen.com/books/a-comprehensive-book-on-autism-spectrum-disorders>. DOI: 10.5772/975
- [25] Miller M, Young GS, Hutman T, Johnson S, Schwichtenberg AJ, Ozonof, S. Early pragmatic language difficulties in siblings of children with autism: Implications for

- DSM-5 social communication disorder? *Journal of Child Psychology and Psychiatry*. 2015;**56**(7):774-781
- [26] Tsai LKY. Review: Impact of DSM-5 on epidemiology of Autism Spectrum Disorder. *Research in Autism Spectrum Disorders*. 2014;**8**(11):1454-1470
- [27] Bernier R. Assessment of core features of ASD. In: Tarbox J, Dixon DR, Sturmey P, Matson JL, editors. *Handbook of Early Intervention for Autism Spectrum Disorders*. 1st ed. New York: Springer Science + Business Media, 2014. pp. 83-110
- [28] Biel L, Peske N. *Raising A Sensory Smart Child. New Times Naturally!* New York: Penguin Books; 2007. pp. 27-28
- [29] Whitehouse AO, Maybery MT, Durkin K. Inner speech impairments in autism. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*. 2006;**47**(8):857-865
- [30] Kunda M, Goel A. Thinking in pictures as a cognitive account of autism. *Journal of Autism and Developmental Disorders*. 2011;**41**(9):1157-1177
- [31] Tierney CD, Kurtz M, Panchik A, Pitterle K. 'Look at me when I am talking to you': Evidence and assessment of social pragmatics interventions for children with autism and social communication disorders. *Current Opinion in Pediatrics*. 2014;**26**(2):259-264. DOI: 10.1097/MOP.0000000000000075
- [32] Schulze C, Tomasello M. 18-month-olds comprehend indirect communicative acts. *Cognition*. 2015;**136**:91-98. DOI: 10.1016/j.cognition.2014.11.036
- [33] Barbosa MP, Fernandes FM. Comparing the results of DAADD and ABC of children included in autism spectrum disorders. *CoDAS*. 2014;**26**(3):208-212
- [34] Kissine M, Cano-Chervel J, Carlier S, De Brabanter P, Ducenne L, Pairon MC, Deconinck N, Delvenne V, Leybaert J. Children with autism understand indirect speech acts: Evidence from a semistructured act-out task. *PLoS ONE*.
- [35] Miilher LP, Fernandes FDM. Considering responsivity: a proposal for pragmatic analysis in autism spectrum. *CoDAS*. 2013;**25**(1):70-75. DOI: <https://dx.doi.org/10.1590/S2317-17822013000100013>
- [36] Vitásková K, Málková M, Hlavinková A. Ověřování výzkumných možností diagnostiky orální stereognozie v oblasti symptomatických poruch řeči u dětí – význam pro interdisciplinární praxi. In: Maierová E, Viktorová L, Dolejš M, editors. *PhD existence6. výzkum + /vs/- praxe. Česko-slovenská psychologická konference (nejen) pro doktorandy a o doktorandech. Sborník odborných příspěvků; 8.-9.12. 2016; Olomouc. Olomouc: Univerzita Palackého v Olomouci; 2016. pp. 124-131*