

Intervention in Speech Therapy in Reducing Phonological Insufficiency in Preschool Children

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Abstract

This research examines the possibilities of promoting the development of phonemic perception among children of preschool age with phonemic insufficiency. Phonemic insufficiency is a complex and difficult disorder; in such cases, therefore, a specialist carries out an in-depth evaluation of a child's speech development and language acquisition, which allows them to determine a precise program of speech therapy using the necessary correction methods and techniques, including games.

The aim of the present study is first, to investigate theoretically and evaluate practically the possibilities of promoting phonological perception in children with phonological insufficiency using a collection of games created by the author; and second, to gather expert opinion to substantiate the efficiency of these games in interventions.

The research was carried out using a literature review, speech and language therapist survey, an analysis of expert opinion of the developed games, and speech therapy sessions to improve phonological perception in pre-school children with phonological insufficiency.

Results. Forty-nine children aged five and six years old with phonological insufficiency were involved in the empirical stage of the study, namely speech therapy sessions over a period of six months. An initial and a follow-up assessment of phonological perception were carried out and showed dynamic growth for all participants. The results of the speech and language therapist survey revealed that speech therapists included the presented games in interventions and viewed them as relevant and effective instruments to reduce phonological insufficiency. The comments by experts selected from among the survey respondents on the games created by the author indicate that they are relevant and effective instruments in phonological insufficiency reduction.

Keywords: game, intervention, preschool children, phonological insufficiency, phonological awareness

Introduction

Language is a cultural heritage and the means of human communication. Every individual learns the laws of language usage in communication with their peers; thus, the cultural continuity of a language is respected so it can be acquired, preserved, and transmitted to future generations (Lüse et al., 2012; Montessori, 1964; Montesori, 2019; Rūķe-Draviņa, 1992). Language is a complicated sign system and a tool for the expression of thinking, thoughts, feelings, and will in communication with others (Lüse et al., 2012). Language use takes two forms, namely code and speech, and speech is implemented in three ways: sign language, spoken language, and written language, each of which has both communicative and expressive characteristics (Aivars et al., 1999).

Speech and language cannot be separated. Speech is a form of cognition and communication implemented with the help of language. Hence, a hierarchy of language elements must be respected in the process of language learning: phonetics (sound articulation and acoustics), morphology (structure of morphemes and functions, grammatical categories, creation of grammatical forms), and syntax (combination of words, sentences, the grammatical structure of sentences, and the laws of their creation) (Bušs et al., 2007; Miltiņa & Skribanovska, 2017). Berman (2008) also states that for a child to become a proficient speaker, they must follow the sequential stages of language learning, which takes a long time.

Language skills develop gradually in children and are based on imitation and exercise in practical activities, including playing different games. Playing ensures physical health, liveliness of mind, and body part movement, leading to a child's full development (Grudulis et al., 1632/1992). For children of preschool age, games offer shelter from unknown situations and support for achievements and successes (Petrovska et al., 2013), favorably affecting comprehensive personality development.

Methodology

This study is based on a review and analysis of the theoretical literature, which reveals the problem and establishes the relevance of the study. A review of the theoretical literature substantiates the importance of thoroughly developed phonemic perception in the speech development and language acquisition of preschool children. Furthermore, a practical study of improving the development of phonemic perception in preschool children with phonological insufficiency was carried out. Criteria, indicators, and assessment levels for phonemic perception assessment were established by the research author. The study included 49 children aged five to six years old who were diagnosed with phonological insufficiency. The practical study administered a questionnaire to practicing speech and language therapists; thus, opinions were collected from experts as follows:

- 1) the opinion of speech therapists in preschool educational institutions on the methods, techniques, and methodological materials most often included in interventions (including games);
- 2) evaluation by experts selected from among the speech therapists of the set of games developed by the author; and 3) the effectiveness of the games in interventions in terms of reducing phonological insufficiency.

Results

The opinions expressed in the theoretical literature show that an increasing number of scientists are turning their attention to children's speech development and language acquisition legality, as well as their development and acquisition legality problems. Experts in this area explain that speech development and language learning develop most rapidly during the first three years of a child's life, when the brain is particularly open to picking up and learning a language (Ahutina & Pylajeva, 2008; Astapov, 2010; Bondar, 2012; Tomele, 2022; Volodin & Shklovskij, 2014; Weyandt, 2006).

Data from the Latvian National Statistical Office about the state of children's health (in the context of a study of speech and language disorders) suggest that the relevant numbers are not positive:

- For the 2018–2019 school year, 2455 of 4102 children in preschool educational institutions were diagnosed with speech and language development disorders (Central Statistical Bureau [CSB], 2020).
- The *Latvian Statistical Yearbook 2020*, published in 2021, presents data regarding the number of persons registered with disabilities at the end of 2019; however, this breakdown did not separate children with speech development and language learning disabilities from others (CSB, 2021).
- The edition of the *Latvian Statistical Yearbook* published in 2022 did not present data on speech development and language learning disability (CSB, 2022).
- The fact that an increasing number of children have speech and language disorders is confirmed by a Dutch study, which states that in the timeframe 2010 to 2013, approximately 43% of children aged four to seven were found to have development disorders (Wiefferink et al., 2020).

In Latvia, the competence approach is applied to learning content in all education stages and entails learning by delving into the essence of the subject and understanding the interconnections between the activities offered so students can use their newly learned knowledge in unknown situations. School 2030 [Skola 2030] documentation and the curriculum for preschool education both offer methodological suggestions for educators about learning content and approach implementation. Moreover, they clearly define achievable results in the area of

language, for which three content units have been created: communication in context, text and text creation, and language structure (Miesniece, n.d.; Namsone et al., n.d.); see Table 1.

The reflected achievable results (see Table 1) provisionally imply that the highest achievable result in the language learning area at the end of preschool is a child who pronounces all speech sounds correctly and knows how to differentiate them, is able to analyze the composition of a word, and can represent a sound with a specific graphic image in reading and writing activities.

Table 1. Formulation of learning outcomes to be achieved at pre-primary stage 3 (5–6 years of age) (School 2030)

Key Stage 3 (age 5–6) (Expected Results (ER) set for a child at full age 6 – by the start of primary education)	Expected results		
	Communication in context	Text and text creation	Language structure
	Explains why people use language to communicate.	Listens to the text, names the characters, retells the events, makes up a sequel.	Identifies and names the speech sounds.
	Asks about the unclear and answers specific questions.	Can talk about what have seen, heard, experienced, and their emotions and actions in a clear and sequential way.	Pronounces all speech sounds correctly.
	Participates in the conversation without interrupting the speaker.		Denotes speech sound by the corresponding letter.
	Uses speech intonations to express emotions appropriate to the communication situation.		Reads the words and understands what is read.
		Writes written letters in an unlimited space.	

Likewise, the child should have an understanding of language usage legalities in each dialog context, know how to listen in others, and be able to express their own opinion. Children with phonological insufficiency can achieve this result in primary school on condition that a speech therapy intervention is carried out.

In the process of speech development and language learning among children of preschool age, great attention must be paid to both speech sound learning and phonematic process development. Fully developed phonematic processes help a person understand, react to, and concentrate on the different noises and sounds of the outside world (both non-language and language sounds), as well as decide from which side such noises are heard and distinguish among their sources (Chu & Syu, 2018; Constantin, 2021; Kramiņš, 2005; Kramiņš, 2016; Tübele & Lüse, 2012; Šenveilers & Ptoks, 2001).

Speech development and/or language learning disorders are among the development disorders most often encountered in children. Speech development and language learning disorders can affect one or more language areas, namely phonetic, morphological, and/or syntactic (Adams, 1990; Adams et al., 2012; Hemenstall, 2016; Miltiņa, 2008; Markus, 2007; Tübele & Lüse, 2012).

Phonematic process development is formed and developed at a preschool age. Children's auditory attention and perception of noise and speech sound develop gradually; hence, having an example of correct speech and language is one of the most important prerequisites to advance correct speech development and language learning (Zinovjeva, 2018; Buldur & Gokkus, 2021; Dalva et al., 2017; Ferraz et al., 2015; Miltiņa, 2005; Murphy et al., 2015; Tübele, 2008).

In order to advance development of phonematic processes, attention is paid to recognition and differentiation of speech sounds, perceiving and repeating rhythm, and enhancing verbal memory, as these components are closely related with reading skills. For children with inferior phonematic process development, difficulties arise in tasks such as missing sound determination and repeating non-words (Melby-Lervåg et al., 2012; Rispens & Been, 2007).

Intervention in speech therapy, explained as set of measures of pedagogical, psychological, and speech therapy, can reduce and/or prevent a child's physical and psychological development and speech disorder if carried out by a speech therapist (Abry et al., 2015; Tübele, 2019; Thomas-Stonell et al., 2013).

Speech therapists use anamnesis acquisition to better understand children's speech and language disorders. They determine speech therapy statement and plan intervention actions with the goal of reducing speech disorder displays. Planning and implementing an intervention are seen as a complex and consecutive set of actions (Barberena et al., 2014; Brosseau-Laprée & Roepke, 2019; Mezzomo et al., 2014; Miltiņa, 2005, 61; Snowling & Hulme, 2012; Tübele, 2019).

Great attention should be paid when the result of the intervention is received. The results need to be fixed and analyzed to evaluate dynamic changes and to evaluate the efficiency of the methods and techniques used in the intervention carried out to reduce the disorder (Baker et al., 2022).

An intervention is structured as follows. First, the anamnesis is received, after which a child's speech development is evaluated, an intervention is carried out, the child's speech development is evaluated, and the obtained results are analyzed; secondly, the feasibility and difficulty level of corrective work are assessed considering the child's experience, abilities, and skills (Baker et al., 2022; Vilka, 2021). Children gain experience in different activities, including playing different games. A game makes children laugh, fantasize, create, think about and express their wishes, rejoice, learn, and relax (Dzintere, 2000, 30; Lundberga, 2007). A game is a form of activity which is practiced from early childhood until the last years of one's life (Elkonin, 2008; Gottfried, 1985; Leontjev, 1996; Levy, 1978; Lieberman, 2007).

Table 2. The characteristics of a game as expressed in the theoretical framework

Authors	Characteristics of the game
Schiller (1794)	A game is an engine of personal development.
Froebel (1887)	Playing games forms experience.
Groos (1901)	A person plays to learn the skills required in life.
Spencer (1920)	A game is a pedagogical activity which gradually prepares a person for work life.
Huizinga (1949)	A game is a targeted and meaningful activity successfully implemented for development in the cognitive, physical, and social spheres.
Piaget (1951)	Playing games ensures a child's intellectual development.
Montessori (1964)	Playing games ensures a child obtains knowledge and skills.
Vygotsky (1966)	A game is preschool child's leading activity in the development of imagination, speech and language, mental ability, and logical thinking.
Bruner (1983)	A game has a therapeutic effect and ensures children's communicative skills.
Broström (1996)	While playing games, a child learns to plan their actions, overcome problem situations, and predict achievable results.
Cook (2000)	A game is an activity which is regulated by rules and has a competitive spirit.
Rubinshtein (2002)	A game motivates a child's knowledge intake on various activities, academic and practical.
Garris et al. (2002)	A game is set in a specific place and time period, with precise rules that everyone must follow.
Elkonin (2008)	A game is an uninterrupted action in a child's psychic process development.
Eden (2008)	The thematic content of a game expands the child's assumptions about the laws of the world.
Leontyev (2009)	In an action of a game, a child learns to understand the rules of life.
Klopper et al. (2009)	The participants in a game use previous and gain new knowledge and skills, thus increasing the probability of winning.
Whitton (2010)	Following the rules of a game makes it more likely that players will achieve the goal.
Salmina & Tihanova (2011)	The interactive nature of a game promotes communication and cooperation skills.
Saracho (2012)	Playing a game promotes a child's curiosity and activates listening and speech skills.
Petrovska et al. (2013)	A game lets a child gain personal experience of what is good and bad, develop new skills and knowledge, and strengthen existing ones.

Table 1. Continued

Wood (2013)	A game is a speech therapist-structured learning activity.
Smith & Hart (2014)	Children need to play games to gain knowledge.
Theobald et al. (2015)	New knowledge is gained from structured play activities.
Kumari et al. (2016)	Energetic games imitating different situations promote cooperation skills.
Ke (2016)	A game is based on a set of structured actions and an achievable result.
Edwards (2017)	In a game, a child learns from their mistakes.
Karagiorgas & Niemann (2017)	A game is a gradual transition from playful activity to a learning activity.
del Moral et al. (2018)	The action of a game reduces anxiety, and the exciting content promotes communication skills.
Boghian et al. (2019)	A game possesses elasticity; multiple players can become involved with different levels of knowledge.
Kirstavridou et al. (2020)	The different levels of a game ensure a qualitative and gradual gain of knowledge.
Bay (2020)	A game teaches players to use newly learned knowledge and skills in action.

The descriptions of a game presented in the theoretical framework shown in Table 2 allow the most usual characteristics to be identified as follows:

- The game involves emotion and a desired tension, which is based on uncertainty, instability, chance, luck, or misfortune, because to achieve the goal of the game, effort must be made (attention, concentration, thinking, verbal expression, etc.).
- Every game has rules that dictate its internal power. The rules of the game are followed mandatorily; as soon as they are broken, progress in and the end result of the game become doubtful, and the hoped-for result is not achievable.
- The game is an adult-structured action, and it is created deliberately by putting up a specific goal and determining sequential tasks to achieve it.
- The game contains a problem situation and a strategy to solve it, because there is a chance to win, but also to lose. All characteristic features are focused on specific learning and/or strengthening of knowledge and skills.

When including games in an intervention, a speech therapist should anticipate possible problems which could cause the child to be unable to carry out the constant tasks the game requires. In regard to such problems, a speech therapist should create multiple variations of a game, with different difficulty levels, to increase its usage in interventions (Vilka, 2021).

The empirical part of the present study was carried out in order to:

- 1) find out the opinion of speech therapists in preschool educational institutions on what methods, techniques, and methodological materials are most often included in interventions (including games);
- 2) obtain an expert evaluation of the set of games developed by the author;
- 3) test the effectiveness of the games in an intervention to reduce phonological insufficiency.

The following data extraction methods were used in the study: (1) survey method – questionnaire; (2) expert opinion method – questionnaire; and (3) speech therapy evaluation of children.

Speech therapists of general educational preschool educational institutes were chosen as the target respondents. The research author created an anonymous survey which was published on the Facebook.com group created by the Latvian Speech Therapist Association. The survey included parameters such as work experience, age of the children being worked on, number of children with speech and language disorders, number and duration of lessons, and methods used in the corrective development process. Eighty-eight Latvian general education preschool speech therapists participated in this research.

The survey of speech therapists of preschool educational institutions had 12 questions, both closed and open-ended, which aimed to clarify: (1) which speech therapy methods and methodological materials are most often used in interventions; and (2) whether speech therapy lessons contain games meant to reduce phonological insufficiency and which criteria the games must meet to promote phonological development.

As part of the explanation of methods and methodological materials used by a speech therapist in an intervention (see Fig. 1), it should be noted that six work methods are most frequently used.

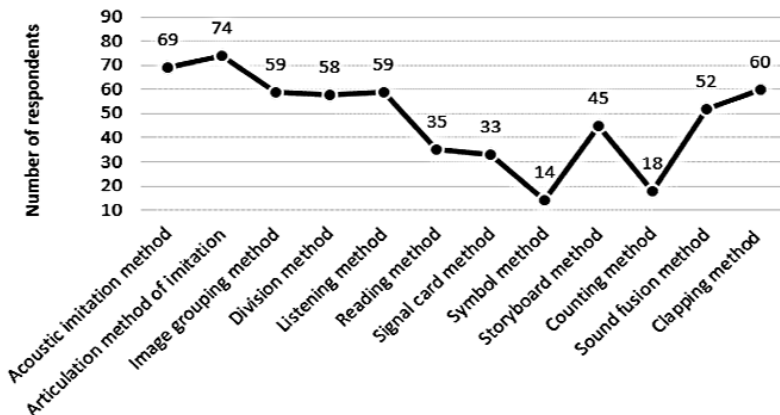


Figure 1. The most common speech and language therapy methods used in interventions

Seventy-four speech therapists use *the method of imitation according to the articular principle* as a primary work method. The second most often-used work method (69 speech therapists) is *the method of imitation according to the acoustical principle*; the third most often-used is indicated as *the clapping method* (60 speech therapists); the fourth and fifth most often-used are *image grouping* and *listening* (both 59 speech therapists), while the sixth – *sound fusion* – is used by 58 speech therapists.

Every single speech therapist’s work method is important; however, to reduce phonological insufficiency, it is important that an intervention contains those work methods that activate a child’s cognitive processes. Thus, children in speech therapy sessions are not only imitators, but also active thinkers and cooperation partners.

In Figure 2, the answers given by speech therapists indicate that the following materials are used in interventions: games (85 speech therapists), image cards (83 speech therapists), and different support materials (e.g., reminders, folding alphabets, small items and toys) (42 speech therapists). It should be noted that these kinds of methodological materials are often included in interventions as support materials, which help in the reduction of phonological insufficiency.

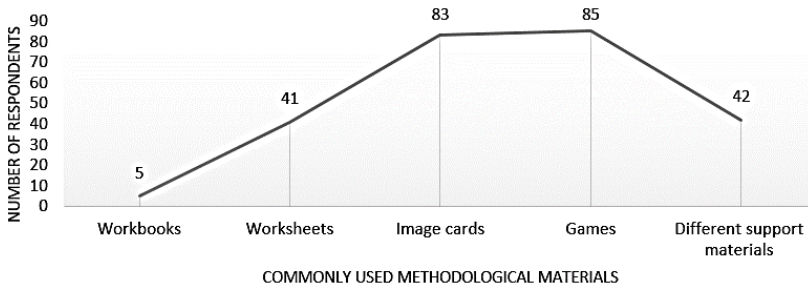


Figure 2. Methodological materials commonly used in the intervention

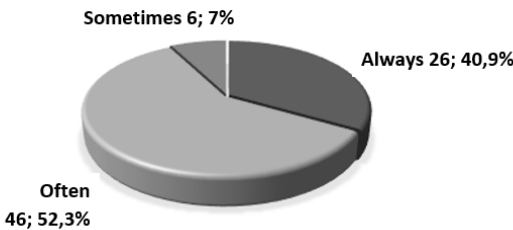


Figure 3. Including games in interventions

It can be seen from Figure 3 that 26 (40.9%) speech therapists *always* use games, meaning they do so in every speech therapy session; 46 (52.3%) speech therapists *often* include games in speech therapy sessions; and six (7%) speech therapists *sometimes* use games in speech therapy sessions. However the option *rarely* was not chosen by a single speech therapist. The given answers indicate that games are included in interventions.

Speech therapists were also asked to note and evaluate the criteria to be taken into account when choosing a game to ensure it is appropriate and effective in an intervention aimed at phonological insufficiency reduction.

As can be seen in Figure 4, speech therapists evaluated the following criteria highest (with a rating of “fully agree” and “agree”):

- *Precisely formulated goal of the game and certain relevant tasks*: fully agree – 56 speech therapists; agree – 29 speech therapists.
- *Visual formation is coordinated with intervention implementation*: fully agree – 53 speech therapists; agree – 32 speech therapists;
- *Progress in speech experience (repeating, strengthening, acquisition of new knowledge and skills)*: fully agree – 54 speech therapists; agree – 32 speech therapists;
- *Practicing the language through different skills (listening, text creation, reading, writing)*: fully agree – 55 speech therapists; agree – 32 speech therapists;
- *Successful intervention method along the usual methods*: fully agree – 57 speech therapists; agree – 28 speech therapists.

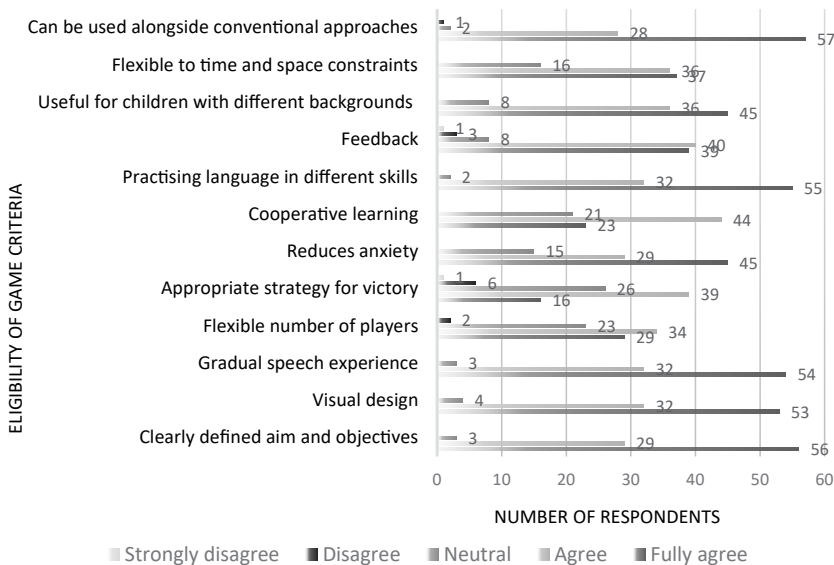


Figure 4. Eligibility of game criteria

From an analysis of the answers provided by speech therapists to the survey questions, it can be concluded that speech therapists include games in interventions and view them as a relevant and effective instrument to reduce phonological insufficiency. The answers provided by speech therapists also show that when choosing to include games in interventions they think about how likely they are to achieve the wished result; check that the games have a good visual presentation, a precisely formulated goal, and appropriate tasks to be carried out; and consider whether they can be used in diverse forms to promote linguistic ways of working in speech therapy sessions, which are organized both individually and as group/sub-group classes.

During the selection of experts, the researcher talking to the candidates personally and gave them information about the study goals, progress, data processing, and other aspects of informed consent and provided each individual expert with an encrypted code as identity.

The following parameters were considered in the selection of experts: position, pedagogical seniority, scientific degree and title, and research seniority; whether the individuals had published on the question being assessed; whether their opinion about the question being assessed was explained with reference to research in the field, speech therapy experience, or intuition; and how much the expert understood the assessed question, with the following range of options: all pedagogical and special aspects are known for the main assessment question; most of the pedagogical and special aspects are known for the assessment question; and some of the pedagogical and special aspects are known for the assessment question (Albrehta, 1999).

The expert questionnaire was implemented to evaluate the game collection created by the author and for the experts to give their own opinions about whether it can be used to reduce phonological insufficiency. The collection contains seven games: “Find the same one, name it and place it!,” “Circus,” “Circus – 1,” “Circus – 2,” “Circus – 3,” “Memory game,” and “Find me a name!” Support material has been created for every game.

For experts to be able to provide an objective evaluation of the games, specific criteria were set for each one. Experts were sent the game collection and a methodological explanation of it and were asked to evaluate each game’s specified criteria on a 5-point scale (Albrehta, 1998): 5 – no complaints, 4 – few complaints, 3 – there are complaints, but overall it is acceptable, 2 – there are serious complaints, the task must be modified, and 1 – the task is not acceptable as it is. They were also asked to provide comments if the evaluation of any criterion was 4 points or lower so corrections and clarifications could be made to the game collection (due to restrictions on the length of the article, additional materials are not included). The maximum score for each criterion of the game was 5 points, and the minimum was 1 point; the average maximum available

assessment was 5 points, and the game collection maximum available assessment was 5 points.

For each expert involved in the study, a code was formulated as follows: initials of name and surname/years of work experience (e.g., Ilze Vilka, 20 years = IV/20).

Figure 5 presents the experts' opinion of the game collection in general. Six experts rated it with the highest possible score, of 5 points, and four gave the following scores: AR/17 – 4,9841 points, DV/25 – 4.9821 points, ZS/7 – 4,9841 points, and IS/18 – 48.21 points, from a maximum available of 5.

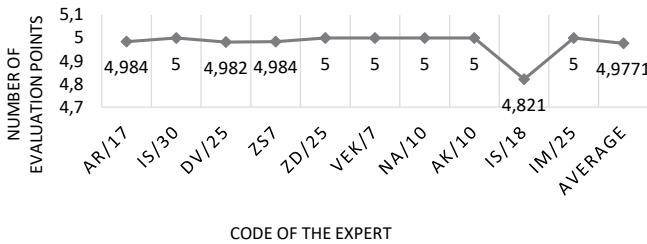


Figure 5. Overall expert evaluation of the game set

The comments of experts AR/17, DV/25, ZS/7, and IS/18 are seen as suggestions for the game collection’s visual appearance and to improve its effectiveness in use. Suggestions and comments made by the experts about the game collection are presented below.

Suggestions:

- IS/18 Make the image correspond more clearly to the pronunciation of the word.
- ZS/7 Review the label usage in the game “Find my word!”
The support material could be in smaller units.
- DV/25 Preferably, the visual material of the game should be made up of photographs, which are closer to reality.

Comments:

- NA/10 It is good that children can choose which image to start the game with. For harder levels, children should be allowed to choose images based on serial numbers.
A speech therapist has the option to adjust the game speed according to a child’s development level.
The images chosen for the child are both recognizable and clearly understood.

- IS/18 The addition of new elements (syllable determination) in the traditional game “Circus” increased the child’s interest in the game. As the words with the syllables to be determined were analyzed before the game started, during the game it was easier to reach the goal, because no additional support or explanation was needed for many children. The skill of correctly working out the syllable count in the given images and inserting these images in the map without any help boosted a child’s self-esteem and contributed to the understanding of the concept of “syllable,” which was expressed in joy at the work they achieved. The traditional game “Circus” offered a non-coerced way of including a phonematic analysis learning element to create a better understanding of phonematic analysis in children by splitting a word into syllables. It also promoted understanding of short and long vowels.
- ZD/25 Implementation of different elements (counting of syllables and sounds in a word) in the traditional game “Circus” contributed to a child’s interest in the game, even though the progress of the game, compared to the two previous ones, was more difficult. The speech therapist observed that if these game elements are used more often in interventions, it would contribute to children having a more sustainable understanding of the concepts of word, syllable, and sound.

The different difficulty levels and mixed tasks in the game collection build and promote a strong understanding of the concepts, namely sounds, syllables, and words. Likewise, the opinion of the experts suggests that these or similar games could be used not only in speech and language therapies, but also in group activities in educational institutions as long as the child fully understands the difficult phonematic processes. These games develop the cognitive scope as well, that is, thinking, memory, and concentration.

An intervention in phonological insufficiency reduction was implemented in successive stages: Awareness of phonematic test criteria, indicators, evaluation indicators, and assessment levels (Table 3) were determined and implemented in speech therapy for children. Based on the phonological perception assessment results, games were selected according to symptoms of the disorder, in parallel to generally accepted intervention methods, and the created games were included in the intervention. Repeated phonematic awareness research was carried out after the intervention.

A logopedic statement was set during an in-depth speech therapy session conforming to the job description of a speech therapist. Inclusion of underaged participants was determined by a specific expert, and an informed consent form was signed by the head of a preschool educational institution. Legal guardians of the underaged participants were then spoken to, who, by signing the informed agreement, agreed to the participation in the study.

Parameters for underaged participants in the study included their age and logopedic statements.

The intervention was implemented in five Latvian preschool institutes among 49 children aged five and six by the speech therapist from each preschool under the supervision of the researcher from March 2021 to August 2021.

The initial and follow-up phonemic awareness test used a phonemic awareness testing protocol developed by the author (protocol not included due to restrictions on the length of the article), and the intervention used a set of games developed by the author (only one sample game is included in the article (Fig. 6)).

The correction action included in the game set was implemented for the following sounds: [Z] → [S]; [Z] → [D]; [S] → [T]; [P] → [B]; [T] → [D]; [R] → [L].

The paper presents the criteria, indicators, assessment levels, and scores (determined by the author) for the phonemic awareness verification (Table 3).

Table 3. Phonemic awareness testing criteria

Criteria	Criteria indicators
Phonological apprehension	1. Define a word in a queue of other words
	2. Speech sound detection in a queue of other speech sounds
	Define a long vowel
	Diphthong detection
	Similar in place and manner of articulation, different in vocal cord involvement
	Similar in place of articulation, different in manner of articulation
	Similar in manner of articulation, different in place of articulation
	Similar in place of articulation, different in active speech organ
	3. Repetition of syllable rows
	Two-syllable line
	Three-syllable line
	4. Name words with a certain sound
	5. Distinguishing acoustically similar-sounding words
Phonematic analysis	1. Detecting the first sound in a word
	2. Detecting the last sound in a name
	3. Naming a word by its sounds
	4. Detecting the sound position in a word (beginning, middle, end)
	5. Detecting the number of sounds in a word
Phonematic synthesis	1. Merging sounds into open syllables
	2. Merging sounds in closed syllables
	3. Merging syllable sounds with consonant clusters
	4. Merging syllables in two-syllable words
	5. Merging syllables in three-syllable words

The author of the research identified four ratings:

- 4 points – a child’s task is carried out independently;
- 3 points – a child’s task is performed with the aid;
- 2 points – a child’s task is carried out with difficulty;
- 1 point – a child is unable to perform the task.

For each of the phonemic awareness indicators, specific tasks were set. Although 78 tasks were included in the study protocol, due to restrictions on the length of the paper the protocol is not viewable.

The following phonemic awareness assessment indicators were also identified:

- 312–279 points (70–78 tasks) – phonological perceptual disorders have not been identified;
- 278–228 points (57–69 tasks) – mild level of phonological awareness;
- 227–153 points (56–39 tasks) – moderate level of phonological awareness;
- Fewer than 152 points (38 tasks and fewer) – low level of phonological awareness.

The maximum score for all 78 correctly completed tasks in the phonemic awareness test is 312 points, and the minimum score is 78 points.

Figure 6 shows that at the beginning of the study, seven children were diagnosed with a low degree of phonological awareness, 12 children with a moderate degree of phonological awareness, and 25 children with a mild degree of phonological awareness. For five children the examination results show that phonemic perception disorder was not identified; however, these children showed significant errors in individual phonemic perception research criteria.

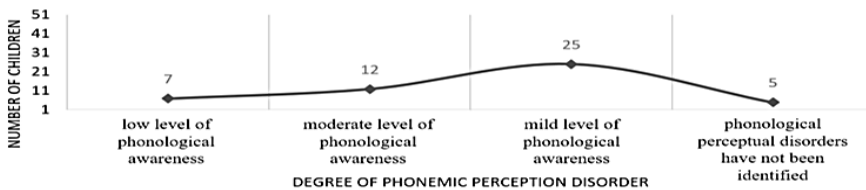


Figure 6. Phonemic awareness verification results before intervention in March 2021

For a more complete insight into the intervention, a sample of a game is provided below.

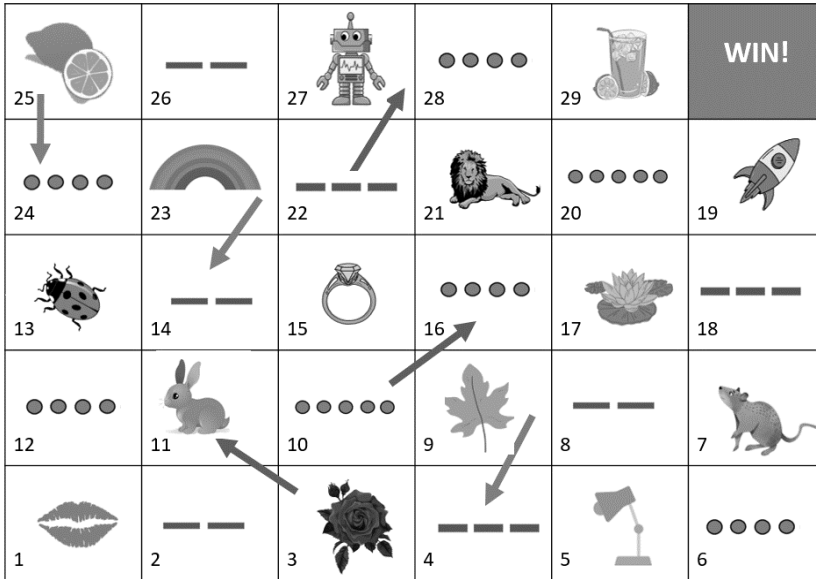


Figure 7. “Circus – 4”: Name (or find in images) the word based on the number of syllables or sounds

The game shown in Figure 7 has the highest difficulty level. Its rules are based on those of the traditional board game “Circus.” There are two or three participants, a die, and game pieces in different colors (one for each participant). The goal is to correctly articulate, differentiate, and use the sounds [R] and [L] in conversational language.

The tasks are as follows: 1. Correctly say the name of the image; 2. Activate phonemic awareness to distinguish sounds [R] and [L] at the beginning of the word; 3. Promote phonemic analysis and synthesis; and 4. Expedite visual attention and memory.

The game can be played by one or multiple players (as decided by the game host, in this case the speech therapist). The participants in the game move up the board. If they land on an image, a child names what they see in it; if they land on an arrow, they follow its direction, either up or down. When they land on the image indicated by the arrow, the participant names the object, phenomenon, etc. they see. If they land on dashes, the participant/participants must think of (or find in the support material) the word (image) with the specified number of syllables. If they land on dots, they must think of (or find in the support material) a word (image) with the specified number of sounds.

At the end of the intervention, a follow-up phonemic awareness examination was conducted.

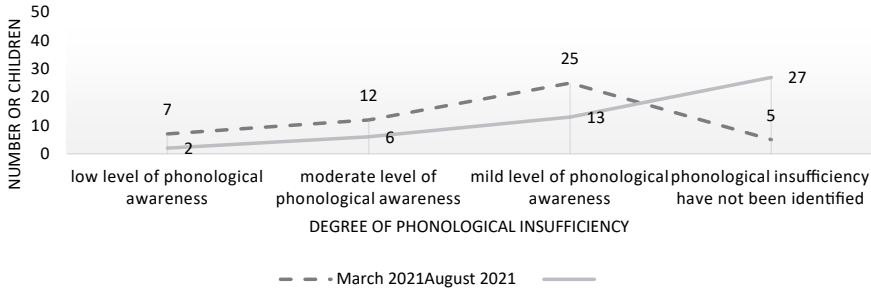


Figure 8. The comparison of level of phonological perception in children

As can be seen in Figure 8, at the end of the study two children were diagnosed with a severe degree of phonemic awareness disorder, six children with a moderate degree of phonemic awareness disorder, and 13 children with a mild degree of phonemic awareness disorder. For 27 children, the examination results show that no phonemic awareness disorder was identified.

Conclusions

A review of the theoretical literature confirmed the author's hypothesis that a game is an effective instrument of intervention in reducing phonological insufficiency. The principle of sequencing should be followed, which is the basis for a qualitative, result-oriented work in reducing phonetic insufficiency.

Different methods and techniques are used in interventions to reduce phonetic insufficiency, such as mimicking, repetition, rhythmizing, analyzing, and synthesizing, all of which can be implemented during a game. A game is, by its nature, interactive, requiring a child to work based on their own previous experience, knowledge, and abilities. A game, as the leading action for a preschool child, contributes to the development of imagination, speech, and language, which is necessary for the development of mind games and logical thinking.

The results of this empirical study of speech therapists show that games to correct different speech sound disorders are often utilized in speech therapy sessions, to reduce both phonetic disorders and phonetic-phonemic deficiency, because they contribute to a spontaneous use of language and activate communication. Likewise, the answers of speech therapists suggest that games can simultaneously create joy and provide knowledge and skills. Undeniably, visual representation is important to a game, as is whether it can be used by or adjusted for multiple linguistic activities, such as listening, speaking, reading, and writing.

The comments given and recommendations made by the experts about the game collection created by the author leads to the conclusion that it is a relevant and

effective instrument in phonological insufficiency reduction. Likewise, the expert comments gathered and analyzed in the paper allow us to claim that the game collection interests participants in actions to correct and develop their speech, indirectly enabling all the tasks proposed in the game and reach the set goal.

Before the process of promoting phonological perception according to the criteria developed by the author of this study began, the levels of development of children's phonological perception were identified and determined. The results of the initial phonological perception survey in March 2021 showed that seven children were assessed as having a low level of phonological awareness, 12 children were assessed with a moderate level of phonological awareness, 25 children were assessed as having a mild level of phonological awareness, and five children were assessed as having fully proficient phonological awareness but making some minor errors in some tasks. The results of the phonological perception retest in August 2021 showed that all the children in the study had improved their phonological awareness, thus confirming that the games developed by the author are an effective tool in reducing phonological insufficiency.

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