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DIFFERENCES BETWEEN THE CREATIVITY OF PEOPLE WHO ARE DEAF OR HARD OF HEARING AND THOSE WITH TYPICAL HEARING: A PROTOCOL FOR THE FURTHER SCOPING REVIEW

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Abstract. As a step prescribed by the Joanna Briggs Institute methodology before conducting a scoping review, the protocol aims to describe differences in creativity between deaf and hard of hearing and typically hearing people. Creativity as a mental process is important for the development of personality, imagination, communication skills, and interpersonal relationships. For this study, the focus was on creativity of deaf and hard of hearing persons. Deaf and hard of hearing people show specific characteristics in their mode of creativity. All the studies that deal with creativity in deaf and hard of hearing people will be included. Studies of any design in English, German, or Czech will be accepted as sources for assessment and analysis for systematic review. The Joanna Briggs Institute methodology for a scoping review will act as a framework for the review that will be prepared. 14 scientific databases will be chosen for this review. Two independent reviewers will identify and evaluate all the titles and abstracts that are acquired. The selected data will be extracted and reported in tabular form and a descriptive format.

Keywords: congenitalness, creativity, hearing impairment, typical hearing, deaf, hard of hearing, scoping review protocol, test of creativity.

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1. Introduction

Creativity is the ability of an individual to approach solving problems unconventionally. It allows an individual to look at things from different angles and look for the most appropriate solution. Batey and Furnham (2006) mentioned that creativity is an important aspect of intellectual functioning. Hennessey and Amabile (2010) stated that creative people have made lasting contributions to culture and society. Nettle (2001) emphasizes that throughout history creative people have both made noteworthy contributions and received adulation. Creativity is perceived as a trait or gift that certain individuals possess and may be a key factor that drives our human society toward success (Batey & Furnham, 2006).

People who are considered creative are expected to help improve society beyond what the average person can do. For this reason, it can be said that creativity is one of the most

important factors in the lifelong learning process in the broadest sense. It thus becomes an important factor not only during schooling but also at work and in other aspects of life. A future scoping review that will map existing studies in the area of the creativity of people who are deaf or hard of hearing (DHH) can shed light on the issue of creativity and can be very important in both the pedagogical field (teachers, educators) and the psychological field (pedagogical psychology, counselling).

As of January 10, 2021, the authors searched *MEDLINE*, the *Cochrane Database of Systematic Reviews*, *Epistemonikos*, and *JBI Evidence Synthesis*. As a result, no systematic reviews or scoping reviews on the topic that were current or underway were found. The main purpose of the scoping review that will be prepared is to describe the differences in creativity between DHH people and people with typical hearing.

The goal of the protocol is to include all terms (including somewhat distant ones) in the search strategy. The reason for this is that articles that also mention abstract thinking in the context of creativity cannot be omitted. Subsequent implementation of scoping review will then exclude inappropriate texts, in the context of the *JBI Evidence Synthesis* strategy. The same is valid for the definition of creativity, which is very broad within the protocol, and it is not the aim of this paper to identify one chosen definition as the basic one.

A scoping review was chosen as an effective tool following the implementation of the protocol because of the need to describe the current state of knowledge in the area of interest. In the context of the *JBI Evidence Synthesis* proceedings, the upcoming scoping review will aim to identify the types of evidence available for the research topic, to describe the research strategies published in the peer-reviewed articles found, and to attempt to identify and describe research gaps and thus opportunities for further research (Munn et al., 2018).

2. Deafness and hard of hearing

DHH are manifested by differences in communication and the construction of communication competencies. DHH is considered to be one of the most serious handicaps that can influence an individual's development, depending on the type and level (Potměšil et al., 2010; Sinnott et al., 2012; Lampropoulou, 2009; DesJardin, 2006). Especially from the educational point of view, this disability can have a major effect on the person concerned, in particular as regards communication and thinking capacities. According to the World Health Organization (2021), it is possible to define three basic areas of impact of DHH: the functional, social and emotional, and economic areas. DHH has a fundamentally negative impact on the development of vocabulary and understanding of verbal terms, especially if they are not wholly concrete, which means the saturation of the concept bank, and activation of the tongue and also its use in communication (van der Straaten et al., 2020; Stepanović & Živković, 2020; Alegre de la Rosa & Villar Angulo, 2020). Marschark et al. (2015, p. 350) suggest that the academic achievement of DHH students is the result of the complex interplay of many factors. These factors include characteristics of the students (*e.g.*, hearing thresholds, language fluencies, mode of communication, and how their communication functions), characteristics of their family environments (*e.g.*, parents' level of education, socioeconomic status), and experiences inside and outside school (*e.g.*, school placement, having been retained at a grade level). DHH children who

grow up in a language-less environment have fundamental problems in the construction of mathematical ideas and thus success in school mathematics and generally speaking in school success (Su et al., 2020; Santos & Cordes, 2022).

For this research, the most important impact is the functional one, which means the effect of DHH on the creation of communication skills that can influence educational possibilities.

3. Creativity

Creativity is the ability to produce new ideas and implement them in a targeted process. Dacey and Lennon (2000) refer to seeing it as a set of biological, psychological, and social factors. Creativity has been explored by psychologists from many aspects; on the one hand, creativity is an independent phenomenon related to the personality of a person in an interdisciplinary context (Kanisauskas, 2014), and on the other hand, as a subject of research from the point of view of art (Brandt, 2021) or technical skills that are emphasized by Cropley (2016). Creativity is also explored as one of the elements of a certain relationship and the search for a mutual influence, for example, creativity and attachment (Kirrane et al., 2019), where the relationship component of the employee to the employer and its projection into work creativity are monitored. The relationship between emotions and attachment levels concerning creativity levels has also been explored (Dirtu & Soponaru, 2016). Eiduson (1962) states that there is a strong emotional investment in creative activity and that it acts to stimulate the result. In his study, Blatt (1964) describes the influence of personality traits (a high value for ego or autonomy and a low value for anxiety) on the level of creativity. The results of this study can be translated into creative functioning in various professions. Richards (2006), in a critical article, emphasizes Frank Barron's contribution to the understanding of creativity built on four different areas that form the basis for the current concept of creativity and approach to the world: (a) creativity as a way of life and everyday events; (b) creativity and mental health; (c) creativity, complexity, and the health of dynamic systems; and (d) creativity as a source of beauty, wonder, and openness to greater meaning.

Such a wide range of research activities makes it to some extent difficult to establish a single and precise definition. Cropley (1999) deals with this issue in great detail. The creation of a general definition was attempted by Runco and Jaeger (2012). Creativity requires both originality and efficiency. Both parameters are defined unevenly in different fields. However, the breadth of aspects that are taken into account in research studies suggests that a general definition of creativity valid for all cases will have to wait.

The updating of the concept of creativity lies mainly in a complex view that emphasizes multidimensionality (Adomaitytė et al., 2018). The focus of the research studies is not only on creativity itself but also on the creative individual and the reflection of the result in the current social context. The development of the concept of creativity can therefore be understood as something that stems from the concept of creativity as human exceptionality, usually artistic or scientific creation or other excellent activities. The current view is focused on personality psychology and individual character traits and behavioural patterns. It is a specific person's contribution of associating an interest in environmental phenomena and processes, the abil-

ity to analyse, expertise, intellectuality, and the ability to apply available information with a degree of effort to original solutions.

For the present protocol and the subsequent scoping review, the relationship between creativity and DHH was chosen as a key topic. Creativity and its concept of personality are particularly evident in childhood, where it is very closely connected with the process of individual learning.

Creativity in childhood is an important factor in the educational career of a child. Especially during preschool age, the development of creativity is of great importance, given the developmental dynamics (Theurer et al., 2021).

But the need for creativity in education to achieve the desired academic results is only one aspect. Creativity in the context of learning assumes the ability to create several original ideas and find new solutions. In conjunction with critical thinking, the development of the child's knowledge is expected. Creativity is a process of education that can be characterized as specific flexibility in thinking.

Guilford (1967) contributed important knowledge to understanding creativity and its importance to the process of education. He created characteristics of creativity based on the structure of intellect theory, arriving at four types of creativity: figural or specifically illustrating content (*e.g.*, colour, the shape of a perceived object), symbolic content (*e.g.*, numbers, letters), semantic content (*e.g.*, concepts, judgments), and behavioural content. It is possible and even desirable to develop all these types of creativity in school practice.

Another contribution to creativity in pedagogical practice can be seen in the view created by Smékal (2004), who describes creativity as a complex psychological activity. From the point of view of educational practice, it is, therefore, a set consisting of abilities, attitudes, and processes. In a pupil's practice, it means the ability to think flexibly in search of different alternative solutions. It is manifested, for example, in mathematics, where pupils can look for different procedures for solving the same task (Rahayuningsih et al., 2021).

Creativity plays an important role, especially in the first years of school education. Creativity should be linked to the learning process so that pupils can spontaneously approach solving tasks with the help of their creativity. Such a process has enormous motivational value. The ability to be more specific is linked to the decision-making process, which should be supported by the teacher, especially at the beginning of the pupil's school education. Creativity in thinking and in solving problems has a positive effect on the development of the child's personality since it not only leads to autonomy in solving tasks but also requires clarification and vindication of the chosen path to the result. The inclusion of opportunities for a creative approach to education can be a resource for improving children's social skills by sharing new ideas and seeking and applying original ideas and new forms of task-solving (Shaheen, 2010; Jeffrey, 2006; Patston et al., 2021).

Another aspect of creativity is in the field of fine arts. In this case, it is the ability to process an original idea creatively into its final form of artistic expression. Creativity in the fine arts is understood as a free and spontaneous expression of a person without focusing on the resulting product and its usability. These include, for example, drawing, collages, and painting (Ceauşu, 2016).

4. Creativity and deaf or hard of hearing

The creativity of DHH people has become a subject of different types of interest for research activity. The design of a comprehensive system of categories describing linguistic creativity was presented by Marschark et al. (1987). These categories were designed for use in research focused on the linguistic creativity of DHH children. This classification is equally useful for working with adult respondents. The seven scoring categories are (a) traditional forms of novel figurative language; (b) frozen figurative language; (c) gesture – supplementary and frozen; (d) mime; (e) amendments to linguistic modification; (f) linguistic inventions – lexical, conceptual, and proper, and (g) lexical substitutions. The creativity of DHH children was evaluated in the research study of Sola Daramola et al. (2019) using the questionnaire on the creativity level of students with hearing-impaired and hearing tool. The results showed that the creativity of the DHH respondents was significantly higher than that of the respondents with typical hearing. This is countered by the research results published by Ebrahim (2006b). The results indicate that deaf children are different from children with typical hearing in their creative abilities concerning abstractness as the main variable. Tukey honestly significant difference test revealed that the children with typical hearing in the study scored significantly ($p < .05$) higher than the deaf children in terms of fluency, originality, and abstractness of titles. However, there were no significant differences between the DHH children and those with typical hearing in terms of elaboration, resistance to premature closure, and creative strengths (p .05) in all cases. Halpin et al. (1973) used the Torrance Tests of Creative Thinking (TTCT) to compare the creativity of DHH children and children with typical hearing and dealt with the issue of artistic creativity in DHH children and its influence on the educational process. Passig and Eden (2000) primarily looked at special possibilities for developing the creative abilities of DHH children and pupils. Ebrahim (2006a) used the TTCT on 200 DHH respondents aged 8–11. On the basis of his analysis of the results, he concluded that the creativity of DHH children and pupils does not differ from the creativity of intact children and pupils. The only difference he noticed between these groups was that they used different ways of naming pictures.

Stanzione et al. (2013) used TTCT to obtain information about creativity in DHH adolescents. In their research, they came to an opinion that confirms the results of the above surveys. The creativity of DHH children and pupils is comparable to the creativity of their intact peers. The main difference lies in verbal creativity.

In the years 2005–2014, research on the creativity of DHH children and adolescents was carried out (Potměšilová, 2015; Potmesilova et al., 2016). The research was based on Guilford's assumption that creativity has four basic factors. TTCT was used first. Over time, a customized version of the test was created. An ambiguous stimulus was chosen, to which DHH children had to respond artistically. The research (Potměšilová, 2015) shows that in comparison with children with typical hearing, DHH children show flexibility and elaboration at a lower level, their originality is comparable, and their fluency is at a higher level. These results make it clear that DHH children have difficulty responding to an ambiguous stimulus. However, if they can react, their solutions are comparable to the reactions of intact children, and they may even have a higher number of details. Sola Daramola et al. (2019) showed in their research that the

level of creativity of DHH students is significantly higher compared to their peers with typical hearing. Ebrahim (2006b) found in his research that there are no differences in originality and elaboration between DHH children and children with typical hearing. In other items that were described, DHH students scored approximately the same as hearing students for fluency and originality. In another research study (Passig & Eden, 2000), the authors concluded that DHH children achieved comparable results to children with typical hearing.

Different researchers (Vágnerová, 2017; Cohen et al., 1994; Leigh Neale, 1994; Maurer, 2017; Shukla et al., 2012) have dealt with creativity as a diagnostic tool for psychological diagnostics in both children and adults.

As mentioned above, differences between the creativity of DHH children and children with typical hearing have been investigated by various researchers. Most of the research studies were focused on children. Marschark (1997) states that DHH children achieve statistically significantly higher results in terms of fluency and flexibility than children with typical hearing. In the area of originality and elaboration, on the other hand, DHH children show lower results. In contrast, Ebrahim (2006a) concluded that the creativity of DHH children is not different from the creativity of children with typical hearing. The only difference he noticed between these groups was in their different ways of naming pictures. Abstract concepts appeared more frequently in children with typical hearing; the DHH children just described the picture. In their research, Stanzione et al. (2013) concluded that creativity in DHH children is comparable to the creativity of their peers with typical hearing, but mentioned that one difference is in verbal creativity.

The above facts lead to the need for a scoping review on the topic of creativity and its conception in the context of DHH and hearing people. Creativity is not only an important factor in education for the school sector but is also significant from a lifelong aspect (Lopata et al., 2022; Frith, 2022; Stanzione et al., 2013). Creativity is an important value in these aspects and the search for possible methodological differences and outcome findings in research on people with typical hearing and DHH persons will serve to develop theoretical knowledge and subsequently to serve practice.

5. Methodology

5.1. Review question

What are the differences in the creativity of DHH people in comparison with people with typical hearing?

5.2. Inclusion criteria

5.2.1. Participants

DHH persons were selected as the target group for this study. For this study, the term *DHH people* means a carrier of a disability that is congenital or acquired before two years of age and who has received a special pedagogical intervention. Thus, individuals with acquired disabilities, individuals with a cochlear implant, and those who did not need any special pedagogical intervention will not be included in the analysis. There is no age limit for participants.

The parameters to be monitored in DHH persons include whether the DHH is congenital or acquired.

5.2.2. Concept

Studies that explore creativity in DHH people will be considered for this scoping review. The aim is to describe the specifics of creativity in DHH people and to identify possible differences from the population with typical hearing.

5.2.3. Context

Consideration will be given to studies from, for example, schools, counselling and therapy settings, and other settings that include both people with typical hearing and people with DHH, regardless of their age.

5.2.4. Types of sources

Experimental and quasi-experimental design studies will be subject to a scoping review. The review will include randomized controlled trials and non-human-checked trials before and after studies, as well as discontinued time-series studies.

Furthermore, analytical observational studies, including prospective and retrospective cohort studies, case-control studies, and cross-cutting analytical studies, are foreseen. Descriptive designs of observational studies, including series of cases, individual case reports, and descriptive cross-sectional studies, will also be subjects of the review.

Qualitative studies, grounded theory, ethnography, qualitative description, action research, and feminist research will be included together in the search strategy.

Research-based on a mixed-methodology approach will also be taken into account.

Systematic reviews that meet the required inclusion criteria will be considered for inclusion, as well as text and opinion papers.

There will be no restrictions regarding the year of publication and language of publication (if the studies have at least a title and abstract in English); all the studies will be considered, given their potential relevance.

5.3. Methods

The JBI methodology for scoping reviews will be accepted as an obligatory frame (Peters et al., 2020).

5.3.1. Search strategy

Both published and unpublished studies will be searched. The pilot search was carried out in the *Ovid MEDLINE* database to search for full-text articles thematically relevant to the upcoming study. Key terms in the names and abstracts of searched articles will form the basis for greater precision of the search strategy in the available relevant databases. The resource list obtained will be used for further searches. The search strategy will focus on texts that have been published in English, Czech, or German. No time limit has been set for the search strategy for the publication of texts.

5.3.2. Information sources

The following databases were used for the search: *ProQuest Central*, *Web of Science Core Collection*, *Scopus*, *APA PsycArticles*, *APA PsycINFO*, *MEDLINE* (*OvidSP*), *Annual Reviews*, *Evidence-Based Medicine Reviews*, and *CINAHL Plus with Full Text*. Databases such as *Clinical Trials*, *Current Controlled Trials*, *CENTRAL*, and *Google Scholar* were used to search for unpublished studies and grey literature. The proposed search strategy for *Ovid MEDLINE* (*R*) *1946* is detailed in Table 1.

Table 1. An example of a search strategy for *Ovid MEDLINE* (*R*) *1946* (search conducted on 20 May, 2021) (source: created by authors)

Search	Query	Results
1	"Creativity/" [Mesh] OR "Imagination/" [Mesh] OR "creativity" [Ti/Ab/Key] OR "creative thinking" [Ti/Ab/Key] OR "creative thinking abilit*" [Ti/Ab/Key] OR "creative abilit*" [Ti/Ab/Key] OR "abstract thinking*" [Ti/Ab/Key] OR "creative activit*" [Ti/Ab/Key] OR "creative training" [Ti/Ab/Key] OR "imagination*" [Ti/Ab/Key] OR "curiosity" [Ti/Ab/Key] OR "originality" [Ti/Ab/Key]	28 221
2	"Deafness/ OR Hearing Loss/" [Mesh] OR "deafness" [Ti/Ab/Key] OR "deaf" [Ti/Ab/Key] OR "hearing loss" [Ti/Ab/Key] OR "hearing impairment" [Ti/Ab/Key] OR "hearing impaired" [Ti/Ab/Key] OR "hearing disabilit*" [Ti/Ab/Key] OR "hearing disorder*" [Ti/Ab/Key] OR "hypoacus?s" [Ti/Ab/Key] OR "defective hearing*" [Ti/Ab/Key] OR "hard of hearing" [Ti/Ab/Key]	82 496
3	#1 AND #2	89

5.3.3. Study selection

The relevant citations from the search will be stored in *EndNote 20/2021* (*Clarivate Analytics*, Philadelphia, United States), allowing duplicates to be removed. After the pilot test, two independent reviewers (Miloň Potměšil and Petra Potměšilová) will assess the article titles and abstract content concerning the requirements for inclusion in the assessment. Usable resources will be stored in full and citation data will be imported into the *JBI* System *for the Unified Management of the Assessment and Review of Information* (Munn et al., 2019). Two reviewers (Potměšil and Potměšilová) will carry out a further independent assessment of the full texts searched according to the criteria. At this stage, a list of texts and the detailed reasons which led to their elimination for non-compliance with the specified parameters will be created. If there is no agreement between the reviewers at this stage, the documents will be submitted to another independent reviewer (Miloslav Klugar) for assessment and possible further discussion. The entire process of searching for and including evaluated texts will be described in detail and presented at the same time in the form of *Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews* (Tricco et al., 2018).

5.3.4. Data extraction

Data extraction from selected papers will be realized using a data extraction tool developed by the reviewers (Table 2).

Table 2. Data extraction tool (source: created by authors)

	Categories studied	
General study details	Publication date	
	Authors	
	Country	
	Gender	
	Age	
	Hearing loss	
Methodology	Study design	
	Study aim	
	Tools – study methods	
	Context (school, counselling workplace, therapeutic facilities)	
	Duration of the intervention	
	Sample size	
Output	Results	

The data extracted will include specific details about the author(s), year of publication, country (where the study was conducted), study design, study aims, study population (age and sex), the DHH participants, the concept of creativity, the context of creativity, study methods, and key findings relevant to the review question – differences in creativity between DHH people and people with typical hearing. The data extraction table will be trialled by the team to ensure that all relevant results are extracted, and it will be revised and modified as necessary during the data charting process. The necessary modifications will be described in detail and documented in the conclusions of the scoping review. Any discrepancies between the opinions of the reviewers (Potměšil and Potměšilová) will be discussed and resolved, if necessary, with the collaboration of an additional reviewer (Klugar). If necessary, to add some data or to verify the data in some of the texts obtained, their authors will be contacted with a request for additions and/or verification. The proposed timetable for the scope check is then given in Table 3.

Table 3. Proposed work plan for completion of scoping review (source: created by authors)

Task	Time	Authors
Identifying relevant studies	1 month	Petra Potměšilová, Miloň Potměšil
Study selection	2 months	Potměšilová, Potměšil, Miloslav Klugar
Charting the data	2 months	Potměšilová, Potměšil
Collating, summarizing, and reporting the results	3 months	Potměšilová, Potměšil, Klugar

5.3.5. Data presentation

The data obtained from the searched sources will be presented in the form of tables and charts. Concerning the aim of the scoping review, the data will provide information on the date of publication, type of research, research question, methodology, basic concept and areas of creativity, type of tool used, and key knowledge. Articles that employ similar methodological approaches or instruments and focus on similar areas of creativity will be grouped by topic and subsequently included in a narrative summary discussion. The tables and charts, together with a descriptive summary, will provide information on how the results relate to the research question and research objectives.

6. Conclusions

The aim of the upcoming scoping review is a detailed description of the creativity of individuals (*i.e.*, not only children but also adolescents and adults) with DHH. As part of the scoping review, we will focus on two basic areas: description and characteristics of possible differences from the typically hearing population and description and characteristics of individual areas of creativity. It is clear from the above that a total of 13 databases have been searched. The first search yielded 1309 potentially relevant studies, which will be subject to a critical evaluation according to these criteria. The intended scoping review can thus provide an interesting insight into the issue not only for teaching staff but also for those who work in the field of counselling services (career counselling, personnel counselling, pedagogical and psychological counselling).

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