



Mediated Learning Strategies in Families with Children with Disabilities: A Literature Review

Strategie di apprendimento mediato in famiglie aventi bambini con disabilità: una rivista della letteratura esistente

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ABSTRACT

The purpose of this literature review is to identify patterns and to discuss key perspectives from empirical studies published from 2000 until 2021 that explore mediated learning strategies in families with children with disabilities. An inductive thematic analysis resulted in four key perspectives: (1) mediator's gender, attitudes, and knowledge, (2) home environment and cultural considerations, (3) activities and evaluation tools, and (4) mediation with toddlers for enhancing language development. Overall, this study revealed (1) a lack of peer-reviewed articles that discuss, investigate, examine, or debate the Mediated Learning Experience with children with disabilities in home environments; (2) a limited emphasis on the father's role as mediator; (3) the need for considering cultural aspects, and (4) the importance of using mediation in free play and everyday situations. Based on the findings, new lines of future research are suggested.

Lo scopo della presente revisione della letteratura esistente è identificare i modelli e discutere le prospettive chiave che esplorano le strategie di apprendimento mediato nelle famiglie con bambini con disabilità, analizzando studi empirici pubblicati dal 2000 al 2021. Un'analisi tematica induttiva ha portato a quattro prospettive chiave: (1) genere, atteggiamenti e conoscenze del mediatore, (2) ambiente domestico e considerazioni culturali, (3) attività e strumenti di valutazione e (4) mediazione con i bambini piccoli per migliorare lo sviluppo del linguaggio. Nel complesso, questo studio ha rivelato (1) una mancanza di articoli che discutano, indagano ed esaminino l'esperienza di apprendimento mediato con bambini con disabilità in famiglia; (2) una presentazione insufficiente del ruolo del padre come mediatore; (3) la necessità di considerare gli aspetti culturali e (4) l'importanza di utilizzare la mediazione nel gioco libero e nelle situazioni quotidiane. Sulla base dei risultati, vengono suggerite nuove linee di ricerca futura.

KEYWORDS

Children, parents, Mediated Learning Experience, Feuerstein, disability.
Bambini, genitori, Esperienza di Apprendimento Mediato, Feuerstein,
disabilità.

1. Introduction

The purpose of this literature review is to identify patterns and discuss key perspectives from empirical studies exploring mediated learning strategies in families with children with disabilities. The literature review is grounded on empirical studies conducted between 2000 and 2021. Feuerstein's Structural Cognitive Modifiability (SCM) and Mediated Learning Experience (MLE) theory (Feuerstein et al., 1991) describe how the interaction between the individual and their social and cultural environment can influence their intellectual development and cognitive modifiability. In particular, MLE exchanges can be defined as an interactional process in which the mediator (e.g., a parent, a teacher, or a peer) can put themselves between a stimulus and the child in order to modify the stimulus for the child so that it will be understood more efficiently.

Many researchers have shown that working with an adult who provides guidance and leadership throughout the learning experience can have cognitive benefits (Göncü & Rogoff, 1998; Weisberg et al., 2013), and an active parental interaction has been shown to be crucial in enhancing children's cognitive development (Luo & Tamis-LeMonda, 2017; Senehi et al., 2018; Stright et al., 2009; Tamis LeMonda et al., 2001). Among other cognitive developmental models, Feuerstein's approach is able to provide both a set of principles and a guiding theory (Tzuriel, 2021) that can be applied on a micro level for observing specific parent-child interactions (Tzuriel, 1999).

In this paper, the two perspectives of the child and the mediator (parents or siblings) will be central, as well as their engagement together as active participants. This affected the inclusion criteria for the papers in this literature review because only articles in which parents (or siblings) were active participants were included. The present review reports results connected with MLE applied by parents or siblings of children with disabilities. It uses as a starting point the literature review previously carried out by Tzuriel that describes the effects of MLE strategies in mother-child interactions on the child's cognitive modifiability (Tzuriel, 1999). It also uses as a reference the book that presents the major theories of mediation, the role of mediation in development of cognitive plasticity or cognitive modifiability, the dynamic assessment approach, and the major cognitive intervention programs that are based on SCM-MLE theory (Tzuriel, 2021).

2. Methodology

The aim of a literature review is the identification of patterns, and the suggestion of new perspectives to the existing literature (Booth et al., 2021; Ridley, 2012). The literature review consists of a selection of international journals on the topic of mediated learning strategies in families with children with disabilities from 2000

to 2021. The research question of the present study was: “What common key perspectives can be identified from research exploring the mediated learning strategies applied in families with children with disabilities?”

Two important aspects affected the results. The first is that although many studies have been carried out concerning the application of an MLE approach in the family setting (Tzuriel, 2021), most of them refer to children from low-income families (Klein & Rye, 2004), adolescents or adults (Lifshitz et al., 2011), children with very low weight at birth (Weitz, 2008), children with poor language skills (Peña et al., 2001), or gifted children (Lidz & Macrine, 2001). A limited number of papers have focused on parent-child interactions using an MLE approach with children with disabilities (Tzuriel, 2013). Therefore, only a small number of articles was included for developing the thematic analysis, which was the object of this present research project. The second aspect is that the search has been conducted through access platforms from only two universities, both Norwegians, and this may have limited the number of articles that were accessible. To limit this factor, google scholar has been included in the list of databases used for the search.

2.1 Search procedures

Systematic searches were performed in December 2020 in Google Scholar, Proquest, Oria, ERIC, and Scopus. We used three search strings across these databases: [(Feuerstein OR mediated learning experience) AND (parents OR family OR siblings) AND children AND (intellectual disability OR intellectual disabilities)], [(Feuerstein OR mediated learning experience) AND (parents OR family OR siblings) AND children AND (developmental disability OR developmental disabilities)], and [(Feuerstein OR mediated learning experience) AND (parents OR family OR siblings) AND children AND (learning disability OR learning disabilities)].

The terms «developmental disability» and «learning disabilities» were included even though they are terms that indicate different specificities. “Intellectual disability” in fact is defined as a condition of arrested or incomplete development of the mind, and this refers to impairment of skills manifested during the developmental period (i.e., cognitive, language, motor, and social abilities). This results in a reduced ability to cope independently and to learn and apply new skills (Schalock, 2011; Schalock et al., 2010). The different term “developmental disabilities” represents a group of lifelong conditions due to impairments in physical, learning, language, or behaviour areas. These conditions begin during the developmental period and may impact day-to-day functioning and usually last throughout a person’s lifetime (Boulet et al., 2009; Holm, 1989). “Learning disabilities”, which start before adulthood, are instead defined as a significantly reduced ability to understand new or complex information or to learn new skills, and these lead to a reduced ability to cope independently. Learning disabilities often include impaired intelligence and impaired social functioning and may affect the learner’s achievements, organization, memory, understanding, and use of verbal and nonverbal information and may therefore lead to difficulties in associating with their peers (Martin, 2001; Smith, 2002; Ugwuanyi et al., 2021). Although these terms have different meanings, all three are sometimes used to indicate children with autism (Grodén et al., 2001; Knott et al., 1995) or with Down syndrome (Fidler et al., 2005; Knott et al., 1995; Steingass et al., 2011). Therefore, we decided to include these terms in the search and then make a manual selection to identify only the articles of interest to our research question.

Because the literature review intended to investigate mediation strategies in

the home setting, we found it interesting to include both parent-child and sibling-child mediation. Indeed, the literature shows that siblings play a very strong mediator role at home when they play with their younger sibling, especially if the younger sibling has disabilities (Tzuriel & Hanuka-Levy, 2014, 2019).

2.2 Inclusion and exclusion criteria

The inclusion and exclusion criteria are reported in Table 1.

Theme	Included	Excluded
Database	Google Scholar, Pro-quest, Oria, ERIC, Scopus	Other
Publication types	Peer-reviewed articles	Books, book chapters, conference proceedings, PhD dissertations, newspaper articles
Time	2000 - 2021	Articles published before 2000
Focus	Empirical studies that explore mediated learning strategies in families with children with disabilities	Studies where no parents or siblings were included, or they were not active mediators; articles related to medical studies or just not focusing on MLE; studies where the MLE was not used in the home environment (involvement of teachers or childcare providers and not parents or siblings); studies not focusing on children (from zero to eight years old) with disabilities; studies that did not specifically indicate whether the children had a disability or not
Language	English	Other languages
Methods	All	Article without a clearly specified research method

Table 1: Literature search: inclusion and exclusion criteria

Parents' participation is essential, and studies where no parents were included, or where they were not active participants, were excluded, as were articles related to medical studies and those not focusing on MLE. For the reasons already specified, articles containing the role of siblings as mediators were included. Studies where the MLE was not used in the home environment (involvement of teachers or childcare providers and not parents or siblings) were also excluded. Studies not focusing on children (from zero to eight years old) with disabilities or that did not specifically indicate whether the children had a disability or not were excluded.

Only peer-reviewed articles about empirical studies were included in the literature review.

Further, only English search terms were used, which limited the findings to articles published in English. One article written by our research group was included because it was found through the literature search. The process of reviewing previous research is an act of interpretation; therefore, we have clearly stated the re-

search question guiding this review and the inclusion and exclusion criteria, to ensure transparency.

The searches resulted in 1317 articles. Following the guidelines for a literature review (Booth et al., 2021; Ridley, 2012), these articles were scanned to assess their relevance based on the title, abstract, and keywords (Figure 1). Among these articles, only 37 articles focused on children, parents, or siblings and MLE. Those articles were then read thoroughly. Based on an informed filtering of what to include, more articles were excluded because they did not meet our inclusion criteria. This was decided independently by each researcher, and after discussing together 10 peer-reviewed research articles were included in this literature review. After a second evaluation, 3 papers were excluded because the parents were considered in the study, but they were not really involved in an active role as mediator. At the end of the process, 7 articles were included in the literature review.

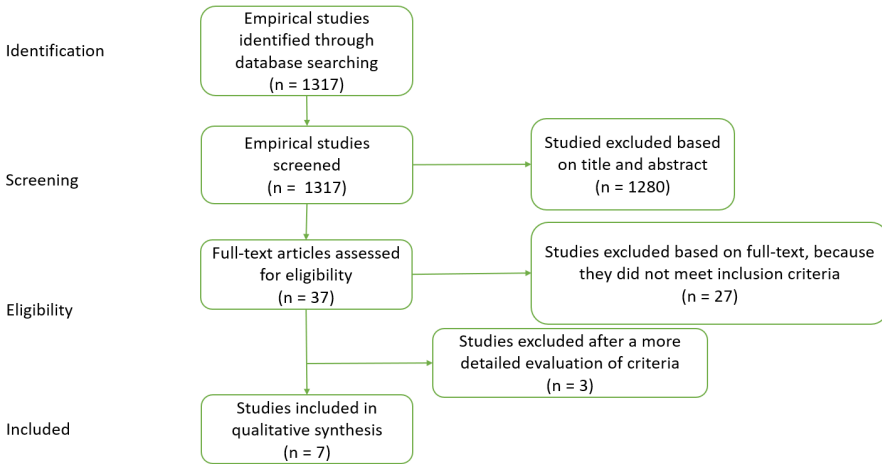


Figure 1: Process of selecting studies, adapted from (Undheim, 2021)

2.3 Analysis

To identify patterns and explore variations and to point out key perspectives, an inductive thematic analysis of the 7 included articles was performed (Braun & Clarke, 2006). First, each article was read thoroughly by groups consisting of two researchers to identify themes that represented mediated learning strategies in families with children with disabilities. The themes were then explored and categorized and the relationships among them were identified and studied. At the end, four main themes were identified: *Mediator's gender, attitudes, and knowledge; Home environment and cultural consideration; Activities and evaluation tools; and Mediation with toddlers for enhancing language development* (Table 2).

Study	The mediator				Environment		Activities and evaluation tools				Toddlers and language	
	Mother	Siblings	OMI	Attitudes	Training	Home	Culture	Free play	RASP	Inductive		Analogy
Schertz et al., 2018	X		Similar		X			X				X
Schertz & Odum, 2007	X							X				X
Tzurriel & Shomron, 2018	X		X	X		X			X	X	X	
Tzurriel & Hanuka-Levy, 2014		X	X					X			X	
Tzurriel & Hanuka-Levy, 2019	X	X	X					X			X	
Granone et al., 2021	X		Similar		X		X	X				X
Ugwuanyi et al., 2021	X		X	X	X	X	X		X		X	

Table 2: Key themes in relation to each study

3. Results

3.1 Overview of the reviewed studies

All of the included articles were peer-reviewed articles published in international journals between 2000 and 2021. The articles draw on studies conducted in several countries across the world, and three were performed in Israel (Tzuriel & Hanuka-Levy, 2014, 2019; Tzuriel & Shomron, 2018), two in the US (Schertz & Odom, 2007; Schertz et al., 2018), one in Nigeria (Ugwuanyi et al., 2021), and one in Norway (Granone et al., 2021). Five studies were focused on children with intellectual disabilities (Granone et al., 2021; Schertz & Odom, 2007; Schertz et al., 2018; Tzuriel & Hanuka-Levy, 2014, 2019), while the others were focused on children with learning disabilities (Tzuriel & Shomron, 2018; Ugwuanyi et al., 2021). No articles were found related to children with developmental disabilities. Most of the reviewed studies were descriptive studies, and all of the researchers described the support through MLE in a positive way. Four articles presented the mother as the mediator (Granone et al., 2021; Schertz & Odom, 2007; Tzuriel & Shomron, 2018; Ugwuanyi et al., 2021), one presented the siblings (Tzuriel & Hanuka-Levy, 2014), and one used the term “parents” without specifying the gender (Schertz et al., 2018). One article presented both siblings and mothers’ interventions, offering a comparison (Tzuriel & Hanuka-Levy, 2019). Furthermore, two studies offered reflections about cultural perspectives (Granone et al., 2021; Ugwuanyi et al., 2021). This opens up to reflections on the importance of evaluating MLE in the cultural context in which it is applied. Most of the studies used several data collection methods, such as interviews and observations of mediators and children. Three studies included children under the age of 3 years (Granone et al., 2021; Schertz & Odom, 2007; Schertz et al., 2018).

3.2 Mediator’s gender, attitudes, and knowledge

The role of the mother as mediator in a home environment is clearly the main role investigated (Granone et al., 2021; Schertz & Odom, 2007; Ugwuanyi et al., 2021; Tzuriel & Shomron, 2018; Tzuriel & Hanuka-Levy, 2019), followed by the siblings (Tzuriel & Hanuka-Levy, 2014, 2019). This is in agreement with literature that shows how, despite the fact that both parents may be equivalently involved in childrearing (Parke 2002), the majority of studies investigating interactions between parents and children with disabilities have been conducted with mothers (De Falco et al., 2008). In the studies that analyse mothers’ mediation strategies, some main elements can be highlighted. For identifying those elements, four articles describe a scale called Observation of Mediation Interaction (OMI) (Tzuriel & Hanuka-Levy, 2014, 2019; Tzuriel & Shomron, 2018; Ugwuanyi et al., 2021), and two articles refer to it but not explicitly (Granone et al., 2021; Schertz et al., 2018). The scale was originally developed by Klein (Klein & Hundeide, 1996) and then adapted for observation of the parent-child interaction for kindergarten children (Isman & Tzuriel, 2008). The scale is based on the following five mediation strategies: Intentionality and Reciprocity (Focusing), Meaning (Affect), Transcendence (Expanding), Feelings of competence (Rewarding), and Regulation of behaviour (Tzuriel & Shomron, 2018). In order to apply the scale, an interaction has to occur, and it has to contain one or more mediation strategies. The important assumption behind the OMI scale is that the observation of MLE processes in a familiar context is related to the spontaneous mediation strategies used at home (Tzuriel & Shomron, 2018).

The first mediation strategy (Intentionality and Reciprocity) has been presented as one that is considered relevant from the mother, in particular when the disability of the child impairs communication (Granone et al., 2021; Tzuriel & Shomron, 2018). This can result in a negative prediction for the child's psychological resilience (Tzuriel & Shomron, 2018) because the mother provides a higher level of focusing for overcoming the child's difficulties. Three other mediation strategies have been highlighted as significant for enhancing the child's cognitive modifiability, namely the mediation of meaning, the mediation of transcendence, and the regulation of behaviour (Tzuriel & Shomron, 2018).

Another important factor for a child's development was highlighted in two articles, namely the mother's attitude towards the child with learning disabilities (MATCLDS) (Tzuriel & Shomron, 2018; Ugwuanyi et al., 2021). MATCLDS was observed through a questionnaire with three subscales, one related to family well-being, one related to acceptance of disability, and one related to treatment of disability. The findings highlight that children whose mothers express positive attitudes towards their learning disabilities develop a higher level of psychological resilience (Tzuriel & Shomron, 2018). This was confirmed by the study conducted with Nigerian boys (Ugwuanyi et al., 2021) even though the study did not highlight this close dependence between the two variables. The absence of correlation is in fact justified by the authors as evidence of cultural prejudices that cause mothers to engage in involuntary hostile behaviour towards their children with disabilities (Ugwuanyi et al., 2021).

When the sibling is the mediator, factors are identified that can be compared with those highlighted by studies focusing on mothers. An important aspect that has to be considered is that sibling interactions in families where the younger child has a disability show a higher level of mediation because the older siblings have probably developed sensitivity and awareness and try to compensate for the difficulties the younger siblings have in processing information (Tzuriel & Hanuka-Levy, 2014, 2019). As a consequence, siblings' mediation strategies are employed frequently and spontaneously (Tzuriel & Hanuka-Levy, 2019). Studies of typically developing children highlighted the regulation of behaviour as the main mediation strategy applied by siblings, followed by the mediation for feelings of competence (Klein et al., 2003). In the study conducted with disabled children's siblings, the mediation of self-regulation was even more evident compared to what is visible in the mediation applied by older siblings with typically developing children. This could be observed in siblings' decision about slowing down their activity, suggesting sequential stages for data gathering, and using practical examples (Tzuriel & Hanuka-Levy, 2014). Other mediation strategies were the mediation of the feeling of competence, mediation of meaning (presented both verbally and non-verbally), and mediation of Intentionality and Reciprocity (Tzuriel & Hanuka-Levy, 2014, 2019). The findings support the idea that mediators spontaneously adapt their mediation strategies to the perception that they have learned about the learner's needs (Tzuriel & Hanuka-Levy, 2014). The role of the siblings is considered crucial because it can compensate for parents' lack of time in their role as mediator for children with disabilities (Tzuriel & Hanuka-Levy, 2019).

An interesting consideration should be noted regarding the differences related to the training processes provided to mothers and siblings. One article involved a parent who was an expert in MLE (Granone et al., 2021), while other studies involved mothers and siblings who received specific instructions regarding how to use the materials during the activities, but no instruction about mediation (Tzuriel & Hanuka-Levy, 2014, 2019; Tzuriel & Shomron, 2018). The choice not to provide information on how to carry out the mediation could be seen in accordance with

the fact that mediation should not be considered as training-specific skills, but rather as a means for affecting the child's desire to learn and interact (Klein et al., 2003). Other studies report parents' training (Schertz et al., 2018; Ugwuanyi et al., 2021) or coaching support provided during the research project (Schertz & Odom, 2007). Because the personal preparation of the mediators who participated in the various studies was not specified, it was not possible to identify which approach should be considered more appropriate.

3.3 Home environment and cultural considerations

Two articles present another important factor, the home environment. This is observed through an instrument called Home Observation Measurement of the Environment (HOME) (Tzuriel & Shomron, 2018; Ugwuanyi et al., 2021). The instrument measures various aspects of a child's social support and is composed of five subscales: encouraging mature behaviour, emotional climate, enhancing growth, active stimulation, and physical environment. The findings highlight that the children with disability whose mothers provide a rich home environment have higher levels of psychological resilience (Tzuriel & Shomron, 2018).

Two articles present considerations regarding the need to carry out reflections related to cultural aspects. One study presents a comparison between some aspects of MLE with a theory strongly rooted in the Scandinavian countries (the Karlstad method), thus highlighting the importance of working with MLE also in Norway (Granone et al., 2021). Another study highlights how cultural aspects and some rooted attitudes in a country should be taken into account when an MLE application model is introduced from another country because the same cultural aspects (Ugwuanyi et al., 2021) could condition the results.

3.4 Activities and evaluation tools

Regarding the interacting situations in which the child and the mediator were involved, structured activities are presented in all the articles. Five articles also present free-play situations (Granone et al., 2021; Schertz & Odom, 2007; Schertz et al., 2018; Tzuriel & Hanuka-Levy, 2014, 2019).

The articles give different information regarding the duration of interventions and the frequency with which they were applied. The sessions varied from 20 minutes to 1 hour per session, ranging from one to two times a week. The durations of the interventions were different, from a minimum of 9 weeks to a maximum of 26 weeks.

Between the two types of interactions – structured activities and free-play – it seems that structured activities are most beneficial because they generate a higher mediation score (Tzuriel & Hanuka-Levy, 2014). This could be justified through the consideration that the mediator perceived the structured situation as requiring more active guidance and responsibility than the free-play situation (Tzuriel & Hanuka-Levy, 2014). It is, however, important to note that both structured activities and free-play situations are fruitful environments for MLEs and that interventions through free-play and daily activities help develop the child's potential (Schertz & Odom, 2007; Schertz et al., 2018). The articles report that the structured situation was given after the free-play situation. Two aims were identified: first, the possibility of controlling possible effects of the structured situation on the mediators' behaviour in the free-play situation. Second, there was the desire from the authors

of controlling the possibly for transferring mediation strategies used during the problem-solving activity (structured) to the free play situation (Tzuriel & Hanuka-Levy, 2014). Those considerations suggest that free-play situations deserve further research attention, focusing on the mediator's role as a constructive partner.

Different structured activities are presented in the articles. The Cognitive Modifiability Battery, or CMB, is described in four articles (Tzuriel & Hanuka-Levy, 2014, 2019; Tzuriel & Shomron, 2018; Ugwuanyi et al., 2021). This battery is a dynamic assessment instrument designed for children from preschool to fourth grade and is composed of seven subtests addressing different areas of cognitive functions (Tzuriel, 2000). Different versions can be used as a 3x3 pattern (Ugwuanyi et al., 2021) or a 2x2 pattern (Tzuriel & Shomron, 2018) to enhance a children's analytical thinking. The Children's Inferential Thinking Modifiability (CITM) is a test aimed at assessing young children's ability to solve inferential problems (Tzuriel, 2001). This test requires systematic exploratory behaviour, control of impulsivity, spontaneous comparative behaviour, planning, inferential-hypothetical thinking, and simultaneous consideration of several sources of information. In one article it is described that it was used as a teaching tool in the mother-child interactions (Tzuriel & Shomron, 2018).

Two articles present the important aspect of personal resilience (Tzuriel & Shomron, 2018; Ugwuanyi et al., 2021). This was observed through the Resilience Attitudes and Skills Profile (RASP) (Wolin & Wolin, 2010). RASP is an observation rating scale divided into the seven criteria of insight, independence, creativity, humour, initiative, interpersonal relations, and moral values. The analysed articles used a modified version of this test, where the original 65 items were reduced to 34 items to suit the children's level of understanding (Hurtes & Allen, 2001).

3.5 Mediation with toddlers for enhancing language development

The articles analysed in this literature review suggest that the focus of the intervention when studies include children under the age of three (toddlers) should be the training of joint attention since this is a key factor for preverbal social communication, (Granone et al., 2021; Schertz & Odom, 2007; Schertz et al., 2018). Joint attention is a key milestone associated with the child's linguistic, cognitive, and social development (Akhtar & Gernsbacher, 2007; Bottema Beutel, 2016; Freeman et al., 2015; Seager et al., 2018), and it is an aspect that toddlers with disabilities have impairments in. Joint attention usually develops in the first year of life. It is described as a situation in which two people focus on an object or event in order to interact with each other (Bruinsma et al., 2004). For toddlers with disabilities, the process of initiating and responding to joint attention is challenging (Adamson et al., 2001). When working on joint attention with the child, one key strategy is to focus on turn taking, in other words, responding to joint attention and initiating joint attention (Schertz & Odom, 2007). This is also maintained by another study (Schertz et al., 2018) that states that one of the key elements to increasing joint attention is to focus on a simpler social communication outcome that usually precede and constitute joint attention.

In the articles, joint attention was observed using the Joint Attention Mediated Learning scale (JAML), which is grounded on a theoretical framework based upon Vygotsky's theory by framing learning as a guided social endeavour (Feuerstein et al., 1980). The JAML is a home-based, parent-implemented early intervention program designed to promote social communication at the preverbal level, and

it leads toddlers with disabilities through achievements in three developmentally sequenced social communicative competencies: focusing on faces, turn taking, and attention. This observation tool is described in two articles (Schertz & Odom, 2007; Schertz et al., 2018) where research that involved toddlers with autism are presented. A similar approach can be found in the article that describes research conducted in Norway with a toddler with Down syndrome (Granone et al., 2021) where the MLE approach was integrated with the Karlstad model, a Scandinavian approach specifically developed for enhancing child's language skills. This may raise interest in conducting in-depth studies on how mediation can be applied to toddlers when the focus is related to language development. More contextual and specific research into the development of joint attention in children with disabilities participating in MLE-focused activities with the goal of language development are needed to fully address the importance of this finding.

4. Discussion

Through an inductive thematic analysis of the empirical studies, the following four key perspectives emerged that in various ways are concerned with the aspects that should be considered when mediated learning strategies are implemented with children with disabilities in a home environment: (1) mediator's gender, attitudes, and knowledge, (2) home environment and cultural considerations, (3) activities and evaluation tools, and (4) mediation with toddlers for enhancing language development.

The studies reviewed show that the main role as mediator in the context of family home is clearly performed by the mother (Granone et al., 2021; Schertz & Odom, 2007; Ugwuanyi et al., 2021; Tzuriel & Shomron, 2018; Tzuriel & Hanuka-Levy, 2019), followed by the siblings (Tzuriel & Hanuka-Levy, 2014, 2019). The articles analysed in this literature review report how the role of siblings can be considered crucial because it can compensate for the lack of time parents have to participate in mediation activities with their disabled children (Tzuriel & Shomron, 2018). A question, however, could be what the influence on the child's cognitive development might be if the father's mediational intervention is inserted in addition to that of the mother. There is a lack of studies that focus on the paternal role as mediator, despite such a role being observed in non-mediating approaches and such a role being considered crucial (De Falco et al., 2008).

The MLE approach is well known for enhancing children's cognitive abilities (Kloppers & Grosser, 2010). However, the analysed studies have shown that also children's resilience attitude can be observed as an important result of an MLE (Tzuriel & Shomron, 2018; Ugwuanyi et al., 2021). The findings highlight that the children with disabilities whose mothers or siblings demonstrate high levels of mediation, express positive attitudes towards the child's learning disabilities, and provide a rich home environment develop higher levels of psychological resilience (Tzuriel & Shomron, 2018).

In addition to the home environment (Tzuriel & Shomron, 2018; Ugwuanyi et al., 2021) also the cultural aspects have been identified as interesting (Granone et al., 2021; Ugwuanyi et al., 2021), raising the question about how these factors can or should be considered in the definition of the mediational approach. Regarding activities proposed as a means for developing mother-child and sibling-child MLEs, both free-play activities (Granone et al., 2021; Schertz & Odom, 2007; Schertz et al., 2018; Tzuriel & Hanuka-Levy, 2014, 2019) and structured activities such as

CMB (Tzuriel & Hanuka-Levy, 2014, 2019; Tzuriel & Shomron, 2018; Ugwuanyi et al., 2021) and CITM (Tzuriel & Shomron, 2018) have been investigated.

With regard to MLE proposed for toddlers, the articles describe joint attention as a key milestone associated with the child's linguistic, cognitive, and social development that can be enhanced by focusing on simpler social communication outcomes, which usually precede and constitute joint attention (Granone et al., 2021; Schertz & Odom, 2007; Schertz et al., 2018).

The importance of a training process for the mediator has not been identified because of the different approaches used in the different articles, including a study describing the presence of a parent expert in MLE (Granone et al., 2021), studies where mothers and siblings received specific instruction regarding how to use the materials during the activities but no instruction about mediation (Tzuriel & Hanuka-Levy, 2014, 2019; Tzuriel & Shomron, 2018), studies reporting parent's training (Schertz et al., 2018; Ugwuanyi et al., 2021), and a study presenting coaching support provided during the course of the research project (Schertz & Odom, 2007).

5. Conclusions

Drawing on the findings from this literature review of mediated learning strategies applied in families with children with disabilities, different educational implications can be highlighted. The first can be identified in the need for more empirical studies focused on mediated learning strategies in families with children with disabilities. The importance of developing studies that have children with disabilities as their centre of interest in a context of mediation would allow an increase in the knowledge necessary to support them in their development. This could have effects, for example, on their cognitive and linguistic development, thus leading to greater self-esteem and easier integration into society. The second is related to the mediator that can be chosen in a family context. The research shows that there is a growing interest in father-child interactions, and more studies focused on the father's role as mediator should be developed for understanding which strategies might be implemented and how these differ from the mother-child and sibling-child interactions already studied. This observation could be important and interesting, especially in Norway where both the father and the mother have a very balanced participation in the upbringing and raising of the children (Ot.prp. nr. 62 (1979-80)).

Another important aspect that should be considered more deeply are cultural aspects and how such characteristics could influence or should influence the choices made when an MLE is realized. The free-play activities have already been presented as interesting in a mediational context, but the role of the mediator has not been enough observed and defined. This could be interesting, for example, in Norway. In fact, play and free play are fundamental aspects of the Norwegian culture, specifically in preschool environment. This implies that more in-depth investigations into mediated experiences related to free-play or everyday situations (Howie, 2019) might be interesting for a Norwegian context. All of these aspects should be the basic characteristics for designing an intervention program to facilitate a mediational style in the family environment.

References

- Adamson, L. B., McArthur, D., Markov, Y., Dunbar, B., & Bakeman, R. (2001). Autism and joint attention: Young children's responses to maternal bids. *Journal of Applied Developmental Psychology, 22*(4), 439-453.
- Akhtar, N., & Gernsbacher, M. A. (2007). Joint attention and vocabulary development: A critical look. *Language and linguistics compass, 1*(3), 195-207.
- Booth, A., Sutton, A., Clowes, M., & Martyn-St James, M. (2021). Systematic approaches to a successful literature review.
- Bottema Beutel, K. (2016). Associations between joint attention and language in autism spectrum disorder and typical development: A systematic review and meta regression analysis. *Autism Research, 9*(10), 1021-1035.
- Boulet, S. L., Boyle, C. A., & Schieve, L. A. (2009). Health care use and health and functional impact of developmental disabilities among US children, 1997-2005. *Archives of pediatrics & adolescent medicine, 163*(1), 19-26.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology, 3*(2), 77-101.
- Bruinsma, Y., Koegel, R. L., & Koegel, L. K. (2004). Joint attention and children with autism: A review of the literature. *Mental retardation and developmental disabilities research reviews, 10*(3), 169-175.
- De Falco, S., Esposito, G., Venuti, P., & Bornstein, M. (2008). Fathers' play with their Down syndrome children. *Journal of Intellectual Disability Research, 52*(6), 490-502.
- Feuerstein, R., Hoffman, M. B., & Miller, R. (1980). *Instrumental enrichment: An intervention program for cognitive modifiability*. Univ Park Press.
- Feuerstein, R., Klein, P. S., & Tannenbaum, A. J. (1991). *Mediated learning experience (MLE): Theoretical, psychosocial and learning implications*. Freund Publishing House Ltd.
- Fidler, D. J., Hepburn, S. L., Mankin, G., & Rogers, S. J. (2005). Praxis skills in young children with Down syndrome, other developmental disabilities, and typically developing children. *American Journal of Occupational Therapy, 59*(2), 129-138.
- Freeman, S. F., Gulsrud, A., & Kasari, C. (2015). Brief report: Linking early joint attention and play abilities to later reports of friendships for children with ASD. *Journal of Autism and Developmental Disorders, 45*(7), 2259-2266.
- Granone, F., Damnotti, S., & Chicco, C. (2021). Integrating a Mediated Learning Experience with Karlstad-model: A Longitudinal Study on a One-Year-Old Child with Down Syndrome. *International Journal of Social Science Studies, 9*(4), 35-42.
- Groden, J., Diller, A., Bausman, M., Velicer, W., Norman, G., & Cautela, J. (2001). The development of a stress survey schedule for persons with autism and other developmental disabilities. *Journal of Autism and Developmental Disorders, 31*(2), 207-217.
- Göncü, A., & Rogoff, B. (1998). Children's categorization with varying adult support. *American Educational Research Journal, 35*(2), 333-349.
- Holm, V. A. (1989). Developmental disabilities: Delivery of medical care for children and adults. *JAMA, 262*(20), 2935-2936.
- Howie, D. R. (2019). *Thinking about the Teaching of Thinking: The Feuerstein Approach*. Routledge.
- Hurtes, K. P., & Allen, L. R. (2001). Measuring resiliency in youth: The resiliency attitudes and skills profile. *Therapeutic recreation journal, 35*(4), 333-347.
- Isman, E. B., & Tzuriel, D. (2008). Relationship between mother-child mediated learning experience (MLE) strategies and mothers' attachment style and mental health. *Journal of Cognitive Education and Psychology, 7*(3), 388-410.
- Klein, P., & Hundeide, K. (1996). A mediational approach to early intervention Early intervention: cross-cultural experiences with a mediational approach (pp. 3-16). *New York: Garland Pub.*
- Klein, P. S., & Rye, H. (2004). Interaction-oriented early intervention in Ethiopia: the MISC approach. *Infants & Young Children, 17*(4), 340-354.
- Klein, P. S., Zarur, S., & Feldman, R. (2003). Mediational behaviours of preschoolers teaching their younger siblings. *Infant and Child Development: An International Journal of Research and Practice, 12*(3), 233-242.

- Kloppers, M. M., & Grosser, M. M. (2010). Exploring the impact of Feuerstein's Instrumental Enrichment Programme on the cognitive development of prospective mathematics educators. *TD: The Journal for Transdisciplinary Research in Southern Africa*, 6(2), 359-378.
- Knott, F., Lewis, C., & Williams, T. (1995). Sibling interaction of children with learning disabilities: A comparison of autism and Down's syndrome. *Journal of child psychology and psychiatry*, 36(6), 965-976.
- Lidz, C. S., & Macrine, S. L. (2001). An alternative approach to the identification of gifted culturally and linguistically diverse learners: The contribution of dynamic assessment. *School psychology international*, 22(1), 74-96.
- Lifshitz, H., Weiss, I., Tzuriel, D., & Tzemach, M. (2011). New model of mapping difficulties in solving analogical problems among adolescents and adults with intellectual disability. *Research in Developmental Disabilities*, 32(1), 326-344.
- Luo, R., & Tamis-LeMonda, C. S. (2017). Reciprocity between maternal questions and child contributions during book-sharing. *Early Childhood Research Quarterly*, 38, 71-83.
- Martin, G. (2001). 'Valuing people'—a new strategy for learning disability for the 21st century: how may it impinge on primary care? *The British Journal of General Practice*, 51(471), 788.
- Ot.prp. nr. 62 (1979-1980): Om lov om barn og foreldre (barneloven)
- Peña, E., Iglesias, A., & Lidz, C. S. (2001). Reducing test bias through dynamic assessment of children's word learning ability.
- Ridley, D. (2012). The literature review: A step-by-step guide for students.
- Schalock, R. L. (2011). The evolving understanding of the construct of intellectual disability. *Journal of Intellectual and Developmental Disability*, 36(4), 227-237.
- Schalock, R. L., Borthwick-Duffy, S. A., Bradley, V. J., Buntinx, W. H., Coulter, D. L., Craig, E. M., Gomez, S. C., Lachapelle, Y., Luckasson, R., & Reeve, A. (2010). *Intellectual disability: Definition, classification, and systems of supports*. ERIC.
- Schertz, H. H., & Odom, S. L. (2007). Promoting joint attention in toddlers with autism: A parent-mediated developmental model. *Journal of Autism and Developmental Disorders*, 37(8), 1562-1575.
- Schertz, H. H., Odom, S. L., Baggett, K. M., & Sideris, J. H. (2018). Mediating parent learning to promote social communication for toddlers with autism: Effects from a randomized controlled trial. *Journal of Autism and Developmental Disorders*, 48(3), 853-867.
- Seager, E., Mason-Apps, E., Stojanovik, V., Norbury, C., Bozicevic, L., & Murray, L. (2018). How do maternal interaction style and joint attention relate to language development in infants with Down syndrome and typically developing infants? *Research in Developmental Disabilities*, 83, 194-205.
- Senehi, N., Brophy-Herb, H. E., & Vallotton, C. D. (2018). Effects of maternal mentalization-related parenting on toddlers' self-regulation. *Early Childhood Research Quarterly*, 44, 1-14.
- Smith, S. L. (2002). What do parents of children with learning disabilities, ADHD, and related disorders deal with? *Pediatric nursing*, 28(3), 254.
- Steingass, K. J., Chicoine, B., McGuire, D., & Roizen, N. J. (2011). Developmental disabilities grown up: Down syndrome. *Journal of Developmental & Behavioral Pediatrics*, 32(7), 548-558.
- Stright, A. D., Herr, M. Y., & Neitzel, C. (2009). Maternal scaffolding of children's problem solving and children's adjustment in kindergarten: Hmong families in the United States. *Journal of Educational Psychology*, 101(1), 207.
- Tamis LeMonda, C. S., Bornstein, M. H., & Baumwell, L. (2001). Maternal responsiveness and children's achievement of language milestones. *Child development*, 72(3), 748-767.
- Tzuriel, D. (1999). Parent-child mediated learning interactions as determinants of cognitive modifiability: Recent research and future directions. *Genetic, Social, and General Psychology Monographs*, 125(2), 109.
- Tzuriel, D. (2000). The cognitive modifiability battery: Assessment and intervention. *Dynamic assessment: Prevailing models and applications*, 375-406.
- Tzuriel, D. (2001). Dynamic assessment of young children. In *Dynamic assessment of young children* (pp. 63-75). Springer.

- Tzuriel, D. (2013). Mediated learning experience and cognitive modifiability. *Journal of Cognitive Education and Psychology, 12*(1), 59-80.
- Tzuriel, D. (2021). Mediated learning and Cognitive modifiability. *Switzerland: Springer Nature*. <https://doi.org/10.1007/978-3-030-75692-5>
- Tzuriel, D., & Hanuka-Levy, D. (2014). Siblings' mediated learning strategies in families with and without children with intellectual disabilities. *American Journal on Intellectual and Developmental Disabilities, 119*(6), 565-588.
- Tzuriel, D., & Hanuka-Levy, D. (2019). Mother-child and siblings' mediated learning strategies in families with and without children with intellectual disability. *Research in Developmental Disabilities, 95*, 103497.
- Tzuriel, D., & Shomron, V. (2018). The effects of mother child mediated learning strategies on psychological resilience and cognitive modifiability of boys with learning disability. *British Journal of Educational Psychology, 88*(2), 236-260.
- Ugwuanyi, C. S., Okeke, C. I., Eseadi, C., Adimora, E. D., Agah, J. J., Obikwelu, C. L., Onyishi, C. N., Ossai, O. V., Ngwoke, A. N., & Okenyi, E. C. (2021). The effects of mother-child mediated learning strategies on cognitive modifiability and psychological resilience of children with learning disabilities: A replication of Tzuriel and Shomron's study (2018) with Nigerian children. *SAGE Open, 11*(2), 21582440211008897.
- Undheim, M. (2021). Children and teachers engaging together with digital technology in early childhood education and care institutions: a literature review. *European Early Childhood Education Research Journal, 30*(3), 1-18.
- Weisberg, D. S., Zosh, J. M., Hirsh-Pasek, K., & Golinkoff, R. M. (2013). Talking it up: play, language development, and the role of adult support. *American Journal of Play, 6*(1), 39-54.
- Weitz, A. (2008). Relationship between mediated learning strategies in mother-child interactions and personality, behavior, temperament, and cognitive skills of 8: 0-to 9: 6-year-old children born with very low birth weight. In: Springer.
- Wolin, S. J., & Wolin, S. (2010). *The resilient self: How survivors of troubled families rise above adversity*. Villard.