https://doi.org/10.62663/pjpprp.v16i1.208

Impact on Language Competence and Cognitive Abilities of Parents and Siblings Interacting with Children Having Mild Intellectual Disabilities

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There is a need to examine how continuous or frequent communication with children having mild intellectual disabilities (MID) impacts the language processing and cognitive abilities of their family members. For this purpose, the observation of a 13 old years child and her family has been systematically conducted over a span of five years (2019-2024). Qualitative Methodology and descriptive mode of writing were used for recording observational data which inculcate documenting behaviors and interactions in real time contexts. The findings of this observational research informs that modifications in behaviors of family occur at two distinct levels. First, during direct interactions with MID children, communicators often adapt their language processing strategies to align with the cognitive and linguistic needs of the children. Second, these adaptations carry over into real-life circumstances beyond interactions with MID children by showing improvements in broader cognitive functions, including memory, problem-solving, attentiveness along with better communication skills. This is not only instrumental in fostering the child's language and social development, but also significantly enhances the cognitive abilities and language competence of the interacting individuals in their real life experiences, encouraging mutual growth and offering opportunities for inclusive education and stronger community connections.

Keywords: mild intellectual disabilities (MID); language competence; cognitive abilities; communication skills

Mild Intellectual Disabilities (MID), previously known as mild retardation, is a condition marked by significant cognitive and adaptive challenges. The American Association on Intellectual and Developmental Disabilities defines it as having an intelligence quotient (IQ) of 50 to 69, as well as significant limitations in adaptive behaviors (Schalock et al., 2021). Individuals with MID account for approximately 85% of those diagnosed with intellectual disabilities. While extensive research has been conducted to better understand the challenges that individuals with MID face, the broader impact of these challenges on their family members and peers is still unknown. Interactions with children with MID necessitate significant adaptation by those around them, affecting not only their emotional well-being but also their language production, comprehension, and cognitive functioning (Emerson & Hatton, 2007).

Language has a significant impact on social interaction, shaping individual relationships and communication patterns. Language processing and communication are significant challenges for children with MID, often making it difficult to engage in meaningful social exchanges (Tomasello, 2008). These challenges, however, have an impact on more than just the children. Family members, including parents and siblings, as well as peers who frequently communicate with children with MID, experience a variety of language and cognitive changes. Research has shown that siblings of children with intellectual disabilities frequently engage in reciprocal relationships, contributing to each other's development in unique ways. For example, siblings

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https://doi.org/10.62663/pjpprp.v16i1.208

without intellectual disabilities provide emotional and social support, whereas siblings with disabilities frequently provide companionship and emotional bonding.

Parents of children with MID face particular difficulties reporting from higher degrees of stress, anxiety, and emotional strain (Hastings, 2002). This emotional burden can impair their ability to process language effectively, resulting in difficulty expressing their thoughts and emotions during social interactions. Furthermore, the constant need to adapt to their child's needs can cause cognitive overload, limiting their ability to handle complex problem-solving tasks and contributing to mental fatigue. Such challenges highlight the bidirectional nature of interactions, in which caregiving demands influence both the child's development and the caregiver's linguistic and cognitive functioning (Hastings, 2002).

This study investigates how interaction with children having Mild Intellectual Disability (MID) influence their language competence, cognitive abilities, and emotional responses of family members and peers. Focusing on two key aspects—cognitive and emotional shifts during conversations with MID children, and subsequent improvements in real-world language processing and problem-solving skills—the research addresses critical questions about the mental and emotional adaptations family members undergo, the enhancement of their communication skills in daily settings, and the development of their problem-solving and adaptability. By highlighting these dynamics, the study aims to bridge the gap in understanding the reciprocal effects of such interactions, offering insights that could inform targeted interventions, strengthen family relationships, and promote inclusive education practices. Ultimately, the findings may contribute to fostering resilience and mutual growth within families and communities.

In a nutshell, interactions with children having MID present unique challenges and opportunities for family members and peers, influencing their cognitive and linguistic development in profound ways. By investigating the reciprocal effects of these interactions, this study hopes to contribute to a better understanding of inclusive family dynamics, laying the foundation for more effective interventions and support systems. These insights are critical for fostering resilience, mutual growth, and stronger community connections in families dealing with intellectual disabilities.

The review integrates findings from research studies that have looked at the psychosocial, relational and developmental aspects of experiences with and interactions with children having Mild intellectual disabilities (MID), with particular emphasis on the effects of linguistic capacity of family members and others within the profession or the domain. The review has been created around three broad themes: Family Dynamics and Psychological Impacts, Sibling Relationships and Peer Interactions, and Language Development in Interpersonal Contexts.

The interrelations between the parents, siblings and children having mild intellectual disabilities (MID) is foundational to the acquisition of language skills, yet very few studies have been conducted in this regard, thus making it a delicate subject. Nevertheless, some studies provide insights into related aspects of family dynamics and social competence in families with children with intellectual disabilities. Like other normal children, even a child with a disability has normal sibling interaction, which means that his/her siblings may be able to help the child overcome some of the challenges in language and social skill development. The analysis by Sang and Nelson (2017) shows that the effect of siblings on social interaction and social initiation is not straightforward and is dependent on the gender of the child. Siblings are said to acquire good communication and interaction skills from social modeling of their disabled child with intellectual al disability which ranges from low to moderate. With regards to Lang et al (2005),

https://doi.org/10.62663/pjpprp.v16i1.208

boys with brothers tend to have trouble with empathy than single girls who do not have any brothers; however, children whose other siblings are young girls benefited in social development as they aged (Allan- Perkins et al., 2017). Of significance to note, however, is the report made by Neece and others in 2010 as cited by Turner et al 2020: parental surveys showed that siblings of children with Mild Intellectual Disabilities (MID) had worse outcomes than siblings of normally experiencing children. However, once child behavior problems were controlled for, they had no significant effect on the relationship between the child's intellectual status and the impact experienced by their siblings.

This implies that behavioral aspects, rather than disability itself, may be more relevant predictors of sibling outcomes (Neece, 2014) with regards to parent-child relations, sheds light on the role of career resilience and career development as a skill set useful for parents with children exhibiting mild intellectual impairment. The study also observed that career resilience and life satisfaction are related, pointing out the importance of helping parents maintain their wellbeing and adaptability skills (Ginevra et al., 2017). These, also, may mediate parent-child interactions and, thereby affect the family's language development. Such studies are not able to bring language competence into direct consideration, however, they do depict the picture of a family, who has children with mild disabilities, while focusing in the relationship between various disciplines. These studies should instead observe language competence and how these interactions affect it, so that the language environment of these families can be understood and the families can be assisted in the ways they need to be.

Adjustment and developmental outcomes of children with mild intellectual disabilities (MID) depend on the interaction with parents and siblings. The studies conducted in various families confirmed the importance of psychological well-being and adaptive coping strategies of family members in the communication with children having MID, which is efficient. Hashtings (2002) looks into factors associated with positive coping strategies among parents taking care of children with mental retardation. This particular study notes that the more resilient the parents are, the better communication strategies they adopt and this directly influences the children with disabilities' language improvement. On the other hand, parents with high levels of stress were found to negatively affect these interactions.

Ainge et al. (1998) sought to determine if there was homogeneity among parents of children with Mild Intellectual Disabilities (MID) in terms of the impact their children had on them. They conducted a study that administered a chi-square test to parental metrics on critical parenting aspects. Through the analysis, they found parents to be heterogeneous. Nonetheless, it was noticed that both mothers and fathers did not show any significant differences in their overall perception of parenthood on a basic negative- positive rating scale—fathers, however, demonstrated a higher sample rate than mothers in terms of variability. Additionally, noteworthy differences existed among subgroups of mothers, thus aiding in the assertion of further nuance being necessary. These results, according to the authors, should encourage service providers to refrain from generalizing parents and instead respond to their requirements as unique cases. They recommended strategies such as parent interviews and surveys to measure specific paternal issues with concern for moderating the issued interventions, and thus the services would become more appropriate.

A study by Hindes (2006) examined the influence of sibling relations on the peer relations and wellbeing of children with developmental disabilities (MR/LD) as well as normally developing children. Children with Special Needs, on the other hand, manifest negative peer relationships along with increasing feelings of loneliness and internalizing disorders. The impact

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of general sibling relationship quality was found to have limited direct buffering effects across studies, but siblings' emotional support or negativity appeared to moderate the effects of peer interactions on children's wellbeing. Such interventions that focus on the sibling relationship might therefore help enhance peer experiences and wellbeing in children with developmental disabilities (Hindes, 2006).

Seltzer et al. (1997) noted that siblings of mentally retarded adults)who also had a close bond with them) felt their sibling's disability had a greater impact on their life and were able to establish better social ties and had improved mental health, when compared to the siblings of those with severe mental issues.

Rossiter and Sharpe (2001) conducted a meta-analysis on the effects of having a sibling suffering from mental retardation, on the psychological development of the average sibling. Contrary to the family system theory that raises some optimistic aspects, it was found, as anticipated, that there was a small, but statistically significant negative impact, which was mainly seen in the findings from direct observation of children, especially depression. This conclusion shows that more work needs to be done in order to better understand the context of siblings within families where at least one of the children is mentally retarded and to formulate strategies that consider the welfare of each sibling involved.

In conclusion, while family and peer dynamics are critical for the language competence of children with MID, their effectiveness is dependent on creating inclusive and supportive environments. Addressing existing gaps in understanding cultural, socioeconomic, and systemic factors can lead to more equitable and effective interventions, ultimately improving language outcomes for children with MID. The reviewed literature emphasizes the multifaceted impact of interactions within families and peer groups on language development in children with MID. While parental and sibling dynamics provide foundational support, inclusive peer interactions play a critical secondary role. Effective interventions must address the emotional and relational complexities of these interactions with the objective to maximise language competence in children with MID.

Method

This qualitative case study examines how interactions with a 13-year-old girl with Mild Intellectual Disability (MID) influences her family members' language competence and cognitive skills. Using Interpretative Phenomenological Analysis (IPA), the study explores participants' lived experiences through in-depth interviews, allowing them to express their perspectives authentically. The researcher maintains rigor through ongoing self-reflection to minimize bias while interpreting data. To ensure validity and reliability, the study employs triangulation, peer debriefing, and a structured questionnaire with clear, unbiased questions tested for consistency. The case is described in detail, including the family's dynamics, communication patterns, and contextual factors, ensuring transparency and credibility in findings.

The research population includes the girl's immediate family (parents and two siblings). Participants were selected using convenient and purposive sampling**,** a non-probability method designed to target individuals who have significant, ongoing interactions with the girl. This approach ensures that the data collected is directly relevant to the research objectives, providing rich insights into the lived experiences of those who interact closely with the girl.

The person central to this research is a 13-year-old girl suffering from Mild Intellectual Disability which has been substantiated with archival history, records of medical doctors, an enduring impairment with social interaction and meeting the MID diagnostic criteria as listed in the DSM-5. These criteria comprise impairment benchmarks which suggest that there are

https://doi.org/10.62663/pjpprp.v16i1.208

cerebral deficits in such regards as reasoning, problem-solving, and learning as well as deficits in communication, social engagement, independent living, and other adaptive functions. In this case, observation has been systematically conducted from 2019 till December 2024 with the subject's family and data collected from the mother through structured proximity observations five times a week at her office, from the subject MID child through bi-weekly meetings, and from the siblings thrice a month during or after events. Such a broad period of research facilitation has made it possible to identify patterns of development and movement within the system and the impact of MID over the particular and relevant history of a family.

The content of the materials obtained in the course of the qualitative observations was subjected to preliminary analysis. The analysis commenced with the familiarization stage, during which the observational notes were read and reread in order to obtain embedded in the data and find some preliminary themes. Finally, conclusions were formed on the relationship of the themes with the definition of MID given in DSM-5 in its social and cultural aspects and in relation to the specifics of the subject of research.

This research worked under strong ethical considerations with respect to her dignity, rights and her family's privacy. Written consent was received from the subject's mother after providing information about the study in terms of its purpose, method and possible consequences. All data collected was de-identified for confidentiality and privacy of both the subject and her family. Observations and interactions were carried out with caution so as not to inflict any psychological or emotional disturbance on the subject or her family members. Written articles were distributed exposing the critique in the subject's family so as to maintain communication with them regarding the progress and outcomes of the study. This approach enhances the reliability, potential and expected outcomes of the study while adding richness to the experience of a person with MID.

Table 1

Demographic Characteristics and Study Parameters of Participants

Pseudo name	Age (years)	Gender	Relation	Interaction Time (years)	Frequency of Interaction	Primary areas of impact to be studied
Mr X	62	Male	Father	17	Daily	Memory, word retrieval
Mrs. X	56	Female	Mother	17	Daily	Coherence and connectivity
Alpha	27	Female	Sister	17	Daily	Expressiveness, Fluency
Beta	23	Female	Sister	17	Daily	Interpretive skills
Gamma	32	Female	Tutor	3 years	3 Days/Week 2 hours/ day	Language comprehension and response

Results

The language abilities of the family members changed greatly in the presence of a mild intellectual disability (MID) child in the family. These participants changed the ways of communicating with the child due to prevailing circumstances, interactions, which greatly enhanced the child's language abilities. It was observed that this change not only enhances their ability to interact with the child, but also altered their overall communication abilities in

https://doi.org/10.62663/pjpprp.v16i1.208

everyday interactions. The changes are presented in the chart below which has been validated by practical examples.

Table 2

Comparison of Language Competence Development: Interactions with MID Children vs. Real-Life Transformations

	Variables	Language Competence with MID Children	Transformation of Language Competence in Real Life
1	Vocabulary	Basic, concrete words; frequent repetition.	Extensive vocabulary, including abstract and domain-specific terms.
2	Sentence Complexity	Simple, short sentences; frequent grammatical errors.	Moderate Length sentences with varied sentence structures
3	Cognition	Struggles, but can infer meaning with contextual clues/ Difficulty anticipating the child's needs or responses	Proactively anticipates diverse scenarios and adapts plans accordingly.
4	Coherence	Partial Coherence with fragmented ideas	Fully coherent communication with logical flow.
5	Fluency	Moderate	Smooth, natural flow
6	Listening Skills	Pays more attention to comprehend	Fully understands fast and complex speech, even in multi talker conversation
7	Adaptability and Problem-Solving Language	struggles with unfamiliar situations. Offers basic explanations or strategies	Fully adaptable to various linguistic and social contexts. Articulates clear, multi-step solutions in an accessible way.
8	Expressive Language	Struggles to express needs or feelings clearly.	Articulates thoughts, feelings fluently
9	Word Retrieval	Struggles to recall complex and difficult words, leading to pauses or repetition	Effortlessly retrieves even complex or less common vocabulary
10	Narrative Skills	Moderately descriptive and sequential narratives.	Provides vivid, well-structured narratives

The process of language change among family members of a child with MID occurred in stages, with new stages being an extension of the preceding ones. In the beginning, parents, brothers, sisters or any fillings for the extended family put in place simpler and basic words to make sure the child understood. However, as such interaction became routine activity, this vocabulary greatly expanded to be more sophisticated and specialized terms which were quite routinely used in their language. For instance, Mr. X, the father of the child, focused on how explaining habitual activities to his daughter developed his language skills and enhanced his social abilities with regards to conveying complex ideas. In the same way, even the siblings started retelling simple stories and gradually improved their ability to notice and use more complex vocabulary in school.

In addition to expanding vocabulary, the desire to enhance communication embraces the idea of very short and clear statements. And gradually, this developed further into the ability to build sentences, however long and complicated they may be. Beta, a sister, informed how

https://doi.org/10.62663/pjpprp.v16i1.208

initially limiting her expressiveness to the 'simplest forms' improved her clarity and accuracy in language use and all conversational practices. Also, when the child with MID attempted to articulate socially accepted views, which were that are incoherent or only make sense in fragments, family and friends' listening comprehension was enhanced. Such parents, for example, Mrs. X, believed that understanding the child's gesture language made it much easier to follow the running conversations in social context. Her ability to read an intricate set of instructions was once obtrusive, but then turned into an asset developed through interactions over time. Parents previously unable to pause or to articulate vital phrases became more fluent even while trying to discuss complicated issues.

The research underscores the fact that parents and siblings of children with mild intellectual disability (MID) become adept at responding in multi-talker situations. Such enhancement can be attributed to their exposure to the dynamics of interacting with the child, which entails considerable effort, patience, and skill. Ultimately, these modifications result in better performance in social situations especially in the presence of many speakers at the same time.

The improved multi-talker reaction can also be ascribed to more precise auditory and cognitive filtration mechanisms. The years spent with the child enhance their ability to extract necessary information while avoiding disruptions and insignificant sounds; such adaptation, as a result, improves information usage. The absence of effects such as shorter response times and or poorer response accuracy indicates, instead, the ability to integrate the verbal aspect of the task with its cognitive element much more smoothly.

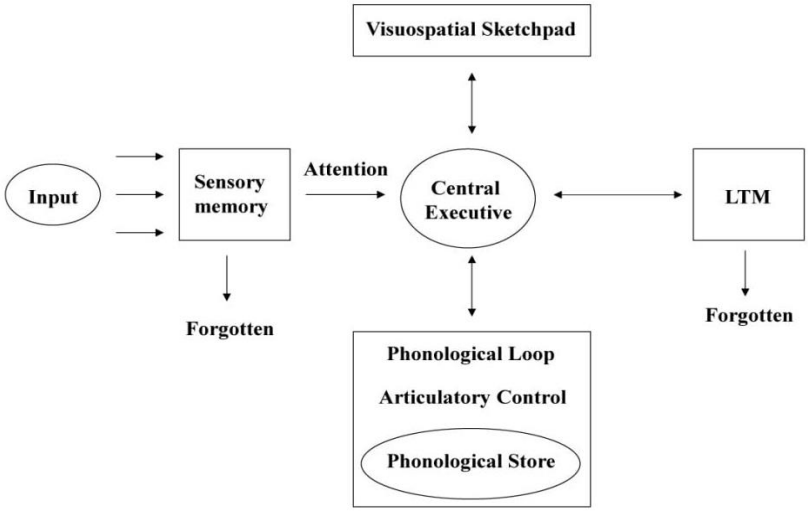
Discussion

The involvement of family members with children having mild intellectual disabilities (MID) can be explained by psycholinguistic principles that account for astonishing linguistic and cognitive changes in these people. These interactions indeed modify their language and thinking functions, as the evidence presented in the study has shown. The family's increased ability to recollect information, viewed in the light of the above, may along psycholinguistic lines be explained using Baddeley and Hitch's Working Memory Model, in particular, the phonological loop. This working memory component is activated when phrases are frequently repeated or when there is a need to remember something specific about the conversation.(Baddeley & Hitch, 1994) As time passes, this practice helps both short term and long term memory storage. This was quite clear in the observations of Mr. X, who reported an enhanced capacity to conceptualize complex ideas after several years of modification in the way he spoke with his daughter.

Figure 1

Working Memory Model (Baddeley and Hitch, 1974)

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Again, the psycholinguistic approach of adjusting the speech rate and its effect on the listener understanding enabled smoothness and clarity in the adequately timed speech. The motor planning system which regulates speech production comes into play when a child with MID alters her speech behavior. With time, these changes become second nature as shown by increased fluency and clear speech habits, according to reports by parents and colleagues.(Levelt, 1993) For instance, Beta the sibling was able to change her speech by trying to speak less and slower to her sister, which went on to change the way she spoke in day-to-day life.

The perception of indirect or subtle interaction has definitely undergone modification too. This is rooted in the so-called Theory of Mind (ToM), and in comprehension of language pragmatics, which enable communicants to go beyond words. Parents and peers train themselves to make sense of intonation, movements, and surroundings (Baron-Cohen, 1997). This ability was especially noticeable in the experiences of Mrs. X. To her surprise, she was able to explain ambiguous phrases used by her daughter, not only in the course of their everyday interactions, but also in the course of her occupational activity, thus emphasizing the wide range of applicability of this improved skill.

Theoretical models of language processing in real-time, contend that the cognitive processes required to quickly and accurately respond during interaction are linked to the lexical access center of the brain. The constant use of this mechanism when communicating with mothers or parents who have Mild Intelligence Disorder (MID) improves neurological functioning so that the caregivers can find requisite words more efficiently (Levelt, 1993). This was illustrated in Gamma's narration of how she was gradually learning to be simpler when explaining things to the child, which she later found useful when teaching other students.

Language development of the family members can be accounted for through the dual-route model of speech production which encompasses the lexical (vocabulary-centered) and non-lexical (rule-based) speech. Making a habit of using low language for children with MID acts to strengthen both speech producing and speech comprehending abilities (Levelt et al., 1999). Alpha, the elder sister, emphasized that interactive story-telling to her younger sister was a great source of generating discipline to help her in framing and communicating logically her ideas in class lectures and presentations.

Incorporating these psycholinguistic principles with the results of interactions with mildly intellectually disabled children suggests that transformations in parents and siblings are both far-reaching and enduring. These models are consistent with the scientific theory of language and

https://doi.org/10.62663/pjpprp.v16i1.208

cognition, which enables them to acquire remarkable linguistic competence which extends beyond the immediate context and serves to enhance their socio-bio-environmental interactions.(Chomsky, 1957)

The results from interactions with children who have mild intellectual deficiency can be assessed in a more comprehensive manner through the use of neuroscientific techniques which include child elicited spontaneous speech and activates language networks, enhancement of talker normalization, and alteration of cognitive processing systems, which are generalized across these points.

The relational implications or effects of parent-child interaction with mild intellectually disabled children make use of the aforementioned multiple language systems throughout. This creates a need for speech modification, paralingual communication feedback and unity in exchanged ideas. Areas widely active are: The phonological loop (for repetition and recollect) (Baddeley & Hitch, 1994); Lexical Retrieval and Semantic Processing (choosing words and understanding the context)(Levelt, 1993); Syntax structure to form fluent and meaningful sentences (Chomsky, 1957).

Parents and siblings seem to report a decreased interaction with broader social information as they concentrate on specific details when interacting with other people or the child. This focus may be due to the changing of the child's needs, which explains how there is a distribution of communication into small units.

Such needs assist them in tasks that are detailed such as academic work or professional duties. Nevertheless, the amending of the focus from understanding the whole idea to analyzing specific pieces of the whole, may decrease sensitivity in interpretation of complex social cues. This reaffirms the theories of Weak Central Coherence whereby the individual has a tendency to concentrate on smaller aspects of social interaction rather than the more intricate ones (Frith, 2003; Happé, 2021).

The WCC hypothesis, which most people associate with the groups of neurodivergent also explains the ways in which parents alter their mode of processing information. They enhance their interactions with the child by considering the minute details as opposed to the big social picture. At face value this might seem rather restrictive, but it does come with significant advantages, such as: Greater accuracy-Relevant details become more satisfactorily recognized which leads to communication becoming more effective and getting to the point and Greater finesse in terms of problem solving-Gamma's sequence of multi-step task explanations indicates primary attention towards constructive and effective responses.

However, there may be other options for cases where there is a need for looking into social aspects as in the case when one needs to understand socio-grouping. The Predictive Adaptation Approach further outlines how parents begin to predict the child's needs and responses. This model says that every time the child's need changes, the brain works to predict that change (Clark, 1998). With MID advancements, repeated observations of the child's communicative actions assist parents in their predictions.

These dimensions also reflect significant differences in language production and cognition in the parents and siblings. Their brains develop a permanent structure that can allow one to speak perfectly while receiving and processing sophisticated linguistic input. These transformations do not only enhance their ways of interaction with the MID child, but also increase their communication skills in general.

https://doi.org/10.62663/pjpprp.v16i1.208

Therefore, we argue, the experience of parenting and caring for a child with MID contributes positively to the development of extraordinary linguistic and cognitive abilities and restructures the parents' tedious intercourse with the world around them.

Conclusion

This research was designed to evaluate the effects of frequent contacts between family members and children with mild intellectual disability (MID) on their language competence development and cognitive functions. It mainly aimed at investigating the ways in which this kind of contact would help in language comprehension, memory retention, the ability to solve problems and other cognitive activities and analyze the implications for caregivers and other contacts.

The results of the present study showed that there are several beneficial aspects for the parents and siblings who interact with children having MID. Most of those who were in direct daily contact were able to recover words with remarkable speed. They were able to voice ideas fluently and focus their attention on the tasks at hand, as well as talk comfortably. In addition, they were able to better resolve life tasks and recall events with improved memory. These benefits were seen over and above interactions with children having MID and were evident in their everyday activities. The most significant finding of the study is therefore, that these alterations in language and thought processes are not merely compensatory mechanisms, but become part of the family's enduring language and cognitive skills.

Implications

The findings of this study have important implications for creating better understanding of potential benefits of inclusive communication practices for both children with MID and their families. Parents who practice adaptive communication strategies improve not only their interactions with children with MID, but also their overall language competence and cognitive functions. These findings challenge preconceived notions about the inherent limitations of communicating with people with intellectual disabilities, implying that working with children with MID can provide a variety of cognitive and linguistic benefits. Furthermore, the study encourages the creation of educational and training programs that promote adaptive communication strategies as a way to improve parents and siblings' skills in a variety of settings.

Strengths

One of the study's primary strengths is its ability to provide empirical evidence which directly challenges existing myths and assumptions in the field. This study successfully debunks the 'no-cost hypothesis,' which suggests that engaging with children with disabilities offers no significant benefit, as well as the 'exaggerated cost hypothesis,' which assumes that such interactions are overwhelmingly burdensome, by focusing on the positive cognitive and linguistic outcomes. The study also challenges belief in the global processing difficulty, which holds that children with MID cause broad cognitive impairments in those who interact with them.

Limitation and Recommendations

Despite its strengths, this study has some limitations. First, the sample size was small, which may limit the generalizability of the findings. Furthermore, the study used self-reported data, which may have resulted in subjective bias.

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Future research should focus on longitudinal studies with a larger and more diverse sample size to investigate the long-term effects of interacting with children with MID on parents and peers. Furthermore, neuroimaging techniques could be used to investigate the neural mechanisms underlying the cognitive and linguistic changes observed in parents and siblings. Additional research could focus on developing structured training programs based on the study's findings to assist parents and siblings in maximizing the cognitive benefits of their interactions with children with intellectual disabilities.

In conclusion, this study provides compelling evidence that frequent interactions with children having MID improves the language competence and cognitive abilities of their families i.e siblings and parents. These interactions result in long-term improvements in communication skills, problem-solving abilities, memory, and attention. By removing misconceptions about the costs of such interactions, this study encourages care takers and peers to reconsider their roles in the lives of children with intellectual disabilities. Overall, the study advances our understanding of the mutual benefits of inclusive communication practices, implying that such interactions have the potential to improve cognitive and linguistic abilities for both children with MID and those who care for them.

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Received 17 Jan 2025
Revision Received 08 July 2025
Published 25 July 2025