What is the effectiveness of using the My Mind Matters Therapy: Brain Training app in improving specific language and cognitive skills?

Introduction

This paper explores the effectiveness of using the My Mind Matters Therapy Brain Training App in improving specific language and cognitive skills. This application targets language and cognitive development by using interactive activities that aim to test and reinforce vocabulary comprehension, working memory, and attention skills.

This small-scale project was completed independently; however, My Mind Matters Therapy collected the data. This project aims to discuss findings that may offer insight into the effectiveness of this app on specific language and cognitive skills. As this project has a limited scope, these findings cannot be considered definitive. This project aims to serve as a foundational piece for more extensive and applicable research. The participants involved in this research project all have a previous diagnosis of autism spectrum disorder (ASD) and a language disorder. While language and communication deficits are traits of both ASD and developmental language disorder, it is not a necessity for ASD diagnosis. Reports suggest that approximately 63% of children with ASD have a language impairment (Levy et al., 2010).

Intervention for language disorders in children is critical in reducing the risk of challenges throughout schooling and beyond. Difficulties in these areas without support can lead to reduced academic abilities, limited job opportunities, negative social consequences, impaired social interactions, and a lack of independence (Curtis et al., 2017). Speech and language have a complex relationship with other areas of development, including cognitive and physical development. This relationship emphasises the importance of having effective intervention strategies (Saeedi et al., 2022). Studies suggest that language proficiency can improve across several domains with intervention (Snow et al., 2021; Vermeij et al., 2023). A systematic review investigating the outcome of applications that target working memory for children with learning difficulties found that through cognitive training, working memory can be enhanced (Shaban et al., 2024).

In the previous decade, there has been a significant increase in the integration of technology in speech-language therapy. Speech-language pathologists have contributed to both the implementation and the design of applications in the field. (Du et al., 2023). Studies suggest that approximately 75% of speech-language pathologists use some form of digital technology in their practice. This varies depending on the infrastructure and training opportunities available. A systematic review found that the use of apps in this field may have a positive effect on children's enjoyment, motivation, and attention during speech therapy sessions (Saeedi et al., 2022).

To maximise the efficiency of speech pathology, interventions should be client centred, engaging and administered consistently (Forsgren et al., 2022; Plante et al., 2019). This presents several barriers for clients, including the number of available clinicians, location, and economic conditions. This is especially prevalent for individuals in rural and low-income areas (Tohidast et al., 2020). Providing exercises to children outside of speech pathology sessions can also be challenging, as it requires adults without clinical experience to deliver exercises that are engaging and provide appropriate and helpful feedback (Ahmed et al., 2018). Digital applications can support parents and caregivers in this area and provide users with suitable feedback (Saeedi et al., 2022). Despite the increasing popularity of technology use in clinical practice, there is a lack of research on the specific technologies employed during practice (Du et al., 2023).

Method

Data from the brain training application was collated and analysed. This data was collected by a built-in function of the app, including progress tables. This project involved seven participants aged between 6 and 9. Participants involved in the study are currently receiving weekly or fortnightly speech therapy at My Mind Matters Therapy. Observation sessions were also conducted to gain a comprehensive understanding of the app's function and performance.

The participant data spanned from June 2024 to April 2025; however, the dates varied for each participant. Key activities included: Hear and Recall (targeting words, colours, pictures, and numbers), Retrieve and Recall, Conversation Recall, and Word Descriptions. During data collection, the difficulty level was adjusted at the speech pathologist's discretion based on the results of the previous session and the participant's presentation and abilities on the day.

Hear and Recall activities involved participants being presented with visuals of several words, colours, pictures, or numbers. Participants are played audio and are required to input the order each item was presented in back into the app. As the difficulty increases, the number of items to recall increases. Retrieve and Recall activities involve participants being presented with a word or image that they define. This definition is spoken to the clinician, who inputs the answer as correct or incorrect. As the difficulty increases, the complexity of the images and words increases. Conversation Recall involves participants being played an animation of a scenario. Participants are asked questions about the content of the conversation. As the difficulty increases, participants are presented with longer and more complex concepts and animations.

When using the app, the speech pathologist did not offer any prompting or cueing to the participants. The tone for completing each question remained consistent regardless of whether or not participants answered correctly. Participants received additional speech and language interventions involving sessions tailored specifically to their goals, alongside the app implementation.

Table 1: Participant Information

Participant	Age	App Use	Therapy
G	8	School only (with SSO support)	Weekly speech therapy
R	9	Home	Fortnightly speech therapy
I	7	Home	Fortnightly speech therapy
H	9	Home	Fortnightly speech therapy
B	6	Home and school	Fortnightly speech therapy
L	8	Home	Fortnightly speech therapy

Results

This study examined the efficacy of the My Mind Matters Therapy Brain Training App on specific language and cognitive functions. Overall, seven participants took part in the study across an average period of 5 weeks. The following outcomes illustrate a sample of the participants' progress in these activities. Complete participant results can be viewed in the appendix.

Broad Participant Trends – to review

Participant G demonstrated a clear upward trend in the Word Descriptions task, which assesses verbal memory and semantic retrieval. Across five sessions in 2025, accuracy increased from 70% to 95%, with fluctuations observed depending on task difficulty. Their performance dipped on a hard-level task (70%), but rebounded in following medium-difficulty tasks, ultimately achieving a high of 95%. In the Name Recall task, their initial performance was low (20%) but improved, reaching 42% in high-difficulty by March 2025.

Participant R showed substantial progress in Hear and Recall: Colours in medium difficulty (from 25% to 90%). Additionally, strong and sustained performance was seen in Hear and Recall: Words (peaking at 100% medium difficulty). This participant improved across the range from easy to hard in Hear and Recall, with numbers peaking at 90% on the hard level. These gains suggest possible improvements in auditory discrimination and verbal working memory.

Participant I demonstrated progress in Hear and Recall: Pictures, with an overall upward progression with a mid-study dip to 70% on medium. The participant achieved 95% on medium at the conclusion of the project. They also improved in Retrieve and Recall: Naming Pictures, from 70% to 80% in medium difficulty, indicating possible improvement in the participant's ability to link visual and verbal information.

Participant L performed steadily in Hear and Recall: Pictures easy (85% to 90%). Despite a performance dip in Retrieve and Recall: Naming Pictures, this participant rebounded to attain 95% in medium difficulty.

Participant B demonstrated growth in both Hear and Recall: Pictures easy difficulty increasing (peaking at 100%) and Naming Pictures (50% to 95%). Improvement across Basic to Hard levels indicated the participant's increased capacity for complex retrieval tasks.

Participant A demonstrated gradual but clear improvement in Hear and Recall: Colours (44% to 50%) and strong gains in Conversation Recall (86% to 100%). Overall accuracy rose from 37% to 42%, suggesting emerging gains in auditory processing and memory.

Participant H showed consistent upward progress in the Retrieve and Recall Word Descriptions task. They progressed from scoring 65% on easy to 75% on hard and 100% on medium.

Table 2: Median Score Improvement (%) Across Activity and Levels

Median Score Improvement (%) Across Activities and Levels	
Conversation Recall	
Easy	14.0%
Hear and Recall - Colours	
Basic	0 (Consistent at 44%)
Easy	0 (Consistent at 50%)
Medium	65%
Hear and Recall - Pictures	
Basic	70%
Easy	5%
Medium	10%
Hard	10%
Name Recall	
Easy	5.0%
Retrieve and Recall – Naming Pictures	
Basic	0% (Consistent at 77%)
Easy	0% (3 Participants consistent or peaked at, 100, 70 & 50%)
Medium	5%
Hard	15%
Retrieve and Recall – Word Descriptions	
Easy	10%
Medium	7.5%
Hard	0%

Discussion

Summary of Key Findings

This research project demonstrated that the My Mind Matters Therapy Brain Training App leads to some improvements in activities that support vocabulary comprehension, working memory, and attention skills. Furthermore, participants who used the app over a longer period demonstrated the most consistent improvement. This may indicate that prolonged use of the app may lead to more consistent results.

Contextualising the Findings

These findings are consistent with the existing literature, which suggests that applications can engage clients and support meaningful improvements in their working memory and language (Saeedi et al., 2022; Shaban et al., 2024). Interactive applications have been shown to improve participants' working memory. The results of this project support the supplementary use of technology in conjunction with conventional speech pathology interventions. Throughout this project, some participants demonstrated higher results on higher difficulty levels or showed significant improvements between trials. This variation in the data trends may be due to transferable skills from other speech pathology interventions. Additionally, participants may have performed differently on different dates, depending on other factors such as fatigue, stress, and the participants' overall well-being. Therefore, these findings support the existing literature, however, these findings are subject to limitations.

Limitations

This project has various limitations. As there was a limited time available for data collection, the results represent a relatively short period. For more exhaustive data, a longer period of data collection would be needed. Additionally, this project had a relatively small sample size so it may not be representative of a larger cohort. As this project did not involve a control group, it may be difficult to draw a meaningful conclusion on the applications influence without some confounding and bias. The additional factors that may have influenced the results include other interventions being provided, frequency, and consistency of at-home or school use.

Follow Up Research

Although these findings suggest the value of this application in the clinical environment, further studies are needed to better understand this relationship and these results. Future research should include the use of this application over longer periods. As a randomised control trial may be difficult in this population, a longitudinal observational design that measures long-term outcomes and aims to isolate the effects of the app from other variables would be beneficial. In addition, future research could explore the transferability of these skills to language comprehension and working memory. Additionally, research could be conducted on how the data and progression trends from the app can be used to inform future interventions.

Conclusion

In conclusion, the My Mind Matters Therapy Brain Training App appears to support the development of key cognitive and language skills, specifically vocabulary comprehension, working memory, and attention. The results of this project support the existing evidence of the benefits of applications in clinical practice. This project highlights the potential for applications to provide engaging and individualised interventions for clients, and how these applications may strengthen client's language and cognitive skills. Despite these results, the limitations of this project highlight the need for more extensive and long-term research.

Reflection

While completing this assignment I feel as though I gained a better understanding on how detailed and structured a research process needs to be. Additionally, I feel this project highlighted the importance of effective communication and collaboration, I felt as though this was important when navigating any challenges that arose. I also found that completing this assignment highlighted the importance of continually relating the data and discussion points back to the research question.

While analysing the data from this project I realised how small changes in the data could impact the results and then how this affects the readers interpretation of the data. This led me to reflect on how important it is to consider the limitations when discussing the results. Without

considering the limitations, readers are not able to fairly interpretate the data and the discussion points.

Additionally, I feel as though this research project changed my understanding of the use of applications during speech pathology intervention. I feel that through this research process I saw how technology can be used positively and as a part of a well-rounded client centred session. I feel as though this app offers a range of activities and clinicians can use clinical judgement to decide what is most appropriate and effective for their client.

Reference List

Ahmed, B., Monroe, P., Hair, A., Tan, C. T., Gutierrez-Osuna, R., & Ballard, K. J. (2018). Speech-driven mobile games for speech therapy: User experiences and feasibility. *International Journal of Speech-Language Pathology*, *20*(6), 644–658. https://doi.org/10.1080/17549507.2018.1513562

Curtis, P. R., Kaiser, A. P., Estabrook, R., & Roberts, M. Y. (2017). The longitudinal effects of early language intervention on children's problem behaviors. *Child Development*, *90*(2), 576–592. https://doi.org/10.1111/cdev.12942

Du, Y., Lubniewski, K., Price, L., Breslin, G., Thomson, P., Natashka, J., & Soni, N. (2023). "They can't believe they're a tiger": Insights from pediatric speech-language pathologists mobile app users and app designers. *International Journal of Language & Communication Disorders*, *58*(5), 1717-1737. https://doi.org/10.1111/1460-6984.12898

Forsgren, E., Åke, S. and Saldert, C. (2022). Person-centred care in speech-language therapy research and practice for adults: A scoping review. *International Journal of Language & Communication Disorders*, *57*(2), 381-402. https://doi.org/10.1111/1460-6984.12690

Levy, S. E., Giarelli, E., Lee, L.C., Schieve, L. A., Kirby, R. S., Cunniff, C., Nicholas, J., Reaven, J., & Rice, C. E. (2010). Autism spectrum disorder and co-occurring developmental, psychiatric, and medical conditions among children in multiple populations of the

United States. *Journal of Developmental & Behavioral Pediatrics*, *31*(4), 267–275. https://doi.org/10.1097/dbp.0b013e3181d5d03b

Plante, E., Mettler, H.M., Tucci, A. and Vance, R. (2019). Maximizing treatment efficiency in developmental language disorder: Positive effects in half the time. *American Journal of Speech-Language Pathology*, *28*(3), pp.1233–1247. https://doi.org/10.1044/2019_ajslp-18-0285

Saeedi, S., Bouraghi, H., Seifpanahi, M. S., & Ghazisaeedi, M. (2022). Application of digital games for speech therapy in children: A systematic review of features and challenges. *Journal of Healthcare Engineering*, *2022*(1), 1–20. https://doi.org/10.1155/2022/4814945

Shaban, A., Chang, V., Amodu, O. D., Attia, M. R., & Abdelhamid, G. S. M. (2024). A systematic review of working memory applications for children with learning difficulties: Transfer outcomes and design principles. *Education Sciences*, *14*(11), 1260. https://doi.org/10.3390/educsci14111260

Snow, C. E., Gillam, R. B., Moore-Porter, N., & Spencer, T. D. (2021). Interventions designed to improve narrative language in school-age children: A synthesis of the evidence. *Intervention in School and Clinic, 57*(2), 76–84. https://files.eric.ed.gov/fulltext/EJ1317773.pdf

Tohidast, S. A., Mansuri, B., Bagheri, R., & Azimi, H. (2020). Provision of speech-language pathology services for the treatment of speech and language disorders in children during the COVID-19 pandemic: Problems, concerns, and solutions. *International Journal of Pediatric Otorhinolaryngology*, *138* https://doi.org/10.1016/j.ijporl.2020.110262

Vermeij, B., Wiefferink, C. H., Knoors, H., & Scholte, R. H. J. (2023). Effects in language development of young children with language delay during early intervention. *Journal of Communication Disorders*, *103*, 106326–10632. https://doi.org/10.1016/j.jcomdis.2023.106326

Appendix

Participant G	
Word Descriptions March 16 – April 5 2025	
Level	**Overall Growth**
Easy	90%
Medium	80-95%
Hard	70%
Name Recall June 7, 2024 – March 29 2025	
Medium	20-42%
Hard	37-42%

Participant R	
Hear and Recall – Numbers March 2 – 31 2025	
Level	**Overall Growth**
Easy	85%
Medium	60-90%
Hard	95-90%
Hear and Recall – Words March 3 – 28, 2025	
Easy	95%
Medium	100%
Hard	85%
Hear and Recall – Colours – March 13 –31, 2025	
Medium	25-90%

Participant L	
Hear and Recall – Pictures March 5 – 30, 2025	
Level	Overall Growth
Easy	85-90%
Retrieve and Recall – Naming Pictures March 14 – April 5, 2025	
Easy	100%
Medium	85-95%

Participant I	
Hear and Recall – Pictures December 7, 2024 – April 5, 2025	
Level	**Overall Growth**
Easy	75-100%
Medium	70-95%
Retrieve and Recall – Pictures March 21 – 24, 2025	
Easy	70%
Medium	80%

Participant B	
Hear and Recall – Pictures February 24, 2025 – March 28, 2025	
Level	Overall Growth
Basic	30-100%
Easy	65%
Medium	60-65%
Hard	55-65%
Retrieve and Recall – Naming Pictures February 10 – April 5, 2025	
Basic	77%
Easy	50%
Hard	80-95%

Participant A

Name Recall – February 28, 2025 – March 28, 2025	
Easy	37-42%
Hear and Recall – Colours March 6 – March 28, 2025	
Basic	44%
Easy	50%
Conversation Recall – March 4 – April 5, 2025	
Easy	86-100%

Participant H	
Retrieve and Recall – Word Descriptions March 22 – April 5, 2025	
Easy	65-85%
Medium	100%
Hard	75%