International Journal of Applied Educational Research (IJAER)
Vol. 3 No. 3 , 2025: 179 - 190

The Impact of Attention Deficit Hyperactivity Disorder on Language Learning: a Narrative Review

Bareq Raad Raheem[1] , Zanyar Nathir Ghafar[2]
[1]Electronic Computer Center, University of Diyala, Diyala, Iraq
[2]Radiology Department, Technical Institute of Sulaimani, Sulaimani Polytechnic University, Sulaimai, Kurdistan Region, Iraq
Corresponding Author: Bareq Raad Raheem bareq.raad@uodiyala.edu.iq

A R T I C L E I N F O

Keywords: ADHD, Language Learning, Cognitive Functioning, Neurodevelopmental

Received : 16 April
Revised : 16 May
Accepted: 17 June

A B S T R A C T

Attention Deficit Hyperactivity Disorder, known as ADHD, is one of the most frequently diagnosed disorders in children. Language learning and cognitive functioning are some of the aspects of cases of ADHD that present a very varied symptomatology. The present study aims to explore the impact of ADHD on language learning, whether it is the native language, a foreign language or a second language. It also aims to bring a new perspective, focusing not only on the challenges but also on offering a solution for those individuals with ADHD and the advantages ADHD may bring to the language learning process. Data from the previously published studies have been collected from several databases, reviewed and analysed carefully to fulfil the study's objective. It has been shown that ADHD is a neurodevelopmental disorder characterised by cognitive and language deficits that begin in childhood and persist into adulthood, affecting daily life. Early and differential diagnosis is crucial due to ADHD's heterogeneity and comorbidity with other disorders like autism and anxiety, making diagnosis challenging.

INTRODUCTION

Paling (2020) stated, "Attention-deficit Hyperactivity Disorder (ADHD) is a neurodevelopmental and neurobehavioral disorder in children, adolescents and adults". It can also be defined as a neurodevelopmental condition characterised by tenacious patterns of hyperactivity, inattention and impulsivity. On the other hand, Turketi (2010) indicated that ADHD has long been classified as a learning disability called Minimal Brain Dysfunction (MBD). The symptoms of ADHD habitually interfere with academic performance, daily activities, relationships and impulsivity. ADHD has far-reaching implications for cognitive and behavioural development aspects, including language acquisition and learning. The diagnosis of ADHD is commonly made in childhood and persists into adulthood (Peyre et al, 2016).

ADHD has been classified as a learning difference due to a particular brain development. This is now increasingly recognised as a major variable in language learning that can prevent language acquisition, has its challenges, and deserves its own pedagogy. Such interest stems from the complex dynamic between ADHD and language acquisition, leading to the emergence of teaching methods that cater to learners with such conditions. Learning a second language is complicated and makes use of a variety of cognitive processes, such as attention, working memory, and executive functioning. Individuals with ADHD frequently experience simultaneous breakdowns across these domains, which complicates language learning and use. Redmond (2016) has found that children with ADHD frequently present with impairments in pragmatic language skills, syntactic coherence (grammar/making complex sentences) and text comprehension skills that can both interfere with academic achievement and their social communication skills. Additionally, the strongly co-occurring nature of ADHD along with Developmental Language Disorder (DLD) makes it more difficult to characterise the linguistic profiles of affected individuals, given the overlap in executive functioning and language processing deficits between these two conditions. Köder (2022) indicates that these are not mere by-products of attention deficit in more complex and broader neurocognitive impairments in ADHD. Language difficulties in this population, for example, have been associated with deficits in executive functions, including response inhibition, cognitive flexibility, and working memory. Environmental influences, such as progressively rising academic and social demands, also magnify these challenges over time and lead to long-term educational and psychosocial inequities (Mendez-Freije et al, 2023).

Students with ADHD, who are also learning a new language, face unique challenges in the classroom environment. Due to distractions, time limits, and a requirement for long durations of focus, ADHD symptoms can be magnified in these students, and they may not progress at the same level as their classmates. Several studies have shown how problematic behaviours associated with ADHD, such as inattention and hyperactivity, correlate with poor academic performance across language subjects, such as reading and writing. These challenges are

compounded and more pronounced in students struggling with ADHD. For instance, creating structured learning environments, breaking down tasks into smaller, manageable goals, and using multimodal strategies (for example, combining visuals with hands-on activities) have been shown to facilitate language learning (Lori Flynn, 2025).

However, advances in technology have provided new tools for ameliorating some of the language deficits seen in children with ADHD. A systematic review of the technology-based interventions found that, given their engaging, individualised, and interactive nature, digital tools have the potential to improve language skills. Yet, although promising, these interventions demand more exploration, especially regarding second-language acquisition (Andreou & Argatzopoulou,2024). Yet, there are critical gaps in the understanding of the complexity of the relationship between ADHD and language learning. New studies put emphasis on the early detection and application of specific actions to reduce the negative impact of language deficiencies on schooling and social outcomes. Standardised assessment tools that measure different domains of language are therefore essential in screening at-risk children and helping in targeting interventions unique to the deficit areas (Méndez-Freije,2023). The present study aims to synthesise previous studies related to how ADHD affects language learning. Thus, looking at what empirics indicate and what is not understood.This helps to explain why this study aims to shed light on the implications and actionable insights for researchers, educators, and clinicians who are working to support learners with ADHD in their language development journey.

METHODOLOGY

This study adopts a **narrative review methodology** to explore the multifaceted impact of Attention-Deficit/Hyperactivity Disorder (ADHD) on language learning. The researchers have used this method because it allows for a comprehensive and interpretive synthesis of findings from different sources, including empirical studies, theoretical frameworks, and pedagogical approaches. The review does not follow a systematic protocol but instead offers a critical and thematic exploration of existing literature. Data have been obtained through searches of academic databases such as **Scopus, Google Scholar,** and **others**. The selected data published in **English between 2000 and 2024** were considered, with a focus on peer-reviewed journals, relevant books, thesis and credible reports. The selected studies were **analysed** to identify certain patterns, challenges, and strategies related to language learning in individuals with ADHD.

RESEARCH RESULT

Language Struggles and Linguistic Challenges in ADHD

The introduction part of the present study has briefly presented an overview regarding the major challenges ADHD learners may face in their academic life, specifically in language learning. The following sections will

illustrate the different aspects and issues, and give ample details in terms of ADHD and language learning:

Neurobiological Basis of Language Impairments in ADHD

Due to underlying neurobiological dysfunctions, children with ADHD often demonstrate deficits in the processing of language. These dysfunctions mainly involve the frontal lobe of the brain and its connections to other areas, such as the temporal lobe, which are crucial for the understanding and production of language. According to a study by Elosúa et al (2017), ADHD-associated deficits in Working Memory (WM) and impairments in attention regulation and executive functioning are important contributors to language difficulties. For example, working memory deficits do not allow following multi-step recommendations or keeping verbal information. These deficits are critical for the acquisition of a language.

Further, the effects of ADHD on the dopaminergic and noradrenergic systems lead to a dysfunction of the neural networks supporting receptive and expressive language skills (Brites, 2020). This disruption leads to challenges with pragmatic language and the social use of language in context.

Neural Mechanisms Underlying ADHD and Language Processing

Attention Deficit Hyperactivity Disorder (ADHD) presents as atypical neural activity in brain areas responsible for executive functioning, attention regulation, and language processing. The current studies emphasise the involvement of the prefrontal cortex, basal ganglia, and cerebellum in ADHD, all regions also involved in language acquisition and use. Studies using Functional Magnetic Resonance Imaging (FMRI) have observed diminished activation of the Dorsolateral Prefrontal Cortex (DLPFC) in individuals with ADHD, hindering the efficient focus and processing of linguistic input (Biederman, 2005; Lange et al., 2010; Faraone, 2024). Additionally, the Anterior Cingulate Cortex (ACC), responsible for error monitoring and conflict resolution, tends to be hyperactive in ADHD. However, this can also affect the ability to resolve linguistic ambiguities or to process complex grammatical structures, both of which are crucial for acquiring language. Moreover, phonological processing and syntactic timing have been linked to ADHD and deficits in posterior aspects of the cerebellum, which are essential for learning new languages (Silva et al. 2023, Redmond 2016).

Working Memory Deficits and Their Role in Language Acquisition

Köder (2024) says one of these is working memory, an essential segment of executive functioning, and it's one of the domains that's often impaired with ADHD. Working memory is critical for holding and manipulating language information, and this deficit has deep implications for students learning a language. For example, in learning a new language, individuals need to hold vocabulary, grammatical rules, and sentence

structures in their working memory to dynamically use them in real-time communication. Studies (Köder, 2024 and Kofler, 2020) show that children with ADHD have a lower working memory capacity, making it harder for them to learn and remember new words. In this regard, Mueller and Tomblin (2012) conducted a study to investigate the impact of working memory deficits associated with ADHD on the processing and retention of syntactic structures in children with and without ADHD in their mother tongue and a second language. This is especially true in tasks that require dual processing, such as parsing complex sentences and retrieving vocabulary simultaneously.

Overlap Between ADHD and Developmental Language Disorder (DLD)

ADHD and DLD are two of the most prevalent neurodevelopmental disorders, and they often co-occur. Researchers have consistently reported that 40–50% of children with ADHD also meet diagnostic criteria for DLD (Van der Meulen et al., 2018). DLD is defined as deficits in receptive and expressive language, including trouble following multi-step instructions, telling stories in a clear manner, and understanding complex syntax (Kuwack & Archibald, 2024; Parks et al., 2023; Mendez-Freije et al., 2023). Common deficits in executive functioning and auditory processing have been cited as possible causes of the overlap between ADHD and DLD. For instance, children with either condition tend to have difficulties with morphosyntactic processing, or understanding and using grammatical structures. Moreover, the impulsivity and inattentiveness included in the diagnostic criteria of ADHD aggravate the linguistic challenges presented in DLD, therefore hindering their development indirectly in both academic and social spheres.

Expressive and Receptive Language Challenges

Parks et al. (2023) commented on the fact that children with ADHD often have deficits in both expressive and receptive language domains. Expressive language difficulties include difficulties putting sentences together, putting thoughts into words coherently and keeping the flow of conversation. These problems are commonly ascribed to poor impulse control and ineffective information organisation, the signature of ADHD. On the other hand, problems in receptive language are when they have challenges in grasping what is spoken, following what is articulated, and processing complex verbal instructions. A study has indicated that between 30–40% of children with attention-deficit hyperactivity disorder (ADHD) demonstrate marked deficits in their receptive language skills (Miller et al., 2007). These deficits can be especially debilitating in academic environments, where kids find it hard to understand lessons, decode math story problems, or learn the subtleties of a foreign language (Megan Taylor, 2022, & Parks et al., 2023)

Pragmatic Language and Social Communication Deficits

Pragmatic language is a skill that allows for proper usage of language in social environments, such as having an understanding of conversational norms, nonverbal cues, or the ability to adapt language depending upon an audience. Communication problems are common among children with ADHD and include deficits in pragmatic language that lead to misunderstandings and social isolation. For example, children with ADHD might interrupt others during conversations, have difficulty staying on topic, or not pick up on subtle social cues. Furthermore, these behaviours are frequently interpreted as rude or disinterested by those around them, making their social experiences more murky. Hutchinson & Sciberras (2012) indicated that pragmatic language impairment in ADHD is strongly associated with impaired impulse and self-control, which affect the capacity to process social feedback and respond to it.

ADHD and Phonological Processing Challenges

Another area influenced by ADHD is phonological processing, the ability to recognise and manipulate the sound structures of language. This is the very first step in language acquisition, and through this, you are able to decipher words, see how they are pronounced, and read and write. Learners with ADHD face difficulties with the phonological awareness needed to learn to read and write in both their first and second languages, which hampers their ability to read and write (Khalid et al, 2021). Benasich et al. (2001) suggested that rapid temporal processing abilities are critical to early language development, and it has been observed that children with ADHD often display deficits in this regard. These deficits may result in trouble with phoneme discrimination, phonemes being the smallest unit of sound in a spoken language. For instance, there is evidence that children with ADHD may have difficulty distinguishing between words that sound similar (e.g., "bat" and "pat"), which can hinder the learning of vocabulary and language overall.

Impacts on Syntax and Grammar Learning

Language learners need to integrate a number of cognitive processes (i.e., attention, working memory, pattern recognition) when it comes to syntax and grammar: Syntax and grammar are quintessential examples of this process, and they present the strongest arguments for the role of cognitive load and awareness in language learning. ADHD-related impairments within these areas ultimately impede individuals' ability to learn and apply grammatical rules. Studies have demonstrated that the use of verb tenses and the structure of sentences are some language features that children with ADHD have difficulty with, which may result in making mistakes in spoken and written language(Redmond, 2005; Mathers,2006). Another study by Oram et al. (1999) demonstrated a significant underperformance of children diagnosed with ADHD in tasks involving comprehension and production of complex syntactic structures compared to their neurotically typically developing peers. These challenges

were ascribed to deficits in sustained attention and working memory, both of which play an important role in processing multi-clause sentences and inferring higher-order grammatical relationships.

The Role of Executive Function Deficits in Language Learning

Executive functions (mostly inhibition, cognitive flexibility and planning) are often impaired in individuals with ADHD and are critical for language learning. For instance, inhibition deficits contribute to paraphasia, or impulsive speech patterns in which a speaker struggles to pause and formulate responses in a second language. Cognitive flexibility skill of switching between tasks or mindsets, is vital for bilinguals, who must switch languages based on context. ADHD-associated deficits in this domain can lead to code-switching challenges or inappropriate language use. Executive functioning deficits, particularly in the domain of planning, can make it quite difficult to assemble our thoughts into coherent, grammatical sentences, especially in a non-native language (Bialystok et al, 2017). Therefore, executive function deficits in two languages may further compound the effects of ADHD on bilingual individuals.

Emotional and Motivational Factors in Language Learning

Language learning involves substantial use of emotional regulation and motivation, and both are common victims of ADHD. When learning a new language, individuals with ADHD may feel frustrated, and anxious, and have low self-esteem as a result of having to deal with the challenges. These circumstances can put an emotional strain on their feelings, and they can not focus on learning (Paulus et al, 2021). Techniques, such as incentive and interest-based learning, may help to alleviate these emotional barriers. For example, adding topics or activities that match the interest of the individual can boost motivation and attraction. This can also provide a more supportive, nonjudgmental learning environment that can help build confidence and reduce anxiety for individuals with ADHD, allowing them to achieve greater success in language learning as well. In addition, most importantly, you are doing so all without exposure to language learning from the start of this journey for kids (Drechsleret et al, 2020).

Strategies for Supporting Language Learning in Students with ADHD

In students with Attention Deficit Hyperactivity Disorder (ADHD), the ways of supporting language learning are effective in dealing with specific difficulties related to them. One potential solution is the incorporation of alternative seating in classrooms to encourage developmentally appropriate engagement, behaviour and focus during lessons. There is a need for targeted interventions that are tailored to specific diagnoses, and the interventions should be well-defined, as seating strategies may play a significant role in the in-seat behaviour and occupational performance of individuals in the classroom with ADHD (Chacko et al. 2019). Additionally, implementing multisensory teaching techniques, visual aids, interactive activities, and auditory supports helps

students' attention and reinforces retention of the new language concepts. By creating both adaptive environments and by using a range of teaching techniques, teachers can enhance inclusivity and cultivate success in the acquisition of language while minimising the manifestations of attentional issues in students with ADHD (Evert et al. 2009). Understanding the distinctive struggles confronted by students with Attention Deficit Hyperactivity Disorder (ADHD) is integral to formulating effective teaching strategies that cater to their distinctive requirements. Tools like constructivist eLearning have proven useful in supporting these students to engage with content despite the challenges of retaining their attention and concentration. Initial research indicates that the use of managed multimedia technology may improve the learning experience for ADHD learners by tailoring educational strategies to their cognitive specificities (Khan, 2011). Moreover, foreign language teachers often do not receive specific training about how to accommodate students with disabilities, underscoring the need for differentiated instructional methods that can also benefit all learning types, including ADHD (Trawick, 2015). However, with properly tailored interventions and the right facets of technology, teachers can create an inclusive environment conducive to these students, which would eventually be beneficial for all students. These methods are crucial for improving language learning for this special population.

CONCLUSIONS AND RECOMMENDATIONS

This study explores how Attention Deficit Hyperactivity Disorder (ADHD) affects language learning, highlighting cognitive and linguistic challenges in individuals with ADHD. It identifies deficits in executive functioning, working memory, and attention regulation as major barriers to acquiring both native and second languages. Children with ADHD often struggle with expressive and receptive language, grammar, syntax, and phonological processing, which impacts their academic and social development. It also notes the frequent overlap between ADHD and Developmental Language Disorder (DLD), complicating diagnosis and intervention. While ADHD poses significant challenges, technology and tailored teaching strategies like multisensory learning and structured environments can support language development. Ultimately, the study emphasizes the need for inclusive, individualized pedagogical approaches to better support ADHD learners in language acquisition.

Implications for Educators and Language Learning Programs

Educators need to recognise the multifaceted challenges that students with ADHD face. Traditional pedagogical methods can be inadvertently self-reinforcing, and they create high-friction language learning environments that become frustrating and even dissatisfying a perpetually postponed getaway. This underscores the need for individualised instructional approaches that meet various learning needs since the school environment is often not conducive to reaching these goals. Furthermore, enhancing an inclusive climate to support self-regulated learning can elevate student academic self-efficacy. Especially as they relate to language and literacy, programs that offer mastery experiences can

serve as a means of empowering students by fostering a sense of accomplishment and investment in their educational experience. In conclusion, adaptive pedagogical approaches in education not only benefit students facing ADHD during language acquisition but also bridge the gap toward equitable learning by refining pedagogical techniques used in the classroom.

REFERENCES

Andreou, G., & Argatzopoulou, A. (2024). A systematic review on the use of technology to enhance the academic achievements of children with attention deficit hyperactivity disorder in language learning. Research in Developmental Disabilities, 145, 104666.

Biederman, J. (2005). Attention-deficit/hyperactivity disorder: a selective overview. Biological Psychiatry, 57(11), 1215-1220.

Brites, C. (2020). ADHD and Impact on Language. ADHD-From Etiology to Comorbidity.

Chacko, A., Kosztyo, K., Long, N., Mullan, Z., Wratcher, L., & Potvin, M. -C. (2019). Efficacy of alternative seating on attention, in-seat behavior, and occupational performance in children with attention deficit hyperactivity disorder. Jefferson Digital Commons, Student Papers & Posters.

Chiriboga Chiriboga, D. G., & Guaraca Defas, G. A. (2023). Teaching EFL to Students with Attention Deficit Hyperactivity Disorder. B.A Project. Available at https://rest-dspace.ucuenca.edu.ec/server/api/core/bitstreams/e7642696-336e-4d2f-bbaa-b22c077ab72c/content

Drechsler, R., Brem, S., Brandeis, D., Grünblatt, E., Berger, G., & Walitza, S. (2020). ADHD: Current concepts and treatments in children and adolescents. Neuropediatrics, 51(05), 315-335.

Ellis, J. H. (2014). A case study on the effects a TBI has on learning (Doctoral dissertation).

Elosúa, M. R., Del Olmo, S., & Contreras, M. J. (2017). Differences in executive functioning in children with attention deficit and hyperactivity disorder (ADHD). Frontiers in Psychology, 8, 976.

Evert B., (2009): Attention Deficit Hyperactivity Disorder (ADHD) in the schools: alternative interventions for school counselors. (Master Thesis). University of Wisconsin-Stout.

Faraone, S. V., Bellgrove, M. A., Brikell, I., Cortese, S., Hartman, C. A., Hollis, C., ... & Buitelaar, J. K. (2024). Attention-deficit/hyperactivity disorder (Primer). Nature Reviews: Disease Primers, 10(1), 11.

Graham, L. J. (2008). From ABCs to ADHD: the role of schooling in the construction of behaviour disorder and production of disorderly objects. International Journal of Inclusive Education, 12(1), 7-33.

Hutchinson, E., Bavin, E., Efron, D., & Sciberras, E. (2012). A comparison of working memory profiles in school-aged children with specific language impairment, attention deficit/hyperactivity disorder, comorbid SLI and ADHD and their typically developing peers. Child Neuropsychology, 18(2), 190-207.

Khalid, A. M., Ahmed, M. E. E., Mahmoud, N. F., Mohamed, A. Y., &

Abdelmonem, A. (2021). Phonological processing and other language parameters in adhd children. Egyptian Journal of Ear, Nose, Throat and Allied Sciences, 22(22), 1-16.

Khan, T. M. (2011). An evaluation of constructivism for learners with ADHD: Development of a constructivist pedagogy for special needs. A conference paper, https://mail.ej-edu.org/index.php/ejedu/article/view/899#title-8.

Köder, F., Rummelhoff, C., & Garraffa, M. (2024). Learning and using multiple languages: Experiences of adults with ADHD. Ampersand, 13, 100191.

Köder, F., Sharma, C., Cameron, S., & Garraffa, M. (2022). The effects of bilingualism on cognition and behaviour in individuals with attention deficits: A scoping review. Frontiers in Psychology, 13, 1057501.

Kofler, M. J., Singh, L. J., Soto, E. F., Chan, E. S. M., Miller, C. E., Harmon, S. L., & Spiegel, J. A. (2020). Working memory and short-term memory deficits in ADHD: A bifactor modeling approach. Neuropsychology, 34(6), 686–698.

Kuiack, A. K., & Archibald, L. M. (2024). Identifying and describing developmental language disorder in children. International Journal of Language & Communication Disorders, 59(3), 1180-1193.

Lange, K. W., Reichl, S., Lange, K. M., Tucha, L., & Tucha, O. (2010). The history of attention deficit hyperactivity disorder. ADHD Attention Deficit and Hyperactivity Disorders, 2, 241-255.

Lori Flynn. (2025). Building blocks: ADHD and executive function interventions for different ages and developmental stages - on-demand. Education Resources. https://educationresourcesinc.com/courses/2025-01-31/building-blocks-adhd-and-executive-function-interventions-for-different-ages-and-developmental-stages/

Malli, M. A., Forrester-Jones, R., & Murphy, G. (2016). Stigma in youth with Tourette's syndrome: A systematic review and synthesis. European Child & Adolescent Psychiatry, 25, 127-139.

Mathers, M. E. (2006). Aspects of language in children with ADHD: Applying functional analyses to explore language use. Journal of Attention Disorders, 9(3), 523-533.

Megan Taylor (2022). Is It a Language Disorder? Or Is It ADHD? How Schools Evaluate Students. Additude Magazine. https://www.additudemag.com/language-disorders-adhd-school-evaluation/.

Mendez-Freije, I., Areces, D., & Rodriguez, C. (2023). Language skills in children with attention deficit hyperactivity disorder and developmental language disorder: a systematic review. Children, 11(1), 14.

Mueller, K. L., & Tomblin, J. B. (2012). Examining the comorbidity of language impairment and attention-deficit/hyperactivity disorder. Topics in

language disorders, 32(3), 228-246.

Paling, R. M. (2020). An Empirical study to determine whether ADHD disorder affects the process of language learning. Journal of Psychology and Neuroscience, 2(1), 1-7.

Parks, K. M., Hannah, K. E., Moreau, C. N., Brainin, L., & Joanisse, M. F. (2023). Language abilities in children and adolescents with DLD and ADHD: A scoping review. Journal of Communication Disorders, 106, 106381.

Paulus, F. W., Ohmann, S., Möhler, E., Plener, P., & Popow, C. (2021). Emotional dysregulation in children and adolescents with psychiatric disorders. A narrative review. Frontiers in Psychiatry, 12, 628252.

Peyre, H., Galera, C., van Der Waerden, J., Hoertel, N., Bernard, J. Y., Melchior, M., & Ramus, F. (2016). Relationship between early language skills and the development of inattention/hyperactivity symptoms during the preschool period: Results of the EDEN mother-child cohort. BMC Psychiatry, 16, 1-11.

Redmond, S. M. (2005). Differentiating SLI from ADHD using children's sentence recall and production of past tense morphology. Clinical Linguistics & Phonetics, 19(2), 109-127.

Redmond, S. M. (2016). Language impairment in the attention-deficit/hyperactivity disorder context. Journal of Speech, Language, and Hearing Research, 59(1), 133-142.

Roth, B. B., Asbjornsen, A., & Manger, T. (2017). The relationship between prisoners' academic self-efficacy and participation in education, previous convictions, sentence length, and portion of sentence served. Journal of Prison Education and Reentry (2014-2023), 3(2), 6.

Trawick, J. E. (2015). Differentiation in the foreign language classroom: including students with disabilities in secondary foreign language classes (Doctoral dissertation). Retrieved from University of Texas Electronic Theses and Dissertations.

Turketi, N. (2010). Teaching English to children with ADHD (MA dissertation). School for International Training Brattleboro, Vermont.