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Case Report on Twice Exceptional Paradox: Unravelling the Potential and Challenges of Children With Neurodevelopmental Disorders and Cognitive Giftedness in Malaysia

Lee Sook Huey
Universiti Pendidikan Sultan Idris
Universiti Sains Malaysia

Saw Jo Anne
Universiti Teknologi MARA (UiTM)
Hospital Al-Sultan Abdullah UiTM

Fatanah Ramlee*
Universiti Pendidikan Sultan Idris

Chan Kah Mun
Universiti Pendidikan Sultan Idris
Universiti Sains Malaysia

Alicia Ng Cher Ching
Universiti Pendidikan Sultan Idris
Universiti Sains Malaysia

Twice-exceptional individuals experience learning and psychosocial challenges resulting from the discrepancies between their cognitive and social-emotional development. This case report illustrates the learning and psychosocial faced by a child and an adolescent who possess both neurodevelopmental disorders and intellectual giftedness, and the clinical difficulties encountered when assessing them. Psychological and cognitive assessments were instrumental in identifying the unique strengths and learning disabilities of these individuals. The parents received psychoeducation, and a strength-based approach involving them led to improved mood and functioning at home and school. By detailing the clinical challenges in assessment and the effectiveness of strength-based interventions, this study provides valuable insights into addressing the complex learning and educational needs of twice-exceptional children and adolescents in Malaysia. The findings emphasize the urgent need for comprehensive assessments and tailored interventions to support this population, whose potential is often hindered by unaddressed learning challenges. Additionally, the paper calls attention to gaps in current services and policies, advocating for improvements that can better support twice-exceptional learners in achieving their full potential.

Keywords: **autism, intellectual giftedness, twice-exceptional children, learning disabilities**

*Please send correspondence to: Fatanah Ramlee, PhD, Department of Psychology, Faculty of Human Development, Universiti Pendidikan Sultan Idris, 35900 Tanjong Malim, Perak, Email: fatanah@fpm.upsi.edu.my.

Introduction

Twice-exceptional learners are those who have one or more disabilities and an exceptional ability in areas such as cognitive abilities or creativity (Reis et al., 2014). Recently, this population has received increasing interest from researchers (Gelbar et al., 2022). However, due to limited research and the complexity of the condition, estimating the prevalence rate is challenging. A recent study estimated that the theoretical probability of twice-exceptional children is approximately 14% (Lee et al., 2023). An example of twice-exceptional individuals is children with intellectual giftedness as well as one or more neurodevelopmental disorders such as Autism Spectrum Disorder (ASD) and/or Attention-Deficit/Hyperactivity Disorder (ADHD). ASD is a neurodevelopmental disorder characterized by impairments in social communication and interaction and persistent restricted, repetitive or behaviors or stereotypes whereas ADHD is characterized by persistent inattention and hyperactivity/impulsivity issues (APA, 2022).

Children with ASD and/or ADHD and giftedness face unique learning and psychosocial challenges due to the discrepancy between their cognitive abilities and specific developmental skills (Cain et al., 2019). This population tends to show underachievement at school due to their learning challenges (Steenbergen-Hu et al., 2020). Maddocks (2019) found that twice-exceptional children tend to struggle in learning due to information processing deficits or their heterogeneous achievement patterns. Twice-exceptional individuals often exhibit uneven cognitive profiles, where their intellectual strengths can mask underlying learning disabilities, leading to misdiagnosis, underdiagnosis, and inappropriate educational placements (Foley-Nicpon et al., 2011; Gelbar et al., 2022).

Parents of gifted children with ASD who were interviewed by Rubenstein and colleagues (2015) reported challenges in finding appropriate educational placement for their children, as the typical educational environment tends to be incompatible with their children's needs. Overall, individuals with ASD and/or ADHD and intellectual giftedness are more likely to experience negative consequences. For example, because of their tendency to compensate for deficits with high cognitive abilities, they often went undiagnosed for longer periods, resulting in delayed access to relevant interventions and educational support (Foley-Nicpon et al., 2011; Gelbar et al., 2022). This delay can exacerbate their academic underachievement, as they miss out on critical resources that could help them thrive both academically and socially.

Dempsey and colleagues (2021) found that having intellectual giftedness does not act as a protective factor to prevent the decline in adaptive functioning that may occur with age for individuals who have ASD. Usually, children with ASD and intellectual giftedness show immaturity in socio-emotional behaviors and tend to be victims of bullies (Gelbar et al., 2022). Ronksley-Pavia and colleagues (2019) obtained perspectives of twice-exceptional learners and described that all of the children they interviewed reported a history of being physically, verbally, or socially bullied at school, usually during times when they are isolated (e.g., during recess). They also reported experiences of relational conflict with teachers (e.g., being negatively targeted) and feeling unsupported and emotionally vulnerable at school (e.g., getting dismissed for their report of being bullied).

There is also a higher likelihood for gifted children with ASD and/or ADHD to face mental health issues. Cain and colleagues (2019) found that gifted children with ASD are more likely to seek mental health services and take medication, whereas those children with ASD without exceptional abilities were inclined to make use of educational services, developmental services, and assistive services. Studies have also found that the self-esteem and self-concepts of twice-exceptional students were more similar to those of students with learning disabilities, and they showed lower self-esteem than gifted or general students (Foley-Nicpon et al., 2011).

From the clinical perspective, ASD and ADHD are usually diagnosed based on a comprehensive assessment process that includes clinical interview, clinical observation, and the use of psychometric rating scales. Individuals who have ASD and ADHD can exhibit a range of cognitive capabilities, which may include exceptional intellectual abilities. Intellectual giftedness is typically identified through standardized intelligence tests, where the individual obtains a standard score of at least 130, performing better than around 98% of the population (Erden et al., 2022). While comprehensive psychological evaluation is the best method to identify the needs of twice-exceptional individuals, complexities arise during the psychological assessment of such individuals, increasing the risk of misdiagnosis or missed diagnosis (Amend & Peter, 2021). Differentiating sub-clinical behaviors from a true disability is also challenging, as gifted children often exhibit quirky behaviors or overexcitement diagnosis (Amend & Peter, 2021). Moreover, the presence of overlapping symptoms in ASD and ADHD and common comorbidities further complicates the diagnostic evaluation process (Hours et al., 2022).

In Malaysia, neurodevelopmental disorders including ASD and ADHD are categorized under learning disabilities in view of the educational challenges these individuals usually faced (Jabatan Kebajikan Masyarakat, 2023). However, both gifted education and special needs education remain largely underserved, both at the local level and within the broader scope of the national education. This situation presents significant challenges for twice-exceptional children who are gifted but also require special learning support due to their learning challenges. Addressing the educational needs of twice-exceptional children requires not only the development of specialized programs that recognize and foster their gifts but also the implementation of individualized learning supports to manage their disabilities (Steenbergen-Hu et al., 2020). This dual approach is crucial for ensuring that these children can achieve their full potential and contribute meaningfully to society.

Phillipson and colleagues (2003) have highlighted the absence of a national policy to cater to the unique requirements of gifted children in Malaysia and emphasized the potential for the country to develop a gifted education program that stands out on the international stage within the context of educational globalization. They proposed comprehensive developments in policy, implementation, advocacy, research, and teacher education to support this initiative (Phillipson et al., 2003). Despite these recommendations, Malaysia has struggled to establish a sustainable gifted education program. Although there were efforts to create programs for talented learners as early as the 1960s, these initiatives were short-lived due to a lack of a clearly defined curriculum, inadequate training, leadership, and resources. For twice-exceptional children, this gap in both gifted and special education is particular-

ly problematic. They often find themselves in educational environments that neither challenge their intellectual abilities nor accommodate their learning disabilities, leading to frustration, underachievement, and unmet potential. Despite the clear need, gifted education has yet to be integrated as a mainstream approach within Malaysia's national education system, leaving twice-exceptional children without the necessary support to thrive academically and socially.

Overall, children with ASD/ADHD and giftedness face unique learning and psychosocial challenges, including underdiagnosis or misdiagnosis of their learning disabilities, difficulties in finding suitable educational placements, and failure to obtain relevant services and appropriate interventions. These challenges are often exacerbated by the simultaneous presence of remarkable cognitive abilities and significant learning disabilities, which can lead to confusion among parents, teachers, peers, and even mental health professionals. This confusion can delay the identification and support of these children's learning disabilities, further complicating their academic and social experiences. Moreover, these children are at a higher risk of being bullied and developing mental health issues due to their socio-emotional immaturity and the misunderstanding of their learning and behavioral needs. Despite these significant challenges, there is a notable lack of literature addressing the complex intersection of giftedness, learning disabilities, and neurodevelopmental disorders.

Hence, this case report aims to fill this gap by providing a real-life illustration of the challenges faced by two twice-exceptional individuals in Malaysia, highlighting the complexities involved in their psychological evaluation. By sharing these cases, the report seeks to raise awareness among parents, educators, and healthcare professionals about the unique needs and challenges of twice-exceptional individuals, particularly those related to their learning and educational challenges. Additionally, it contributes to the existing literature by promoting a better understanding of the strengths and vulnerabilities faced by twice-exceptional children. This understanding is crucial for identifying gaps in current services and policies, emphasizing the need for tailored assessments and strength-based support that can address both their learning disabilities and their exceptional abilities, ultimately helping them reach their full potential.

Case Series

The following section will describe the background information and behavioral observations of two twice-exceptional learners, called AD and EE. In this case study, data collection involved a comprehensive review and analysis of clinical records from various healthcare professionals. The first author (LSH) and the second author (SJA), both clinical psychologists, conducted the psychological assessment for AD. EE was assessed by the second author (SJA) and two clinical psychology trainees, who are the fourth (CKM) and fifth authors (ANCC) of the study. The assessment for AD and EE took one unstructured clinical interview session with parents and child (one hour) and two assessment sessions with child (each one hour) to complete, with one week gap between each session.

The data extracted for this case report included session notes and clinical records from the psychological assessment by the aforementioned authors, as well as sessions with the referral psychiatrist (for AD) and the paediatrician (for EE), all

of which were derived from clerked notes within the hospital's digital note-taking system. These records provided detailed information on the children's developmental history, results from clinical interview, psychological assessments (including intelligence tests and developmental rating scales), and observations made by the various professionals involved. The authors then thoroughly reviewed and analyzed these records to ensure a comprehensive understanding of the children's cognitive profiles, developmental and learning challenges. This analysis was integral to forming the case report, which sheds light on the unique challenges faced by twice-exceptional children.

Ethical review exemption was obtained from the University Teknologi MARA's research ethics committee in accordance with the ICH Good Clinical Practice Guidelines, Malaysian Good Clinical Practice Guidelines, and the Declaration of Helsinki. Written parental consents have been obtained for both cases. To ensure anonymity, pseudonyms were used.

Case 1: AD

AD, a 13-year-old Malay boy, was internally referred by the psychiatric clinic to the psychology clinic for a psychological assessment to clarify his diagnosis after his parents brought him in due to mood disruption and suicidal thoughts resulting from bullying at his boarding school. Based on the clinical interview, AD struggles in making friends and getting along well with others. He is poor at holding a conversation and tends to speak in English instead of Malay like his peers. He prefers playing alone as a child and has poor eye contact when talking to others. He also shows an obsession with wheels and has hypersensitivity to noise, food texture and certain emotional content (e.g., agitated by loud sound, is a picky eater, closes his ear and moves away when he is emotionally affected by movie scenes of people getting shamed). His parents described that AD does not adjust his behaviors based on the context (e.g., often wears clothes that don't fit the context such as formal cloth at home).

AD's parents also reported that he gets bored easily and has a short attention span during online learning. He hyper-focuses when watching television and cannot hear others calling him. At home, he needs frequent reminders on basic self-care such as brushing his teeth, washing his hair, and completing his homework. At times, he is disorganized, struggles to sit still, and tends to be impulsive and reactive (e.g., cannot control his anger and hits his younger siblings). He also has problems controlling his phone usage and does not cooperate with his parents' instructions. AD reported that he is easily distracted by sounds and movements. He described that he usually takes around 30 minutes to calm down before he is able to concentrate during lessons. He reported feeling sad due to bullying at school and relational issues with parents (e.g., his parents had expressed comments such as "*we rather have a stupid child than someone who is ill behaved*").

AD is the eldest of 3 siblings. He frequently fought with his younger siblings as he was agitated by their loud sound and behaviors (e.g., reporting his behaviors to their parents and got him into trouble). For developmental history, AD was born full-term via emergency caesarean section after failed induction of labor. He had a normal birth weight of 3kg. His mother had gestational diabetes and hypertension during pregnancy, but there was no complication during postpartum period. He walked at

1 year old, scribbled at 3 years old and wrote at 4 years old. As he has no speech at 3 years old, he attended speech therapy and could speak properly by 4 years old. AD did a hearing assessment at 3 years old, and his hearing was normal.

AD attended primary one to six at a local mainstream school and was a top scorer despite sleeping in class and not completing his homework. His favorite subjects include science, information and communications technology, and English. He has been a victim of bullying (taunted at school) since he was in year 1. He reported having thoughts "to jump off the roof" at school when he was bullied during year 1 to 3, and the situation improved after he made a few friends. AD was subsequently enrolled in a boarding school in a different state for secondary school. He was again being bullied such as taunted and teased as "*slow and useless*" in class or in hostel, being thrown books/pencil case, belongings being taken away, being called vulgarly, being touch inappropriately in the groin area once. AD fought back at times and informed his senior. However, his complaints were dismissed. AD did not report to the teacher as he did not want the issue to escalate. He expressed that overtime, he felt that the taunting was true and felt that his parents "wasted so much money" on him. Four months later, his parents decisively moved him to a local secondary school in view of the bullying and sought help from a psychiatrist. His psychiatrist subsequently referred him for psychological assessment to clarify his diagnosis.

When AD was first seen in the Psychology clinic, he was neatly groomed and has a lean built. He showed staring eye contact, restricted affect, and a rigid posture. AD had a book with him and wanted to read the book after he sat down, but he cooperatively put the book down when he was prompted by his father. He willingly responded to questions. He spoke in fluent English with an accent and rigid tone, and he would have a brief pause to process the questions before he responded. His speech style was pedantic with use of advanced vocabularies (e.g., "*I play lego to find my creativity, put reality into those bricks*"; "*my little brother ambushes me*"). He struggled to describe his emotions.

Case 2: EE

EE, six years old boy, was referred by the paediatric clinic to the psychology clinic for intellectual assessment. He is an only child, and he has a cousin who was diagnosed with ASD and seemed to have high intelligence. He was delivered at 36 weeks via vacuum-assisted vaginal delivery with a birth weight of 2.7kg. He started walking at 18 months and only spoke his first word at the age of four. His parents noticed that he was socially less responsive since he was a toddler (e.g., indifferent to contact with others, did not maintain eye contact, did not respond to his own name, and liked to play alone). He was then diagnosed with ASD at the age of three. He was referred to attend individual and group occupational therapy which improved his speech and fine motor skills.

EE did not attend preschool during the Covid-19 pandemic. When he was enrolled in mainstream primary school, his teachers were not able to manage his high activity level in his class (e.g., walking around in class, touching other classmates' personal belongings, struggling to sit still, and being unable to focus during classes). He also could not make friends. Despite the complaints, his parents shared that EE has scholastic skills that exceed his chronological age such as memorising chain of digits,

answering equations up to trillion and power of 20 and higher, working on secondary physics, chemistry and mathematics workbooks, playing complete songs with piano, completing 500-piece puzzles alone, and decoding computer games.

During the assessment, EE did not maintain eye contact and showed very high activity level (e.g., could sit still for only 10 minutes, rocking back and forth on the chair, running around, and drawing pictures on the paper). He often wanted to grab and flip the test stimulus book by himself or provide an answer immediately before the evaluator finished the questions. When the evaluator attempted to withdraw the stimulus book or blocks from the table, he would push the evaluator's hand away. Repetitive instructions were required at times to get his attention. He was observed to be distracted easily during the assessment and repeated instructions were required at times to get this attention. He also needed several break times.

Based on the information gathered from the clinical interview sessions, a comprehensive assessment was conducted to evaluate AD and EE's current learning and cognitive strengths and vulnerabilities, as well as to clarify their diagnosis. This assessment included diagnostic rating scale, objective neuropsychological tests, and involved input from both parents and teachers whenever possible, to evaluate their learning abilities and to determine whether they have underlying neurodevelopmental conditions such as ASD and ADHD. The following sections summarize the findings from the assessment.

Case 1: Assessment results of AD

Wechsler Intelligence Scale for Children-Fifth Edition

Wechsler Intelligence Scale for Children-Fifth Edition (WISC-V) is one of the gold standards in evaluating intellectual functioning of children. Intelligence test was administered to evaluate his cognitive and learning abilities (Wechsler, 2014). AD's overall intellectual function fell in the Very High range (FSIQ=129, 97th percentile). He obtained Extremely High performance in his perceptual and mathematical reasoning skills (Fluid Reasoning Index =144, 99.8th percentile) and in his visual spatial skills (Visual Spatial =135, 99th percentile), indicating that he is gifted in his non-verbal processing and reasoning. In comparison, he obtained High Average performance in his verbal and abstract reasoning skills (Verbal Comprehension Index =111, 77th percentile), working memory skills (Working Memory Index= 115, 85th percentile), and Processing Speed skills (Processing Speed Index=116, 86th percentile). Table 1 summarizes his WISC-V results, including the subtests results.

Table 1. ***AD's WISC-V results***

Scale	Composite/ scaled Score	Percentile Rank	Qualitative Description
Full Scale IQ (FSIQ)	129	97th	Very High
Fluid Reasoning (FRI)	144	99.8th	Extremely High
Matrix Reasoning	17	99th	
Figure Weights	15	95th	
Visual Spatial (VSI)	135	99th	Extremely High
Block Design	17	99th	
Visual Puzzles	15	95th	
Processing Speed (PSI)	116	86th	High Average
Coding	11	63rd	
Symbol Search	15	95th	
Working Memory (WMI)	115	84th	High Average
Digit Span	11	63rd	
Picture Span	14	91st	
Verbal Comprehension (VCI)	111	77th	High Average
Vocabulary	13	84th	
Similarities	11	63rd	

Childhood Autism Rating Scale, Second Edition High Functioning (CARS 2-HF)

ASD specific diagnostic tool Childhood Autism Rating Scale, Second Edition High Functioning Version (CARS 2-HF) was administered to evaluate for autism spectrum disorder. CARS 2 is a 15-item clinician-rated questionnaire with a 4-point rating scale to identify children with autism and distinguish them from those with developmental disabilities (Schopler et al., 2010). Examples of areas rated include his social-emotional understanding, body use, adaptation to change, verbal communication etc. CARS 2 has a sensitivity of 89-94% and specificity of 61-100% (Schopler et al., 2010). Based on the clinician's rating, AD obtained a raw score of 31 (T-score = 46), indicating that he showed Mild to Moderate Symptoms of ASD, with symptom level higher than 35% of individuals with ASD.

Gilliam Autism Rating Scale-Third Edition (GARS-3)

Gilliam Autism Rating Scale-Third Edition (GARS-3) was administered to AD's father to assess his probability and severity of autism spectrum disorder (Gilliam, 2014). GARS-3 is a rating scale with 56 items and 6 subscales: Restrictive/Repetitive Behaviors, Social Interaction, Social Communication, Emotional Responses, Cognitive Style, and Maladaptive Speech. It is a valid and reliable scale and is used for individuals aged 3-22. The autism index scores were reported to have the following sensitivity and specificity values for identifying children with ASD from typically

developing children: sensitivity = 0.96 (4 subscales) and 0.95 (6 subscales), specificity = 0.95 (4 subscales) and 0.97 (6 subscales). Based on the GARS-3 completed by AD's father, he obtained an Autism Index (6 scores) of 99, indicating Very Likely probability of ASD. This score suggests that he is at Level 2 requiring substantial support based on the DSM-5 Severity Level for ASD.

Autism Spectrum Rating Scale (ASRS 2-5 years)

Autism Spectrum Rating Scale (ASRS 2-5 years) was administered to AD's class teacher to evaluate if he showed characteristics of autism at school setting. *ASRS* is a 70-item rating scale to quantify observation of AD on core features of ASD (Goldstein & Naglieri, 2009).The scale has a sensitivity and specificity score between .90-.95. It helps to determine treatment targets on the symptoms associated with autism (Goldstein & Naglieri, 2009). AD obtained a Slightly Elevated score in terms of similarity in behavioral characteristics with children diagnosed with ASD and symptoms directedly related to the DSM-5 criteria for ASD. His symptoms are higher than 88% of children for his age range. He showed Very Elevated social communication deficits. Specifically, his class teacher reported Very Elevated social/emotional reciprocity issue, indicating high level of difficulties in providing appropriate emotional response to others. He also showed Elevated peer socialization issues, suggesting poor willingness and capacity to successfully engage in activities that develop and maintain relationships with other children. Table 2 summarizes the ASRS's result.

Table 2. ***AD's ASRS results***

ASRS Scales	T-Score	Percentile Rank	Classification
DSM scale	62	88th	Slightly Elevated
Social Communication	74	99th	Very Elevated
Unusual Behaviors	41	18th	Average
Self-Regulation	36	8th	Low
Treatment Scales			
Peer Socialization	65	93rd	Elevated
Adult Socialization	41	18th	Average
Social/Emotional Reciprocity	70	98th	Very Elevated
Atypical Language	39	14th	Low
Stereotypy	45	31st	Average
Behavioral Rigidity	38	12th	Low
Sensory Sensitivity	43	24th	Low
Attention/Self-Regulation	40	16th	Average

D2 Test of Attention

In view of the complaints on AD's attention and behavioral regulation skills, the d2 Test of Attention was administered to evaluate if he shows attention deficits. D2 Test of Attention is a paper and pencil performance measure of sustained and selective attention (Brickenkamp & Cubero, 2002). It takes into account the speed and accuracy of the performance during a cancellation test where respondents need to cross out target stimulus (D with 2 dashes) and ignore nontarget stimulus. There are 14 consecutive lines and 20 seconds limit are allowed for each line with no pause in between the lines. AD obtained a Total Number standard score of 130 (99.9th percentile), indicating Superior performance. Table 3 summarizes the results for D2 Test of attention.

Table 3. ***AD's Results for D2 Test of Attention***

	Standard score/percentage	Percentile rank	Category
Total Number	130	99.9th	Superior
Omissions	2		
Commissions	7		
Errors	1.7%	90th	Superior
Total-errors	130	99.9th	Superior
Fluctuation rate	17		

Comprehensive Trail-Making Test (CTMT)

The CTMT was administered to evaluate AD's executive function, in view of the presenting issue of needing frequent reminders for his to execute daily tasks at home. The CTMT is a paper and pencil performance test where the respondent needs to make trail based on sequential rules (Reynolds, 2002). It measures executive function skills including attention, concentration, cognitive flexibility, and resistance to distraction. It can be administered to individuals aged 11 to 74 and takes around 10 minutes to administer. His CTMT Composite Index fell in the Very Superior range (T-score =85, 97th percentile), indicating that he has good ability in resistance to distraction, inhibition, task switching, and cognitive flexibility.

Attention-Deficit/Hyperactivity Disorder Test, Second Edition (ADHDT-2)

ADHDT-2 is a brief rating scale consisting of 33 items that are categorized into inattention and hyperactivity/impulsivity symptoms for children aged 5-17 (Gilliam, 2015). This was administered to evaluate for ADHD. The Likert scale ranges from 0 (never observed) to 3 (very often observed). The scale has a sensitivity index of .90 and a specificity index of .82. ADHDT-2 was completed by AD's father and his class teacher to screen for the likelihood of him having Attention-Deficit/Hyperactivity Disorder (ADHD). He obtained an ADHD index of 83, indicating Likely Probability of ADHD based on his father's rating. However, he obtained an ADHD index of 53 based on his teacher's rating, indicating Very Unlikely Probability of ADHD. Table 4 summarizes the results of ADHDT-2.

Table 4. ***AD's ADHDT-2 results***

Scales	Scaled score/Percentile rank	
	Father	**Class teacher**
ADHD Index	83	53
Inattention	6 (9^{th})	2 ($<1^{st}$)
Hyperactivity/Impulsivity	8 (25^{th})	2 ($<1^{st}$)

Conners Clinical Index (Conners CI-Self)

Conner CI-self is a self-report rating scale that helps to provide an overview of a child's functioning in the areas of social/emotional, learning, and behaviors (Conners et al., 1998). It provides indictor of potential clinical issues that warrant detailed evaluation, including ADHD, disruptive and behavior disorder, mood disorder, and anxiety disorder for children between age 6-18. It is based on 24 items that have the best statistical properties to differentiate youth with these clinical diagnoses. AD reported the highest rating for Disruptive Behavior Disorder Indicator, where individuals with a clinical diagnosis obtained this raw score 96% of the time. AD reported feeling angry with adults around him and struggled to comply to instructions.

Case 2: Assessment Results of EE

Wechsler Intelligence Scale for Children – Fifth Edition (WISC-V)

WISC-V was used to evaluate EE's learning strengths and weaknesses. EE obtained a Full-Scale IQ of 128, which places his intellectual functioning in a very high range and above that of approximately 97% of his peers of the same age. EE's ability to evaluate visual details and understand visual spatial relationships in order to construct geometric designs from a model falls in the Extremely High range (Visual Spatial Index = 151, 99.9^{th} percentile). Similarly, his ability to detect the underlying conceptual relationship among visual objects and use reasoning to identify and apply rules falls in the Extremely high range (Fluid Reasoning index = 142, 99.7^{th} percentile). EE's speed and accuracy of visual identification, decision making, and decision implementation fell in the Very High range (Processing Speed index = 123, 94^{th} percentile). Table 5 summarizes EE's WISC-V results. EE's ability to access and apply acquired word knowledge was diverse, but overall is in the Average range for his age (Verbal Comprehension Index = 100, 50^{th} percentile). He excelled when identifying how two words relate to a common concept (SI = 15); however, he showed greater difficulty in defining words aloud (VC = 5). This pattern of performance suggests that he has a very strong ability with verbal tasks that require abstract reasoning but appears to have greater difficulty with learning new words and defining them aloud. EE's ability to register, maintain, and manipulate visual and auditory information in conscious awareness was diverse although the overall falls in the Average range (Working Memory Index= 97, 42^{nd} percentile). His performance on listening to strings of numbers and recalling them in specified sequence (Digit Span= 13) was

significantly better when compared to his performance on remembering a series of rapidly-presented pictures (Picture Span =6).

Table 5. ***EE's WISC-V results***

Scale	Composite/ scaled Score	Percentile Rank	Qualitative Description
Full Scale IQ (FSIQ)	128	97th	Very High
Fluid Reasoning (FRI)	142	99.7th	Extremely High
Matrix Reasoning	18	99.6th	
Figure Weights	17	99th	
Visual Spatial (VSI)	151	>99.9th	Extremely High
Block Design	18	99.6th	
Visual Puzzles	19	99.9th	
Processing Speed (PSI)	123	94th	Very High
Coding	11	63rd	
Symbol Search	17	99th	
Working Memory (WMI)	97	42nd	Average
Digit Span	13	84th	
Picture Span	6	9th	
Verbal Comprehension (VCI)	100	50th	Average
Vocabulary	5	5th	
Similarities	15	95th	

Gilliam Autism Rating Scale – Third Edition (GARS-3)

GARS-3 was used to evaluate for autism spectrum disorder. EE's father completed the GARS-3 He obtained an Autism Index standard score of 87, which revealed that he is demonstrating behaviours associating with the Autism Spectrum Disorder at a Very Likely level in the home setting, and that these behaviours are limiting EE's academic and social interactions. It also suggests that his DSM-5 is at severity level two, indicating that EE requires substantial support. At the subscale level, EE scored the highest in the Social Communication subscale, suggesting difficulties in the area of understanding social interactions with others.

Conners' Parent Rating Scale – Revised: Long Form (CPRS – R:L)

The revised Conners' Rating Scale (CRS–R:L) is an instrument for the assessment of attention deficit/hyperactivity disorder (ADHD) in children and adolescents (Conners et al., 1998). It evaluates problem behaviors as reported by the teacher, parents, and adolescents. The form is appropriate for children aged 3 to 17. CRS-R was administered to EE's father. Feedback from his teacher could not be obtained as he was terminated by his school. Based on the results, the prime indicator of ADHD,

the ADHD index, was Elevated (T-score = 62). The general analysis of the profile indicated that his parent perceived a high concern on EE's hyperactivity-impulsivity and a mild concern about his attention deficit. The subscale descriptions show slight elevations in Cognitive Problems/Inattention and higher elevations in Hyperactivity. There is also a high elevation on Social Problems. This suggests that the parent perceives EE to have slight problems organising his work, have difficulty completing tasks of schoolwork, and appear to have trouble concentrating on tasks that require sustained mental effort. However, he is more prone than peers his age to have difficulty sitting still, feel more restless and impulsive, and have the need to always be 'on the go'. EE is also perceived to have few friends, low self-esteem, little self-confidence, and will likely feel more socially detached from his peers. Table 6 summarizes the result.

Clinical impression of AD and EE

Based on the assessment results, AD and EE's psychological profile suggests that they are twice exceptional. On one hand, they are gifted in terms of cognitive abilities, especially in their extremely high performance in Fluid Reasoning and Visual Spatial ability based on the WISC-V. On the other hand, results from diagnostic rating scales indicate that both AD and EE have underlying neurodevelopmental disorder(s). AD fulfilled the criteria for ASD based on the DSM-5-TR. While he exhibits some inattentive and impulsive tendencies, particularly at home, he does not meet the criteria for ADHD, as he does not display these difficulties across various settings. AD also shows superior performance in the objective attention and executive function tests (i.e., D2 Attention and CTMT).

As for EE, the diagnosis of ASD given when EE was three years old remains the same. In addition, this evaluation shows that EE also displayed symptoms of hyperactivity since he was three years old such as being squirmy in seat, leaving his seat when seating is expected, always on the go, running around the room, giving an answer before a complete question, unable to wait for his turn, and often interrupts others as reported by the school teachers. In other words, EE has a comorbid condition of ADHD, specifically predominantly hyperactive/impulsivity type. In line with the literature, the comorbidity of ASD and ADHD is high (Antshel & Russo, 2019; Hours et al., 2022).

Additionally, while AD's exceptional non-verbal reasoning and visual-spatial skills suggest that he is gifted in these areas, the relative difference in his verbal reasoning, working memory, and processing speed might present specific learning challenges. These could impact his academic performance, particularly in subjects that require strong verbal skills and efficient processing of information. Similarly, EE's cognitive profile suggests that while EE excels in verbal tasks requiring abstract reasoning, but he may struggle with learning and verbally expressing new vocabulary, which could present learning challenges in language-heavy subjects. The variability in his working memory index also suggests that EE might face challenges in tasks that require strong visual memory or learning new verbal information, which could impact his academic performance in areas that rely heavily on these skills.

Table 6. ***EE's results for Conners' Parent Rating Scale – Revised: Long Form (CPRS – R:L).***

Subscale	T-score	Classification	Description
Oppositional	41	Slightly atypical (not a concern)	Not likely to break rules, have problems with persons in authority, or easily annoyed and angered than most individuals his age.
Cognitive problems/ Inattention	56	Slightly atypical (borderline; should raise a concern)	May have more difficulties than most individuals their age, have problems organizing their work, have difficulty completing tasks of schoolwork, and appear to have trouble concentrating on tasks that require sustained mental effort.
Hyperactivity	61	Mildly atypical (possible sig. problems)	Have difficulty sitting still, feel more restless and impulsive than most individuals his age, and have the need to always be 'on the go'.
Anxious-Shy	46	Average	Do not have more worries and fears than most individuals his age: unlikely to be emotional, sensitive to criticism, or anxiowus in new/unfamiliar situations.
Perfectionism	55	Average	Average level of wanting things to be perfect
Social Problems	90	Markedly atypical (indicates sig. problem)	Have few friends, low self-esteem, little self-confidence, and will likely feel more socially detached from his peers.
Psychosomatic	42	Slightly atypical (not a concern)	Normal amount of aches and pains
ADHD Index	62	Mildly atypical (possible sig. problem)	At risk of ADHD
DSM-IV Inattentive	60	Slightly atypical (borderline; should raise concern)	Slight risk
DSM-IV H-I	65	Mildly atypical (possible sig. problem)	High risk
DSM-IV Total	63	Mildly atypical (possible sig. problem)	High risk

Intervention provided

Psychoeducation was provided to AD's parents following his assessment to guide them on effective parenting strategies tailored to his needs. Parents and AD attended four one-hour weekly sessions, which was conducted by the first author (LSH). The first session focused on explaining the assessment results and educating the parents and AD about twice-exceptional learners and AD's ASD condition. Emphasis was given to parents to nurture his strengths and interests. The second session involved coaching them on a strength-based parenting style that granted AD more autonomy while also improving his relationship with his siblings (e.g., ignoring tattling behaviors among the siblings). In the third session, the parents received guidance on how to support AD in preparing for his upcoming exams and discussed educational placement options.

The final session included a progress review and the conclusion of the psychoeducation program. Since AD's parents adjusted their parenting approach to be more collaborative while maintaining clear structure, and with the support of regular family counseling sessions, AD has shown significant improvements. He now enjoys better relationships with his parents and has become more cooperative at home. According to AD, he is happy that his parents are now "*kind to him*." His relationship with his siblings has also improved, and his parents have started supporting him in independent projects that interest him, such as building robots and solving various types of Rubik's Cubes. Additionally, AD is now more receptive to his parents' guidance during revision after he was given more autonomy. At school, AD is much happier; there is no bullying, and he has made a few friends. He has even become more open to trying new activities, such as volunteering for the cheer team and participating in singing competitions. After exploring educational options together, AD and his parents decided to continue with his current school for another year while looking into institutions that cater specifically to gifted children with ASD.

For EE, his parents participated in a psychoeducation session conducted by the fourth and fifth author (CKM and ANCC) focused on understanding his symptoms and learning management strategies. These strategies include behavioral interventions, such as using reinforcements and consequences, establishing routines, and adjusting their communication with EE. To further support his development, a strength-based approach was recommended. Academically, it was suggested that EE be enrolled in a private school or consider homeschooling, where he could receive better learning support to maximize his potential and strengths within the curriculum (e.g., visual spatial and logical reasoning skills) and accommodate his hyperactivity symptoms. A comprehensive reassessment was recommended after one year to evaluate his progress and determine any additional support he might need. It was recommended that he continue his regular appointments at the pediatric clinic as part of a multimodal intervention plan. This plan includes ongoing monitoring of his development by the referral pediatrician and to attend attention training with an occupational therapist.

Discussion

These two case studies illustrate the complex and paradoxical psychosocial and learning challenges faced by twice-exceptional learners. While they are cognitively gifted, they would also be classified as having learning disabilities in Malaysia. The difficulties that AD and EE encounter align with findings from previous research on twice-exceptional individuals, which highlights the unique and often contradictory demands placed on them (Cain et al., 2019; Gelbar et al., 2022; Foley-Nicpon et al., 2011; Ronksley-Pavia et al., 2019). For instance, despite their intellectual strengths, both AD and EE lack the social-emotional skills necessary to thrive in traditional educational settings, a common issue noted in twice-exceptional populations.

AD's case, in particular, underscores the challenge of poor adaptive functioning and immature behavior, which not only confused his parents but also exacerbated his difficulties through their authoritarian approach, leading to defiance and anger. His experiences of prolonged bullying and lack of support at school have further impacted his mental health, contributing to low self-esteem and mood disturbances. These challenges reflect the complex interplay between cognitive abilities and social-emotional difficulties that twice-exceptional children often face. In contrast, EE's condition was identified earlier, which allowed for timely interventions and more suitable educational placement. However, both AD and EE exhibit uneven cognitive profiles, characterized by strengths in visual reasoning but relative weaknesses in verbal learning and information processing. This cognitive disparity poses significant challenges in academic areas requiring linguistic abilities, despite their exceptional skills in visual tasks.

Identifying and addressing these challenges early on is crucial to ensuring that twice-exceptional children like AD and EE are placed in learning environments that not only leverage their strengths but also provide the necessary support for their areas of difficulty. This approach is vital to help them navigate the dual demands of their giftedness and learning disabilities, ultimately fostering their academic and personal development.

The cases also highlight the clinical challenges of evaluating gifted young individuals who also have neurodevelopmental disorders, due to the overlapping and diverse nature of their symptoms. This case report underscores the value of psychological assessments in helping clinicians identify that AD and EE are twice-exceptional. Through the psychological assessment process, which included a clinical interview, behavioral observations, objective neuropsychological tests, and standardized psychometric tests, we were able to clarify the diagnoses of AD and EE. For example, ASD seems to explain AD's current behavioral characteristics better than ADHD diagnosis since he shows superior attention skills based on the neurological test and does not show significant attention issues at school setting.

In addition, this case study illustrates the importance to assess intelligence within the ASD population to understand their needs. Beckmann and Minnaert found that compared to the general population, those with ASD have a 12-fold higher likelihood of scoring within the range of intellectual disability (Beckmann & Minnaert, 2018). However, they are also 1.5 times more likely than the general population to score within the superior range, which indicates that more individuals with ASD

could potentially be recognized as gifted. Hence, administering intelligence test is recommended when assessing for autism.

The findings from these two cases highlight the potential importance of focusing on learning strengths, as twice-exceptional children may sometimes be overshadowed by their psychosocial difficulties. Strength-based approach is also beneficial in management of the case. Based on the assessment findings, the parents were psychoeducated on the child's condition. They were guided to understand their child communication style (e.g., taking what others say literally) and struggles with transitions (Reis et al., 2022). Evidence-based strategies for twice-exceptional students, including those suggested by Amran and Majid (2019), were shared with them. For example, a strength-based approach is recommended for AD, which is likely to improve his learning achievement and self-efficacy by developing strengths while overcoming limitations. Parents and teachers can help identify his academic strengths, engage them in interest-based extracurricular activities, and guide them to develop compensation strategies. Academic acceleration or Advanced Placement (AP) is also helpful. Additionally, AD is likely to learn better through short assignments with clear structures and feedback checkpoints and benefit from learning support to improve organizational skills. Further behavioral and emotional interventions should be provided. Parents and teachers can also help him build social connections and positive relationships with others, as poorer social skills and low self-esteem are common characteristics of ASD children with giftedness.

This case report shows the importance of timely identification of twice-exceptional individuals through comprehensive psychological assessment. Unfortunately, individuals with twice-exceptional abilities and those with high functioning autism tend to be underdiagnosed due to their own compensatory strategies. Proper identification and understanding lead to effective management. The coexistence of giftedness and ASD/ADHD is possible, and there are various interventions available to assist these children and adolescents. For example, Melogno and colleagues provide social reading intervention to improve a child with ASD and gifted verbal intelligence's theory of mind and pragmatic communication via a 14 sessions program (Melogno et al., 2022). The child shows improvement in social cognitive measure. Public awareness among parents, educators, and healthcare professionals about the characteristics of twice-exceptional learners is essential to allow early identification and referral. Aziz (2020) suggests training educators to identify for high functioning autism/twice-exceptional students and create a conducive and stimulating environment for them. Aziz (2020) also suggested that NGO's such as MAHFAA (Malaysia High Functioning Autism Association) to work on public advocacy and collaborate with the government to discuss a conducive learning environment for individuals with high functioning autism/twice-exceptional learners.

In Malaysia, some interests toward gifted children were reignited in recent years and one example will be the development of the Malaysian National Gifted Center -also known as Pusat GENIUS@Pintar Negara. The center used Malaysian based standardized test to evaluate intellectual, creativity, socio-affective and sensorimotor ability for children between age 9-15 (Ishak & Bakar, 2017). The program currently includes components of talent search, school holiday program, boarding pre-matriculation and college. It also provides counseling services to address the

common issues faced by gifted students in current local educational settings (Bakar & Brody, 2021). Moreover, there is a gifted school named Genius Insan College at Negeri Sembilan, Malaysia that uses a special curriculum of gifted and talented education that focuses on Muslim education (Mohd et al., 2022). However, despite these efforts, twice-exceptional children are yet to be fully recognized and supported in the country.

Given the classification of ASD and ADHD under learning disabilities in Malaysia, policy changes are crucial to better support twice-exceptional learners. These children often fall through the cracks in a system that is not fully equipped to address their unique needs. As Malaysia continues to develop its educational landscape, it is essential to incorporate comprehensive support systems for twice-exceptional students within existing policies such as the Malaysian Education Blueprint 2013-2025, the National Policy for Persons with Disabilities 2007, and in alignment with Sustainable Development Goal 4 (SDG 4): Quality Education (UNESCO, 2016).

SDG 4 focuses on ensuring inclusive and equitable quality education for all, which aligns with the objectives of the Malaysian Education Blueprint 2013-2025. The Blueprint aims to create an education system that provides every student, including those with special needs, the opportunity to achieve their full potential. However, the current framework lacks specific provisions for twice-exceptional children, who require both advanced academic challenges and specialized support for their disabilities. To address this gap, the Blueprint could be revised to include targeted strategies for identifying and supporting twice-exceptional students within both mainstream and special education settings, thus advancing the goals of SDG 4 in Malaysia.

Malaysia's educational framework includes initiatives like Pusat GENIUS@ Pintar Negara and Genius Insan College, which cater to gifted students. These programs could be expanded to include specialized tracks for twice-exceptional students, offering tailored interventions that address both their giftedness and their learning disabilities. Moreover, the National Policy for Persons with Disabilities (2007) could be leveraged to advocate for more inclusive practices that ensure twice-exceptional children receive the necessary support across educational and social services, further promoting the inclusive education principles of SDG 4.

In addition, teacher training programs could be aligned with the Special Education Policy under the Ministry of Education, which already provides guidelines for the training of educators in special needs. By integrating modules on identifying and supporting twice-exceptional students, these programs could better equip educators to recognize the often-subtle signs of giftedness in students with learning disabilities and to implement teaching strategies that leverage their strengths while accommodating their difficulties. This approach supports the SDG 4 target to increase the supply of qualified teachers, especially in inclusive education settings.

Collaboration between special education and gifted education professionals should also be encouraged to create a more integrated approach to supporting twice-exceptional students. This could involve joint training sessions, shared resources, and the development of interdisciplinary teams that work together to assess and support these students. Such efforts would not only align with the Blueprint's aim to improve the quality of education through professional development and capacity building but also with SDG 4's broader commitment to inclusive education.

Finally, ongoing research and advocacy are essential to raising awareness about the unique needs of twice-exceptional children in Malaysia. This includes securing funding for studies that explore the effectiveness of current programs and developing new interventions tailored to this population. Aligning these efforts with the National Policy for Research and Development in Education could help drive innovations in educational practices and policies for twice-exceptional students, further contributing to the realization of SDG 4 in Malaysia.

Conclusion

To conclude, the case of AD and EE highlights the learning, educational, and psychosocial challenges faced by children and adolescents in Malaysia who are both gifted and have neurodevelopmental disorders. Although every individual's situation is unique, these two cases illustrate a typical example of the learning and psychosocial issues that twice-exceptional individuals face. The challenges they faced at school such as bullying, discrepancies in their learning abilities, social-emotional development, and finding a suitable educational placement are common among many adolescents with both autism and giftedness. It is essential to provide more comprehensive assessments and tailored support to this population to help them reach their full potential and contribute to the nation. Overall, it is hoped that this case report will help to raise awareness of the unique challenges faced by adolescents with autism and giftedness in Malaysia and lead to the development of more effective support services including early detection for this population. With the right support and guidance, individuals like AD and EE can achieve their full potential and contribute meaningfully to society.

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