

Research Article

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Twice-Exceptional Students and their Challenges

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Many schoolchildren face difficulties with their academic studies, including reading, spelling, writing, and reading comprehension issues. As a result, their grades may suffer, and they may lack the motivation to continue studying. However, some of these same children may also be exceptionally talented, with a high IQ of 130 or more. They may excel in areas like math, writing, painting, or programming. Despite their talents, they often feel lonely and misunderstood by their parents, teachers, and peers. This can lead to disappointment and anxiety, and many may struggle with depression. These children are known as "twice exceptional" and require extra attention as their giftedness is part of neurodiversity, like learning difficulties such as dyslexia and other developmental disorders.

Keywords: neurodiversity; giftedness; dyslexia; ADHD; ASD; twice-exceptional kids

Introduction

Many gifted students who have dyslexia and other learning disabilities (LDs) are often not identified for these talents and challenges. Their cognitive and non-cognitive characteristics are not given much attention during the identification and intervention process. This article aims to review the non-cognitive characteristics of such students in-depth for identification and intervention purposes. As a remedial teacher, I have discovered that they have high negative emotions, low self-perception, and difficult interpersonal relationships. However, they also possess high levels of motivation, coping skills, and perseverance. A common characteristic among these students is frustration with academic situations. Thus, being excellent in one subject, they might struggle in others. This research aims to explore the psychology of studying twice-exceptional students and reveal that these students exhibit duality in their non-

cognitive characteristics, requiring an individual approach to each student regarding their personalities and learning needs.

What is neurodiversity?

Neurodiversity is a term coined by Judy Singer (Harris, 2023) that refers to the range of neurological differences in people resulting from structural variations in the brain. These differences can cause differences in cognitive, sensory, and emotional functions and can lead to various neurodevelopmental disorders. This article examines dyslexia, one of the most common LDs, and giftedness as a form of neurodiversity (Beckmann et al., 2018). Matthew (2021) claims that twice-exceptional kids might also suffer from autism spectrum disorder (ASD) and attention deficit hyperactivity disorder (ADHD), as illustrated in Figure 1.

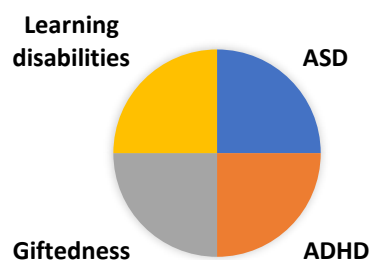
SORTS OF NEURODIVERSITY

Figure 1: sorts of neurodiversity

Neurodivergent people often face societal challenges due to stereotypes and prejudices, and the lack of social support makes it even more difficult for them (Reber, 2023), (Bainbridge, 2020). Therefore, it is important to recognize that gifted children may have unique learning needs that require tailored approaches, as well as children with LD, ASD, or ADHD. The pathways leading to giftedness are highly variable, so it is crucial to provide appropriate support and accommodations to help these individuals reach their potential (Matthew, 2021). According to Judy Singer's concept, the educational system is imperfect and not ready to cater to the diverse needs of students (Harris, 2023), (Ruban and Reis, 2005). Hence, instead of considering the individual as someone who needs special education, the concept of neurodiversity suggests that every person is unique, with their own strengths and weaknesses. It helps to move away from the pathology paradigm and embrace the idea that differences are not flaws but a natural part of human diversity (Beckmann et al., 2018).

The research claims that one or more types of the forenamed sorts of neurodiversity occur due to the brain structure. The characteristics of dominance in

the brain's functioning determine a person's physical activity and neurological condition, for instance, working memory, which is responsible for perception, storage, and later use of information (Aubry et al., 2018). Working memory, as described by Cowan (2008), can be considered a short-term storage system with a limited capacity and relies heavily on attention and other central executive processes. The stored information can be used later for interactions with long-term memory or other cognitive processes (Ger and Roebbers, 2023). The prefrontal, cingulate, and parietal cortices are activated during working memory tasks in the frontal-parietal brain regions. "When discussing working memory, the focus often shifts from the activated brain regions to the underlying neurobiological processes. Working memory is characterized by two key features: its limited capacity and its transient nature. These features are generated by neurons along the neural network." (Chai et al., 2018, p.5). Scientists have long believed that neurons are the key players in memory formation, but new findings suggest that these brain cells may be an important collaborator in this process (Cooke, 2023). It is illustrated in Figure 2.

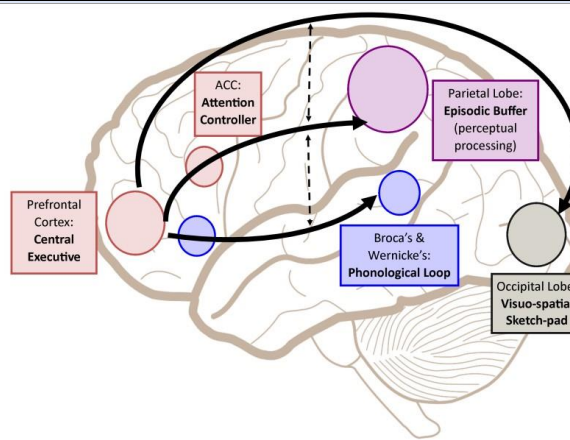


Figure 2: Multicomponent working memory model.

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Scientific research suggests that individuals with dyslexia undergo an evolutionary process that affects the functioning of their brains. Working memory works unevenly in dyslexic gifted children (Dashevsky, 2019). For instance, it perceives and stores math formulas and struggles to do the same with learning new vocabulary and spelling. Asynchrony is common among highly gifted and twice-exceptional children, delaying the development of executive functioning skills (Ger and Roebbers, 2023). It refers to uneven development between cognitive, physical, and

emotional domains, affecting executive function. Gifted children may have advanced working memory but struggle with task-switching. Asynchrony highlights executive function challenges, such as excelling in math but struggling with homework (Davidson Institute, 2022).

Dyslexic people often show brain symmetry, where both hemispheres of the brain are equally active and dominant, leading to various behavioural challenges like reading and writing difficulties. If the left or the right hemisphere alternately dominates, the brain

literally becomes confused, so the person has difficulty reading and writing. However, the lack of dominance in the functioning of the hemispheres can also provide individuals with intellectual advantages (Gogvadze, 2022). This theory suggests that a child might have unique strengths and weaknesses, such as dyslexia and giftedness. When the brain exhibits talents or creativity, it operates in genius mode, which requires effective communication between the neocortex and hippocampus. The hippocampus acts as the memory library, and new connections are formed between the neocortex and hippocampus throughout one's life. However, this process occurs much faster in genius children due to their brain structure (Romanchuk, 2023).

Giftedness, learning, and developmental disorders

"Intelligence is typically similarly defined as a higher-order cognitive ability, allowing complex and abstract reasoning used in novel and challenging situations" (Ger and Roebbers, 2023, p.2). Many research studies use a method based on intelligence tests to identify students with both LDs and giftedness (Beckmann et

al., 2018). In this method, students' performance is evaluated by comparing their IQ scores to a predetermined cut-off score for giftedness. Giftedness is defined as intelligence in the "intellectual area" and is evaluated through an intelligence test. Students with an IQ of 130 and above are considered gifted (Pezziti et al., 2022).

The study found that intellectually gifted children had higher working memory capacity than typical children, but the differences in working memory were not influenced by differences in executive attention (Aubry, 2018). Thus, sometimes, kids cannot be focused due to ADHD and problems with reading comprehension (Beckmann et al., 2018), (Matthews, 2019). It is displayed in Figure 3. Dyslexia is one of the most typical developmental disorders and LDs (Sulkes, 2023). According to the World Health Organization (WHO), 10% of the population suffers from dyslexia. Furthermore, about 15% of schoolchildren have symptoms of dyslexia, while in the USA, the quantity of people struggling to read and understand is up to 20% (Diana, 2023). Gogvadze (2022) claims that dyslexic children often have high IQs and hidden talents.

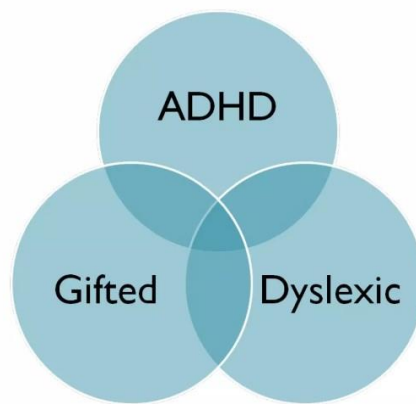


Figure 3: What makes gifted children twice exceptional?

Copyright by Bob Hudson, 2008

Thus, giftedness can be either a peculiarity, a variation of neurodiversity, or a disorder that significantly affects life, creating problems (Matthews, 2021). For instance, some children at elementary school can do math or physics tasks for junior high or high school. Others can write novels at 10 or 12 years old or create masterpieces of art. They may get excellent grades in specific subjects, but they also complain that the lessons are "too easy" or "too boring," which reduces their motivation. Furthermore, despite being talented or gifted in one subject, they may have LDs, such as dyslexia, dysgraphia, or dyscalculia, that affect their

physical, cognitive, language, or behavioural development. (Dashevsky, 2019). Neurodiversity includes conditions like Giftedness, LDs, and DDs based on neurological differences, which can impact daily functioning (Sulkes, 2022). These conditions can persist throughout a person's lifetime and affect physical and mental abilities. Children with LDs may struggle with perception, coordination, memory, and metacognition (Main Health, 2023). Gifted children with ADHD and ASD may face loneliness, misunderstanding, and lack of acceptance (Rodden, 2023).

It is not uncommon for neurotypical children to possess exceptional strengths or weaknesses in certain areas. In a school environment, students with these abilities may require different instructional approaches compared to other students. The term "twice exceptional" refers to students with exceptional intelligence, as measured by a standardized assessment, and a LD, for instance, dyslexia. Thus, a young Russian prodigy, Nika Turbina, started writing poetry at the age of four. When she was very young, she dictated her verses to her mother, who wrote them for her. Later, when she was at school, she made many spelling mistakes when she wrote her verses on paper (Koifman, 2023). The National Association for Gifted Children (NAGC) identifies three categories of students who could be classified as twice exceptional:

- Students who are identified as gifted and have one or more LDs.
- Students with a LD whose giftedness has not been identified.
- Students who are not identified as either gifted or having a disability but who possess both gifts and disabilities that may be hidden by average school performance.

Children are considered gifted if they are extremely talented in any area, such as verbal or nonverbal ability, fluid reasoning, or visual-spatial thinking. However, if they also have ADHD and/or dyslexia, they are classified as twice exceptional who are often misunderstood and underserved (MacEachron, 2021). Giftedness is not defined by a single theory or concept, and therefore, there may be many differences between gifted students depending on the criteria used to identify them (Beckmann, 2018). I have researched students with exceptional abilities or talents in different areas, either in one specific field or across a wide range. This group represented a broad spectrum of giftedness, from slightly above average to profoundly gifted. Nevertheless, they had some LDs and psychological problems. Gifted students also tend to have asynchronous development, meaning they may have a considerable degree of intra-individual variation (Mönks et al., 2000).

Given these characteristics, they can achieve exceptional levels of success. When gifted individuals are placed in a traditional learning environment that is not adapted to their needs, they may encounter psychological or socio-emotional difficulties. These challenges can include fear of failure due to high expectations, feelings of depression, and social isolation from peers (Coleman and Cross, 2000).

However, giftedness can empower these individuals to handle difficult situations more easily with appropriate support and ideal conditions.

How to find an appropriate approach to each twice-exceptional child

Individuals with high intelligence levels may exhibit certain traits such as a great sense of humour, rapid understanding, insatiable curiosity, a vast vocabulary, perfectionism, heightened sensitivity, and intense self-criticism. However, they may also experience mental health issues and face social and emotional difficulties that can manifest in various developmental challenges (Dashevsky, 2019). Usually, such groups are heterogeneous, and the teacher cannot assign the same tasks to each. Starting each lesson with opening activities is highly recommended, depending on the lesson's topic. Then, each student does the tasks according to his level and ability. So, the exercises should be marked with the stars that show the level. Sometimes gifted children do them quickly but make many mistakes, and the grades should not be reduced for misspellings not to reduce their motivation.

In schools for special education, each student may require behavioural support, medication, executive function coaching, or school accommodations, such as movement breaks, to address areas of challenge (MacEachron, 2021). Thus, distractible and hyperactive kids may have short breaks, and they do not have to do all the tasks. Gifted students with ASD might know the material very well. However, they often refuse to read aloud or give classroom presentations since they struggle to communicate with their peers due to their perfectionism and fear of making mistakes. "Unless kids are consistently engaged in challenging work, they will lose their motivation to work hard." (Winebrenner, 2014, p. 3). This quotation refers to all students, whether they are neurotypical or neurodivergent. As for the latter, each child with LD or DD needs an individual approach. Therefore, in special education schools, differential teaching is practiced so that kids with dyslexia, giftedness, or both disorders, accompanied by ADHD and ASD, are involved in classroom activities (Rodden, 2023).

The characteristics of gifted students with LDs have been extensively studied in literature reviews. However, they are usually only briefly mentioned in discussions related to definition, identification, and intervention (Ruban and Reis, 2005). Some of the common characteristics found in these students are advanced vocabulary usage, high creativity, strong

critical-thinking skills, and task commitment. However, they may display low self-esteem, poor motivation, disruptive behaviour, perfectionism, and unrealistic self-expectations (Newman and Sternberg, 2004). The overall findings are not conclusive, probably due to the students' wide range of talents and weaknesses.

Conclusion

Twice exceptionality is a condition in which an individual possesses extremely low abilities in one activity while exhibiting exceptional skills in another. This rare development pattern requires specific biological prerequisites, such as certain features of brain functioning that may be inherited or acquired (Beckmann et al., 2018). Neurological studies confirm that giftedness is multidimensional, meaning that gifted children differ in brain morphology and cognitive strategies. On the one hand, giftedness is an ability and a desire to think and solve problems. On the other hand, it is a sort of neurodiversity, which is often accompanied by some other ones, for instance, LDs, ASD, or ADHD (Rodden, 2023). Therefore, twice-exceptional kids need twice as much attention, which can be given in special education schools or in special classes in regular schools. The education system must support their desire to do the activities they excel in, and, at the same time, their teachers and parents should encourage them to overcome difficulties (MacEachron, 2021).

The research claims that gifted children's brains are highly plastic and can change due to cognitive loads (Chai et al., 2018). This suggests that abilities can and should be developed and that slow learners are not necessarily hopeless. The neurobiological basis of giftedness underscores the importance of providing the right environment for talent development because success and motivation are crucial in their assertiveness. Thus, when children fail at something, they and their parents should focus on their efforts in areas where they can succeed, developing hidden talents (Gogvadze, 2022). For instance, children with dyslexia or dysgraphia may have creative, mathematical, or artistic abilities that should be discovered and nurtured to help them gain assertiveness and adequate self-esteem.

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