



# THE TRAILMIX



## Issue 1:

Comorbidity - Dyslexia, Autism, ADHD,  
and neurobiology



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# Introduction:

## What is Comorbidity?

You've probably heard of the terms 'ADHD', 'autism' and 'dyslexia' before, but the term 'comorbidity' remains unfamiliar to many, much less in the world of neurodivergence. Comorbidity means having 2 or more medical conditions at the same time. These conditions may interact and influence each other, and have overlapping risk factors, but they can also exist separately. They do not directly cause the presence of other medical conditions. In terms of neurodivergence, comorbidity can occur at a very high rate. If someone is neurodivergent, they are more likely to have at least one other neurodevelopmental disorder. This intricate relationship of the human brain will be explored in this issue.

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1. Yetman D. Comorbidity: Causes and Health Implications. Healthline. Published April 4, 2022. Accessed November 11, 2023. <https://www.healthline.com/health/comorbidity>  
2. Ames H. What to Know about Dyslexia and ADHD. Medical News Today. Published May 26, 2023. Accessed November 11, 2023. <https://www.medicalnewstoday.com/articles/dyslexia-and-adhd#link>

# Comorbidity in Reality

BY ISABELLE LIM

Those familiar with neurodivergence should know, ADHD, ASD and other neurodiverse conditions often come as a package. But how many can say that they truly understand the factors and significance behind the topic of comorbidity?

The lifetime prevalence of any disorder has been reported to be 46.4%, while the lifetime prevalence of 2 and 3 disorders were found to be 27.7% and 17.3%, respectively.<sup>1</sup> In the context of neurodivergence, those with Dyslexia and Attention Deficit Hyperactivity Disorder (ADHD) have a higher comorbidity rate, while people with Autistic Spectrum Disorder (ASD) are at higher risk for mental health conditions.<sup>2</sup>



**approximately 1 in  
2 people with ADHD  
have dyslexia<sup>2</sup>**



**9 in 10 people with  
Tourette's have  
ADHD<sup>2</sup>**

Statistics also reveal that it is common for neurodevelopmental conditions to occur with co-occurring mental health conditions.<sup>3</sup> Such comorbidity can occur for a variety of reasons. It may be a chance occurrence or it may have developed due to overlapping risk factors.<sup>4</sup> An example would be how both ADHD and ASD have common features like sensory sensitivities, social communication challenges and executive functioning challenges. Recognising the various overlapping risk factors is vital for tailored interventions and support strategies. It allows parents to better understand their child's needs and ensures that none of their needs get ignored.

Looking at the comorbidity of two or more learning disabilities from a neurobiological perspective, genetic predispositions, neurotransmitter dysregulation, and hormonal influences, just to name a few, all play a notable role in comorbid disorders. These many factors would explain why comorbidity is such a common occurrence.

Therefore, there is a pressing need to spread awareness for more targeted healthcare approaches,

1. AL-Asadi AM, Klein B, Meyer D. Multiple Comorbidities of 21 Psychological Disorders and Relationships With psychosocial Variables: A Study of the Online Assessment and Diagnostic System Within a Web-Based Population. National Library of Medicine. Published February 26, 2015. Accessed November 11, 2023. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4392551/#:~:text=The%20comorbidity%20of%20psychological%20disorders%20is%20a%20common%20problem%20that,%25%2C%20respectively%20%5B1%5D>.

2. Neurodevelopmental Conditions. ADHD aware. Accessed November 11, 2023. <https://adhdaware.org.uk/what-is-adhd/neurodiversity-and-other-conditions/#:~:text=While%20it%20is%20common%20for,be%20misdiagnosed%20as%20mental%20illness>

3. Boulton KA, Guastella AJ, Hodge MA, Demetriou EA, Ong N, Silove N. Mental health concerns in children with neurodevelopmental conditions attending a developmental assessment service. ScienceDirect. Published May 19, 2023. Accessed November 11, 2023. [https://www.sciencedirect.com/science/article/pii/S0165032723005591#:~:text=Children%20with%20neurodevelopmental%20conditions%20\(NDCs,children%20attending%20developmental%20assessment%20services](https://www.sciencedirect.com/science/article/pii/S0165032723005591#:~:text=Children%20with%20neurodevelopmental%20conditions%20(NDCs,children%20attending%20developmental%20assessment%20services)

4. Klein DN. Different reasons for comorbidity require different solutions. National Library of Medicine. Published February 2004. Accessed November 11, 2023. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1414660/#:~:text=It%20may%20be%20a%20chance,disorders%2C%20or%20a%20third%20independent>



such that diagnosis and treatment strategies can be further improved.

Comorbidity can also make proper diagnosis and treatment harder, as one condition may mask or suppress symptoms of another. Oftentimes, an individual may be misdiagnosed or only diagnosed with one condition. When dealing with comorbidity, it can be useful to seek help from professionals that have experience in dealing with similar cases of comorbid conditions. It is especially important to know if there is a second co-occurring condition because it can affect treatment of the existing diagnosis. For example, medications for a certain condition can have adverse effects on a patient who also suffers from another condition.



**Medications for a certain condition can have adverse effects on a patient who suffers from another condition.<sup>5</sup>**

**“Comorbidity in specific learning difficulties is more common than you think,” says Ms Jeniyanti Rijanto, a specialist psychologist and founder of Catchwise Learning.**

**“It has to do with how areas of your brain are interconnected. When one area is affected, it will manifest in other areas as well.”**

It is prudent to keep an eye out for common comorbid conditions, to prevent the development of secondary mental health issues like depression and anxiety. Being familiar with the signs and symptoms of other disorders that present similarly can also help to prevent a misdiagnosis.

All in all, learning disabilities like ADHD and dyslexia often co-occur alongside other conditions and mental health issues, which can make diagnosis and treatment a bit harder. Knowing more about said conditions can help us learn to adapt and receive better treatment in the long run.<sup>6</sup>

5. Michael Bihari, M. (2023) Switching from a brand-name drug can save money when you have ADHD, Verywell Mind. Available at: <https://www.verywellmind.com/generic-medications-to-treat-adhd-1124015> (Accessed: 17 November 2023).

6. Wes Crenshaw, Ph.D. and Kelsey Daugherty, D. (2023) Is it just ADHD? Comorbidities that unlock an accurate mental health diagnosis, ADDitude. Available at: <https://www.additudemag.com/mental-health-diagnosis-adhd-comorbidities/> (Accessed: 17 November 2023).

# Featured Artwork:

## Japanese Tea House





# Neurodivergence and Mental Illness are Inextricable - Or are they?

BY WANG YUANXIN

In and of itself, comorbidity of conditions is not an unusual occurrence. Our above article on the neurobiology of comorbidity extensively delves into the overlapping risk factors that cause neurodiverse conditions to manifest together. The issue at hand then, is why clinical depression is present in approximately 50% of children on the autism spectrum, 19-53% of those with ADHD, and why the majority of the neurodivergent population suffer from anxiety disorders among other mental health conditions.<sup>1</sup>

Autism and ADHD are both linked with higher rates of depression, anxiety, substance abuse disorder (SUD), bipolar disorder, obsessive compulsive disorder (OCD), eating disorders, personality disorders, and more - They are often comorbid?<sup>2</sup> Characteristics of autism

and ADHD can be distressing and difficult to manage, including sensory issues and genetic predisposition, resulting in negatively affected mental health. However, a more complex social issue exists, which must be addressed for the betterment of those with neurodiverse conditions.

So what then, is the root of the profound connection between mental health and neurodiverse conditions? It all comes back to social stigma. External, systemic factors that are out of control of the neurodivergent individual.<sup>3</sup>

Firstly, for as long as there has been neurodivergence, there has been stigma attached to it. In schools, children are often isolated and ostracised by their neurotypical peers for their different needs, and even by teachers who may be unable to

1. Mayes, Susan Dickerson, et al. "Variables Associated with Anxiety and Depression in Children with Autism." *Journal of Developmental and Physical Disabilities*, vol. 23, no. 4, 23 Feb. 2011, pp. 325-337, <https://doi.org/10.1007/s10882-011-9231-7>

2. Katzman, Martin A et al. "Adult ADHD and comorbid disorders: clinical implications of a dimensional approach." *BMC psychiatry* vol. 17,1 302. 22 Aug. 2017, [doi:10.1186/s12888-017-1463-3](https://doi.org/10.1186/s12888-017-1463-3)

3. Cage, E., Di Monaco, J. & Newell, V. Experiences of Autism Acceptance and Mental Health in Autistic Adults. *J Autism Dev Disord* 48, 473-484 (2018). <https://doi.org/10.1007/s10803-017-3342-7>

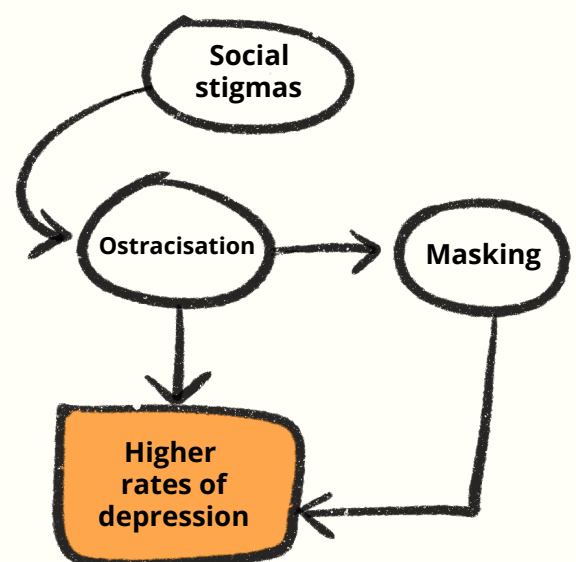
identify the different neurotypes present in their students. For instance, children with ADHD may be thought to have attitude and behavioural issues, that "they are not applying themselves", and are hence dealt disciplinary punishments. that are often unnecessary. While it is not completely the fault of educators who fail to understand the needs of children with a different neurotype, it is evident that misleading information and the lack thereof results in neurodivergent children not receiving the help they need. Furthermore, when these children are faced with ostracization, when they are told by adult figures that there is something wrong with them, when they don't know what is wrong with them, it is inevitable that they feel ashamed of themselves and try to hide their condition to appear "normal". This is called masking - an act linked with higher levels of depression.<sup>1</sup>

Secondly, in a similar vein, lack of education and stigma from mental health professionals is also a potential barrier to accessing treatment.

Many mental illnesses share symptoms with autism and ADHD, and thus may be hard to

differentiate, which can lead to a misdiagnosis or the patient not being diagnosed at all, and them not receiving the type of support they need.<sup>4</sup> Additionally, many healthcare professionals are unfamiliar with the complexities of neurodivergence, and may be unwilling to expand their field of vision due to the stigma associated with such individuals. This is especially an issue for comorbid ADHD and depression, with one study finding that 34% of a cohort of patients with treatment resistant depression had undiagnosed ADHD.<sup>1</sup>

Given society's tendency to overlook neurodivergent individuals, it is unsurprising that a significant portion of the population grapples with coexisting mental health issues.



4. Lai, Meng-Chuan, et al. "Prevalence of Co-Occurring Mental Health Diagnoses in the Autism Population: A Systematic Review and Meta-Analysis." *The Lancet Psychiatry*, vol. 6, no. 10, Oct. 2019, pp. 819–829, [https://doi.org/10.1016/S2215-0366\(19\)30289-5](https://doi.org/10.1016/S2215-0366(19)30289-5)



# Twice Exceptional Children

BY KAYLYN TJHIN

Twice exceptional, or “2e”, refers to children who are gifted intellectually, and suffer from one or more learning or developmental disabilities.

Twice exceptional children think and interact with the world differently compared to other children, both due to their giftedness and their disability. They may have exceptional talent in areas such as math or science, language or music, and yet struggle more than other children with certain tasks.

It may be harder to detect a learning disability in a twice-exceptional child. Symptoms of their disability may be masked by their strengths, causing them to be overlooked by teachers and professionals. They may also face difficulties in school. For example, a gifted child with dyslexia may be able to use inference and deductive reasoning skills to fill in words that they are unable to decode when reading. In this way, the child

manages to compensate for their reading disability, and avoids detection. The child may only be diagnosed later on, when the curriculum becomes more challenging; or they may never receive a diagnosis.

Being gifted can also increase the likelihood of a misdiagnosis. Many traits and characteristics common to giftedness overlap signs of neurodivergence. For example, gifted children are more sensitive to external stimuli, such as sounds and smells; they also tend to have an intense interest in certain areas, and would much rather play by themselves. These are also traits typically found in individuals with aspergers, or Autism Spectrum Disorder. As such, 2e children may remain undetected for a long time.

Twice exceptional children may also struggle more emotionally, with emotional dysregulation, elevated frustration or anxiety. This is due to the fact that they often do not understand what makes them different from their peers, and are frustrated with themselves for not being able to accomplish certain tasks. They are also at higher risk of being bullied. With undiagnosed kids, teachers and parents may write off their behaviour as being ‘lazy’ or

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1. Dlugosz, M. (2022) Twice exceptional: Definition, Characteristics & Identification, Davidson Institute. Available at: <https://www.davidsongifted.org/gifted-blog/twice-exceptional-definition-characteristics-identification/> (Accessed: 29 November 2023).

intentionally defiant, which can adversely affect their self-esteem and mental health. As such, many 2e children wind up feeling “stupid” and hating or avoiding school.

Twice exceptional children often display certain characteristics. These include:

- Adept ability to problem-solve and think critically
- Greater sensitivity to stimuli around them
- Negative self image due to seeking perfection
- Struggling with social cues
- Ability to concentrate intensely on areas of interest
- Difficulties reading and/or writing
- Behavioural problems due to high levels of stress or boredom

Due to these specific strengths and weaknesses, 2e kids benefit from a learning environment that is customised to their needs. They would be adequately challenged in school, while still receiving the necessary support. While it may not be easy to specially customise the school curriculum for the child, there are a number of after-school programs that cater to gifted children which can help them develop in the areas of their interest. Schools can also offer help by providing kids with Access Arrangements such as extra time in exams, and give additional support during class time.

Understanding your 2e child's strengths and weaknesses is the key to helping them maximise their potential.

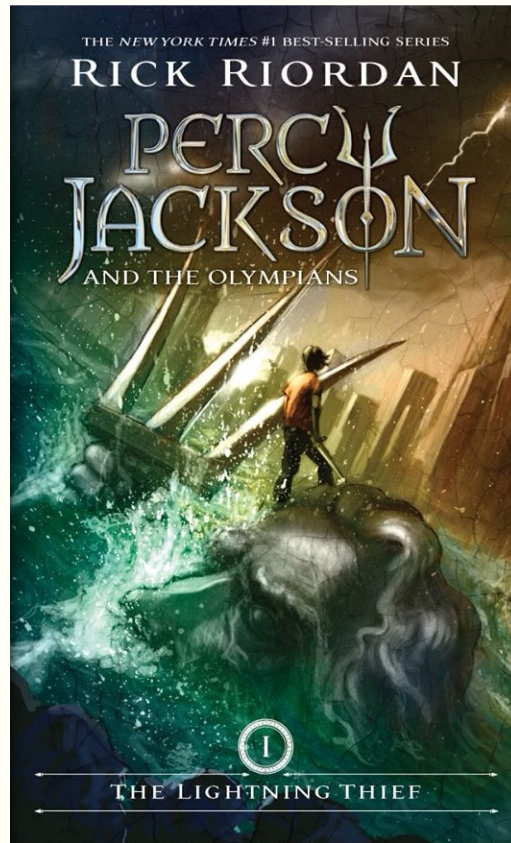


2. Twice-exceptional kids: Both gifted and challenged (2023) Child Mind Institute. Available at: <https://childmind.org/article/twice-exceptional-kids-both-gifted-and-challenged/> (Accessed: 29 November 2023).

3. Children doing art projects · Free Stock Photo - PEXELS. Available at: <https://www.pexels.com/photo/children-doing-art-projects-7869800/> (Accessed: 29 November 2023).



# BOOK RECOMMENDATION!



## *Percy Jackson and the Lightning Thief* by Rick Riordan

*Percy Jackson and the Lightning Thief* is the first book in the Percy Jackson series that follows Percy, a demigod and son of the Greek god Poseidon, as he embarks on quests with other demigods to save the world. Percy, like all demigods, has ADHD because of his natural battlefield reflexes, and dyslexia because he is hardwired to read Ancient Greek. The character and stories of Percy Jackson were conceptualised when Rick Riordan started inventing stories for his son Haley Riordan, who was diagnosed with ADHD and dyslexia. This book offers a powerful narrative of a boy with neurodivergent comorbidity who is able to become a brave hero and triumph in the face of challenges.

# DAILY PLANNER!

Using a planner can allow those with ADHD to better keep track of time, stay organised and avoid procrastination. It also provides structure for those who experience heightened sensitivity, giving them a greater sense of control and comfort as they go about their daily lives.

Do flip to the next page for a copy of the daily planner!

Scan this for an online version of the daily planner:





# DAILY PLAN



DATE: \_\_\_\_\_

## TODAY'S SCHEDULE



8-9 am	
9-10 am	
10-11 am	
11-12 am	
12-1 pm	
1-2 pm	
2-3 pm	
3-4 pm	
4-5 pm	
5-6 pm	
6-7 pm	
7-8 pm	

## TOP PRIORITIES




## TO DO LIST



NOTE...

# THE END!

We hope you  
enjoyed this issue of  
The Trailmix!



**Want to give feedback? Want to write an  
article or stand a chance to be featured  
in our next issue of The Trailmix?**

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