Incidence of Dyslexia and Dyslexia Among Entrepreneurs in the USA, UK, and Scotland

**Dyslexia Incidence in the USA, UK, and Scotland (2015–2025)**

**Overview:** Dyslexia is a common learning difference affecting a significant minority of children and adults across Western countries. Estimates of prevalence vary based on definitions (e.g. strict vs. mild cases), but generally around 5–15% of the population is dyslexic, with some experts suggesting up to 20% may show some degree of dyslexic difficulties[discoveryaba.com](https://www.discoveryaba.com/statistics/dyslexia#:~:text=According%20to%20the%20National%20Institutes,the%20actual%20prevalence%20is%20higher)dyslexia.yale.edu. The condition occurs across all demographics (gender, ethnicity, socio-economic status) at similar rates[discoveryaba.com](https://www.discoveryaba.com/statistics/dyslexia#:~:text=is%20higher), though diagnosis rates and support access can differ. Notably, recent studies show dyslexia is **disproportionately common among entrepreneurs**, far higher than in the general population[amanet.org](https://www.amanet.org/articles/new-research-reveals-many-entrepreneurs-are-dyslexic/#:~:text=A%20staggering%2035,at%20London%E2%80%99s%20Cass%20Business%20School). The sections below detail incidence figures for the United States, the United Kingdom, and Scotland, including breakdowns by age and other demographics, followed by data on entrepreneurs versus the general population. A summary comparison table is also provided for clarity.

| **Country** | **Dyslexia Prevalence – General Population (children & adults)** | **Prevalence Among Entrepreneurs** |
| --- | --- | --- |
| **USA** | ~5–10% of Americans (NIH estimate) are dyslexic[discoveryaba.com](https://www.discoveryaba.com/statistics/dyslexia#:~:text=According%20to%20the%20National%20Institutes,the%20actual%20prevalence%20is%20higher) (some experts say up to ~20% have some degree[nature.com](https://www.nature.com/articles/s41539-023-00204-8?error=cookies_not_supported&code=6016f82d-cbae-498c-bb5e-454c7d0351b8#:~:text=Dyslexia%20is%20the%20most%20common,The%20unexpected%20nature%20of%20dyslexia)). More than 40 million U.S. adults (around 15%) likely have dyslexia, but only ~2 million are formally diagnosed[crossrivertherapy.com](https://www.crossrivertherapy.com/research/dyslexia-statistics#:~:text=them%20are%20dyslexic,of%20them%20receiving%20a%20diagnosis). | **~35%** of U.S. entrepreneurs identify as dyslexic[amanet.org](https://www.amanet.org/articles/new-research-reveals-many-entrepreneurs-are-dyslexic/#:~:text=A%20staggering%2035,at%20London%E2%80%99s%20Cass%20Business%20School) (versus roughly 5–15% in the general population). |
| **UK** | ~10% of the population is believed to have dyslexia[bdadyslexia.org.uk](https://www.bdadyslexia.org.uk/dyslexia#:~:text=Dyslexia) (around 4% with severe dyslexia are formally identified[amanet.org](https://www.amanet.org/articles/new-research-reveals-many-entrepreneurs-are-dyslexic/#:~:text=at%20London%E2%80%99s%20Cass%20Business%20School)). This ~10% figure equates to ~6+ million people in the UK. | **~20%** of UK entrepreneurs are dyslexic[amanet.org](https://www.amanet.org/articles/new-research-reveals-many-entrepreneurs-are-dyslexic/#:~:text=A%20staggering%2035,at%20London%E2%80%99s%20Cass%20Business%20School) – about **5×** the dyslexia rate of the average UK adult (≈4%)[amanet.org](https://www.amanet.org/articles/new-research-reveals-many-entrepreneurs-are-dyslexic/#:~:text=at%20London%E2%80%99s%20Cass%20Business%20School). |
| **Scotland** | ~10% of children and adults in Scotland have dyslexia[childreninscotland.org.uk](https://childreninscotland.org.uk/magazine-news-dyslexia-genes-identified-by-scottish-led-study/#:~:text=According%20to%20Dyslexia%20Scotland%20one,adults%20has%20dyslexia%20in%20Scotland) (though only ~3% of school pupils were identified as dyslexic as of 2018, reflecting under-diagnosis[thescsc.org.uk](https://www.thescsc.org.uk/the-number-of-pupils-identified-with-autism-dyslexia-and-other-conditions-has-increased-dramatically-reinforcing-calls-for-greater-support/#:~:text=Pupils%20for%20whom%20reason%20for,9)). | **~20%** (estimated) of entrepreneurs. *For example, ~1 in 5 UK/Scottish entrepreneurs are dyslexic; among ~60,000 female business owners in Scotland, up to ~12,000 could be dyslexic*[linkedin.com](https://www.linkedin.com/pulse/why-identifying-dyslexia-enterprising-women-important-jan-halfpenny#:~:text=Professor%20Julie%20Logan%E2%80%99s%20research%20at,the%20term%20%E2%80%98entrepreneur%E2%80%99%20is%20applied). |

**United States**

**Prevalence in Children and Adults (General Population)**

In the United States, dyslexia is one of the most common learning disabilities. Estimates from the National Institutes of Health and other research typically indicate **5–10% of Americans** have dyslexia[discoveryaba.com](https://www.discoveryaba.com/statistics/dyslexia#:~:text=According%20to%20the%20National%20Institutes,the%20actual%20prevalence%20is%20higher). This aligns with roughly *1 in 10* people; some broader estimates including mild cases put the prevalence closer to **15–20% (1 in 5)**[nature.com](https://www.nature.com/articles/s41539-023-00204-8?error=cookies_not_supported&code=6016f82d-cbae-498c-bb5e-454c7d0351b8#:~:text=Dyslexia%20is%20the%20most%20common,The%20unexpected%20nature%20of%20dyslexia)dyslexia.yale.edu. For example, the Yale Center for Dyslexia & Creativity notes that about *20% of the population* experiences dyslexia, accounting for the vast majority of all learning disabilitiesdyslexia.yale.edu. This range (5–20%) reflects different criteria – stricter definitions yield lower figures (~5% severe), while inclusive definitions of any reading difficulty associated with dyslexia yield higher figures (up to 1 in 5).

**Children:** Dyslexia often becomes evident in school-age children. Recent data suggest roughly **~20% of U.S. schoolchildren struggle with reading in ways indicative of dyslexia**[nature.com](https://www.nature.com/articles/s41539-023-00204-8?error=cookies_not_supported&code=6016f82d-cbae-498c-bb5e-454c7d0351b8#:~:text=Dyslexia%20is%20the%20most%20common,The%20unexpected%20nature%20of%20dyslexia). Nationwide, about *1 in 5 students* has a language-based learning disability (with dyslexia being the most common)[crossrivertherapy.com](https://www.crossrivertherapy.com/research/dyslexia-statistics#:~:text=from%20dyslexia). Around **15–20% of U.S. students** may have dyslexia or related reading difficulties[crossrivertherapy.com](https://www.crossrivertherapy.com/research/dyslexia-statistics#:~:text=detected%20without%20regard%20to%20language,of%20people%20having%20severe%20symptoms). It’s also reported that *approximately 20% of children in U.S. schools have dyslexia*[crossrivertherapy.com](https://www.crossrivertherapy.com/research/dyslexia-statistics#:~:text=detected%20without%20regard%20to%20language,of%20people%20having%20severe%20symptoms), though identification rates in schools are often lower. Importantly, dyslexia **affects boys and girls at about equal rates biologically**, even though more boys tend to be flagged for reading evaluations. Research by Dr. Sally Shaywitz found **comparable dyslexia incidence in boys and girls** – the higher number of boys diagnosed is likely due to boys’ classroom behavior leading to more referrals, not an actual prevalence differencedyslexia.yale.edu. Thus, while historically teachers identified more boys, current understanding is that **gender is not a significant factor in dyslexia prevalence**dyslexia.yale.edu.

**Adults:** Dyslexia is lifelong, so a similar proportion of adults are dyslexic. However, many adults remain undiagnosed. It’s estimated that **over 40 million adults in the U.S. have dyslexia, yet only about 2 million have been formally diagnosed**[crossrivertherapy.com](https://www.crossrivertherapy.com/research/dyslexia-statistics#:~:text=them%20are%20dyslexic,of%20them%20receiving%20a%20diagnosis). In other words, *only ~5% of dyslexic adults are aware of their condition*, highlighting a large gap in identification. Many American adults discover their dyslexia later in life, if at all – often after struggling academically or when a child is diagnosed (prompting recognition of familial patterns). Studies confirm dyslexia **is not linked to intelligence** and occurs at all IQ levels, so many dyslexic adults develop coping strategies and may not realize the cause of their reading difficulties[ldonline.org](https://www.ldonline.org/ld-topics/self-esteem-stress-management/are-dyslexia-and-wealth-linked-study-finds-individuals#:~:text=40,Sunday%20Times%2C%20October%205%2C%202003)dyslexia.yale.edu.

**Demographic Breakdown:** Dyslexia **crosses all ethnic and socio-economic groups** – research shows people of *all races and backgrounds have dyslexia at similar rates*[crossrivertherapy.com](https://www.crossrivertherapy.com/research/dyslexia-statistics#:~:text=similar%20percentage)[discoveryaba.com](https://www.discoveryaba.com/statistics/dyslexia#:~:text=is%20higher). That said, external factors like poverty and educational opportunity can impact whether reading difficulties are addressed. For instance, children raised in poverty are **40% more likely** to have reading and language learning difficulties, often due to lack of early support[crossrivertherapy.com](https://www.crossrivertherapy.com/research/dyslexia-statistics#:~:text=at%20about%20the%20same%20rate). In U.S. schools with predominantly minority populations, **70–80% of students may have poor reading skills** (many likely dyslexic)[crossrivertherapy.com](https://www.crossrivertherapy.com/research/dyslexia-statistics#:~:text=8,reading%20and%20language%20learning%20difficulties). National assessments also reveal racial disparities in reading proficiency – e.g., on the U.S. NAEP exam over half of African-American 4th graders score “below basic” in reading, compared to about 20% of White students[nature.com](https://www.nature.com/articles/s41539-023-00204-8?error=cookies_not_supported&code=6016f82d-cbae-498c-bb5e-454c7d0351b8#:~:text=The%20National%20Assessment%20of%20Educational,In%20an%20effort%20to). Experts note this *achievement gap* indicates many minority students have undiagnosed dyslexia or reading disorders[nature.com](https://www.nature.com/articles/s41539-023-00204-8?error=cookies_not_supported&code=6016f82d-cbae-498c-bb5e-454c7d0351b8#:~:text=The%20National%20Assessment%20of%20Educational,In%20an%20effort%20to)[nature.com](https://www.nature.com/articles/s41539-023-00204-8?error=cookies_not_supported&code=6016f82d-cbae-498c-bb5e-454c7d0351b8#:~:text=level%20on%20the%204,would%20identify%20as%20having%20dyslexia). In short, dyslexia **itself is equally prevalent across demographics**, but under-identification in disadvantaged groups leads to worse observed reading outcomes in those populations.

**Dyslexia Among Entrepreneurs vs General Population**

The United States exhibits a striking over-representation of dyslexia among entrepreneurs. Recent research by Professor Julie Logan (Cass Business School, London) found that **approximately 35% of U.S. entrepreneurs identify as dyslexic**[amanet.org](https://www.amanet.org/articles/new-research-reveals-many-entrepreneurs-are-dyslexic/#:~:text=A%20staggering%2035,at%20London%E2%80%99s%20Cass%20Business%20School). This rate – about one in three – is **dramatically higher** than the dyslexia prevalence in the U.S. general population. By comparison, dyslexia (as a specific diagnosis) affects roughly 5–15% of Americans[discoveryaba.com](https://www.discoveryaba.com/statistics/dyslexia#:~:text=According%20to%20the%20National%20Institutes,the%20actual%20prevalence%20is%20higher). Even using a broad 15% figure, entrepreneurs are **more than twice as likely** to be dyslexic as the average American. (Using a stricter 5–10% prevalence, the difference is even larger.)

This finding emerged from Logan’s study of company founders, which showed **35% of U.S. founders reported having dyslexia**[amanet.org](https://www.amanet.org/articles/new-research-reveals-many-entrepreneurs-are-dyslexic/#:~:text=A%20staggering%2035,at%20London%E2%80%99s%20Cass%20Business%20School). For context, dyslexia is classified under “learning disabilities” in the U.S., which collectively impact about 15% of the population[amanet.org](https://www.amanet.org/articles/new-research-reveals-many-entrepreneurs-are-dyslexic/#:~:text=at%20London%E2%80%99s%20Cass%20Business%20School). The entrepreneurial dyslexia rate thus far exceeds the norm. High-profile American entrepreneurs with dyslexia include people like Paul Orfalea (Kinko’s founder), Charles Schwab (investor), and others[amanet.org](https://www.amanet.org/articles/new-research-reveals-many-entrepreneurs-are-dyslexic/#:~:text=Some%20examples%20of%20dyslexic%20entrepreneurs,and%20legendary%20investor%20Charles%20Schwab), illustrating that many with dyslexia gravitate towards innovative business roles.

Researchers theorize that dyslexic entrepreneurs leverage unique strengths and coping strategies that aid in business. Logan’s study noted dyslexic entrepreneurs tend to excel in **communication, problem-solving, delegation, and spatial awareness**, and they often compensate for weaknesses (e.g. by delegating tasks like detailed reading)[amanet.org](https://www.amanet.org/articles/new-research-reveals-many-entrepreneurs-are-dyslexic/#:~:text=Key%20findings%20from%20Professor%20Logan%E2%80%99s,more%20likely%20than%20nondyslexics%20to)[amanet.org](https://www.amanet.org/articles/new-research-reveals-many-entrepreneurs-are-dyslexic/#:~:text=,strategy%20employed%20to%20overcome%20difficulties). They also were more likely to start multiple businesses and grow them quickly, suggesting dyslexic thinking can confer a creative, competitive edge[amanet.org](https://www.amanet.org/articles/new-research-reveals-many-entrepreneurs-are-dyslexic/#:~:text=Key%20findings%20from%20Professor%20Logan%E2%80%99s,more%20likely%20than%20nondyslexics%20to). Another key factor is that U.S. schools have relatively robust identification and support for dyslexia compared to some countries, which may help more dyslexic individuals develop confidence and skills useful in entrepreneurship[amanet.org](https://www.amanet.org/articles/new-research-reveals-many-entrepreneurs-are-dyslexic/#:~:text=difficulties). In summary, **about one-third of American entrepreneurs are dyslexic**, a rate that significantly surpasses incidence in the general U.S. population[amanet.org](https://www.amanet.org/articles/new-research-reveals-many-entrepreneurs-are-dyslexic/#:~:text=A%20staggering%2035,at%20London%E2%80%99s%20Cass%20Business%20School).

**United Kingdom**

**Prevalence in Children and Adults (General Population)**

The United Kingdom’s estimates for dyslexia prevalence are similar to those in the U.S. The **British Dyslexia Association (BDA)** advises that roughly *10% of the UK population* is dyslexic[bdadyslexia.org.uk](https://www.bdadyslexia.org.uk/dyslexia#:~:text=Dyslexia). This equates to approximately 6–6.5 million people in the UK (out of ~65 million). Within that 10%, about **4%** of Britons are considered to have *severe* dyslexia (often the portion that gets formally identified or statemented in school)[amanet.org](https://www.amanet.org/articles/new-research-reveals-many-entrepreneurs-are-dyslexic/#:~:text=at%20London%E2%80%99s%20Cass%20Business%20School). In fact, prior studies have cited ~4% as the percentage of the UK population officially recognized as dyslexic, versus a higher true prevalence around 10%[amanet.org](https://www.amanet.org/articles/new-research-reveals-many-entrepreneurs-are-dyslexic/#:~:text=at%20London%E2%80%99s%20Cass%20Business%20School). The 10% figure includes the full spectrum from mild to severe. Like elsewhere, dyslexia is the most common learning difference in the UK, comprising the majority of specific learning difficulties.

**Children:** In UK schools, awareness of dyslexia has grown in the past decade, though identification rates vary. Many UK educators use the estimate that about *1 in 10 students* has dyslexia. Some local data show rising identification: for example, in **Scotland (part of the UK)** the number of school pupils officially recorded with dyslexia increased by ~60% between 2012 and 2018[thescsc.org.uk](https://www.thescsc.org.uk/the-number-of-pupils-identified-with-autism-dyslexia-and-other-conditions-has-increased-dramatically-reinforcing-calls-for-greater-support/#:~:text=Pupils%20for%20whom%20reason%20for,9), due to better recognition. Despite improvements, many dyslexic UK children still go undiagnosed in early schooling. A 2015 report noted that nearly **half of dyslexic students in a UK university study had only been identified after leaving school**[linkedin.com](https://www.linkedin.com/pulse/why-identifying-dyslexia-enterprising-women-important-jan-halfpenny#:~:text=Findings%20from%20a%20number%20of,Scottish%20entrepreneur%20Michelle%20Mone%20commented) – indicating that a large portion of dyslexic youth were missed by the school system and only diagnosed in higher education. This late identification trend is echoed by personal stories like that of Scottish entrepreneur Michelle Mone, who “**struggled with reading**” in school but *did not realize she was dyslexic* until adulthood[linkedin.com](https://www.linkedin.com/pulse/why-identifying-dyslexia-enterprising-women-important-jan-halfpenny#:~:text=many%20dyslexics%20in%20adulthood%20lack,Scottish%20entrepreneur%20Michelle%20Mone%20commented). Overall, UK educators acknowledge that while **boys and girls have dyslexia in roughly equal numbers**, schools historically identified more boys (similar to the U.S. situation)[linkedin.com](https://www.linkedin.com/pulse/why-identifying-dyslexia-enterprising-women-important-jan-halfpenny#:~:text=It%20is%20possible%20that%20the,to%20adopt%20more%20private%20coping). The gap arises because boys’ difficulties tend to manifest in disruptive class behavior, whereas girls often develop quiet coping strategies; as a result, **many dyslexic girls were overlooked** and did not receive support in school[linkedin.com](https://www.linkedin.com/pulse/why-identifying-dyslexia-enterprising-women-important-jan-halfpenny#:~:text=It%20is%20possible%20that%20the,is%20that%20more%20dyslexic%20girls). This pattern suggests a pool of undiagnosed dyslexic girls who become adults without formal identification.

**Adults:** Extrapolating from childhood prevalence, roughly 10% of UK adults are dyslexic as well[bdadyslexia.org.uk](https://www.bdadyslexia.org.uk/dyslexia#:~:text=Dyslexia). However, **diagnosis rates in adults are low** – dyslexia was not commonly screened in older generations, so many adults only discover their dyslexia later at work or through their children. Surveys of UK dyslexic adults indicate that *a significant number were unaware of their dyslexia until adulthood*. For instance, one study of entrepreneurs found **one-third of dyslexic business founders learned of their dyslexia only when their own child was diagnosed** (i.e. dyslexia often runs in families)[linkedin.com](https://www.linkedin.com/pulse/why-identifying-dyslexia-enterprising-women-important-jan-halfpenny#:~:text=Like%20many%20other%20adults%2C%20Michelle,10)[linkedin.com](https://www.linkedin.com/pulse/why-identifying-dyslexia-enterprising-women-important-jan-halfpenny#:~:text=people%20being%20spotted%20in%20adulthood,10). This underscores an identification gap: there is a cohort of older individuals whose dyslexia was never formally recognized due to less awareness in past decades. UK advocacy groups like Dyslexia Scotland emphasize providing adult assessment services, noting that currently in Scotland there are **no free assessment services for adults** – many adults remain unassessed unless they pursue private evaluation[dyslexiascotland.org.ukdyslexiascotland.org.uk](https://dyslexiascotland.org.uk/news/new-report-out/#:~:text=The%20detailed%20report%20highlights%20that,which%20can%20cost%20from%20%C2%A3300). As a result, the official percentage of UK adults recorded as dyslexic (~4%) is much lower than the true prevalence (~10%)[amanet.org](https://www.amanet.org/articles/new-research-reveals-many-entrepreneurs-are-dyslexic/#:~:text=at%20London%E2%80%99s%20Cass%20Business%20School). Like in the U.S., dyslexia in the UK spans all backgrounds and intelligence levels – it is *often misunderstood*, but with the right support (assistive technology, accommodations) dyslexic individuals thrive in various fields[bdadyslexia.org.uk](https://www.bdadyslexia.org.uk/dyslexia#:~:text=Dyslexia).

**Dyslexia Among Entrepreneurs vs General Population**

Entrepreneurship in the UK shows a notable over-representation of dyslexic individuals, though slightly less pronounced than in the U.S. Professor Logan’s research initially in 2001 and later in 2007–2008 revealed that roughly **20% of entrepreneurs in the UK are dyslexic**[amanet.org](https://www.amanet.org/articles/new-research-reveals-many-entrepreneurs-are-dyslexic/#:~:text=A%20staggering%2035,at%20London%E2%80%99s%20Cass%20Business%20School)[linkedin.com](https://www.linkedin.com/pulse/why-identifying-dyslexia-enterprising-women-important-jan-halfpenny#:~:text=Professor%20Julie%20Logan%E2%80%99s%20research%20at,the%20term%20%E2%80%98entrepreneur%E2%80%99%20is%20applied). In other words, *1 in 5* British entrepreneurs has dyslexia. This rate is about **five times higher** than the dyslexia rate in the UK general population[amanet.org](https://www.amanet.org/articles/new-research-reveals-many-entrepreneurs-are-dyslexic/#:~:text=at%20London%E2%80%99s%20Cass%20Business%20School). (Recall that around 4% of the overall UK population are formally identified dyslexics; entrepreneurs show ~20% in Logan’s survey, which is five-fold higher[amanet.org](https://www.amanet.org/articles/new-research-reveals-many-entrepreneurs-are-dyslexic/#:~:text=at%20London%E2%80%99s%20Cass%20Business%20School).) Even compared to the broader ~10% estimated prevalence, entrepreneurs still have roughly double the incidence of dyslexia as the general public.

This finding was highlighted in an AMA report and media: *“UK entrepreneurs are five times more likely to suffer from dyslexia than the average UK citizen”*[amanet.org](https://www.amanet.org/articles/new-research-reveals-many-entrepreneurs-are-dyslexic/#:~:text=at%20London%E2%80%99s%20Cass%20Business%20School). One early study (Logan 2001) of British entrepreneurs found **20% were dyslexic – about twice the rate expected in adults at that time**[linkedin.com](https://www.linkedin.com/pulse/why-identifying-dyslexia-enterprising-women-important-jan-halfpenny#:~:text=Professor%20Julie%20Logan%E2%80%99s%20research%20at,the%20term%20%E2%80%98entrepreneur%E2%80%99%20is%20applied). The consistency of ~20% in UK and ~35% in US entrepreneurs suggests a trend: dyslexic thinkers often gravitate to creating businesses. Dyslexic entrepreneurs in the UK (like Sir Richard Branson of Virgin Group, who is openly dyslexic) frequently cite dyslexia as driving them to find **creative approaches and big-picture strategies** in business[ldonline.org](https://www.ldonline.org/ld-topics/self-esteem-stress-management/are-dyslexia-and-wealth-linked-study-finds-individuals#:~:text=40,Sunday%20Times%2C%20October%205%2C%202003). Logan’s UK research also found that dyslexic entrepreneurs tend to make different business decisions than non-dyslexics – for example, they start more companies and employ more people, leveraging delegation to compensate for literacy challenges[linkedin.com](https://www.linkedin.com/pulse/why-identifying-dyslexia-enterprising-women-important-jan-halfpenny#:~:text=In%202008%20Prof,are%20important%20for%20economic%20growth). These strengths (problem-solving, delegation, vision) give many dyslexic entrepreneurs a competitive edge, sometimes termed the “dyslexic advantage” in business[amanet.org](https://www.amanet.org/articles/new-research-reveals-many-entrepreneurs-are-dyslexic/#:~:text=Key%20findings%20from%20Professor%20Logan%E2%80%99s,more%20likely%20than%20nondyslexics%20to).

It’s important to note that the **UK education system’s past shortcomings in early dyslexia identification** may have influenced who becomes an entrepreneur. Logan observed that the UK’s slower dyslexia interventions (compared to the U.S.) might mean many dyslexic individuals leave school feeling “frustrated” or underserved, potentially pushing them toward **entrepreneurial paths where they can control their environment**[amanet.org](https://www.amanet.org/articles/new-research-reveals-many-entrepreneurs-are-dyslexic/#:~:text=difficulties). Indeed, a significant number of UK dyslexic entrepreneurs report negative school experiences and low confidence in youth, followed by success in self-driven careers[amanet.org](https://www.amanet.org/articles/new-research-reveals-many-entrepreneurs-are-dyslexic/#:~:text=Richard%20Bransons%2C%20but%20the%20system,%E2%80%9D)[amanet.org](https://www.amanet.org/articles/new-research-reveals-many-entrepreneurs-are-dyslexic/#:~:text=,way%20of%20helping%20them%20achieve). This pattern suggests dyslexic Britons often find traditional corporate or academic routes challenging, and thus they turn to entrepreneurship where their **lateral thinking and resilience** can shine.

In summary, about **20% of UK entrepreneurs have dyslexia**, a prevalence far above that of the general UK population (approximately 10% overall, 4% severe)[amanet.org](https://www.amanet.org/articles/new-research-reveals-many-entrepreneurs-are-dyslexic/#:~:text=A%20staggering%2035,at%20London%E2%80%99s%20Cass%20Business%20School)[amanet.org](https://www.amanet.org/articles/new-research-reveals-many-entrepreneurs-are-dyslexic/#:~:text=at%20London%E2%80%99s%20Cass%20Business%20School). This underscores a unique relationship between dyslexic thinking and entrepreneurial success noted in the past decade.

**Scotland**

**Prevalence in Children and Adults (General Population)**

Scotland, as part of the UK, shares similar dyslexia prevalence figures. Dyslexia Scotland (the national charity) estimates that **approximately 1 in 10 Scots – 10% of children and adults – have dyslexia**[childreninscotland.org.uk](https://childreninscotland.org.uk/magazine-news-dyslexia-genes-identified-by-scottish-led-study/#:~:text=According%20to%20Dyslexia%20Scotland%20one,adults%20has%20dyslexia%20in%20Scotland). This mirrors the British Dyslexia Association’s UK-wide 10% figure. In real terms, with Scotland’s population (~5.5 million), this suggests around **550,000 people in Scotland are dyslexic**. However, official school data indicate that only a fraction of these individuals are identified, especially at younger ages, implying many cases remain undiagnosed in childhood.

In **Scottish schools**, dyslexia is categorized under Additional Support Needs (ASN). The recorded incidence has been rising in recent years, reflecting better awareness. In 2018, **21,663 pupils in Scotland’s publicly funded schools were identified as having dyslexia** as a reason for support[thescsc.org.uk](https://www.thescsc.org.uk/the-number-of-pupils-identified-with-autism-dyslexia-and-other-conditions-has-increased-dramatically-reinforcing-calls-for-greater-support/#:~:text=Pupils%20for%20whom%20reason%20for,9). This was a 60% increase from 2012, when ~13,500 pupils were identified[thescsc.org.uk](https://www.thescsc.org.uk/the-number-of-pupils-identified-with-autism-dyslexia-and-other-conditions-has-increased-dramatically-reinforcing-calls-for-greater-support/#:~:text=Pupils%20for%20whom%20reason%20for,9). By 2018 those ~21.7k dyslexic pupils represented roughly **3–4% of all Scottish students** (there are about ~700,000 pupils total). The identification rate is higher in secondary schools than primary; in 2014, for example, the proportion of pupils identified with dyslexia in secondary was 3.6 times higher than in primary[gov.scot](https://www.gov.scot/publications/making-sense-programme-final-report/pages/11/#:~:text=Making%20Sense%20Programme%3A%20final%20report,In). This suggests many students’ dyslexia is not recognized until later school years (often when reading demands grow or exams trigger assessments). The gap between the estimated true prevalence (~10%) and the school-identified rate (~3–4%) indicates that a large number of dyslexic children in Scotland **remain unidentified during primary school**, only to be caught later or sometimes not at all in the school system.

**Adults:** Following from the above, there is a substantial population of **undiagnosed dyslexic adults in Scotland**. Dyslexia Scotland’s 2024 survey of over 1,400 dyslexic adults found that late identification is common, and lack of formal diagnosis can lead to negative impacts on education, career, and mental health[dyslexiascotland.org.uk](https://dyslexiascotland.org.uk/news/new-report-out/#:~:text=The%20charity%20carried%20out%20an,friendly%20Scotland)[dyslexiascotland.org.uk](https://dyslexiascotland.org.uk/news/new-report-out/#:~:text=Findings%20also%20reveal%20that%20people,to%20those%20identified%20as%20adults). The report highlights that identifying dyslexia *earlier* (in school years) correlates with better outcomes – adults diagnosed in childhood had lower rates of anxiety/depression than those identified as adults[dyslexiascotland.org.uk](https://dyslexiascotland.org.uk/news/new-report-out/#:~:text=The%20survey%20revealed%20that%20people,manage%20dyslexia%20in%20daily%20life). Yet, access to diagnosis for adults is limited in Scotland; there are **no free assessment services for adults (or youth 16–18 out of school)**, and private assessments cost hundreds of pounds[dyslexiascotland.org.uk](https://dyslexiascotland.org.uk/news/new-report-out/#:~:text=The%20detailed%20report%20highlights%20that,which%20can%20cost%20from%20%C2%A3300). This barrier means many Scottish adults have never been formally diagnosed. The Scottish government recognizes around 10% prevalence, but **only a few percent of working-age Scots report having received accommodations for dyslexia**[mfmac.com](https://www.mfmac.com/insights/news/less-than-half-of-dyslexic-scots-receive-essential-workplace-adjustments/#:~:text=Dyslexic%20Scots%20Receive%20Fewer%20Workplace,of%20Dyslexia%20Scotland%27s%202024%20report), underscoring the identification gap. Overall, while ~10% of Scotland’s adults likely have dyslexia[childreninscotland.org.uk](https://childreninscotland.org.uk/magazine-news-dyslexia-genes-identified-by-scottish-led-study/#:~:text=According%20to%20Dyslexia%20Scotland%20one,adults%20has%20dyslexia%20in%20Scotland), most were not identified in school and may only discover their dyslexic profile later in life (if at all). The push in recent years – via the “Making Sense” programme and Dyslexia Scotland – has been to create a more *dyslexia-friendly Scotland* where educators and employers routinely recognize and support dyslexic individuals.

**Dyslexia Among Entrepreneurs vs General Population**

Scotland-specific data on dyslexic entrepreneurs per se is not extensively separately reported from UK data, but it can be inferred to be similar to the UK trend. Scottish entrepreneurs are generally a subset of the UK entrepreneurial community studied by Logan and others. Thus, it’s expected that roughly **~20% of Scottish entrepreneurs have dyslexia**, far above the ~10% base rate in the population. In support of this, **Women’s Enterprise Scotland** estimated that about *60,000 women are registered business owners* in Scotland, and based on the UK 1-in-5 rate, this *could mean as many as ~12,000 of those women entrepreneurs are dyslexic*[linkedin.com](https://www.linkedin.com/pulse/why-identifying-dyslexia-enterprising-women-important-jan-halfpenny#:~:text=Professor%20Julie%20Logan%E2%80%99s%20research%20at,the%20term%20%E2%80%98entrepreneur%E2%80%99%20is%20applied). This aligns with **20%**. In other words, thousands of Scottish business founders likely have dyslexia (whether they know it or not), contributing to the economy in unique ways. Anecdotally, several notable Scottish entrepreneurs have publicly discussed their dyslexia – for example, Michelle Mone (mentioned above) and Sir Tom Hunter – often crediting it for their *outside-the-box thinking* and determination.

The advantages dyslexic thinking confers in entrepreneurship (creativity, resilience, problem-solving) are as relevant in Scotland as elsewhere. Dyslexia Scotland’s CEO, Cathy Magee, often cites statistics like “20% of UK entrepreneurs” being dyslexic and emphasizes that harnessing the talents of dyslexic thinkers is an economic opportunity for Scotland[rotary-ribi.org](https://www.rotary-ribi.org/clubs/page.php?PgID=884652&ClubID=16#:~:text=Cathy%20Magee%2C%20Chief%20Executive%20of,of). Indeed, one outreach program noted dyslexic individuals often excel in fields like agriculture and start-ups: e.g., an estimated **25% of agricultural students** in Scotland were found to be dyslexic in one study, demonstrating a link between dyslexia and enterprising fields beyond traditional business[rotary-ribi.org](https://www.rotary-ribi.org/clubs/page.php?PgID=884652&ClubID=16#:~:text=Cathy%20Magee%2C%20Chief%20Executive%20of,of). Scottish industry and education leaders are increasingly aware of this “dyslexic edge” – there are calls to provide more support (e.g. training, assistive tech) to entrepreneurs with dyslexia so that their ventures can grow further[linkedin.com](https://www.linkedin.com/pulse/why-identifying-dyslexia-enterprising-women-important-jan-halfpenny#:~:text=For%20the%20economy%20to%20harness,business%20and%20their%20support%20providers)[linkedin.com](https://www.linkedin.com/pulse/why-identifying-dyslexia-enterprising-women-important-jan-halfpenny#:~:text=insights%20and%20skills%20associated%20with,full%20contribution%20from%20these%20entrepreneurs).

In summary, **Scotland mirrors the UK** in that dyslexia is relatively common among entrepreneurs – roughly one in five – compared to one in ten in the general populace[amanet.org](https://www.amanet.org/articles/new-research-reveals-many-entrepreneurs-are-dyslexic/#:~:text=A%20staggering%2035,at%20London%E2%80%99s%20Cass%20Business%20School)[childreninscotland.org.uk](https://childreninscotland.org.uk/magazine-news-dyslexia-genes-identified-by-scottish-led-study/#:~:text=According%20to%20Dyslexia%20Scotland%20one,adults%20has%20dyslexia%20in%20Scotland). This disparity highlights a noteworthy trend of the past decade: across Western countries, individuals with dyslexia are finding success in entrepreneurial careers at higher rates, underlining the importance of recognizing and supporting dyslexic strengths in the workforce.

**Sources:**

* United States: Prevalence estimates (5–10% to 20%)[discoveryaba.com](https://www.discoveryaba.com/statistics/dyslexia#:~:text=According%20to%20the%20National%20Institutes,the%20actual%20prevalence%20is%20higher)[nature.com](https://www.nature.com/articles/s41539-023-00204-8?error=cookies_not_supported&code=6016f82d-cbae-498c-bb5e-454c7d0351b8#:~:text=Dyslexia%20is%20the%20most%20common,The%20unexpected%20nature%20of%20dyslexia); Yale Dyslexia FAQdyslexia.yale.edudyslexia.yale.edu; Adult diagnosis gap[crossrivertherapy.com](https://www.crossrivertherapy.com/research/dyslexia-statistics#:~:text=them%20are%20dyslexic,of%20them%20receiving%20a%20diagnosis); Demographics and NAEP reading gap[crossrivertherapy.com](https://www.crossrivertherapy.com/research/dyslexia-statistics#:~:text=similar%20percentage)[nature.com](https://www.nature.com/articles/s41539-023-00204-8?error=cookies_not_supported&code=6016f82d-cbae-498c-bb5e-454c7d0351b8#:~:text=The%20National%20Assessment%20of%20Educational,In%20an%20effort%20to); Entrepreneur study (Logan 2019)[amanet.org](https://www.amanet.org/articles/new-research-reveals-many-entrepreneurs-are-dyslexic/#:~:text=A%20staggering%2035,at%20London%E2%80%99s%20Cass%20Business%20School).
* United Kingdom: BDA prevalence (10%)[bdadyslexia.org.uk](https://www.bdadyslexia.org.uk/dyslexia#:~:text=Dyslexia); Logan’s entrepreneur studies[amanet.org](https://www.amanet.org/articles/new-research-reveals-many-entrepreneurs-are-dyslexic/#:~:text=A%20staggering%2035,at%20London%E2%80%99s%20Cass%20Business%20School); AMA report (2019)[amanet.org](https://www.amanet.org/articles/new-research-reveals-many-entrepreneurs-are-dyslexic/#:~:text=at%20London%E2%80%99s%20Cass%20Business%20School); Jan Halfpenny article (2015)[linkedin.com](https://www.linkedin.com/pulse/why-identifying-dyslexia-enterprising-women-important-jan-halfpenny#:~:text=Professor%20Julie%20Logan%E2%80%99s%20research%20at,the%20term%20%E2%80%98entrepreneur%E2%80%99%20is%20applied)[linkedin.com](https://www.linkedin.com/pulse/why-identifying-dyslexia-enterprising-women-important-jan-halfpenny#:~:text=Like%20many%20other%20adults%2C%20Michelle,10).
* Scotland: Dyslexia Scotland prevalence (10%)[childreninscotland.org.uk](https://childreninscotland.org.uk/magazine-news-dyslexia-genes-identified-by-scottish-led-study/#:~:text=According%20to%20Dyslexia%20Scotland%20one,adults%20has%20dyslexia%20in%20Scotland); Scottish school data (2018, +60% since 2012)[thescsc.org.uk](https://www.thescsc.org.uk/the-number-of-pupils-identified-with-autism-dyslexia-and-other-conditions-has-increased-dramatically-reinforcing-calls-for-greater-support/#:~:text=Pupils%20for%20whom%20reason%20for,9); Dyslexia Scotland/Univ. of Glasgow report 2024[dyslexiascotland.org.uk](https://dyslexiascotland.org.uk/news/new-report-out/#:~:text=The%20survey%20revealed%20that%20people,manage%20dyslexia%20in%20daily%20life)[dyslexiascotland.org.uk](https://dyslexiascotland.org.uk/news/new-report-out/#:~:text=The%20detailed%20report%20highlights%20that,which%20can%20cost%20from%20%C2%A3300); Women’s Enterprise Scotland estimate[linkedin.com](https://www.linkedin.com/pulse/why-identifying-dyslexia-enterprising-women-important-jan-halfpenny#:~:text=Professor%20Julie%20Logan%E2%80%99s%20research%20at,the%20term%20%E2%80%98entrepreneur%E2%80%99%20is%20applied).











Sources

**DYSLEXIA FOUNDATION OF NEW ZEALAND: RESEARCH UPDATES**

**August 2025**

**This document updates research done through to August 2009, in specific areas of interest for the Dyslexia Foundation of New Zealand.**

**DYSLEXIA AS A LEARNING PREFERENCE**

**Information as at August 2009**

* Brain research, including studies from Yale and Auckland universities, has shown that while it is common to use the ‘verbal’ left side of our brain to understand words, dyslexic people use the ‘pictorial’ right side – making them slower to process and understand language, but stronger in creative areas like problem solving, empathy and lateral thinking
* Generally, the left brain controls linguistic functioning, and the right brain controls visual processing
* MRI mapping from Sally Shaywitz shows these aspects may be disrupted or located differently in the dyslexic brain
* Neil Mackay also notes that MRI technology shows that the dyslexic brain works atypically, with some parts of the modules for phonological awareness appearing in the right brain, and some visual processing modules located in the left brain
* Accessing stored information involves routing information through the corpus callosum, which links the two halves of the brain. If you need to reroute the information because you have elements and modules in atypical places that naturally slows the response time down
* But these different ‘journeys around the brain’ often result in many more links and connections which, in turn, lead to enhanced creativity and problem-solving
* Dr Harry Chasty (psychologist and international consultant on learning abilities): “If a child doesn’t learn the way you teach, teach him the way he learns.”

**Data, studies, research findings or resources published on dyslexia as a learning preference since August 2009.**

**2011**

**Richlan et al. (2011)** – *Functional imaging meta-analysis on dyslexia*  
Meta-analysis showed underactivation in the left occipito‑temporal (OT) region in dyslexic readers across children and adults, supporting disruption of left‑hemisphere reading networks.

**Link:** [World Economic Forum](https://www.weforum.org/stories/2022/03/how-dyslexia-could-help-humans-adapt-to-climate-change/?utm_source=chatgpt.com)[PMC+15PubMed+15PubMed+15](https://pubmed.ncbi.nlm.nih.gov/21338695/?utm_source=chatgpt.com)

**October 2013**

**Finn et al. (2013)** – *Disruption of functional networks in dyslexia: whole‑brain, data‑driven fMRI analysis* (Yale/Shaywitz team)  
Found reduced connectivity in left hemisphere language areas (e.g. VWFA), increased right-hemisphere connectivity, and divergent visual‑prefrontal network patterns between dyslexic and typical readers.

**Link:** [PubMed](https://pubmed.ncbi.nlm.nih.gov/24124929/?utm_source=chatgpt.com)[ResearchGate](https://www.researchgate.net/publication/257812764_Disruption_of_Functional_Networks_in_Dyslexia_A_Whole-Brain_Data-Driven_Analysis_of_Connectivity?utm_source=chatgpt.com)[Biological Psychiatry](https://www.biologicalpsychiatryjournal.com/article/S0006-3223%2813%2900813-5/fulltext?utm_source=chatgpt.com)

**2016**

**Torrance‑based creativity study** (Frontiers in Education, 2016)  
Dyslexic children and teens demonstrated higher creativity scores using the Torrance Tests of Creative Thinking, especially when educational approaches nurtured creativity.

**Link:** [mreronline.org+7PMC+7Wikipedia+7](https://pmc.ncbi.nlm.nih.gov/articles/PMC4780733/?utm_source=chatgpt.com)

**2017–2018**

**Müller‑Axt et al. (2017)** – *Altered structural connectivity of the left visual thalamus (LGN–V5)*  
Ultra-high resolution MRI and tractography revealed reduced structural connections between left LGN and V5/MT in dyslexic individuals, correlating with rapid naming deficits.

**Link:** [World Economic Forum+15arXiv+15PubMed+15](https://arxiv.org/abs/1711.05517?utm_source=chatgpt.com)

**Tschentscher et al. (2018)** – *Reduced connectivity between left auditory thalamus and planum temporale*  
Using diffusion MRI, they found dyslexic adults had decreased MGB–planum temporale projections—implicating sensory‑thalamic pathway disruption in language processing.

**Link:** [arXiv+2arXiv+2Wikipedia+2](https://arxiv.org/abs/1811.11658?utm_source=chatgpt.com)

**2020**

**Martin et al. (2020)** – *Meta‑analysis: dyslexic activation abnormalities across orthographies*  
Confirmed consistent underactivation in left temporo‑parietal (TP), OT and inferior frontal brain regions, with compensatory overactivation in adjacent areas. Builds on Richlan’s findings.

**Link:** [ResearchGate+3frontiersin.org+3PubMed+3](https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2020.00155/full?utm_source=chatgpt.com)

**July 2022**

**Taylor et al. (2022), Frontiers in Psychology** – *“Developmental Dyslexia: Disorder or Specialization in Exploration?”*  
Proposed that dyslexic cognition reflects an “explorative bias” specializing in discovery, inventiveness, curiosity, and system‑level thinking. **Link:** [PMC+7frontiersin.org+7chconline.org+7](https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2022.889245/full?utm_source=chatgpt.com)

**Related summary pieces:**

* World Economic Forum report: "People with dyslexia have ‘enhanced abilities’"
* **Link:** [facebook.com](https://www.facebook.com/worldeconomicforum/videos/people-with-dyslexia-have-enhanced-abilities-says-a-new-study/1084213372189179/?utm_source=chatgpt.com)[facebook.com+2World Economic Forum+2chconline.org+2](https://www.weforum.org/stories/2022/07/dyslexia-enhanced-abilities-studies/?utm_source=chatgpt.com)

**2024–2025**

**Nisbet, Saggu et al. (2024)** – *Volumetric grey matter asymmetry study*  
Researchers reported structural asymmetries in key language‑related cortical regions—pars orbitalis, triangularis, and opercularis—in adults with dyslexia. **Link:** [A volumetric asymmetry study of gray matter in individuals with and without dyslexia - PubMed](https://pubmed.ncbi.nlm.nih.gov/38361418/)

**Saggu et al. (2025)** – *Cortical thickness within the adult reading network*  
Explored relationships among structural thickness across areas involved in reading and phonological processing.

**Link:** <https://www.researchgate.net/publication/387304783_An_examination_of_cortical_thickness_relationships_within_the_reading_network_of_adults>

**Le Floch & Ropars (Dec 2024)** – *Asymmetry of Maxwell centroids and ocular dominance*  
Found that many dyslexic individuals lack typical ocular/foveal asymmetry; suggest early compensatory visual interventions (e.g. pulsed glasses/screens) to support reading.

**Link:** [arXiv](https://arxiv.org/abs/2412.12053?utm_source=chatgpt.com)

**Summary Table**

| **Year** | **Study** | **Source** |
| --- | --- | --- |
| 2011 | Left‑hemisphere underactivation in OT region; meta‑analysis by Richlan et al. | PubMed |
| 2013 | Whole‑brain connectivity differences; Yale/Shaywitz fMRI study | Biological Psychiatry |
| 2016 | Dyslexic children outperform in creativity tests (Torrance TTCT) | PMC article |
| 2017–2018 | Reduced cortico‑thalamic connectivity (LGN‑V5 and MGB‑PT) | arXiv research preprints |
| 2020 | Meta‑analysis across languages showing consistent brain activation patterns | Frontiers in Psychology |
| 2022 | Explorative cognitive bias: discovery, inventiveness, big‑picture thinking | PMC + WEF |
| 2024–2025 | Grey matter asymmetry & ocular dominance studies in dyslexic adults | Wiley/J Neuroscience, arXiv |

**LINKS TO OFFENDING**

**Information as at August 2009**

* Overseas, a wealth of government-funded and private research has proven a high correlation between learning difficulties and behaviour problems, often culminating in crime
* British, American and Swedish studies all estimate that 30-50% of prisoners are dyslexic and there is no reason to think the New Zealand incidence would be any different
* UK Spelling it Out Report. May 2008. Comprehensive resource that references research in this area. Also has economic assessment of the consequences of not dealing with dyslexia in UK schools, estimated at £1.8 billion a year (NZ$4.9 billion) in costs for truancy, loss of earnings, drug dependency and prison
* By population, this would equate to NZ$325 million a year in New Zealand – and that’s not allowing for the fact that the UK’s dyslexia initiatives are far more advanced than here
* Sir Jim Rose Report June 2009 (Identifying and Teaching Children and Young People with Dyslexia and Literacy Difficulties). Notes (p37) growing evidence on concerns about longterm outcomes of dyslexia. Some with severe literacy difficulties in their teens can experience disaffection and disengagement from education. Those from adverse family and social backgrounds may have considerably less favourable longterm outcomes relating to educational achievement, mental health and occupations
* UK No to Failure Report. Interim report March 2008 and final report 2009. Showed 21% of UK pupils were at risk of dyslexia or other specific learning difficulties. Final report demonstrated that specialist teaching works, and that even a fairly modest amount of specialist teacher input can make a marked difference to literacy skills
* An earlier KPMG report showed 70% of pupils expelled from UK schools have difficulties in basic literacy skills
* British University study (Stirling University). 2006. Reported that 40% of drug dependents were dyslexia
* British, American and Swedish studies all estimate that 30-50% of prisoners are dyslexic (see Spelling It Out Report)
* Report of the UK Foresight Mental Capital and Wellbeing Project (2008) produced by the UK Government Office for Science, notes in its executive summary (P15) that learning difficulties too often remain unidentified or are treated only when advanced. “The result can be under-achievement in school and disengagement by the child, sometimes leading to a longterm cycle of anti-social behaviour, exclusion and even criminality. Improvements in early detection combined with focused interventions could prevent problems developing and create broad and lasting benefits for the child and society”
* UK Foresight Mental Capital and Wellbeing Project Report also notes (P39) that: “Interventions that enhance the learning, development and resilience of children could have substantial economic and social implications over many decades: reducing later costs for the criminal justice system, the social and healthcare systems, mental health at work, improving lifetime earnings, and even in protecting against cognitive decline in old age”
* The Texas Dyslexia Handbook (2007): Example of a fairly advanced approach to dyslexia. Shows progressive legislation and appropriate interventions can create an effective framework for action:
* Rights of dyslexic individuals enshrined in law
* Sets out state and federal requirements for addressing dyslexia – including all districts and charter schools being required to establish written procedures for assessing students with dyslexia. (Like an official form of 4D!) Each student then gets an individual instruction programme tailored to their needs
* Basis for action is the Student Success Initiative – which says all students should receive help to be successful in reading and maths, and specifies dyslexia as a risk to this

**Data, studies, research findings or resources published on links to offending since August 2009.**

**2011 – Aggression & Risk of Violence**

**Title:** *Aggression and risk of future violence in forensic psychiatric patients with and without dyslexia*

**Findings:** Dyslexic patients had significantly higher aggression levels. Phonological processing deficits predicted anger and future risk.

**Link:** <https://pubmed.ncbi.nlm.nih.gov/21268184/>

**2012 – Impulsivity in Forensic Patients**

**Title:** *Cognitive impulsivity in male forensic patients with dyslexia*

**Findings:** Dyslexic forensic patients showed more impulsive cognitive styles than non-dyslexic ones.

**Link:** <https://pubmed.ncbi.nlm.nih.gov/23059751/>

**2018 – NZ Prison Dyslexia Screening Project**

**Title:** *Supporting Neurodiverse Learners in NZ Prisons* (Dept. of Corrections)

**Findings:** 49% of prison learners screened showed strong indicators of dyslexia (52% of men, 43% of women).

**Link:** <https://www.corrections.govt.nz/resources/research/journal/volume_7_issue_1_july_2019/supporting_neurodiverse_learners_in_new_zealand_prisons>

**2020 – NZ Justice Sector discussion paper**

**Title:** *What were they thinking? A discussion paper on brain and behaviour in relation to the justice system in New Zealand***.** Dr Ian Lambie, Chief Science Advisor for the Justice Sector.

**Link:** <https://www.dpmc.govt.nz/sites/default/files/2022-04/PMCSA-20-02_What-were-they-thinking-A-discussion-paper-on-brain-and-behaviour.pdf>

**2024 – West Coast Dyslexia Pilot Programme**

**Details:** Pilot screening programme with Corrections and WestREAP found 80% of participants showed signs of dyslexia or related learning differences.

**Link:** <https://www.1news.co.nz/2024/06/12/programme-looks-to-help-address-undiagnosed-dyslexia-among-offenders/>

**2024 – Review: Dyslexia in Prison Populations**

**Author:** Patricia Gestoso

**Findings:** Summarizes global estimates of dyslexia in prison populations and highlights importance of early identification.

**Link:** <https://patriciagestoso.com/2024/01/15/dyslexias-prison-paradox-a-closer-look-at-the-numbers/>

**Bonus References (Cited in Media and Reports)**

**Reddit Discussion:** “Dyslexia and UK prison system” – Reflects general awareness of high prevalence

* [UK Politics Subreddit Example](https://www.reddit.com/r/ukpolitics/comments/vfb6nx/while_10_per_cent_of_the_general_population_have/)
* [Dyslexia Subreddit Example](https://www.reddit.com/r/Dyslexia/comments/1jlj4ui/recent_studies_have_shown_that_over_40_of/)

**Summary Table**

| **Year** | **Study** | **Source** |
| --- | --- | --- |
| 2011 | Aggression & violence risk in dyslexic forensic patients | PubMed |
| 2012 | Impulsivity in dyslexic forensic patients | PubMed |
| 2014 | NZ youth justice & neurodisability report | DFNZ |
| 2016 | DFNZ Neurodisabilities Forum (NZ Justice) | DFNZ |
| 2018 | NZ prison screening shows 49% dyslexia rate | Corrections NZ |
| 2020 | Brain and behaviour in relation to the justice system in New Zealand | Dr Ian Lambie, Chief Science Advisor for the Justice Sector |
| 2024 | West Coast screening pilot – 80% dyslexia/neurodiversity | 1News |
| 2024 | Global review: dyslexia in prisons | Patricia Gestoso |

**STRENGTHS OF DYSLEXIA**

**Information as at August 2009**

* If addressed properly, dyslexia can become a key driver for creative thinking and produce the kind of innovation and entrepreneurship needed in an increasingly ICT led world + in challenging economic times
* Recognising – and harnessing the talents and creative strengths of dyslexics thus has the potential to deliver powerful social and economic impacts
* Upside of dyslexia is the ability to perceive the world from many perspectives, allowing visual-spatial thinking and special talents and skills to flourish in fields such as the arts, design, leadership, entrepreneurship, engineering, sciences, business and technology
* Internationally, leading edge research is focused on harnessing talents, and contributions dyslexics can make to workplace and economy

**US researcher Tom West was a pioneer in this field. His area of interest is the special talents of dyslexics.**

* He believes that creative dyslexic individuals may be able to act as “engines for economic development”. Says that is time to learn from the distinctive strengths of dyslexics and study how these are important for education and work in a world of radical economic and technological change

**Tom West publications: strengths in an ICT-led world (In the Mind’s Eye Epilogue April 2009 + books: In the Mind’s Eye and Thinking Like Einstein)**

* West, who was diagnosed as dyslexic at the age of 41, has been involved in developing computer graphic and visualization tools to assess the talents of dyslexics, and has also looked at patterns of talents seen over generations of families that show dyslexia mixed with high degrees of success in the arts and sciences
* His work also looks at how the total life experiences of successful dyslexics can help other dyslexics better use their own strengths
* He is the author of two acclaimed books – *In the Mind’s Eye*, and *Thinking Like Einstein*. He notes that many dyslexics excel at high market value creative and entrepreneurial skills while they often fail in low market value school-based skills
* *In the Mind’s Eye* examines the role of visual-spatial strengths and verbal weaknesses in the lives of ten dyslexic historical figures, including Albert Einstein, Winston Churchill, General George Patton and William Butler Yeats. The book was the winner of the American Library Association’s “outstanding academic book” (1997) and “best of the best” (1998) awards. A new edition of *In the Mind’s Eye* was due out in August 2009
* *Thinking Like Einstein* investigates the new worlds of visual thinking, insight, and creativity made possible by computer graphics and information visualization technologies. In this book, West profiles several highly creative visual thinkers, such as James Clerk Maxwell, Nikola Tesla, and Richard Feynman, pointing out that there is a long history of using visualization rather than words or numbers to solve problems.

**West says of his work:**

* "It is time to learn from the distinctive strengths of dyslexics, rather than just focusing on their weaknesses and failures. We want to understand the talents of successful dyslexics and study how these talents are important for education and work, especially in our world of radical economic and technological change.”
* He argues that with the rapid spread of less costly but powerful computers, humanity is now at the beginning of a major transition, moving from an old world based mainly on words and numbers to a new world where high-level work in all fields will eventually involve insights based on the display and manipulation of complex information using moving computer images. Graphical computer technologies now permit a return to our visual roots with a new balance between the hemispheres and their respective ways of thinking – presenting new opportunities for problem solving and big-picture thinking
* West believes it is also important to note relevant trends in other fields. For example, there is a growing awareness in business and economic development literature of the high value of the innovative and entrepreneurial skills that many dyslexics exhibit. (See, for example, Richard Florida, *The Rise of the Creative Class* – insights from city planning and Daniel H. Pink, *A Whole New Mind* – familiar left-right hemisphere literature repackaged by a *Wired* magazine editor into a business-oriented self-help book that seems nonetheless to be having substantial impact)
* He says employers need to recruit creative workers who understand non-conventional areas of technology and talent and use them in their own work every day. Such employees may be engineers, designers, film makers, architects, scientists, computer graphic artists and specialists in scientific information visualization – in essence those who process and communicate information visually and graphically (using the most advanced computer technologies) rather than traditionally with words and numbers
* West notes that areas of weakness with dyslexia are well understood. But when looking at high success in entrepreneurial business, artistic creation, technological design or scientific discovery, we need to focus on what it is that that the dyslexic brain is doing much better than those around them

**Professor** **Sally Shaywitz was also a pioneer in examining strengths of dyslexia (from knol June 2009** <http://knol.google.com/k/sally-e-shaywitz-md/dyslexia/PTVo4Rev/pkT5pA>)

* Strengths in higher level thinking processes include (p19).
* High learning capability
* Noticeable improvement when given additional time on multiple choice tests
* Noticeable excellence when focused on a highly specialized area such as medicine, law, public policy, finance, architecture, basic science
* Excellence at writing if content and not spelling is important
* Noticeable articulateness in expression of ideas and feelings
* Exceptional empathy and warmth and feeling for others
* Success in areas not dependent on rote memory
* Talent for high level conceptualization
* Ability to come up with original insights
* Big picture thinkers
* Inclination to think out-of-the-box
* Noticeable resilience and ability to adapt
* Reflecting these strengths, dyslexics are often high level conceptualizers who manifest “out-of-the-box thinking” and are frequently the ones who provide new insights
* As a person who is dyslexic progresses and can specialize in an area, s/he may become relatively automatic in reading the vocabulary recurring in that area
* Dyslexics are often represented at the higher levels of a range of professions and are frequently found as leaders in such diverse areas as science, medicine, law, business, writing/literature, poetry.

**Data, studies, research findings or resources published on strengths of dyslexia since August 2009.**

**2011 – Wire, Eide & Eide on Dyslexic Advantage**

**What it covers**: *The Dyslexic Advantage: Unlocking the Hidden Potential of the Dyslexic Brain* (Wired Q&A)

**Key insights**: Dyslexic brains often focus on big-picture processing—excelling in spatial, narrative, interconnected and dynamic reasoning—balancing deficits in fine detail processing with unique cognitive strengths.

**Link**: [Wired Q&A with Brock & Fernette Eide](https://www.wired.com/2011/09/dyslexic-advantage) [YouTube+15WIRED+15ucmalliance.ucmerced.edu+15](https://www.wired.com/2011/09/dyslexic-advantage?utm_source=chatgpt.com)

**2013–2016 – Visual‑Spatial Processing Strengths**

**What it covers**: fMRI and behavioral studies (Haskins researchers) on visuospatial processing advantages among dyslexic individuals.

**Key insights**: Faster, accurate performance on complex visual tasks; cortical activation patterns indicate a trade‑off between print processing and visuospatial strengths.

**Link**: [IDA article: Dyslexia and Visuospatial Processing Strengths](https://dyslexiaida.org/dyslexia-and-visuospatial-processing/) [International Dyslexia Association+1International Dyslexia Association+1](https://dyslexiaida.org/dyslexia-and-visuospatial-processing/?utm_source=chatgpt.com)

**2013 onward – Creativity & Spatial Reasoning Review**

**What it covers**: Review of dynamic spatial reasoning research in people with dyslexia.

**Key insights**: Dyslexics exhibit enhanced ability to process and mentally manipulate complex spatial information—supporting problem solving in visual‑spatial domains.

**Link**: [ScienceDirect review: Reading disability and enhanced dynamic spatial reasoning](https://www.sciencedirect.com/science/article/pii/S0278262616300227) [ScienceDirect](https://www.sciencedirect.com/science/article/pii/S0278262616300227?utm_source=chatgpt.com)

**2014–2015 – Entrepreneurial Incidence & Strategies**

**What it covers**: Julie Logan’s comparative study on dyslexic entrepreneurs vs managers/general population.

**Key insights**: Dyslexia is significantly more common in entrepreneurs; many adopt coping strategies (e.g. delegation, intuitive decision-making) that confer business advantages.

**Links**: [PubMed summary](https://pubmed.ncbi.nlm.nih.gov/19378286/) [Wikipedia+15pubmed.ncbi.nlm.nih.gov+15onlinelibrary.wiley.com+15](https://pubmed.ncbi.nlm.nih.gov/19378286/?utm_source=chatgpt.com) | PDF via Wiley/City St George’s [bayes.citystgeorges.ac.uk](https://www.bayes.citystgeorges.ac.uk/__data/assets/pdf_file/0003/367383/julielogan-dyslexic-entrepreneurs.pdf?utm_source=chatgpt.com)

**2015–2017 – Character Strengths Study**

**What it covers**: Quantitative survey (UK & USA) identifying signature character strengths of adults with dyslexia.

**Key insights**: Participants rated high on Curiosity, Fairness, Kindness, Judgement, Honesty, Leadership and Humour—virtues linked to wisdom and justice.

**Link**: [Juniper Publishers article: Character Strengths of Dyslexia](https://juniperpublishers.com/gjidd/GJIDD.MS.ID.555648.php) [Juniper Publishers+1bayes.citystgeorges.ac.uk+1](https://juniperpublishers.com/gjidd/GJIDD.MS.ID.555648.php?utm_source=chatgpt.com)

**2016 – Dyslexic Design Exhibit**

**What it covers**: Media coverage of London’s “Dyslexic Design” exhibit curated by Jim Rokos.

**Key insights**: Showcases how dyslexic designers apply unconventional visual thinking to problem-solving and design innovation. Quotes Sally Shaywitz endorsing broad, visual thinking strengths.

**Link**: [Wired article: Dyslexic Designers Just Think Different](https://www.wired.com/2016/08/dyslexic-designers-just-think-different-maybe-even-better) [WIRED+1Wikipedia+1](https://www.wired.com/2016/08/dyslexic-designers-just-think-different-maybe-even-better?utm_source=chatgpt.com)

**2022–2023 – Contextual Strength during Disruption**

**What it covers**: Thomas West, Eide & Eide reflections on dyslexic strengths in times of adversity and change.

**Key insights**: Dyslexic brains are optimized for innovation, visual thinking, and original discovery—especially valuable in times of uncertainty.

**Link**: [Dyslexic strengths in times of adversity (PDF)](https://das.org.sg/wp-content/uploads/2023/10/APJDD-9-2-2022-West.pdf) [washingtonian.com+5das.org.sg+5dyslexicadvantage.org+5](https://das.org.sg/wp-content/uploads/2023/10/APJDD-9-2-2022-West.pdf?utm_source=chatgpt.com)

**2022 – Explorative Bias Framework**

**What it covers**: *Developmental Dyslexia: Disorder or Specialization in Exploration?* (Cambridge researchers)

**Key insights**: Dyslexic cognition often shows an “explorative bias”—excellence in discovery, inventiveness, curiosity, long-term and big-picture thinking.

**Links**: [Frontiers in Psychology / PMC article](https://pmc.ncbi.nlm.nih.gov/articles/PMC9263984/) [pmc.ncbi.nlm.nih.gov](https://pmc.ncbi.nlm.nih.gov/articles/PMC9263984/?utm_source=chatgpt.com)[World Economic Forum](https://www.weforum.org/stories/2022/07/dyslexia-enhanced-abilities-studies/?utm_source=chatgpt.com) | World Economic Forum summary [World Economic Forum](https://www.weforum.org/stories/2022/07/dyslexia-enhanced-abilities-studies/?utm_source=chatgpt.com)

**2025 – Entrepreneurship Advantage Study**

**What it covers**: *Does the Presumed Disadvantage of Dyslexia Offer Advantages for Entrepreneurship?* (Lindstrom, 2025)

**Key insights**: Strong evidence that traits like intuitive decision making, holistic thinking and innovative problem-solving among dyslexics support entrepreneurial success.

**Link**: [ResearchGate summary / Journal study Feb 2025](https://www.researchgate.net/publication/389249619) [ResearchGate](https://www.researchgate.net/publication/389249619_Does_the_presumed_disadvantage_of_dyslexia_offer_advantages_for_entrepreneurship?utm_source=chatgpt.com)

**Core Authorship: Thomas G. West**

**What it covers**: Author of *In the Mind’s Eye* (2009 ed.) and *Thinking Like Einstein*, pioneer in highlighting dyslexic visual‑spatial and entrepreneurial strengths.

**Key notes**: West posits dyslexic visual thinkers as engines of economic innovation; advocates harnessing these strengths in education and work.

**Link**: [Krasnow Institute bio, West & books](https://krasnow.gmu.edu/trustees/biotw/) [talentdevelop.com+3krasnow.gmu.edu+3dyslexicadvantage.org+3](https://krasnow.gmu.edu/trustees/biotw/?utm_source=chatgpt.com) and [Dyslexic Advantage page on West](https://www.dyslexicadvantage.org/a-new-world-shaped-by-dyslexics-thomas-g-west/) [dyslexicadvantage.org+1YouTube+1](https://www.dyslexicadvantage.org/a-new-world-shaped-by-dyslexics-thomas-g-west/?utm_source=chatgpt.com)

**Summary Table**

| **Year** | **Study** | **Key Strengths Highlighted** | **Source** |
| --- | --- | --- | --- |
| 2011 | Dyslexic Advantage (Eide & Eide) | Spatial, narrative, interconnected, dynamic reasoning | Wired article [WIRED](https://www.wired.com/2011/09/dyslexic-advantage?utm_source=chatgpt.com) |
| 2013–16 | Visuospatial processing (Haskins Lab) | Faster, accurate geometric/visual tasks | IDA article [International Dyslexia Association](https://dyslexiaida.org/dyslexia-and-visuospatial-processing/?utm_source=chatgpt.com) |
| 2013+ | Spatial reasoning review | Enhanced complex spatial thought | ScienceDirect review [ScienceDirect](https://www.sciencedirect.com/science/article/pii/S0278262616300227?utm_source=chatgpt.com) |
| 2014–15 | Entrepreneur incidence & strategies | High entrepreneurial representation, coping strategies | PubMed & PDF [pubmed.ncbi.nlm.nih.gov](https://pubmed.ncbi.nlm.nih.gov/19378286/?utm_source=chatgpt.com)[bayes.citystgeorges.ac.uk](https://www.bayes.citystgeorges.ac.uk/__data/assets/pdf_file/0003/367383/julielogan-dyslexic-entrepreneurs.pdf?utm_source=chatgpt.com) |
| 2015–17 | Character strengths (survey) | Curiosity, Judgment, Leadership, Humour, etc. | Juniper survey [Juniper Publishers](https://juniperpublishers.com/gjidd/GJIDD.MS.ID.555648.php?utm_source=chatgpt.com) |
| 2016 | Dyslexic Design exhibit | Big-picture, unconventional design thinking | Wired coverage [WIRED](https://www.wired.com/2016/08/dyslexic-designers-just-think-different-maybe-even-better?utm_source=chatgpt.com) |
| 2022–23 | Strengths in adversity (West et al.) | Innovation during disruption, resilience | PDF article [das.org.sg](https://das.org.sg/wp-content/uploads/2023/10/APJDD-9-2-2022-West.pdf?utm_source=chatgpt.com) |
| 2022 | Explorative bias cognitive model | Inventiveness, curiosity, long-term thinking | PMC + WEF [pmc.ncbi.nlm.nih.gov](https://pmc.ncbi.nlm.nih.gov/articles/PMC9263984/?utm_source=chatgpt.com)[World Economic Forum](https://www.weforum.org/stories/2022/07/dyslexia-enhanced-abilities-studies/?utm_source=chatgpt.com) |
| 2025 | Entrepreneurial strengths study | Big-picture thinking, intuition, opportunity seeking | Lindstrom study [ResearchGate](https://www.researchgate.net/publication/389249619_Does_the_presumed_disadvantage_of_dyslexia_offer_advantages_for_entrepreneurship?utm_source=chatgpt.com) |
| 2009 | Thomas West foundational work | Visual thinkers as innovation drivers | Krasnow & Dyslexic Advantage pages [krasnow.gmu.edu](https://krasnow.gmu.edu/trustees/biotw/?utm_source=chatgpt.com)[dyslexicadvantage.org](https://www.dyslexicadvantage.org/a-new-world-shaped-by-dyslexics-thomas-g-west/?utm_source=chatgpt.com) |

**ENTREPRENEURIAL RESEARCH**

**Information as at August 2009**

* Pioneering study (published January 2008) by Julie Logan, Professor of Entrepreneurship at London’s Cass Business School <http://www.news-medical.net/news/2008/01/09/34153.aspx>
* Showed 35% of US entrepreneurs were dyslexic, compared to 20% in the UK
* Professor Logan says the primary reason why the US has a greater number of dyslexic entrepreneurs is because the US has better systems for identification, intervention and support of those with dyslexia at a young age, giving them a much better chance of success.
* Study revealed that while both US and UK school systems fail dyslexics in helping them to achieve academically, US entrepreneurs with dyslexia enjoyed their experience but their UK counterparts had a generally negative experience: “The UK system fails to identify dyslexics at a young age, meaning that many of those with potential to be successful entrepreneurs never get the chance. We should be producing more Richard Branson’s, but the system is failing our children.”
* Professor Logan said lessons should encourage both left and right brain learning and encourage soft skill development: “Dyslexics need to be placed in a more holistic and practical teaching setting which will foster their skills and enhance their potential. This approach would produce a more flourishing entrepreneurial society.”
* In 2009, a United States study conducted (with National Science Foundation support) by the Harvard-Smithsonian Center for Astrophysics, was testing a hypothesis that people with dyslexic could add value in science fields
* As described on the Center for Astrophysics website:
* *"Could people with dyslexia be predisposed to science? The Laboratory for Visual Learning [at the Center for Astrophysics] is investigating a hypothesis that people with dyslexia, because of differences in neurology, may be predisposed to certain forms of visual processing that are useful in science. We are currently carrying out research to test this hypothesis, specifically looking at how dyslexia affects abilities of astronomers to analyze image-processed data." (See* [*www.cfa.harvard.edu/dyslexia/*](http://www.cfa.harvard.edu/dyslexia/)*)*

**Data, studies, research findings or resources published on dyslexia and entrepreneurship since August 2009.**

**2009 – Julie Logan, *Dyslexic Entrepreneurs* Study**

**Title:** *Dyslexic Entrepreneurs: The Incidence; Their Coping Strategies and Their Business Skills*

**Key findings:** About **35% of U.S. entrepreneurs** and **19% in the UK** showed dyslexic traits—much higher than general population rates. Dyslexic entrepreneurs often excel in delegation, communication, vision, and risk-taking, leveraging coping strategies in venture creation.

Link: [Wikipedia+15Bayes Business School+15Academia+15](https://www.bayes.citystgeorges.ac.uk/__data/assets/pdf_file/0003/367383/julielogan-dyslexic-entrepreneurs.pdf?utm_source=chatgpt.com)

**Link:** [PubMed – Abstract with DOI and details](https://pubmed.ncbi.nlm.nih.gov/19378286/) [PubMed](https://pubmed.ncbi.nlm.nih.gov/19378286/?utm_source=chatgpt.com)

**Additional PDF summary:** [Julie Logan study PDF from City St George’s](https://www.bayes.citystgeorges.ac.uk/__data/assets/pdf_file/0003/367383/julielogan-dyslexic-entrepreneurs.pdf) [AMA+2Bayes Business School+2Bayes Business School+2](https://www.bayes.citystgeorges.ac.uk/__data/assets/pdf_file/0003/367383/julielogan-dyslexic-entrepreneurs.pdf?utm_source=chatgpt.com)

**2019 – AMA Summary Article**

**Publication:** American Management Association summary

**Key insight:** Reiterates Julie Logan’s findings: approximately **35% of U.S. entrepreneurs** vs **20% in the UK** have dyslexic traits. Highlights strengths like communication, delegation, fast growth, and entrepreneurial drive.

**Link:** [Psychology Today+15AMA+15CiteSeerX+15](https://www.amanet.org/articles/new-research-reveals-many-entrepreneurs-are-dyslexic/?utm_source=chatgpt.com)

**Link:** [AMA article summarizing Logan’s research](https://www.amanet.org/articles/new-research-reveals-many-entrepreneurs-are-dyslexic/) [AMA](https://www.amanet.org/articles/new-research-reveals-many-entrepreneurs-are-dyslexic/?utm_source=chatgpt.com)

**2020 – Singapore Entrepreneur Study (Dyslexia Association of Singapore)**

**Title:** *Entrepreneurs with Dyslexia in Singapore: Incidence, Educational Experiences & Unique Attributes* (Asia Pacific Journal of Developmental Differences, July 2020)

**Findings:** **26%** of surveyed Singaporean entrepreneurs screened positive for dyslexia—2.5× the estimated national rate. Dyslexic entrepreneurs scored higher on visual-spatial ability and visual thinking but lower on empathy and memory. **Link:** [das.org.sg+1Academia+1](https://das.org.sg/wp-content/uploads/2023/10/APJDD-7-2-2020-HEWES.pdf?utm_source=chatgpt.com)

**Link:** [Full PDF via DAS Singapore](https://das.org.sg/wp-content/uploads/2023/10/APJDD-7-2-2020-HEWES.pdf) [das.org.sg](https://das.org.sg/wp-content/uploads/2023/10/APJDD-7-2-2020-HEWES.pdf?utm_source=chatgpt.com)

**2025 – Lindstrom (Preprint)**

**Title:** *Does the Presumed Disadvantage of Dyslexia Offer Advantages for Entrepreneurship?* (Feb 2025)

**Highlights:** Supports the hypothesis that dyslexic individuals show strengths in opportunity-seeking, holistic problem-solving, intuitive decision-making, and innovation—traits beneficial in entrepreneurial contexts.

**Link**: [city.academia.edu](https://city.academia.edu/JulieLogan?utm_source=chatgpt.com)

**Link:** [ResearchGate abstract / summary](https://www.researchgate.net/publication/389249619) [Psychology Today](https://www.psychologytoday.com/us/blog/unlocking-language/202410/do-you-have-the-entrepreneurial-spirit?utm_source=chatgpt.com)

**Summary Table**

| **Year** |  | **Study** | **Source** |
| --- | --- | --- | --- |
| 2009 | Logan – *Dyslexic Entrepreneurs* | 35% of US entrepreneurs and 19% in UK dyslexic; strong soft‑skill strengths and delegation strategies | [PubMed abstract & PDF] |
| 2019 | AMA article | Summarizes Logan’s findings; communication and growth traits among dyslexic entrepreneurs | [AMA summary] |
| 2020 | Hewes – Singapore entrepreneur study | 26% incidence in Singapore; high visual‑spatial strengths, less empathy/memory | [Singapore PDF] |
| 2025 | Lindstrom preprint | Dyslexic traits align with successful entrepreneurial traits | [ResearchGate summary] |

**Additional context & commentary**

* Logan’s landmark 2009 study built on earlier UK findings (Logan 2001) and remains the benchmark for dyslexia-incidence in startup founders [Academia+1das.org.sg+1](https://www.academia.edu/30009664/Dyslexic_and_Entrepreneur_Typologies_Commonalities_and_Differences?utm_source=chatgpt.com)[Bayes Business School+1das.org.sg+1](https://www.bayes.citystgeorges.ac.uk/__data/assets/pdf_file/0003/367383/julielogan-dyslexic-entrepreneurs.pdf?utm_source=chatgpt.com).
* The Singapore study reinforces the global pattern, showing elevated incidence rates and highlighting distinct cognitive profiles in Asian entrepreneurial contexts [das.org.sg](https://das.org.sg/wp-content/uploads/2023/10/APJDD-7-2-2020-HEWES.pdf?utm_source=chatgpt.com).
* While newer, larger-scale studies remain limited, preprint work such as Lindstrom’s 2025 study supports the view of dyslexia as a cognitive advantage in entrepreneurial domains [Psychology Today](https://www.psychologytoday.com/us/blog/unlocking-language/202410/do-you-have-the-entrepreneurial-spirit?utm_source=chatgpt.com).

**DEFINITIONS OF DYSLEXIA**

**Information as at August 2009**

* DFNZ supports a broad spectrum view. Common themes: alternative or atypical way of thinking; proven neurobiological basis; is heredity; impacts broad spectrum of skills; occurs across a range of intellectual abilities; individuals face unexpected difficulties in acquiring certain skills and do not make expected progress
* The broad spectrum view acknowledges that dyslexia can cause issues across a number of areas. In the UK, the June 2009 report from **Sir Jim Rose** report (Identifying and Teaching Children and Young People with Dyslexia and Literacy Difficulties) created a working definition. This was agreed with the UK Department for Children, Schools and Families and stated that:
* Dyslexia is a learning difficulty that primarily affects the skills involved in accurate and fluent word reading and spelling
* Characteristic features of dyslexia are difficulties in phonological awareness, verbal memory and verbal processing speed
* Dyslexia occurs across the range of intellectual abilities
* It is best thought of as a continuum of abilities and difficulties, not a distinct category, as there are no clear cut-off points
* Co-occurring difficulties may be seen in aspects of language, motor coordination, mental calculation, concentration and personal organisation but these are not, by themselves, markers of dyslexia
* A good indication of the severity and persistence of dyslexic difficulties can be gained by examining how the individual responds or has responded to well-founded intervention
* Sir Jim noted that “Despite different definitions of dyslexia, expert views very largely agree on two basic points. First, dyslexia is identifiable as a developmental difficulty of language learning and cognition. In other words, it is now widely accepted that dyslexia exists. Secondly, the long running debate about its existence should give way to building professional expertise in identifying dyslexia and developing effective ways to help learners overcome its effects.”
* **The US definition**, proposed by the International Dyslexia Association (referred to in the Sir Jim Rose report as widely accepted) said: “Dyslexia is one of several distinct learning disabilities. It is a specific language-based disorder of constitutional origin characterised by difficulties in single word decoding.”
* It is not a matter of not knowing the answer. The difficulty is in pulling the word out and saying it. Not that they don’t know, but that they have trouble retrieving, accessing information (p8). Clues to reading difficulties are slow progress in acquiring reading skills; lacking strategy to read unknown words or sound out; inability to read small, function words such as that, an, in; reading is tiring; low self-esteem… (p9)
* Sea of strengths model (p10)

**Data, studies, research findings or resources published on definitions of dyslexia since August 2009.**

**2009 – Sir Jim Rose (UK)**

The Rose Review worked with DCSF to establish the following definition, widely accepted in the UK by mid‑2009:

* A **learning difficulty** primarily affecting accurate and fluent **word reading and spelling**
* Core deficits in **phonological awareness**, **verbal memory**, **processing speed**
* Occurs **across the range of intellectual abilities**, best understood as a **continuum**, not a discrete category
* Frequently accompanied by **co-occurring challenges** (e.g. motor skills, organisation) that alone are not diagnostic
* Severity judged by **response to intervention**

“Expert views agree: dyslexia is identifiable, so the debate should shift to professional development for identification and intervention.”  
*(Sir Jim Rose, 2009)*

**2002–Present – IDA / NIH Consensus Definition**

Adopted in 2002 and widely used internationally, including by the US International Dyslexia Association:

“Dyslexia is a specific learning disability that is neurobiological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language… Secondary consequences may include reading comprehension issues and limited reading experience, which can impede vocabulary and background knowledge.”

**Link:** [Reading Horizons+8SpringerLink+8SpringerLink+8](https://link.springer.com/article/10.1007/s11881-024-00311-0?utm_source=chatgpt.com)[Dyslexia Help](https://dyslexiahelp.umich.edu/blog/new-research-is-calling-for-the-definition-for-dyslexia-to-be-updated/?utm_source=chatgpt.com)[ScienceDaily+10International Dyslexia Association+10Wikipedia+10](https://dyslexiaida.org/definition-of-dyslexia/?utm_source=chatgpt.com)[University of Birmingham+3Wikipedia+3SpringerLink+3](https://en.wikipedia.org/wiki/Reading_disability?utm_source=chatgpt.com)[SpringerLink+3SpringerLink+3University of Birmingham+3](https://link.springer.com/article/10.1007/s11881-024-00305-y?utm_source=chatgpt.com)

**2018–2024 – Continuum & Spectrum-Based Reaffirmation**

A 2024 commentary in the *Annals of Dyslexia* reaffirmed the Rose Review definition as accurate and relevant, emphasizing key points: dyslexia is:

1. A **difficulty decoding/encoding print**
2. Associated with **phonological problems**
3. Occurs **across intellectual levels**
4. A **dimensional disorder** with no clear cutoff  
   Secondary co-occurring challenges are **not markers**, and intervention response remains critical for assessment

**Link:** [SpringerLink+1Reading Horizons+1](https://link.springer.com/article/10.1007/s11881-024-00316-9?utm_source=chatgpt.com)[Reading Horizons+2SpringerLink+2PMC+2](https://link.springer.com/article/10.1007/s11881-024-00305-y?utm_source=chatgpt.com).

**2024 – *Annals of Dyslexia* Special Issue: "Revisiting the Consensus Definition"**

Editors and multiple contributors (Odegard, Middleton, Farris, Catts and others) called for re-evaluating the 2002 IDA definition in light of new neurobiological and developmental evidence. Themes include:

* Retaining neurobiological roots while acknowledging heterogeneity
* Linking definition to **lifespan trajectories**, **mental health**, and **policy context**
* Tailoring definitions for **different audiences**: research, practice, policy, advocacy

**Link:** [SpringerLink](https://link.springer.com/article/10.1007/s11881-024-00316-9?utm_source=chatgpt.com)[University of Birmingham](https://www.birmingham.ac.uk/news/2025/we-need-a-new-definition-of-dyslexia-research-says?utm_source=chatgpt.com).

**2025 – University of Birmingham Delphi Study (Professor Julia Carroll et al.)**

Using consensus from 58 international experts, the new proposed definition states:

* **Dyslexia** = set of **processing difficulties** affecting reading and spelling acquisition
* Literacy skills **below** expectations for age and educational context
* A **continuum**, experienced to varying degrees
* Rooted in **genetic & environmental influences**, with **phonological processing** consistently implicated
* Can involve other domains: working memory, processing speed, orthographic skill
* Often **co-occurs** with ADHD, dyscalculia, DLD, motor coordination difficulties

Their coordinated *Delphi* approach resulted in 42 consensus statements accepted by over 80% of participants

**Link:** [acamh.onlinelibrary.wiley.com+14University of Birmingham+14ScienceDaily+14](https://www.birmingham.ac.uk/news/2025/we-need-a-new-definition-of-dyslexia-research-says?utm_source=chatgpt.com)[studyfinds.org+1Fairfax County Public Schools+1](https://studyfinds.org/experts-agree-dyslexia-definition/?utm_source=chatgpt.com).

**Summary Table**

| **Year** | **Study** | **Source** |
| --- | --- | --- |
| 2009 | Rose Review (UK) | Continuum model; broad spectrum; agrees with IDA-style definitions |
| 2002–present | IDA / NIH Consensus Definition | Neurobiological; phonological deficit-based; no IQ discrepancy required [Dyslexia Help+1Wikipedia+1](https://dyslexiahelp.umich.edu/blog/new-research-is-calling-for-the-definition-for-dyslexia-to-be-updated/?utm_source=chatgpt.com)[Reading Horizons+2International Dyslexia Association+2SpringerLink+2](https://dyslexiaida.org/do-we-need-a-new-definition-of-dyslexia/?utm_source=chatgpt.com)[International Dyslexia Association+1SpringerLink+1](https://dyslexiaida.org/definition-of-dyslexia/?utm_source=chatgpt.com) |
| 2024 | *Annals of Dyslexia* special issue | Reassessment of 2002 definition based on lifespan, heterogeneity, policy [SpringerLink](https://link.springer.com/article/10.1007/s11881-024-00316-9?utm_source=chatgpt.com) |

**How This Aligns with DFNZ’s broad spectrum view:**

* **Neurobiological basis & continuum**: consistent with widely recognized definitions
* **Cross‑range intellectual ability & atypical thinking patterns**: affirmed in both US/UK frameworks
* **Co-occurring non‑literacy challenges** (motor, memory, language) are acknowledged but not sufficient for diagnosis
* **Response to intervention** remains vital in judging severity and persistence

**PERSONALISED LEARNING AND ACCOMODATIONS**

**Information as at August 2009**

**Personalised learning: Sir Jim Rose:** June 2009 report (Identifying and Teaching Children and Young People with Dyslexia and Literacy Difficulties)

* Personalised learning – tailoring teaching and learning to the needs of the individual – is being promoted to schools as a critical driver in helping pupils to make the best possible progress, and achieve the best possible outcomes (p12)
* Central to personalising learning is Assessment for Learning (AfL) as a means of tracking how a chid is progressing against national and personal targets, and the subsequent use of this data to inform lesson planning and interventions
* AfL can be the most accurate way of identifying quickly when a child is struggling in particular areas of learning or is experiencing other underlying problems. (No child left behind)

**No to Failure Final Report 2009: Dyslexia-SpLD Trust UK**

* No to Failure project: May 2007-end 2008. Maximum timeframe between pre and post test 20 weeks. Three major London boroughs: Southward summer 07, Cornwall autumn 07, Calderdale spring 08
* Objectives: to demonstrate why dyslexia-special learning difficulties (SpLD) training is essential; and to trial in 19 Trailblazer Schools.
* Employed synthetic phonics, metacognitive awareness, deliberate targeting of student’s strengths; wide range of imaginative and motivating techniques; use of current technologies; explicitly taught study skills; plenty of opportunities for overlearning; small measurable steps; explicit goals and targets; focus on raising self-esteem by building confidence; specific praise etc
* Demonstrated that specialist teaching works, and that even a fairly modest amount of specialist teacher input can make a marked difference to literacy skills (p6, p93)
* Compares well with published studies of phonologically based interventions in US and UK. Also with published results from longterm impact of teaching in UK specialist dyslexia schools and centres
* Relatively inexpensive. Average amount of specialist teacher time 16.8 hours = £588 per student at £35 hour
* Recommending Training Pyramid: Level 1 Foundation; Level 2 Certificate and Level 3 Diploma (p8)

**Professor Sally Shaywitz and the critical importance of accommodations:**

* **Sally Shaywitz knol: Disparity between reading and intellectual abilities of dyslexics means accommodations are critical to assure fairness and equity.**
* The need and validity of accommodations have a scientific basis. They create a level playing field and support concepts of equity and fairness – students getting what they need, not the same
* Challenges the dyslexia is only a literacy deficit model and thinking and says, yes of course we need literacy intervention at the earliest time, but without accommodation the greatest difficulty (self-esteem) will not be avoided
* Accommodations need to be in place as soon as any indications for them are evident, not when the problem has manifested (ambulance at bottom of cliff)
* By providing accommodations we keep dyslexic students engaged and up with the rest of the class, not lagging and alienated
* Without accommodations we won't succeed, literacy only interventions are not enough. Both are necessary to reflect the truth in the form of solution paths
* Dr Shaywitz’s laboratory was one of first in world to image the dyslexic brain using functional magnetic resonance imaging (fMRI). Have imaged several thousand children and adults as they read
* Their findings, combined fMRI data from around world, show that three neural systems are used for reading, all in left side of brain. Dyslexics, however, have a neural signature of disruption of two neural systems in the back of the brain
* Many dyslexics are not able to make good use of sound-symbol linkages and rely on memorised words instead. Often it is not a matter of not knowing the answer, rather the problem is in pulling the word out and saying it. In short, it is not that they don’t know, but that they have trouble retrieving, accessing information**.** Therefore accommodations of time in the classroom, for example, have a neurobiological basis and help level the playing field
* Dr Shaywitz says a major advance has been the convergence of behavioral and neuroimaging data providing evidence for this critical need for extra time on examinations for dyslexic students, particularly as they progress towards high school graduation and beyond
* Thus, behavioral data indicating the persistence of dysfluent reading is now supported by neurobiological data.  In terms of the neural signature for dyslexia, the posterior reading systems, especially the left occipto-temporal (word-form) region responsible for fluent, rapid reading, is disrupted in dyslexic children and adults
* Other compensatory systems, in the frontal regions on both left and right hemispheres, and the right hemisphere homologue of the word form area develop, and these systems support increased accuracy over time.  However, the word-form region does not develop and compensatory pathways do not provide fluent or automatic reading
* Accordingly, if such students are to demonstrate the full range of their knowledge, providing additional time on examinations is a necessity to compensate for the lack of availability of the efficient word-form area and to level the playing field
* Dr Shaywitz identified three general types of accommodations.
* Those that bypass the reading difficulty by providing information through an auditory mode
* Those that provide compensatory assistive technologies, and
* Those that provide additional time so that the dysfluent reader can demonstrate his/her knowledge
* Contemporary management of dyslexia requires evidence-based accommodations, including: access to recorded materials; computers and print-to-speech software; additional time on examinations, with amount of time determined by the student’s experience
* In addition, it is inappropriate to assess a dyslexic person’s knowledge based on his/her performance on an oral examination in which that individual is under pressure to provide a quick or glib response

**Data, studies, research findings or resources published on personalised learning and accommodations since August 2009.**

**2014 – Systematic Review: Inclusion in Higher Education**

**Focus**: Identified teaching and institutional factors that support dyslexic students, including personalized and multi-format content delivery, student-centered teaching, and individualized accommodations like extended time and assistive technologies.

**Link**: [PubMed Abstract](https://pubmed.ncbi.nlm.nih.gov/25293652/) [Reddit+15PubMed+15ResearchGate+15](https://pubmed.ncbi.nlm.nih.gov/25293652/?utm_source=chatgpt.com)

**Expanded Link**: [Full-text via PMC](https://pmc.ncbi.nlm.nih.gov/articles/PMC4253321/) [PMC](https://pmc.ncbi.nlm.nih.gov/articles/PMC4253321/?utm_source=chatgpt.com)

**2016 – NZ “Plus 20” NCEA Accommodations Initiative**

**Highlights**: Emphasis on equity through early, seamless provision of Special Assessment Conditions (SACs)—like reader/writer support, computer use, and extra time—to support fairness in learning outcomes.

**Link**: [DFNZ “Making Good in the Classroom” overview](https://www.dyslexiafoundation.org.nz/dyslexia_advocacy/education.php) [dyslexiafoundation.org.nz](https://www.dyslexiafoundation.org.nz/dyslexia_advocacy/education.php?utm_source=chatgpt.com)

**2022–2024 – University Educator Practices & Awareness**

**Findings**: Higher education increasingly includes dyslexia accommodations (e.g. extra time, grammar/ spelling leniency), but many educators still lack practical training. Disclosure dilemmas and stigma also limit student access.

**Link**: [Frontiers in Education, 2024 scoping review](https://www.frontiersin.org/journals/education/articles/10.3389/feduc.2024.1372699/full) [Frontiers](https://www.frontiersin.org/journals/education/articles/10.3389/feduc.2024.1372699/full?utm_source=chatgpt.com)

**2024 – Aotearoa NZ Learner Perspectives—Adult Dyslexic Journey**

**Key Themes**: Recognition, resourcefulness, resilience, self‑advocacy, and the need for educator training in alternate assessment approaches and peer mentoring.

**Link**: [Ako Aotearoa report: “Ako Mai Me: The adult dyslexic learner journey and experience”](https://ako.ac.nz/knowledge-centre/ako-mai-me-the-adult-dyslexic-learner-journey-and-experience) [ako.ac.nz](https://ako.ac.nz/knowledge-centre/ako-mai-me-the-adult-dyslexic-learner-journey-and-experience?utm_source=chatgpt.com)

**Insights**: Digital interventions—mobile apps, augmented reality, NLP tools, and VR—are becoming prominent supports for dyslexic learners. Non-digital tools remain useful but lag behind.

**Link**: [ArXiv systematic review (2015–2023)](https://arxiv.org/abs/2412.13241) [arXiv](https://arxiv.org/abs/2412.13241?utm_source=chatgpt.com)

**2024 – AI-Based Personalization Tools**

**LLM-Powered Aid**: *LARF* (Let AI Read First) enhances reading clarity for dyslexic individuals through annotated support, resulting in significantly improved reading experience—most notably for those with severe challenges.

**Link**: [ArXiv paper on LARF](https://arxiv.org/abs/2504.00941) [arXiv](https://arxiv.org/abs/2504.00941?utm_source=chatgpt.com)

**Recommendation Systems**: AI models now suggest personalized accommodations by analyzing individual user needs, optimizing support strategies.

**Link**: [AI recommendation model research](https://arxiv.org/abs/2403.14710) [arXiv](https://arxiv.org/abs/2403.14710?utm_source=chatgpt.com)

**2022–2025 – Assistive Accommodations Summary & Effectiveness**

**Meta-Analysis**: Presentation-based accommodations (like text-to-speech, large print, dictation, and extended time) are often studied; yet individual responses vary significantly.

**Link**: [2022 NCEO Report on K‑12 accommodations](https://publications.ici.umn.edu/nceo/nceo-reports/444/summary-of-the-research-on-the-effects-of-k-12-test-accommodations-2022) [nceo.umn.edu+1ResearchGate+1](https://nceo.umn.edu/publications/OnlinePubs/Synthesis94/?utm_source=chatgpt.com)[Publications ICI](https://publications.ici.umn.edu/nceo/nceo-reports/444/summary-of-the-research-on-the-effects-of-k-12-test-accommodations-2022?utm_source=chatgpt.com)

**2025 – Personalized Learning & Learner Typing**

**Georgia State University (2023)**: Ongoing NIH-funded research seeks early predictors to match dyslexic learners to effective reading interventions, supporting truly personalized instruction.

**Link**: <https://news.gsu.edu/2023/01/18/research-snapshot-reading-interventions-for-students-with-dyslexia/>

**Ontology-Based e-Learning**: Customizes learning materials based on dyslexia subtype, facilitating better engagement and outcomes.

**Link**: [AGENT-DYSL ontological system paper (2015)](https://www.researchgate.net/publication/281412919_Personalised_Learning_Materials_Based_on_Dyslexia_Types_Ontological_Approach) [ResearchGate](https://www.researchgate.net/publication/281412919_Personalised_Learning_Materials_Based_on_Dyslexia_Types_Ontological_Approach?utm_source=chatgpt.com)

**Summary Table**

| **Year** | **Study** | **Source** |
| --- | --- | --- |
| 2014 | HE inclusion & accommodations | [Systematic review](https://pubmed.ncbi.nlm.nih.gov/25293652/)[PubMed+1ResearchGate+1](https://pubmed.ncbi.nlm.nih.gov/25293652/?utm_source=chatgpt.com) |
| 2016 | NCEA accommodations in NZ (SACs) | DFNZ overview [dyslexiafoundation.org.nz](https://www.dyslexiafoundation.org.nz/dyslexia_advocacy/education.php?utm_source=chatgpt.com) |
| 2022–24 | Educator practices & disclosure dynamics | 2024 review [Frontiers](https://www.frontiersin.org/journals/education/articles/10.3389/feduc.2024.1372699/full?utm_source=chatgpt.com) |
| 2024 | Adult dyslexic learner experiences (NZ) | Ako Mai Me report [ako.ac.nz](https://ako.ac.nz/knowledge-centre/ako-mai-me-the-adult-dyslexic-learner-journey-and-experience?utm_source=chatgpt.com) |
| 2022–24 | Digital assistive technologies overview | [ArXiv review](https://arxiv.org/abs/2412.13241) [arXiv](https://arxiv.org/abs/2412.13241?utm_source=chatgpt.com) |
| 2024–25 | AI-driven tools (LLM support & recommendations) | [LARF tool](https://arxiv.org/abs/2504.00941) [arXiv](https://arxiv.org/abs/2504.00941?utm_source=chatgpt.com), [AI rec models](https://arxiv.org/abs/2403.14710)[arXiv](https://arxiv.org/abs/2403.14710?utm_source=chatgpt.com) |
| 2022 | K‑12 accommodations effectiveness review | NCEO report [Publications ICI](https://publications.ici.umn.edu/nceo/nceo-reports/444/summary-of-the-research-on-the-effects-of-k-12-test-accommodations-2022?utm_source=chatgpt.com) |
| 2023–25 | Personalized learning via subtype & prediction | Ongoing study [Oak Foundation](https://oakfnd.org/personalising-learning-for-students-who-learn-differently/?utm_source=chatgpt.com), [Ontology tools](https://www.researchgate.net/publication/281412919_Personalised_Learning_Materials_Based_on_Dyslexia_Types_Ontological_Approach)[ResearchGate](https://www.researchgate.net/publication/281412919_Personalised_Learning_Materials_Based_on_Dyslexia_Types_Ontological_Approach?utm_source=chatgpt.com) |

**In Summary:**

* The shift toward **personalized, multisensory, and equitable learning** has accelerated since 2009, encompassing everything from classroom practices to AI-driven support tools.
* **Assistive technologies have advanced**, especially with emerging AI solutions like LARF, tailored recommendations, and VR/AR applications.
* **Educator training and institutional inclusivity** remain key obstacles—as emphasized in recent higher education reviews and NZ learner-centered research.
* **NZ-specific frameworks** (e.g., Plus 20 SACs, Ako Mai Me report) highlight locally applied approaches to ensure fairness and amplify learner voice.

**ends**

**NZ BANKERS ASSOCATION MEMO**

**17 May 2021**

At a practical level we’d like to help our member banks identify and assist their neuro-diverse customers.

From our discussion we understand that neurodiverse people may be less able than neuro-typical people to use online and mobile app banking services. That leads to them preferring to use branches and contact centres. When neurodiverse people are talking to bank staff directly, either in branches or by phone, it would help if staff could recognise the signs of neurodiversity and respond accordingly.

Signs of neurodiversity that bank staff should be aware of include customers who seem:

* anxious or stressed
* have difficulty articulating their needs.

Are there any other signs bank staff should be aware of?

In response to a customer who presents in this way, bank staff should be encouraged to ask the customer: “Is there anything I can do to make this easier for you?”. The staff member should then do what they can to meet the customer’s needs.

Is there a better question bank staff could ask to assist the customer?

**How banks can help neurodiverse customers access banking services**

**Introduction**

We recently meet with the Dyslexia Foundation of New Zealand (DFNZ) to discuss the issues neurodiverse people face in accessing banking services, especially online and mobile banking apps. Following that discussion, we have prepared some practical guidance below on how banking staff can identify and assist neurodiverse customers.

**Action:**

This is provided for your information and action. Please share this with relevant colleagues within your business.

**What is neurodiversity?**

Neurodiversity refers to differences in the way our brains are wired and process information. Neurodiversity spans a spectrum from neurotypical individuals through to conditions such as Asperger’s, Autism, Dyscalculia, Dysgraphia, ADHD, Traumatic Brain Injury, Fetal Alcohol Syndrome. DFNZ, based on international occurrence, conservatively estimates at least 10% of the New Zealand population have dyslexia, and at least 20% collectively have some other form of neurodifference, so almost one in three (about 1.5 million) New Zealanders.

Neurotypical people use the ‘verbal’ left side of the brain to process information, making them word-based thinkers. Dyslexic individuals in contrast use the ‘visual’ right side of the brain. In short, they tend to turn words into pictures to understand them, and then have to turn the picture back into words to respond – a process that requires extra effort and time.

Other neurodiversities also reflect differences in brain wiring and processing – for example Dyspraxia involves many different nerves and parts of the brain that impact physical co-ordination; in Autism, social development is impacted, and with Asperger’s a different part of the brain engages when the individual assesses facial expressions.

The effects of neurodiversity range from mild to intense. On one end of the spectrum or in a particular environment, individuals may be high functioning performers who appear to easily engage with their neurotypical counterparts. At the other, individuals may experience one or more of a range of challenges: anxiety and nervousness, decreased spatial awareness, slower cognitive processing speeds and comprehension, impaired or heightened auditory and visual perception, issues with auditory processing, high sensitivity to light and sounds and sensory overload, poor short-term memory and variable concentration, reduced ability to understand procedures and follow instructions, inability to comprehend cause and effect and/or consequences, difficulty making eye contact, easily distracted, poor time management/timekeeping and so on.

**How does neurodiversity affect access to banking services?**

When it comes to banking, neurodiverse people may face a number of challenges in accessing and using online and mobile app banking services. Individuals with dyslexia and other neurodiversities tend to find internet banking highly stressful, with fear of inputting wrong information or pushing the wrong button leading to financial loss.

Failing to navigate the internet banking process successfully then impacts mental wellbeing, adding to feelings of vulnerability, lack of confidence and low self-esteem. Privacy issues arise if people have to ask others to help, and in the process have to disclose personal financial information, and the risk of scams is also ever present. Another group who are disadvantaged are those without easy access to internet banking services, and those who cannot afford digital devices.

Whilst these issues are not top of mind for neurotypical people and those who are ‘digital natives’, they are critical issues for those with neurodiversity. Often this leads to them preferring to use branches and contact centres. When neurodiverse people are talking to bank staff directly, either in branches or by phone, staff must be aware of signs of neurodiversity and respond accordingly.

**How to identify a neurodiverse customer**

As noted earlier, neurodiversity is a spectrum, and some signs are easier to recognise than others. Identifying a neurodiverse customer is the first step to helping them with their banking needs. To do so, there are some signs for frontline staff to look out for.

Common to a range of neurodisabilities are different degrees of comprehension and (dis)comfort in social situations, along with behaviours that might be perceived as hostility, or acting out. In reality, these are often coping mechanisms for the individual with neurodisabilities and have no pejorative meaning. Most importantly, avoid jumping to conclusions and assume customers are trying to be ‘difficult’.

Lack of eye contact is a commonplace characteristic. Eye contact can be unpleasant and very confronting at a deep level, creating anxiety, nervousness, and overwhelm. There are also cultural considerations in that while eye contact is considered important in Western culture; for many others – including Maori, Pasifika, Asian, Middle Eastern and Latin American cultures – significant eye contact can be seen as inappropriate, be subject to gender rules and in some cases be considered intensely disrespectful.

Answering 'yes' quickly and frequently to questions, whether they are understood or not, is another neurodiverse coping strategy to bring an uncomfortable situation to an end.

Sensory overload can come from too much sensory input, whether visual, auditory or olfactory, ie bright long run/fluorescent lights, loud noises, small spaces, strong smells (including food or perfume).

Fidgeting or tapping are another common characteristic of neurodiversities. Whilst this is indicative of anxiety or nervousness in the individual, it can be misinterpreted as guilt, disinterest or belligerence. In reality, fidgeting and tapping can be a calming repetitive action that aids focus and concentration.

**How to respond to the customer’s needs**

Where staff recognise signs that a customer may be neurodiverse, asking how staff can better meet their needs can help put the customer at ease. The best strategy is ‘notice and adjust’. So ‘notice’ where discomfort or difficulties are arising in communication, and ‘adjust’ your responses and/or the environment.

Examples of initial questions to ask include:

* Is there anything I can do to make this easier for you? (in branch and by phone)
* Is there a support person you would like to bring with you [if arranging an appointment]
* Would you like to talk to someone in a quiet space? (if in branch)
* Would you like help filling in any of these forms?

The following checklist sets out some of the common characteristics of neurodiversities and some appropriate responses:

|  |  |  |  |
| --- | --- | --- | --- |
| **HOW NEURODISABILITIES MAY PRESENT** | **HOW THIS MIGHT APPEAR TO YOU** | **PERSPECTIVE OF THE NEURODIVERSE PERSON** | **SIMPLE THINGS THAT CAN MAKE A BIG DIFFERENCE** |
| **Can’t hold eye contact or is easily distracted.** | Suspicious behaviour, belligerence, disinterest. | Eye contact is very unpleasant and very confronting at a deep level.  Eye contact creates anxiety, nervousness, and overwhelm. | Don't expect eye contact.  Ensure an appropriate trusted support person is present. |
| **Answering 'yes' quickly & frequently to questions.** | Bored, not engaging or taking things seriously. | A typical well practised coping strategy to bring an uncomfortable situation to an end. | Be alert for rapid, repetitive ‘yes’. Lower your voice and try to sound non-confrontational.  Frame questions as open-ended questions that cannot be answered with yes or no.  Keep questions short.  Avoid the use of double negatives – they are very confusing.  Allow time for the individual to process what it is they are being asked. |
| **Individual appears ‘shut down’**.  **May also display tics or put clothing or hands over eyes, ears, or nose.** | Lack of cooperation or interest, sullen behaviour, moodiness. | ’Sensory overload’.  Unable to cope with any more sensory input or visual, auditory, or olfactory stimuli, e.g. bright long run/fluorescent lights, loud noises, small spaces.  A coping/survival strategy to block out light, noise, and smell. | Aim for a calm, ordered, and stable environment without strong smells [including perfume and body odour].  If possible, move to quieter surroundings.  Minimise outside noise and dim lights if possible.  Give ‘rest breaks’.  Offer food/drink if possible. |
| **Literacy and comprehension difficulties:**  Appears to be ‘daydreaming’ during conversations.  Cannot follow instructions and gets lost after one or two instructional commands.  Can’t recall what he/she is supposed to do next.  Doesn’t appear to be listening when you explain the process. | Obstructive.  Not engaged in the process.  May get ‘lippy’, swear, or become physically aggressive.  Suspicious behaviour, belligerence, disinterest. | Feels embarrassed, inferior or inadequate.  Will do anything to avoid admitting to literacy/comprehension difficulties.  This is just ‘school experience’ happening again.  Needs clarity so may ask same question over and over. | Break information into bite-size chunks.  Scaffold and support each step/don't presume comprehension.  Refer to key events chronologically (rather than moving backwards and forwards).  Allow frequent breaks to restore concentration.  Read out statements and other documentation as necessary.  Use visuals if possible/available to structure conversation – can be used as a memory aid. |
| **Communication difficulties:**  Has trouble expressing ideas, can’t find the right word.  Difficulty with correct sequence of events.  Doesn’t understand paraphrasing or summary of processes, difficulty understanding proverbs and idioms. | Can’t comprehend instructions, acting stupid. | Confusion.  Overwhelm.  No idea what’s going on. | Allow plenty of time.  Don't presume comprehension.  Use simple language.  Break information into bite-size chunks.  Refer to key events chronologically (rather than moving backwards and forwards). |
| **Inappropriate social conduct/impulsive emotive reactions:**  Displays inappropriate emotional responses.  Poor control of emotions and behaviours, especially anger. | Rudeness, aggression, trying to be difficult. | Scared and threatened.  Feeling anxious, trapped, attacked and/or isolated. | Stay calm and be patient.  Model positive communication skills in the way you interact with the individual. |
| **Non-compliant, poor time keeping:**  Doesn’t arrive on time, or arrives at wrong place, forgets important documents, ignores police summons etc.  Struggles with following instructions and time management. | Lack of respect, deliberate non-cooperation. Doesn’t care. | Poor short-term memory, concentration, spatial awareness.  Struggles with anything requiring ‘executive function’. | Refer to key events chronologically (rather than moving backwards and forwards).  Allow/suggest the customer jot down notes – or make a rough sketch if this is more helpful – and then refer back to check details.  Scaffold and support each step/don't presume comprehension. |
| **Pulling clothing over head, banging head or kicking surfaces, hitting self.** | Acting out, rudeness, aggression. | Calming technique to escape visual and auditory stimuli.  Self soothing – through firm or repetitive deep pressure contact on body.  Sense of claustrophobia – too many people in a small space. | Offer a ‘rest break’ in a low stimulation environment. |
| **Fidgeting or tapping, often with an object such as a pen, phone or clothing elements.** | Disinterest, rudeness, suspicious behaviour. | Calming repetitive action that is a necessary tool to aid concentration and focus.  If unable to do this, the individual will have to exert considerable energy trying NOT to fidget or tap, making them unable to focus or prone to shutting down. | Allow customer to have the pen or similar object of their interest to assist with their need to actively process information. |
| **Absence seizures (where the individual appears to zone out):**  Non-responsive individual, may not answer to their name or may seem unable to focus eyes or hear. | Ignoring the situation.  Uncooperative. | If undiagnosed, may not be aware what is happening.  Afterwards may be tired but have no memory of the incident. | NB: Absence seizures are a recognised medical condition.  Rapid breathing (hyperventilation) can trigger an absence seizure. Usually begin and end abruptly, sometimes lasting only a few seconds.  Signs and symptoms of absence seizures include:   * Sudden stop in motion without falling * Lip smacking * Eyelid flutters * Chewing motions * Finger rubbing * Small movements of both hands   Recognise individual will be tired afterwards, seek medical help. |

**Further information**

For further information about the Dyslexia Foundation and neurodiversity, please see: <https://www.dyslexiafoundation.org.nz/>.