Presented by Chrissa Manoli

# NEURODIVERSITY IN HIGHER EDUCATION

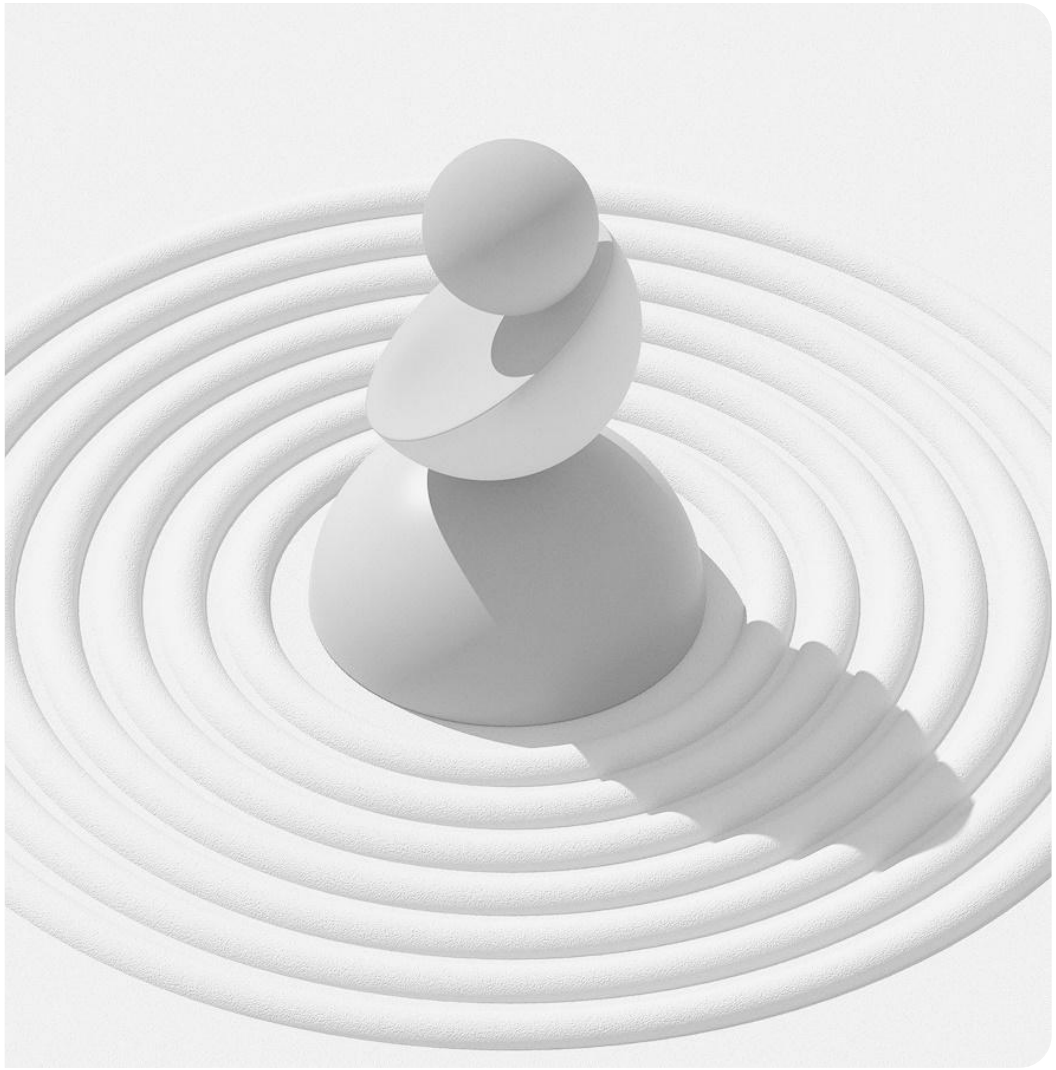
Understanding & Supporting Diverse Learners

UNIVERSITY OF TWENTE. | Centre of Expertise in Learning and Teaching (CELT)

# WELCOME

**In this session:**

1. Introduction to Neurodiversity and why
2. Common Neurodivergent types
3. Key Characteristics (**Discussion**)
4. Best Practices (**Discussion**)
5. Key Takeaways



# 01. WHY NEURODIVERSITY?

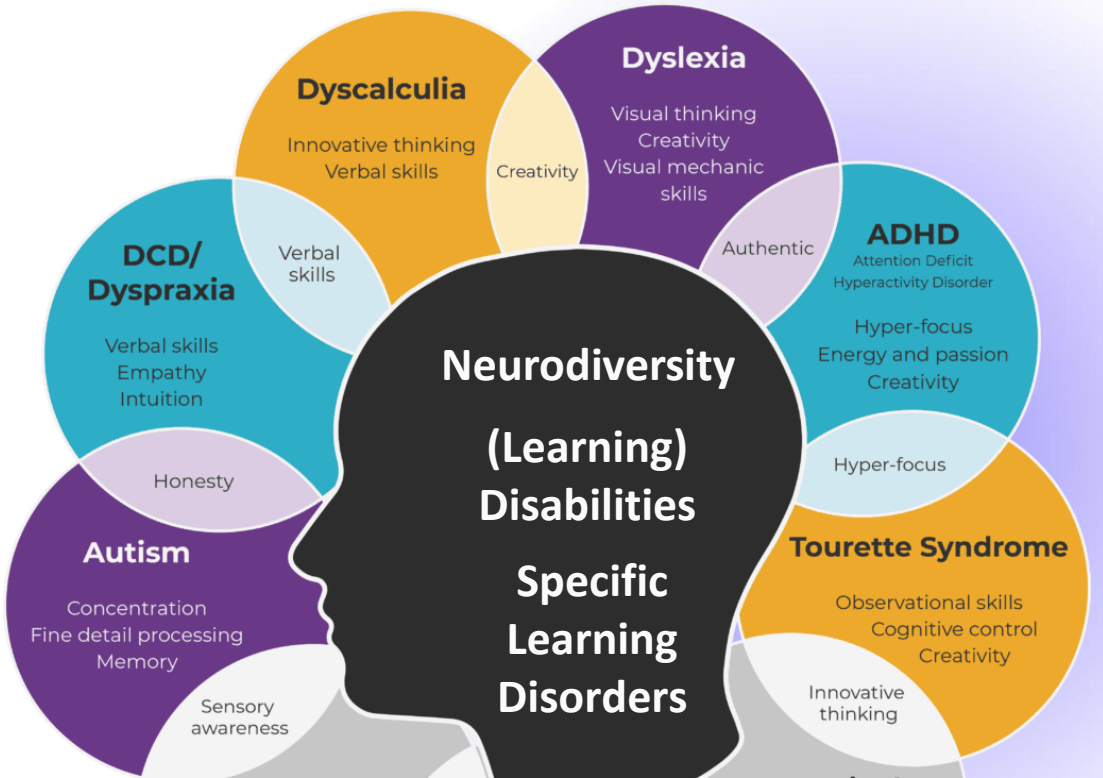
What is Neurodiversity and why is it relevant for Higher Education?

# WHAT IS NEURODIVERSITY ?

*Terms are often used interchangeably*

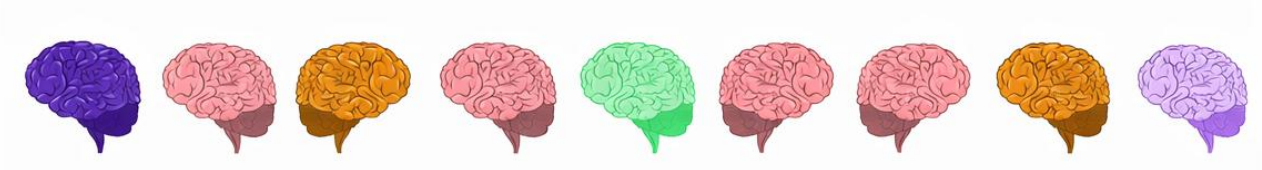
Some terms are:

- Clinical
- Educational
- Social / Descriptive



# NEURODIVERGENCE VS NEURODIVERSITY

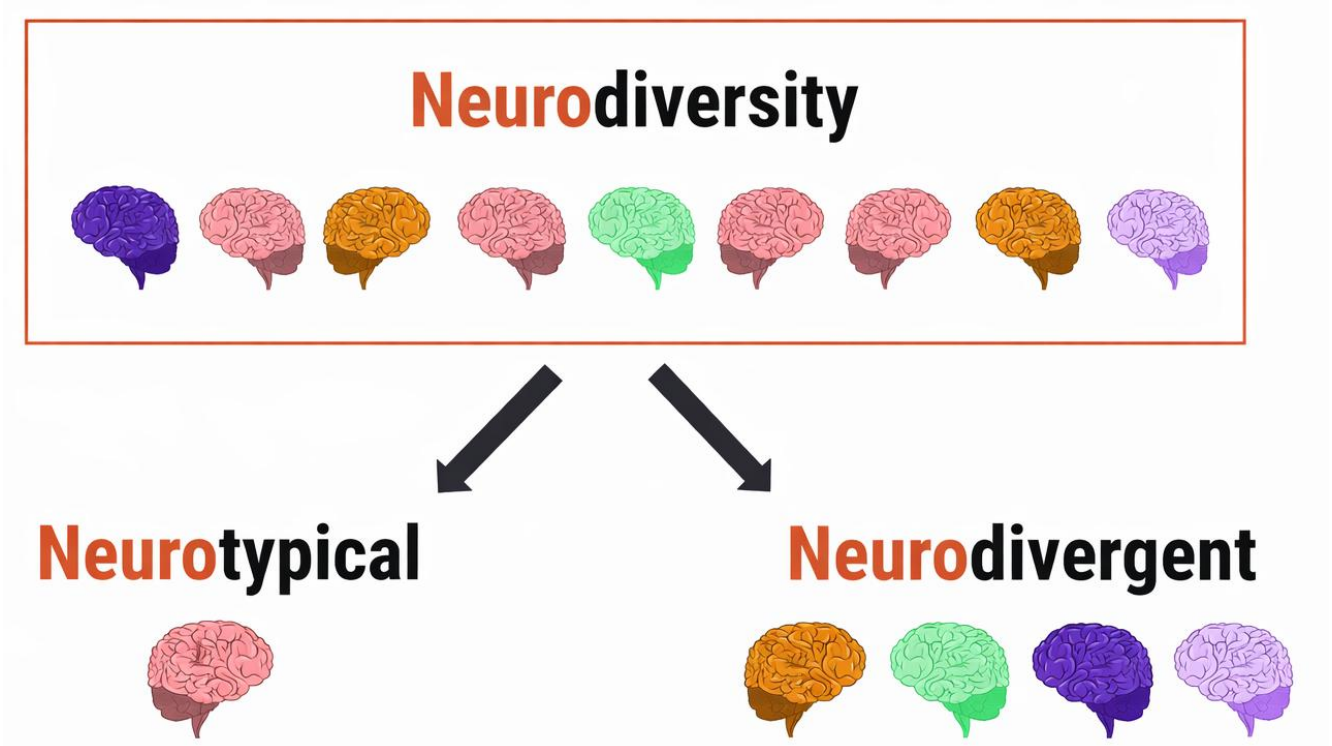
**Neurodiversity**



**Neurotypical**

**Neurodivergence**

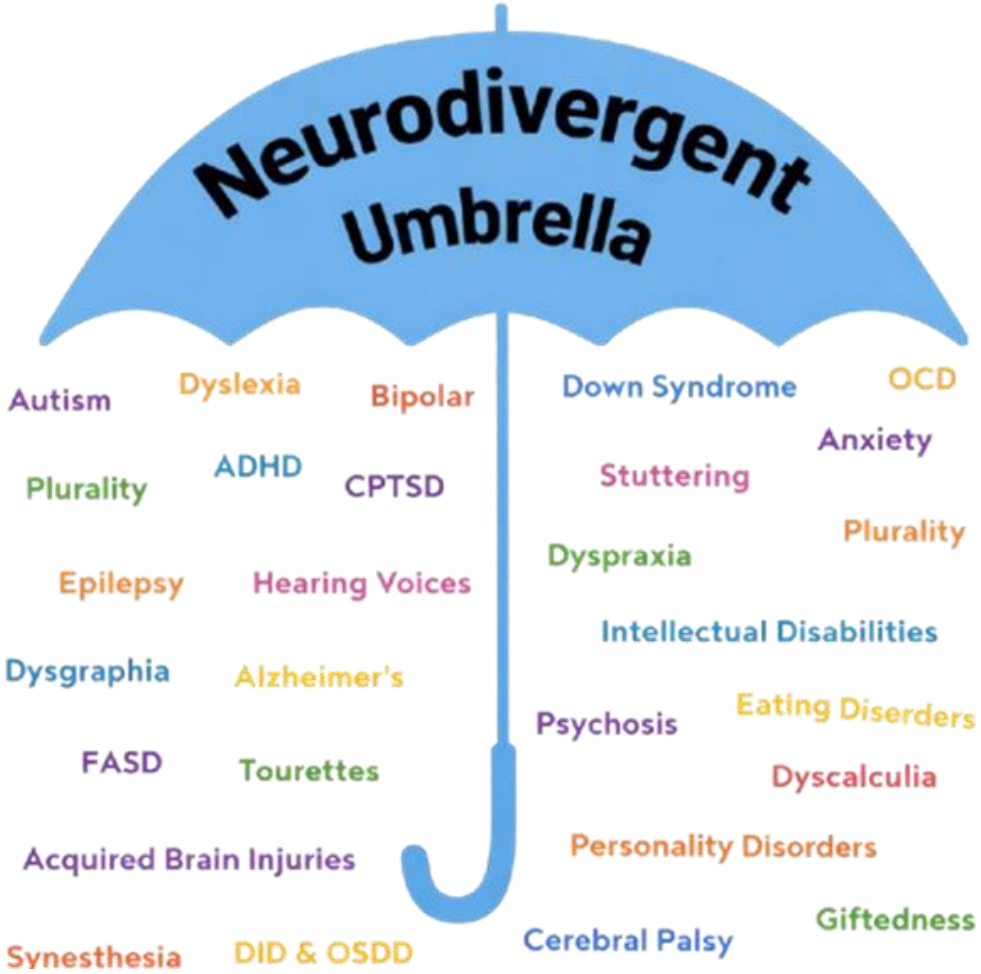
# NEURODIVERGENCE VS NEURODIVERSITY




Neurodiversity is a **population-level** concept

Neurodivergence is an **individual-level descriptor**

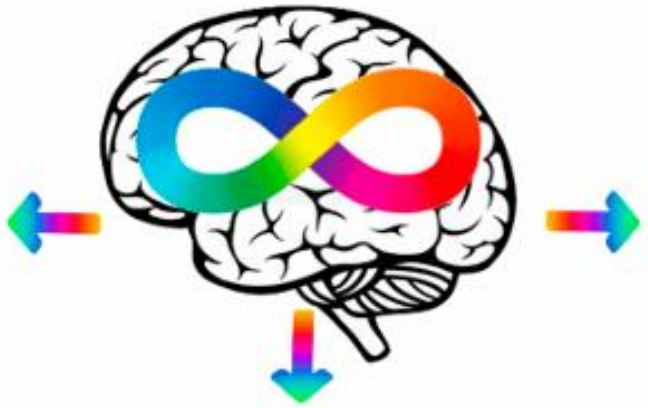
# WHAT IS NEURODIVERGENCE & WHY?




- **15-20%** of the world's population exhibits some form of neurodivergence (NIH, 2022)
- **21 %** of students in the Netherlands report study barriers due to neurodivergent conditions
- **28%** of students have **more than one condition** (Nationale Studenten Enquete, 2025)

# WHAT IS NEURODIVERGENCE & WHY?

**Neurominorities Classification**



**Developmental - Applied**

Related to the application of skills in specific domains with no health implications

e.g. learning disabilities (dyslexia, dysgraphia, dyscalculia)

**Developmental - Clinical**

Related to atypical behavior and communication patterns across domains.
Considered health issues.

e.g. (ADHD, ASD)

**Acquired - Clinical**

**Neurological**

Related to functional changes due to illness or injury to the nervous system.
Considered health issues.

e.g. (amnesia, aphasia)

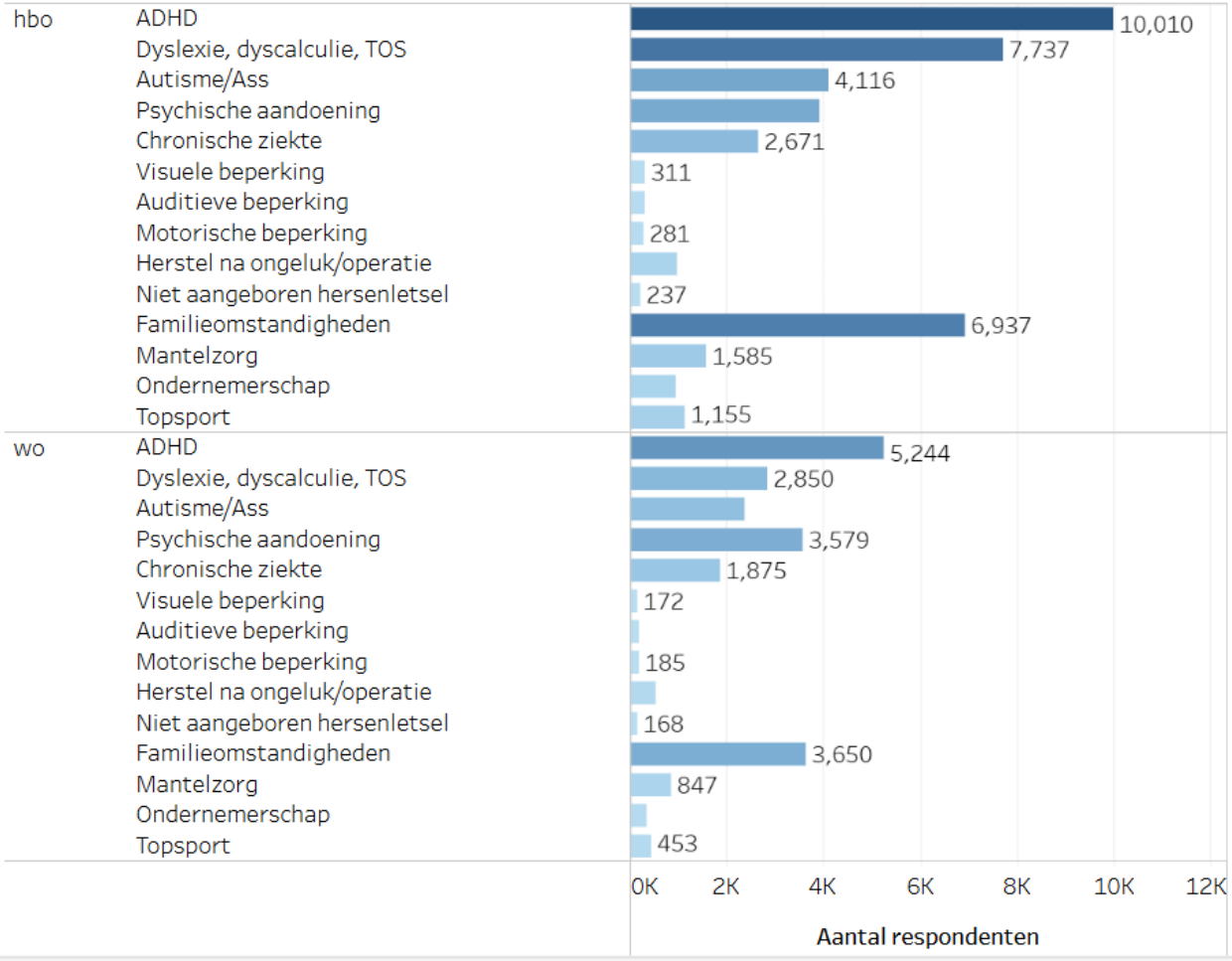
**Psychiatric**

Related to mental disorders affecting mood, perception and behavior.
Considered health issues.

e.g. (depression, schizophrenia)

# WHAT IS NEURODIVERGENCE AND WHY?

**Figuur 1.5. Meest genoemde bijzondere omstandigheden in het hbo en wo** by ECIO ECIO

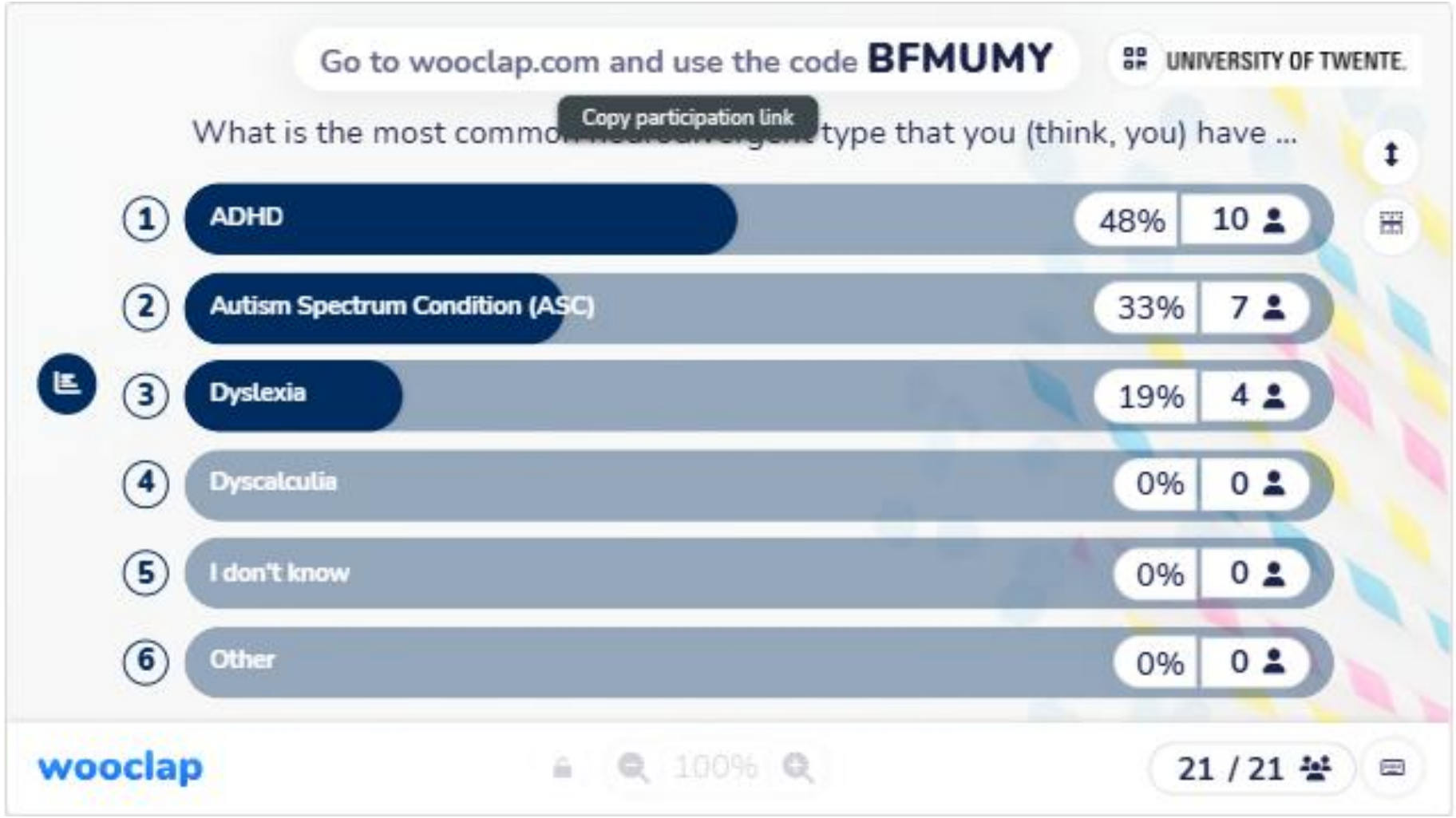



~20% ADHD

~4-6% Autism

5-10% Dyslexia/ Dyscalculia

# WHAT IS YOUR EXPERIENCE WITH NEURODIVERGENCE?



# 02. COMMON NEURODIVERGENT TYPES

What are the characteristics of the most common neurodevelopmental conditions in Higher Education?

# ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD)

What's it like? & Myths

Key Characteristics

How to support

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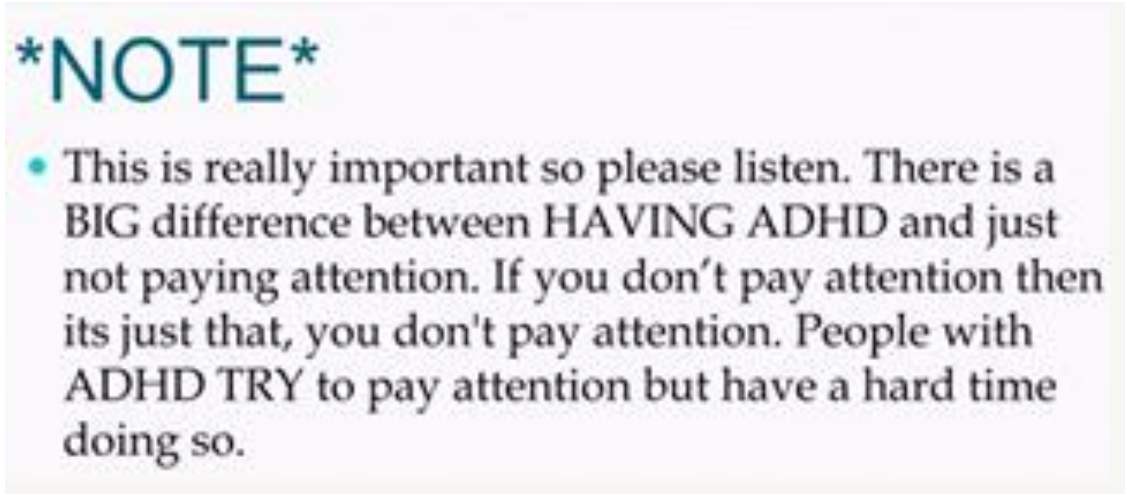
# ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD)




People with ADHD are often perceived as:

- *Daydreaming.*
- *Forgetting or losing things.*
- *Talking too much.*
- *Make careless mistakes.*
- *Hyperactivity.*
- *Inattentive.*
- *Impulsive*

# ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD)

- ADHD is a life-long developmental disorder of self-regulation and **Executive Functions (EF).** *(Barkley, 2013).*

3 sub-types:

- **1. ADHD-I (Inattentive)**: Difficulty sustaining attention
- **2. ADHD-H: (Hyperactive)**: mainly hyperactive and impulsive behaviour
- **3. ADHD-C (Combined):** both hyperactive and impulsive behaviour and difficulty maintaining attention.

# ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD)

MYTH 01

**ADHD IS NOT REAL**

ADHD is included in the American Psychiatric Association's **Diagnostic and Statistical Manual of Mental Disorders**.

MYTH 02

**PEOPLE WITH ADHD ARE JUST LAZY**

ADHD affects **attention, impulse control, and executive functioning.** Not a reflection of character.

MYTH 03

**THERE IS NO TREATMENT**

ADHD can be effectively treated through **behavior treatment, medications** and combined therapies.

# ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD)

**Problems with the working memory**

**Table 1:** Key Challenges in Educating Students with ADHD

| Challenges | Key Characteristic |
|---|---|
| Cognitive Challenges | • Difficulties with attention and concentration.<br>• Inability to organize and complete tasks.<br>• Careless errors in academic work. |
| Social Interactions | • Challenges in building positive relationships with peers.<br>• Misunderstanding of social norms.<br>• Impulsive behavior leading to conflicts.<br>• Feelings of isolation from the social group. |
| Emotional Challenges | • Increased levels of stress and anxiety.<br>• Low self-esteem due to frequent failures.<br>• Intense reactions to stressful situations.<br>• Difficulty managing conflicts. |
| Physical Challenges | • Difficulty maintaining attention while staying still.<br>• A need for physical activity that disrupts the learning process.<br>• Easily distracted by external factors.<br>• A constant need for "movement" in the classroom. |

*(Fidosieva, 2024)*

# AUTISM SPECTRUM DISORDER (ASD)

What's it like? & Myths

Key Characteristics

How to support

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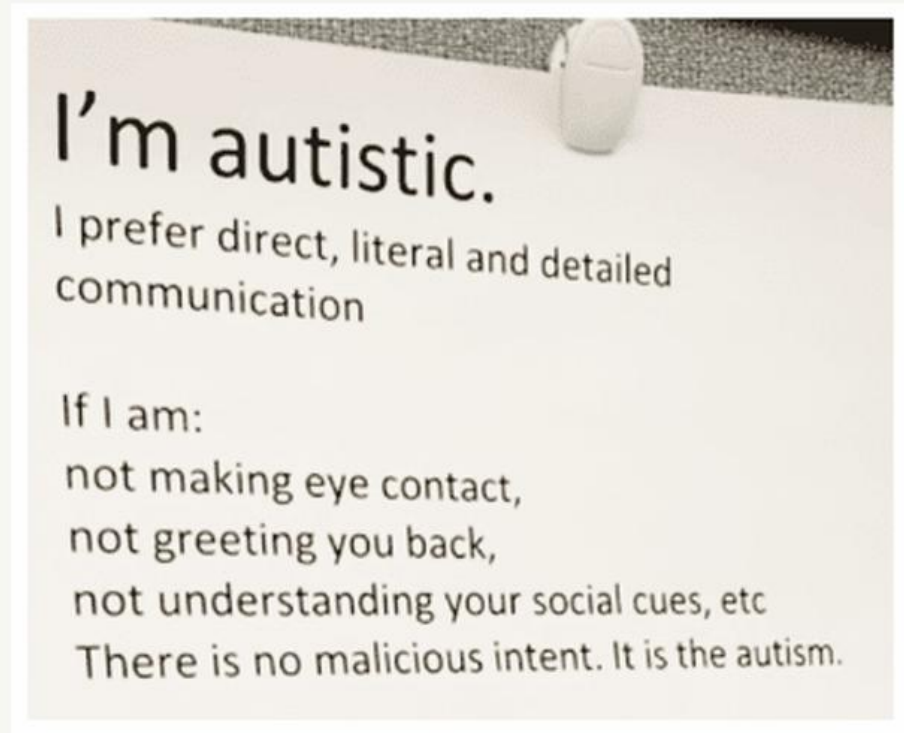
# AUTISM SPECTRUM DISORDER (ASD)

People on the autism spectrum are often perceived as:

- *Take things literally.*
- *Routine is important.*
- *Avoid eye contact.*
- *Sensitive to sounds and smells.*
- *May not understand sarcasm or figures of speech.*
- *Find it hard to tell how others feel.*



# AUTISM SPECTRUM DISORDER (ASD)

MYTH 01

**CANNOT EMPATHISE**

People with ASD **do care**, but may not know how to show develop empathy and spontaneous behaviour**.**

MYTH 02

**CAN BE CURED**

There **is no cure** for ASD. Early, behaviour-based interventions can have a positive effect on some children with autism.

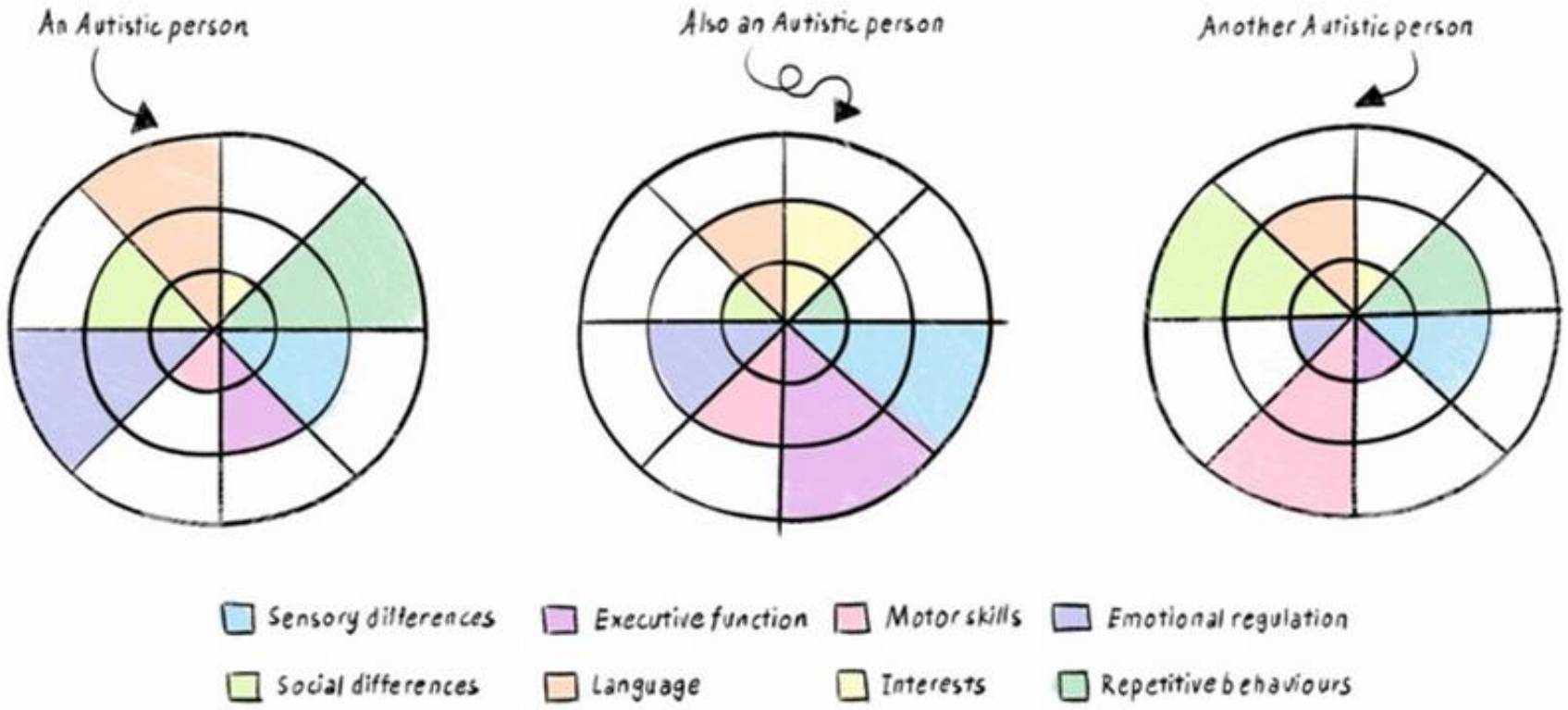
MYTH 03

**CANNOT LIVE SUCCESSFUL LIVES**

Many people with ASD are living and working **successfully,** and contributing to the well being of others.

# AUTISM SPECTRUM DISORDER (ASD)

ASD does affect all levels of intelligence



# AUTISM SPECTRUM DISORDER (ASD)

**Problems with the working memory**

**Strengths**

- Enhanced visual-spatial processing.
- Hyper-focus on areas of interest.
- Attention to detail.
- Reasoning.
- Strong memory recall.
- Sensory acuity

| | |
|---|---|
| **Cognitive** | •Difficulties with planning, organisation, & time management<br>•Process information and respond quickly<br>•Challenges adapting to new situations<br>•Verbal Reasoning |
| **Social** | • Difficulty understanding social cues (tone, body language)<br>• Challenges in group work and relationships (blunt and not tactful)<br>•Difficulty understanding using language metaphorically |
| **Emotional** | • Increased anxiety and stress<br>• Difficulty regulating emotions |
| **Sensory** | • Sensitivity to noise, light, crowded spaces<br>• Sensory overload affecting concentration |
| **Adaptive** | • lack of social imagination in problem-solving |
| **Academic** | • Difficulty with unclear instructions<br>• Issues with organisation and transitions |

# AUTISM SPECTRUM DISORDER (ASD)

- Autism Spectrum (ASD) is a neurodevelopmental condition involving differences in **social communication** and **repetitive behaviours**

(Bregman & Higdon, 2012).

| Severity level | Social communication | Repetitive behaviours |
|---|---|---|
| Level 3 | Very limited communication; rarely initiates or responds | Extremely rigid; cannot cope with change; high distress |
| Level 2 | Clear communication difficulties; limited interaction | Inflexible; struggles with change; behaviours interfere |
| Level 1 | Difficulty with social interaction and conversation | Some rigidity; difficulty switching and organising |

*DSM, 5th edition*

# DYSLEXIA

What's it like? & Myths

Key Characteristics

How to support

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# DYSLEXIA

| | |
|---|---|
| **Reading & writing difficulties** | • Slow or effortful reading<br>• Difficulty with spelling and writing with frequent errors<br>• Problems decoding words – linking letters to sounds<br>• Difficulty organising ideas in writing |
| **Cognitive processing difficulties** | • Slower processing speed – takes longer to read/write<br>• Working memory difficulties (e.g. following instructions, note-taking)<br>• Word-finding difficulties (e.g. recalling names or terms) |
| **Executive functioning** | • Difficulties with planning, prioritizing & time-keeping<br>• Following multi-step instructions |

(Kannangara et al, 2018)

# DYSLEXIA

## Phonological

- Difficulty with sounds
- Struggle to decode new words
- Difficulty reading nonwords
- Memorizing whole word

## Surface



- Difficulty recognizing words by sight
- Sounding out words
- Struggle with irregular words
- Slow reading pace

## Deep



- Difficulty with meaning (semantic processing)
- Semantic errors when reading
- Difficulty reading abstract words
- Severe reading impairment

# DYSLEXIA

MYTH 01

**IS A VISUAL DISORDER**

Dyslexia is a brain-based disorder associated with impairments in the brain regions, associated with the **manipulations of sounds and not vision.**

MYTH 02

**CANNOT LEARN TO READ**

Requires significantly more effort and academic support but people with dyslexia **can learn to read.**

MYTH 03

**INTELLIGENT PEOPLE DON'T HAVE DYSLEXIA**

People with a range of cognitive skills can have dyslexia including those with average and above average intelligence .

# DYSCALCULIA

What's it like? & Myths

Key Characteristics

How to support

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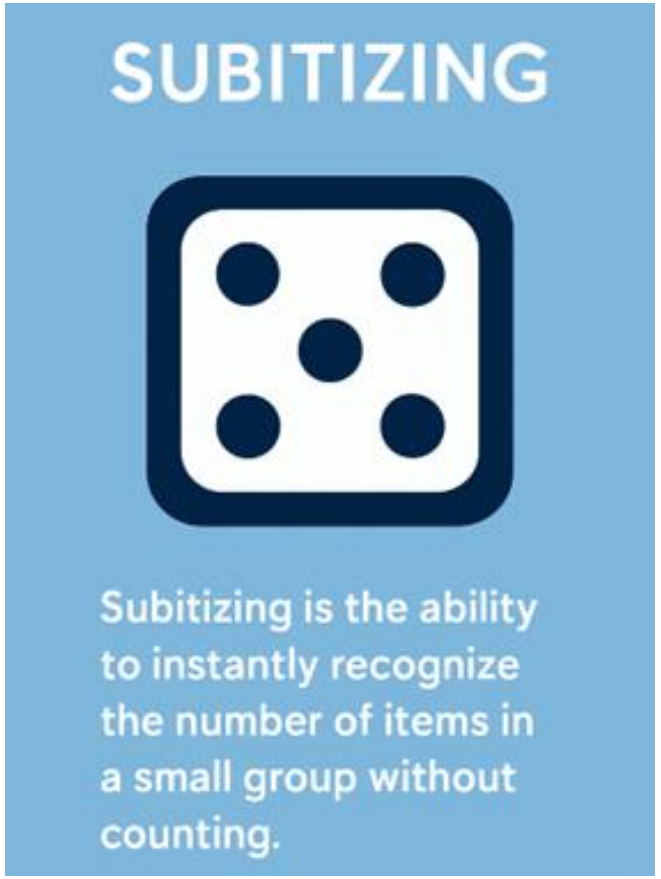
# DYSCALCULIA

People with dyscalculia usually experience the following challenges:

- Difficulty with **basic number sense**
- **Subitizing problems**
- Difficulty learning and **recalling math facts**
- Challenges with **math symbols** and vocabulary
- **Poor calculation strategies**
- Difficulty with **generalisation**




(Salisa & Meiliasari, 2023)

# DYSCALCULIA

There are four commonly acknowledged types of dyscalculia:

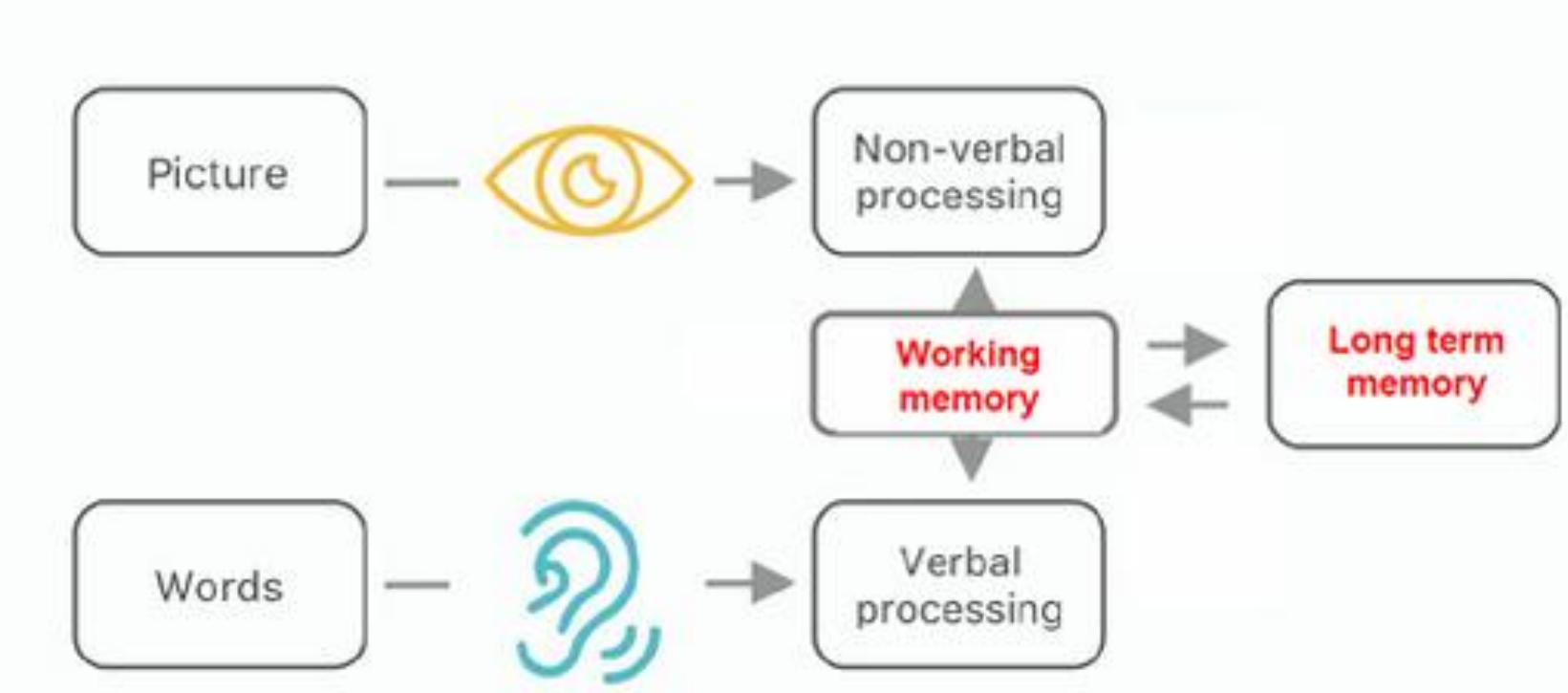
- **Core Number:** Difficulties with number sense, estimation, and comparing quantities
- **Reasoning:** Difficulty understanding mathematical concepts and relationships, generalizing, & knowledge transfer
- **Memory:** Difficulty recalling math facts and terminology, steps, rules and procedures
- **Visual Spatial:** Difficulty recognising symbols and visual representations

(Salisa & Meiliasari, 2023)

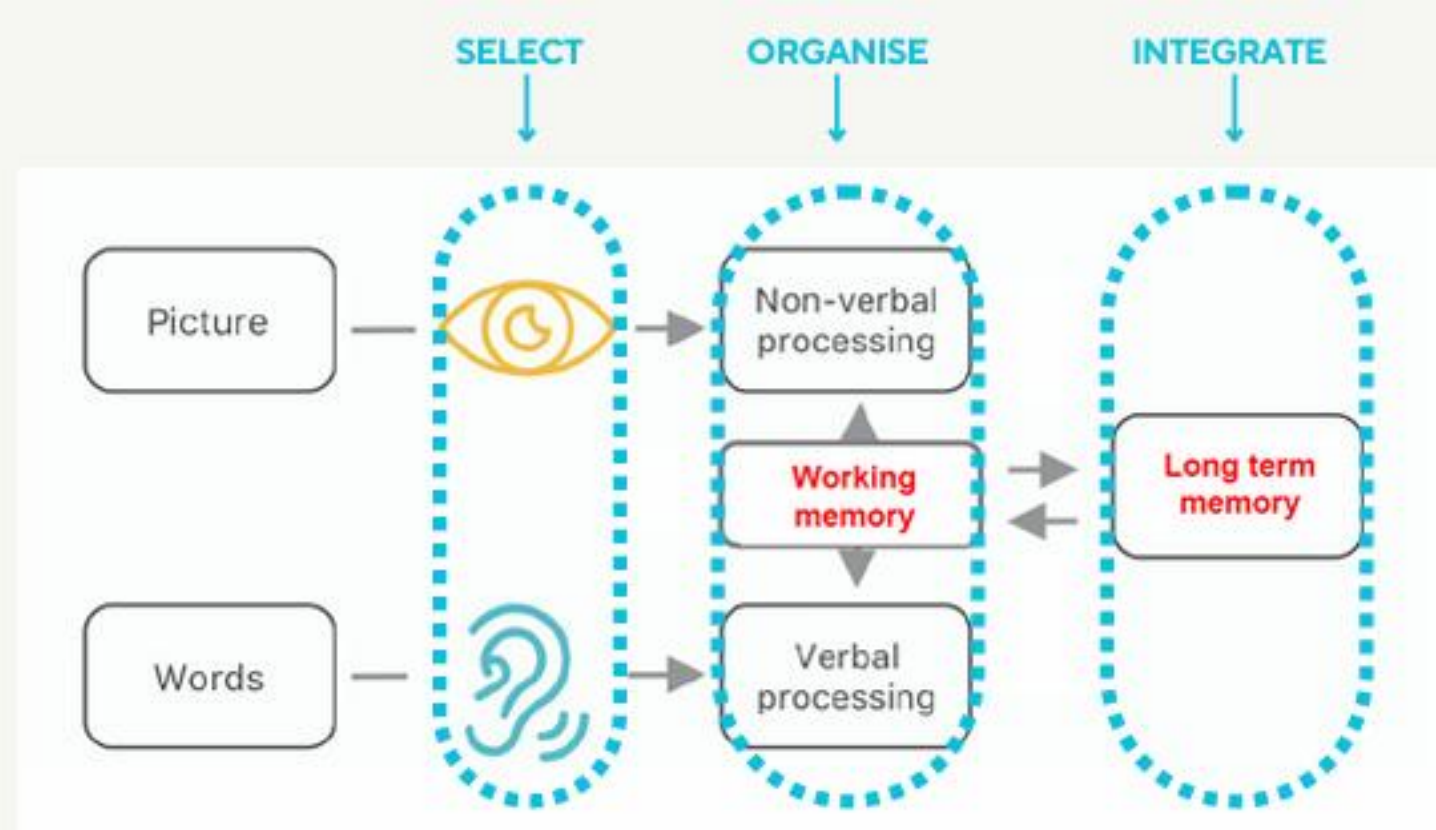
# 04. Best Practices

What are the characteristics of the most common neurodevelopmental conditions in Higher Education?

# SUPPORTING THE WORKING MEMORY



# SUPPORTING THE WORKING MEMORY




**Select**:

- Use **signalling** strategies such as underlining, bold text and highlighting.
- **Eliminate** irrelevant information.

**Organise:**

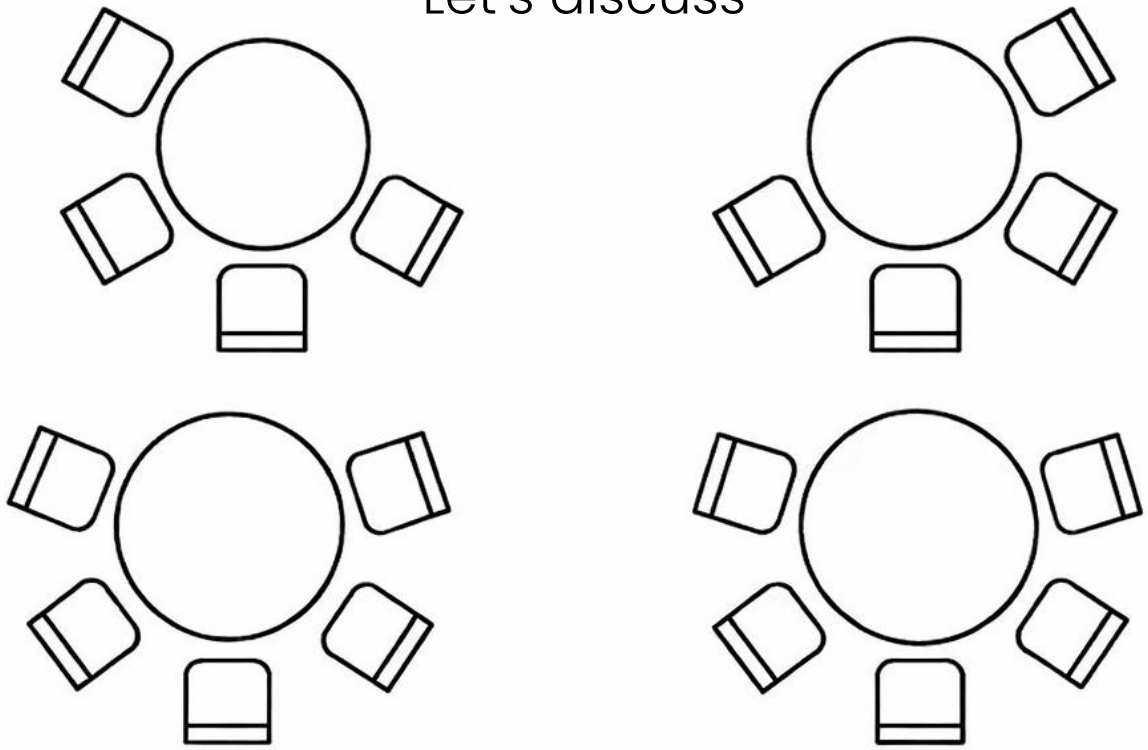
- Use **graphs and tables**.
- Use **same structure**.
- Present **cause-and-effect**

**Integrate**:

- Ask them to **summarise**.
- Ask questions for comparison/ predictions

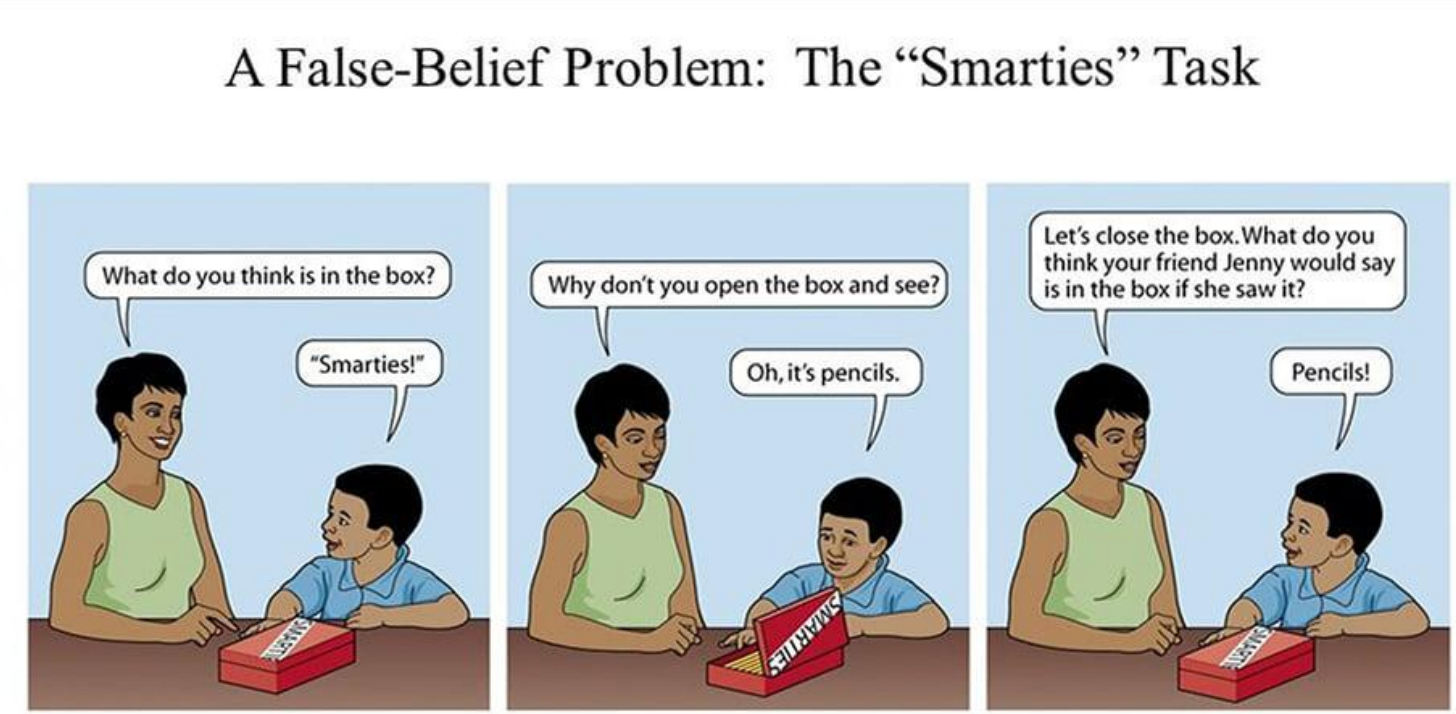
# WHAT ARE SOME STRATEGIES FOR DEALING WITH NEURODIVERGENT STUDENTS ?

Let’s discuss



# AUTISM SPECTRUM DISORDER (ASD)

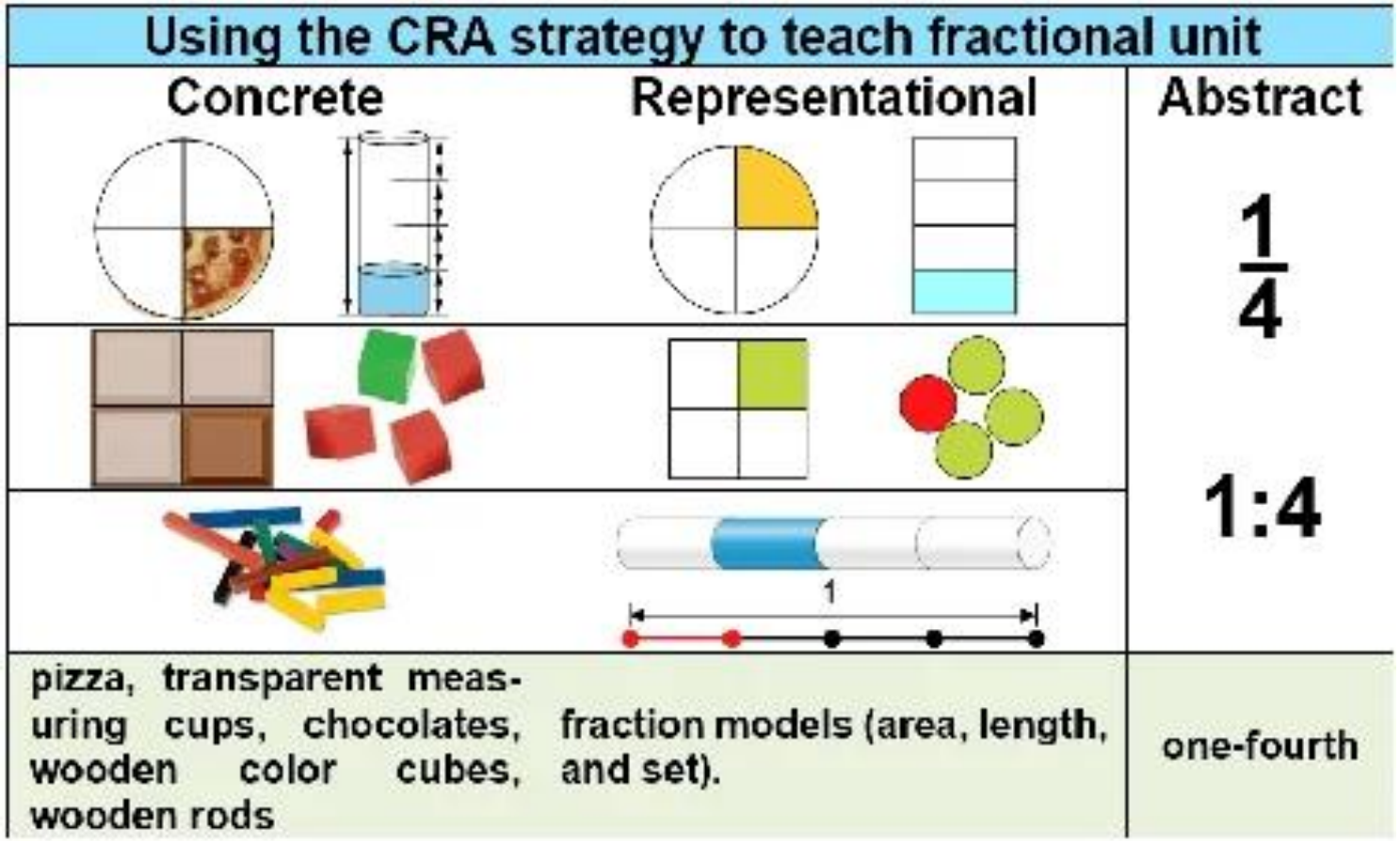
Individuals with ASD struggle with emotional **self-awareness** and **empathy** (Huggins et al., 2020)




The **theory of mind (TOM)** is social-cognitive skill - ability to **think about mental states**, both your own and those of others.

1. **Recognising emotions**
2. **Understanding desires**
3. **Understanding beliefs**
4. **False belief understanding**
5. **Perspective-taking**
6. **Interpreting intentions**

# DYSCALCULIA




(Fuchs et al., 2008Witzel, & Mize (2018).

# HOW TO SUPPORT STUDENTS WITH ADHD

| STRATEGY | EXPLANATION |
|---|---|
| **Utilise strengths** | Increase student engagement and participation by using activities such as '**Think-Pair-Share**' and '**Jigsaw**'. Working in groups requires high energy levels, cognitive flexibility and good social skills. Provide opportunities for creative problem solving. |
| **Active learning methods** | Promote active learning techniques (**e.g. let them summarise**) that engage. |
| **Structured classroom** | **Establish rules and routines** so that they know what is expected of them. Create a predictable environment. |
| **Visual aids** | Incorporate visual aids: lists, **tables, color, highlight, graphic organisers** etc. to organise information effectively. |
| **Positive attention** | Provide regular **positive attention on learners' effort and achievements** to strengthen motivation. |
| **Physical breaks** | Incorporate **short breaks** to improve concentration, prevent fatigue and overload. |
| **Social & organisational** | Consider time impairment: **shorter, clearer milestones** and **deadline reminders**. Help to organise things if needed, e.g. break down tasks. Monitor their progress by checking in from time to time. |
| **Technological solutions** | Capture attention and simplify the acquisition of knowledge. |
| **Adapt educational material** | Modify task so that the task can be managed more easily. Offer information concisely; **avoid ''fuzzy'' language and too much text**. Add notes with information about the topic to the PowerPoint slides. |

Fidosieva, 2024. Creelman, 2021. Fabiano et al., 202

# HOW TO SUPPORT STUDENTS WITH ASD

| STRATEGY | EXPLANATION |
|---|---|
| **Utilise strengths** | Use tasks that match students' strengths, interests, and attention to detail (e.g. problem solving, analysis). |
| **Adapt educational material** | Simplify tasks and present information clearly; avoid too much text, vague language, and figurative expressions. |
| **Structured classroom** | Establish rules and routines so that they know what is expected of them. Create a predictable environment. |
| **Social support** | Support with mentalisation: verify, don't interpret. Adopt an ignorant attitude. Actively encourage reflection on other perspectives. For example, ask "Why did you say this?" or "What do you think they meant by that?", or explain the type of conversation. |
| **Visual aids** | Use visual supports (lists, tables, colour, organisers) to structure information. |
| **Positive attention** | Give regular positive feedback on effort and achievements. |
| **Physical breaks** | Include short breaks to support concentration and reduce overload. |
| **Communication** | Clearly explain conversation types and topics; use precise language. |
| **Technological solutions** | Use technology to support attention and simplify learning. |

Fidosieva, 2004; Creelman, 2021; Fabiano et al., 2024; Wu et al., 2015; Reis et al., 2020; Silver & Parens, 2022

# HOW TO SUPPORT STUDENTS WITH DYSLEXIA

| STRATEGY | EXPLANATION |
|---|---|
| **Provide materials in advance and in accessible formats** | Share materials **early in digital form** so students can adjust format, prepare, and reduce processing load. |
| **Reduce working-memory** | **Use clear goals, step-by-step instruction, modelling, and summaries** to reduce overload and support understanding. |
| **Multisensory and visual supports** | Combine **visual and verbal information** (e.g. diagrams) to improve comprehension and memory. |
| **Planned pauses & guided discussion** | Include **short breaks** for discussion and note review to improve recall. |
| **Assistive Educational Technology** | Use **tools (e.g. text-to-speech**) to reduce reading/writing demands and support independent study. Allow recording the lecture. |
| **Accessible Instructions & Feedback** | Give **clear instructions in both written and oral form**, with opportunities for clarification. |
| **Design assessments flexibly and mark for meaning** | **Allow extra time and alternative formats**; prioritise understanding over spelling errors. |

Dobson Waters & Torgerson, 2020; Mortimore, 2012

# HOW TO SUPPORT STUDENTS WITH DYSCALCULIA

| Strategy / Solution | Explanation |
|---|---|
| **Task analysis** | Break work into **small steps**, teach one step at a time, **use a simple checklist**, and ensure each step is understood before moving on to reduce cognitive load and support understanding. |
| **Explicit instruction** | Clearly **explain what to do and why**, model thinking aloud, provide guided practice before independent work, and check understanding frequently to support learning. |
| **Multisensory teaching (CRA)** | Start with **concrete** materials (e.g. blocks, counters), move to **representational forms** (pictures, drawings), and then to **abstract** numbers and symbols to build understanding step by step. Encourage students to verbalise their thinking. |
| **Scaffolding** | Begin with a **full worked example**, gradually remove parts for students to complete, and reduce support over time to develop independence. |

(Fuchs et al., 2008Witzel, & Mize (2018).

# WHERE DO WE GO FROM HERE?

# Q & A

Panel discussion session

# WOULD YOU BE INTERESTED IN SHARING YOUR INCLUSIVE TEACHING PRACTICES?

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- Please contact us here:

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# THANK YOU FOR JOINING TODAY

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