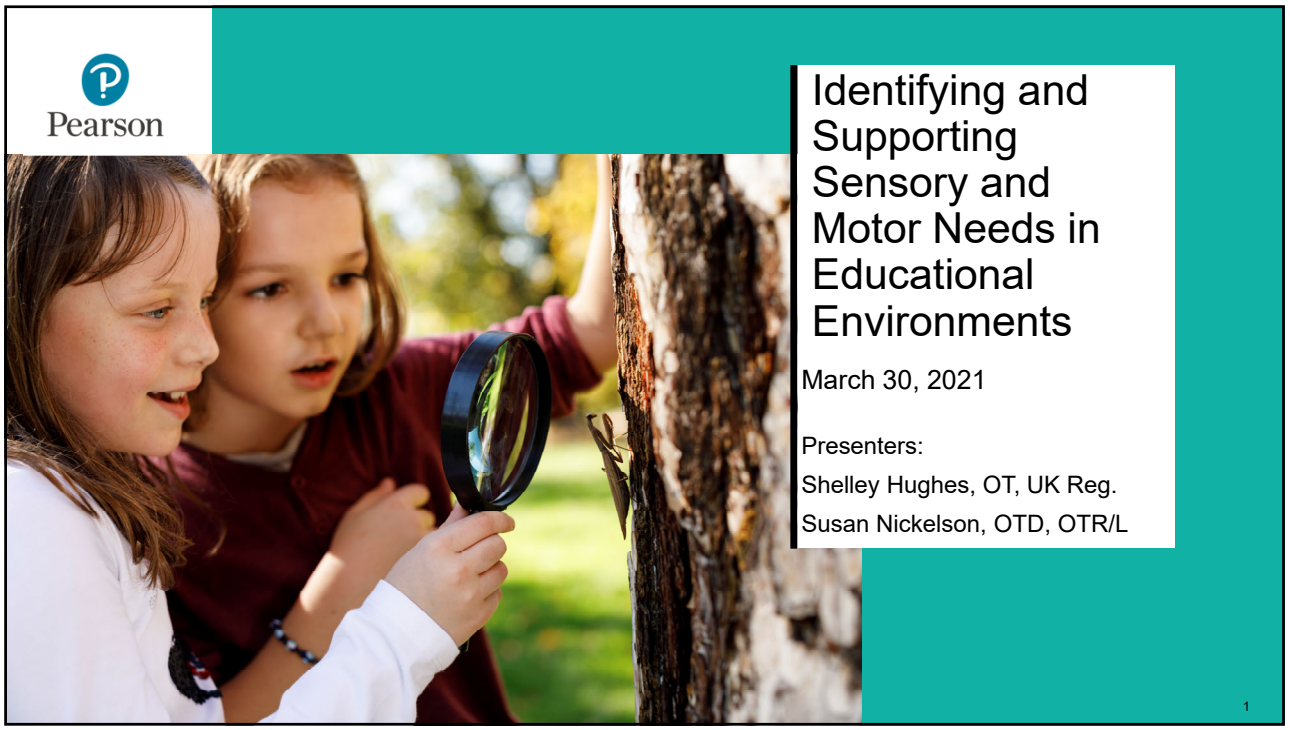

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Disclosure

Financial:

Susan Nickelson and Shelley Hughes are employed by Pearson Clinical Assessment.

Non-financial disclosure:

- Susan Nickelson is the Education Committee Chair for The Texas Occupational Therapy Association.
- Shelley Hughes: There are no relevant non-financial relationships to disclose.

The Pearson Assessment Division, the sponsor of this webinar, develops and distributes assessments and intervention tools for speech-language pathologists, occupational therapists, and psychologists. This course will address appropriate the use of Bruininks-Oseretsky Test of Motor Proficiency (BOT-2), Beery-Buktenica Test of Visual Motor Integration (Beery VMI-6), Sensory Profile 2, School Function Assessment (SFA), and the Detailed Assessment of Speed of Handwriting (DASH). These assessments are published by Pearson. Pediatric Evaluation of Disability Inventory Computer Adaptive Test (PEDI-CAT) is distributed by Pearson.

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Learner Outcomes

Based on the content of the workshop, participants will be able to:

1. Describe 3 educational or diagnostic groups at higher risk of sensory and/or motor difficulties
2. List 3 strategies which can be employed in an educational setting to support sensory and/or motor needs
3. Identify 3 assessment tools available for the identification of sensory and/or motor needs in education
4. Discuss the considerations to be made when selecting sensory and/or motor assessment instruments for education

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Agenda

1:00 p.m. – 1:10 p.m.	Overview of the Clinical and Educational groups which typically present with motor and sensory needs
1:10 p.m. – 1:20 p.m.	Input and output demands of educational tasks
1:20 p.m. – 1:40 p.m.	Sensory and motor assessment options for education
1:40 p.m. – 1:55 p.m.	Strategies to support sensory processing and motor needs in education
1:55 p.m. – 2:00 p.m.	Questions and Answers

6

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Pearson

Overview of the Clinical and Educational Groups Which Typically Present with Motor and Sensory Needs

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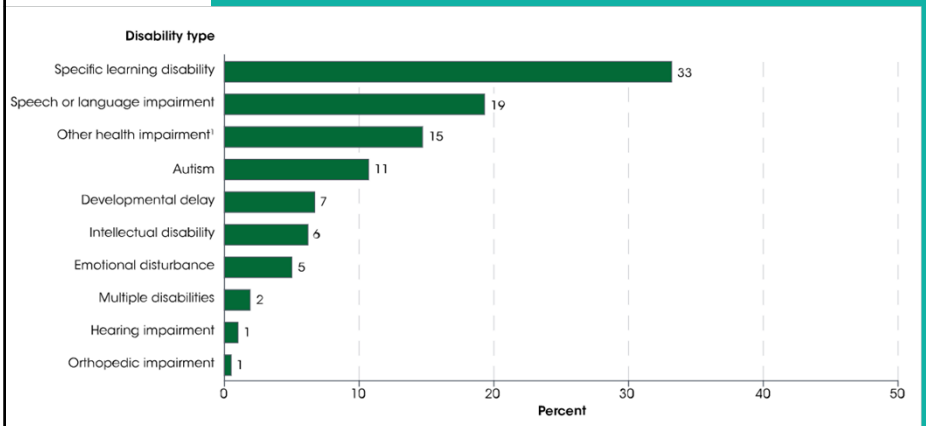
Pearson

Percentage distribution of students ages 3–21 served under the Individuals with Disabilities Education Act (IDEA), by disability type: School year 2018–19



[1] Other health impairments include having limited strength, vitality, or alertness due to chronic or acute health problems such as a heart condition, tuberculosis, rheumatic fever, nephritis, asthma, sickle cell anemia, hemophilia, epilepsy, lead poisoning, leukemia, or diabetes.
NOTE: Data are for the 50 states and the District of Columbia only. Includes 2015–16 data for 3- to 21-year-olds in Wisconsin due to unavailability of more recent data for children served in Wisconsin. Visual impairment, traumatic brain injury, and deaf-blindness are not shown because they each account for less than 0.5 percent of students served under IDEA. Due to categories not shown, detail does not sum to 100 percent. Although rounded numbers are displayed, the figures are based on unrounded data.

Source:
National Center for Education Statistics (2020),
https://nces.ed.gov/programs/coe/indicator_cgg.asp

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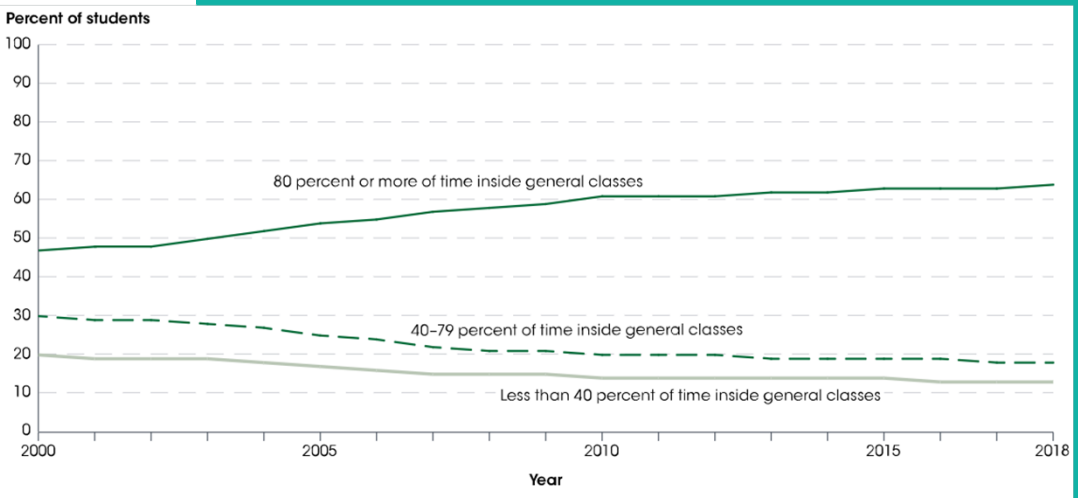
Students ages 6–21 served under the Individuals with Disabilities Education Act (IDEA), percentage who spent various amounts of time inside general classes: Fall 2000 through fall 2018



NOTE: Data are for the 50 states and the District of Columbia only. Fall 2016, 2017, and 2018 include fall 2015 data for 6- to 21-year-olds in Wisconsin due to unavailability of fall 2016, 2017, and 2018 data for children served in Wisconsin. Fall 2017 also includes fall 2016 data for 6- to 21-year-olds in Maine and Vermont due to unavailability of fall 2017 data for children in that age group served in those states.

Source: National Center for Education Statistics (2020), https://nces.ed.gov/programs/coe/indicator_cgg.asp

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Specific Learning Disorder and Dyslexia

DSM-5:

Estimated 5 to 15% of school-age children struggle with a learning disability.

Estimated 80% of those with learning disorders have reading disorder in particular*

- Difficulty with reading accuracy / fluency: **Dyslexia**
- Difficulty with spelling / written expression competence and fluency: **Dysgraphia**
- Difficulty mastering number facts: **Dyscalculia**

(American Psychiatric Association (APA), 2013; APA, 2018)

*https://www.psychiatry.org/patients-families/specific-learning-disorder/what-is-specific-learning-disorder

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Motor and Spatial Dysgraphia

- DSM-5 term: SLD with impairment in written expression
- Can stem from difficulties with fine motor development, visual-motor skills and sensory processing, resulting in slow and/or poorly formed letters.
- Lower level perceptual-motor processes (motor planning and execution) not fully automatic; impacting higher level cognitive processes (for example planning, language generation, reading and editing)
- Prevalence largely unknown, studies cite from 5 – 27 % (Van Hoorn et al., 2013) to 5-33% (Overveide & Hulstijn, 2011)
- Low-detection rates (Chung & Patel, 2015)
- Poor legibility = lower marks (Engel-Yeger et al., 2009)

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Developmental Coordination Disorder

See criteria in DSM-5 (APA, 2013); World Health Organization (WHO) ICD-11 (2018)

Prevalence: 5%-6% of school aged children (Blank et al., 2012)

Reduced motor performance = elevated risk factors for other health conditions

Low recognition rates:
Survey of 1297 parents, teachers and physicians (from Canada, USA and UK); Only 20% of the sample had knowledge of DCD, with 41% of pediatricians and 23% of general practitioners having knowledge of the condition. Furthermore, only 10% of teachers were aware of the condition.
70% of physicians and teachers identified the common physical characteristics of DCD, less than 30% identified the psychological and secondary consequences of DCD, including low self-esteem, poor fitness, anxiety and depression. (Wilson et al., 2013)

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Autism

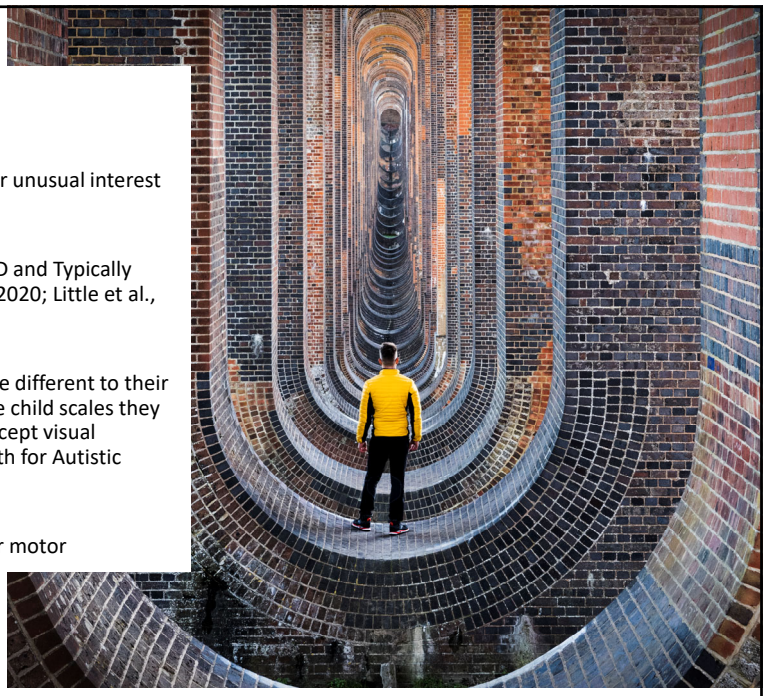
DSM-5:

Hyper- or hypo-reactivity to sensory Input or unusual interest in sensory aspects of the environment

Sensory Processing differences between ASD and Typically Developing populations (Dellapiazza et al., 2020; Little et al., 2018)

Sensory Profile 2: Children with Autism were different to their peers in all school companion scales. For the child scales they were different to their peers on all scales except visual processing. Visual processing often a strength for Autistic individuals (Dunn, 2014)

Up to 87% of children with Autism at risk for motor impairment too (Baht, 2020)



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ADHD

Prevalence in children and adolescents approx. 10% (Xu et al., 2018)

Highly co-morbid with other conditions (e.g. behavioral, anxiety, autism)

Most Frequently Co-occurring condition with DCD (APA, 2013)

Sensory Processing differences between ADHD and Typically Developing populations (Dellapiazza et al., 2020; Little et al., 2018)

Sensory Profile 2: Children with ADHD were different to their peers in all scales, with the exception of Avoiding in the School Companion form (Dunn, 2014)

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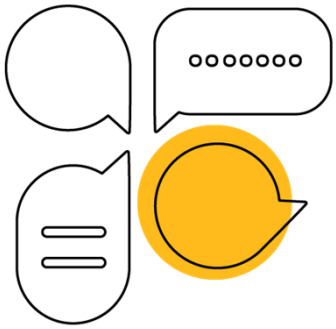
Intellectual Disability



Self-advocacy challenges

When overwhelmed, individuals may respond with:

'**Fight**' response (responding with anger, irritability or oppositionality), or

'**Flight**' (responding with avoidance, fear, or withdrawal) or

'**Freeze**' response (simply shutting down).

Reduced motor performance = elevated risk factors for other health conditions

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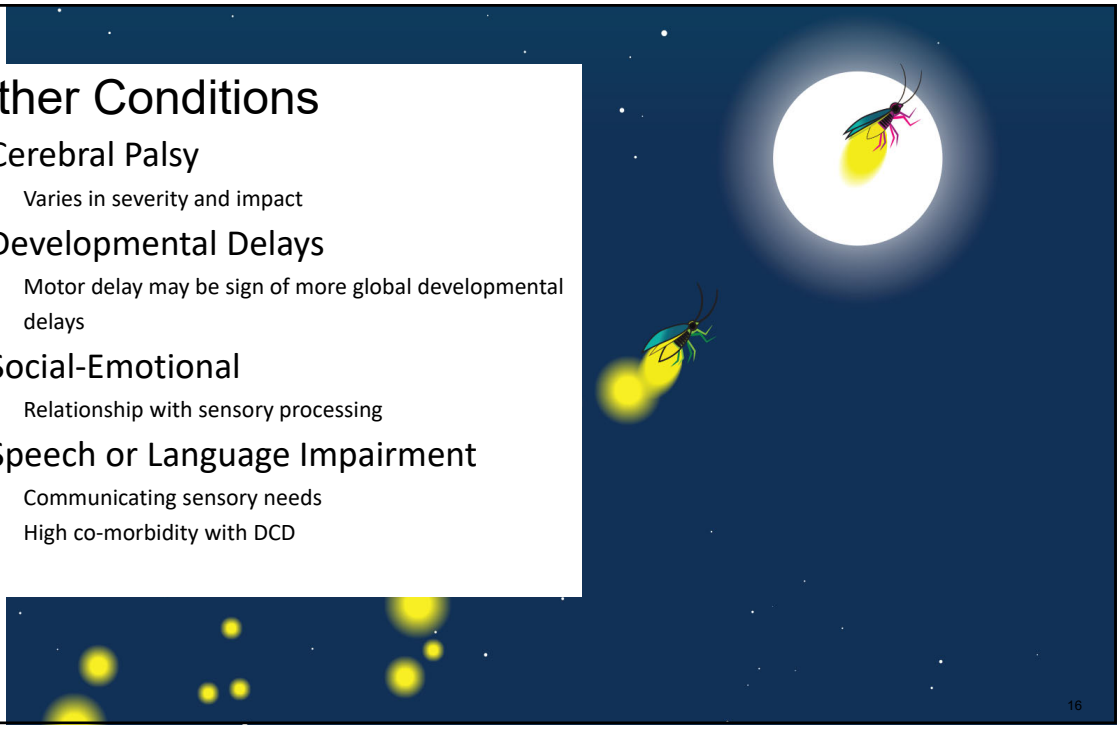
Other Conditions

- Cerebral Palsy
  - Varies in severity and impact
- Developmental Delays
  - Motor delay may be sign of more global developmental delays
- Social-Emotional
  - Relationship with sensory processing
- Speech or Language Impairment
  - Communicating sensory needs
  - High co-morbidity with DCD



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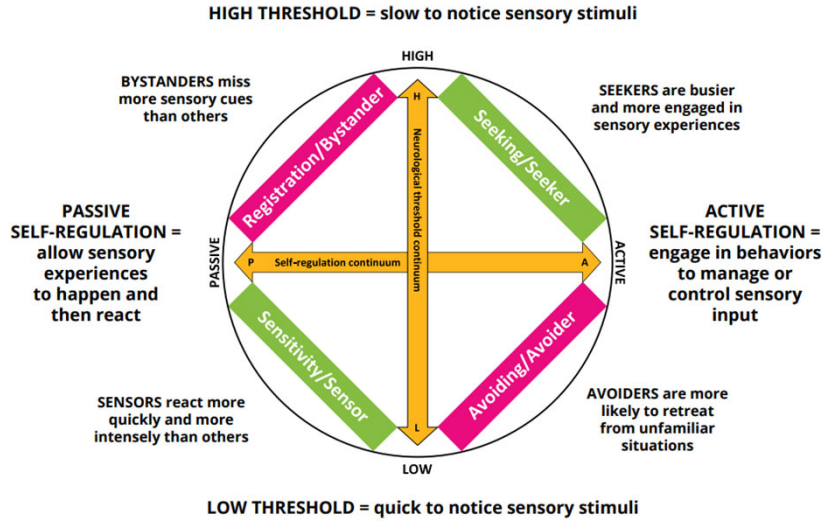
Sensory Processing Needs



(Dunn, 2014)

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Input and Output Demands for Educational Tasks:

What is needed for student success?

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Defining Input and Output Demands

Input Demands

Demands a student is receiving from others, the environment, and their own body

Output Demands

The expectations for action and performance from a student given the set of input demands

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When are input and output demands important to consider?

- **Assessment Process**
  - Determining areas of suspected need to target
  - Completing task analysis
  - Completing functional behavior assessments
  - Determining testing accommodations
  - Choice of assessments
- **Providing Support**
  - Identifying intervention focus
  - Determining assistive technology options
  - Supporting self-regulation and participation
  - Providing options for choice making
  - Enhancing learning tasks
  - Access to all school environments
  - Determining appropriate accommodations

(Cook & Tankersley, 2013; Coster et al., 2013; Frolek Clark & Chandler, 2013)

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Classroom Input Demands

Task Demands

- Reading words on the board
- Reading text in a book
- Working within time limits
- Following verbal instructions
- Interpreting pictorial stimuli
- Using physical objects
- Following a demonstration
- Audio/video recordings
- Interpreting non-verbal cues

Sensory Demands

- Visual Functions
- Hearing Functions
- Vestibular Functions
- Taste Functions
- Smell Functions
- Proprioceptive Functions
- Touch Functions
- Interoception

OTPF-4 (AOTA, 2020)

Environmental Factors

- Physical
  (e.g., building architecture, lighting, furniture)
- Social
  (e.g., rules, attitudes)
- Cultural
  (e.g., norms, expectations)

(WHO, 2007)

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Classroom Output Demands

Task Demands

- Completing timed tasks
- Attending to task
- Finishing assignments
- Engaging in class activities
- Copying text or shapes
- Using technology
- Following directions
- Responding to requests
- Tolerating the sensory input

Motor Demands

- Managing materials/supplies
- Fine motor action
- Gross motor action
- Simple written response
- Maintaining seated position
- Moving within classroom
- Walking between locations
- Putting on jacket for recess

Social Demands

- Answering teacher's questions
- Small group with peers
- Whole group activities
- Appropriate behavior
- Safe interactions with others
- Joint attention
- Responding to non-verbal cues

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Input Demands

- Listening to group instruction
- Interpreting visual stimuli in book
- Using physical objects
- Tolerating the sensory environment

Output Demands

- Written/fine motor response
- Maintaining postural control
- Copying from near-point model
- Following oral directions
- Shifting attention
- Disregarding irrelevant sensory input

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Other School Settings

Virtual learning
Art room
Science lab
Music room
Band hall
Cafeteria
Gymnasium
Auditorium
Sports fields
Sports stadium
Bathroom
Locker room
Stairwells
Hallways
Recess area
Playground
Transportation
Community outings

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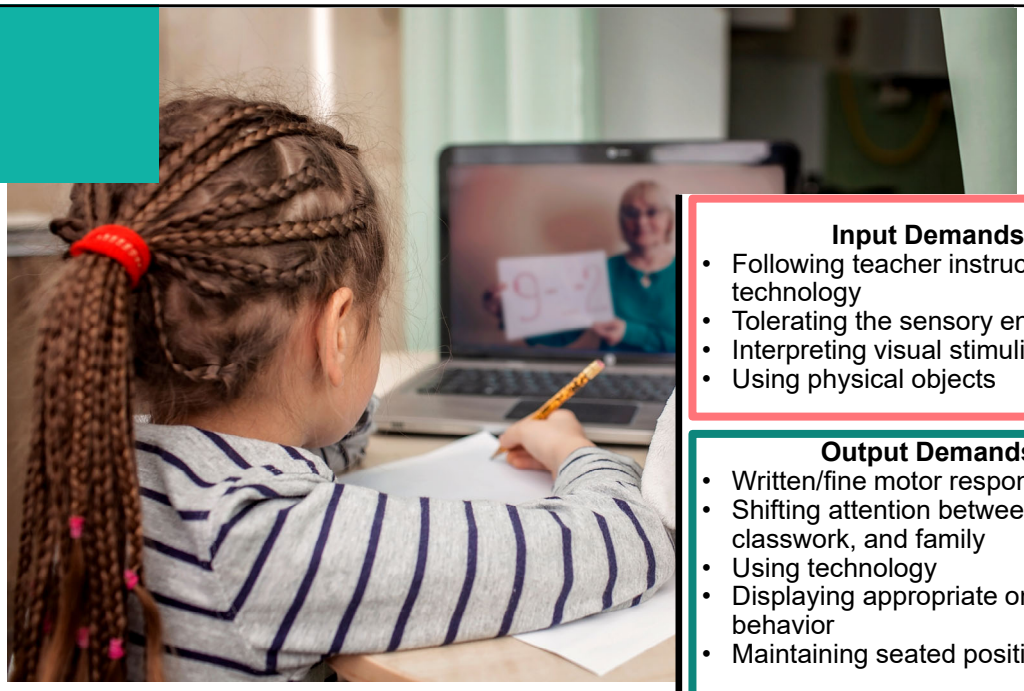

Input Demands
- Following teacher instruction via technology
- Tolerating the sensory environment
- Interpreting visual stimuli
- Using physical objects

Output Demands
- Written/fine motor response
- Shifting attention between teacher, classwork, and family
- Using technology
- Displaying appropriate online behavior
- Maintaining seated position

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Input Demands
- Using novel objects
- Requests from peers and teacher
- Tolerating the sensory environment
- Following demonstration

Output Demands
- Fine motor response
- Dynamic postural control
- Communicating with peers
- Sharing materials
- Maintaining personal space

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Input Demands
- Following group direction
- Tolerating the sensory environment
- Using materials
- Finishing meal within time limits

Output Demands
- Opening food items
- Carrying lunch tray across room
- Oral motor control to eat meal
- Static and dynamic postural control
- Following rules and routines
- Interacting with others appropriately

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Input Demands
- Using playground equipment
- Tolerating sensory environment
- Peer interactions during unstructured task
- Accepting end of recess

Output Demands
- Gross motor skills
- Dynamic postural control
- Using sensory information effectively to move on bars
- Interacting with others safely
- Following rules
- Making personal choices

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Sensory and Motor Assessment Options for Education

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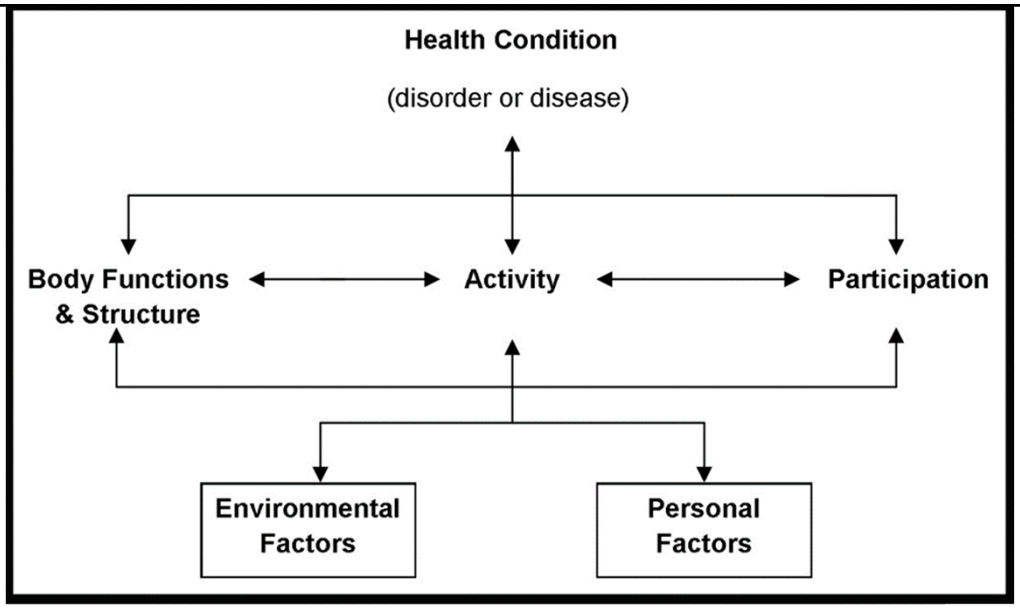
World Health Organization: International Classification of Function, Disability and Health (ICF). (WHO, 2007)



See also: Sanches-Ferreira Silveria-Maia, & Alves (2014) and Sanches-Ferreira et al. (2017)

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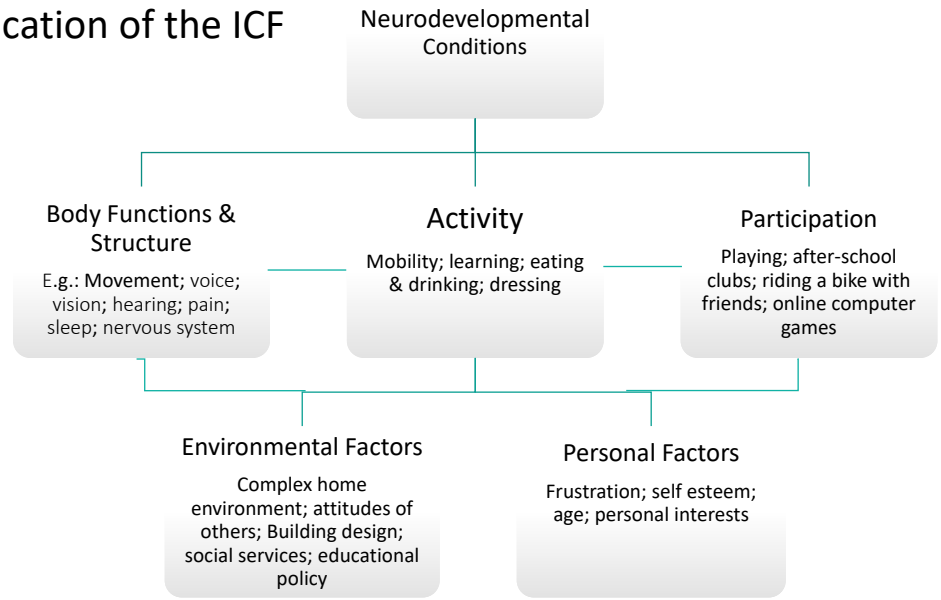
Application of the ICF



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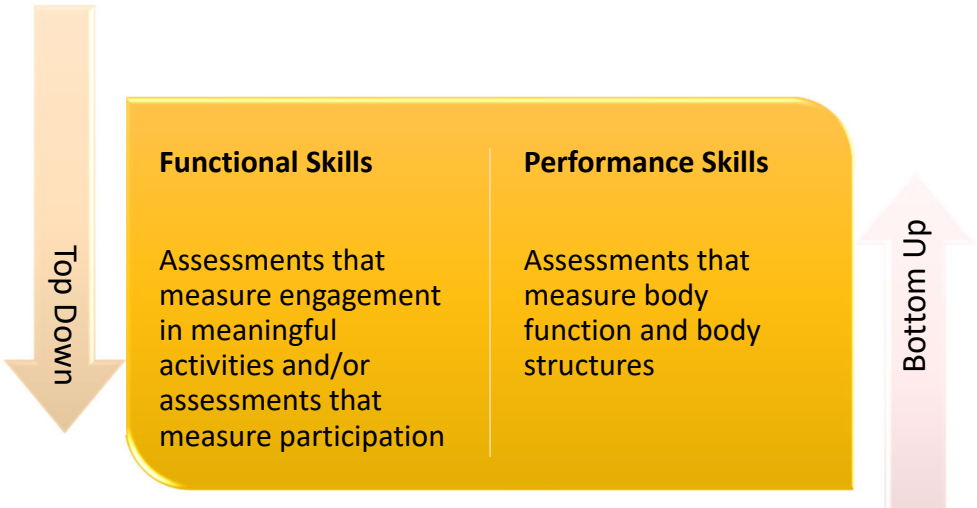

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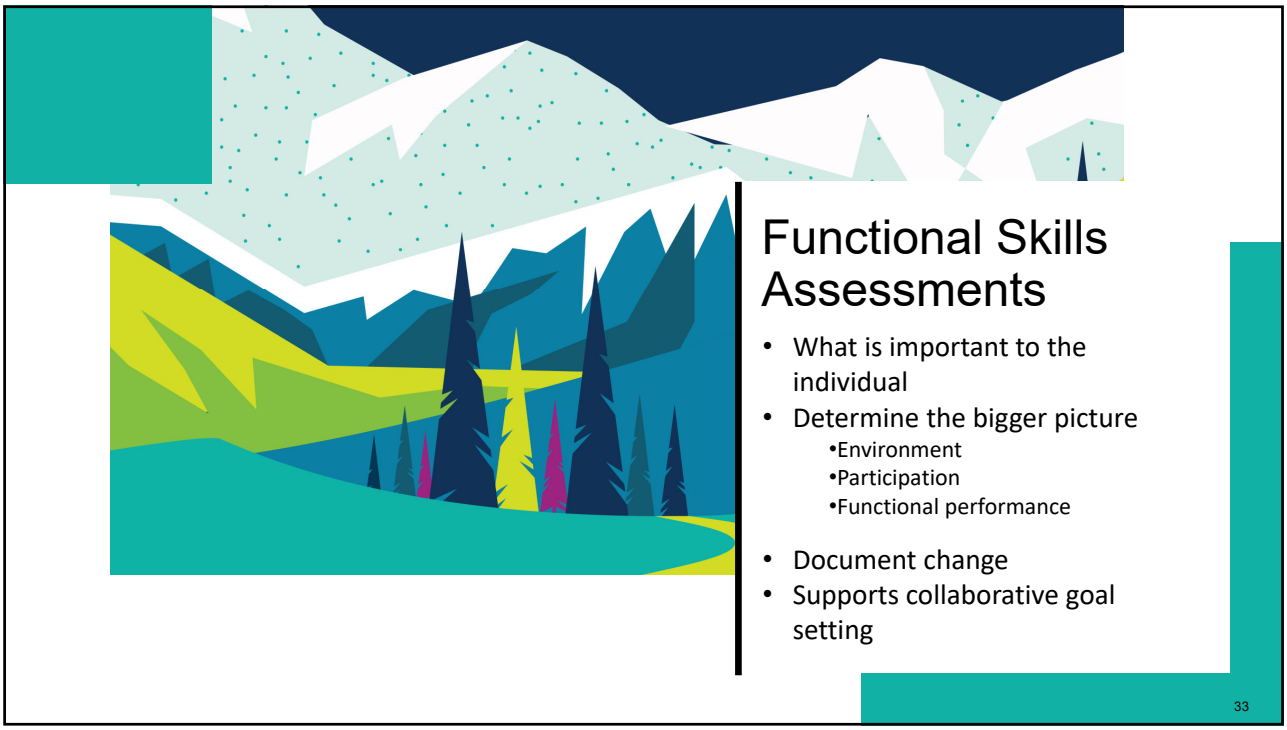

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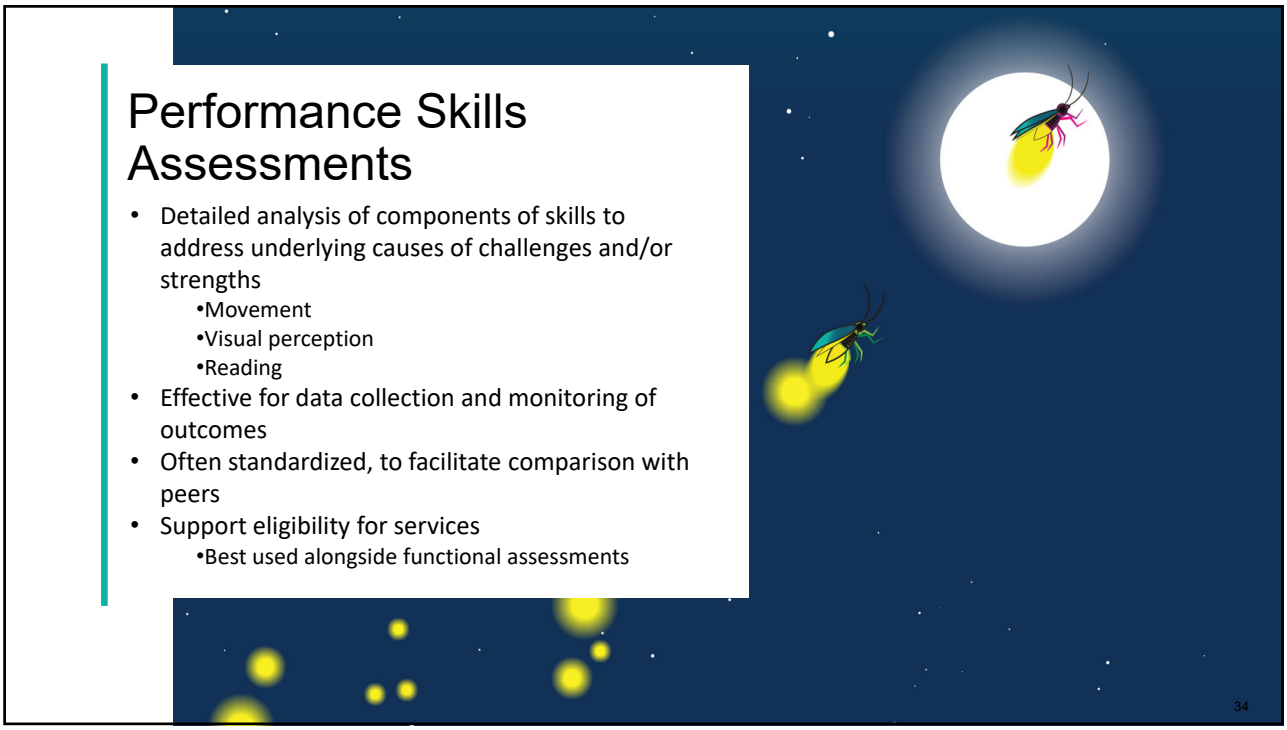

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Using a Combination of Tools to Support a Top-down and Bottom-up Approach

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Sensory Profile 2 / Adolescent/Adult Sensory Profile

- Caregiver or teacher questionnaires
- Sensory processing in context
  - School
  - Home
  - Community
- Strengths focused
- Assessment and planning report
- Provides insight for caregivers and professionals
  - Adolescent / Adult Sensory Profile
- Appendix D: Ecological Assessment of Sensory Processing Features of the Context (Dunn, 2014)

Q-global™ Better Insights. Anytime. Anywhere. Telepractice options

(Dunn, 2014; Frolek Clark & Chandler, 2013, pp. 406 & 423)

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Context & environment

Screening

Comprehensive assessment

Intervention planning and accommodations

(Dunn, 2014; Frolek Clark & Chandler, 2013, pp. 406 & 423)

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- Caregiver, teacher or clinician questionnaire
- Computer adaptive
- Functional skills
  - Daily activities
  - Mobility
  - Social / cognition
  - Responsibility
- Mobility device filters
- Autism scale
- Short and comprehensive version

(Haley et al., 2012; Haley et al., 2020)

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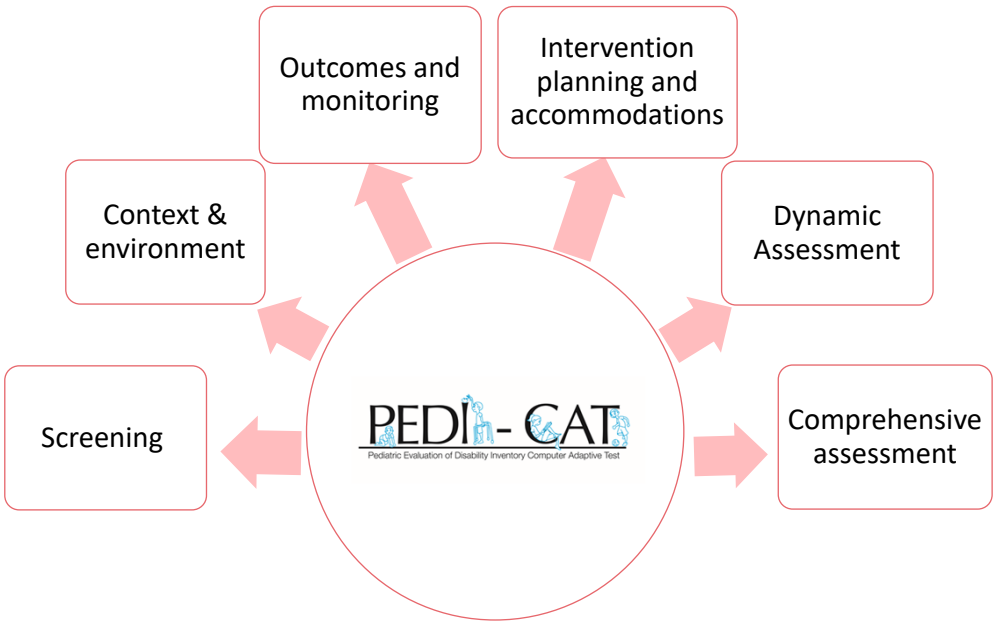

(Haley et al., 2012; Haley et al., 2020)

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Beery™ VMI

- Performance Skills
- Visual-motor integration
  - Visual perceptual subtest
  - Motor coordination subtest
- Short form available
- Group or individual admin

Telepractice options

(Beery et al., 2010)

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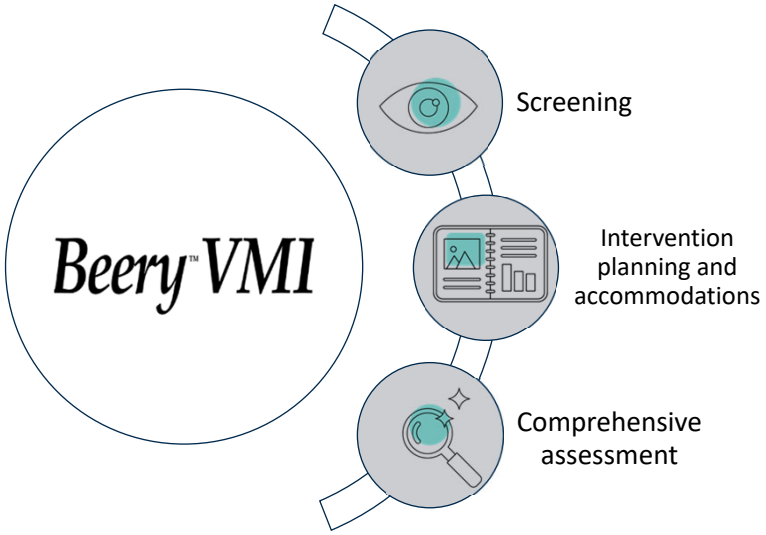

(Beery et al., 2010)

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MILLER FUNCTION & PARTICIPATION SCALES

- Aligns with ICF framework
- Game like tasks
- Functional skills related to school participation
  - Fine motor
  - Gross motor
- Additional observational checklists for participation in school and home environments

(Miller, 2006)

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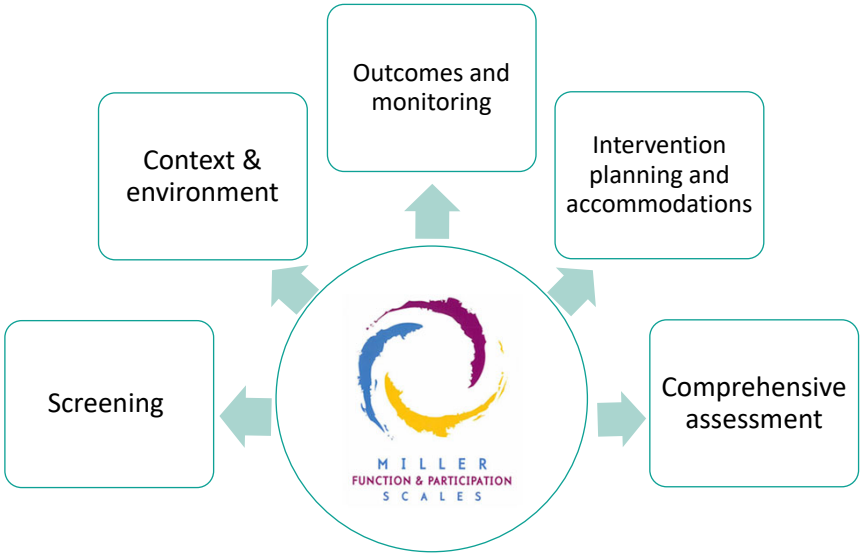

(Miller, 2006)

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School Function Assessment
SFA

- School based functional skills
- Variety of physical and/or behavioral conditions
- Collaborative program planning
- Use in regular and/or special-ed settings
- Focus on function regardless of the methods used
- Evaluates support needs

(Coster et al., 1998; Frolek Clark & Chandler, 2013, pp. 406 & 423)

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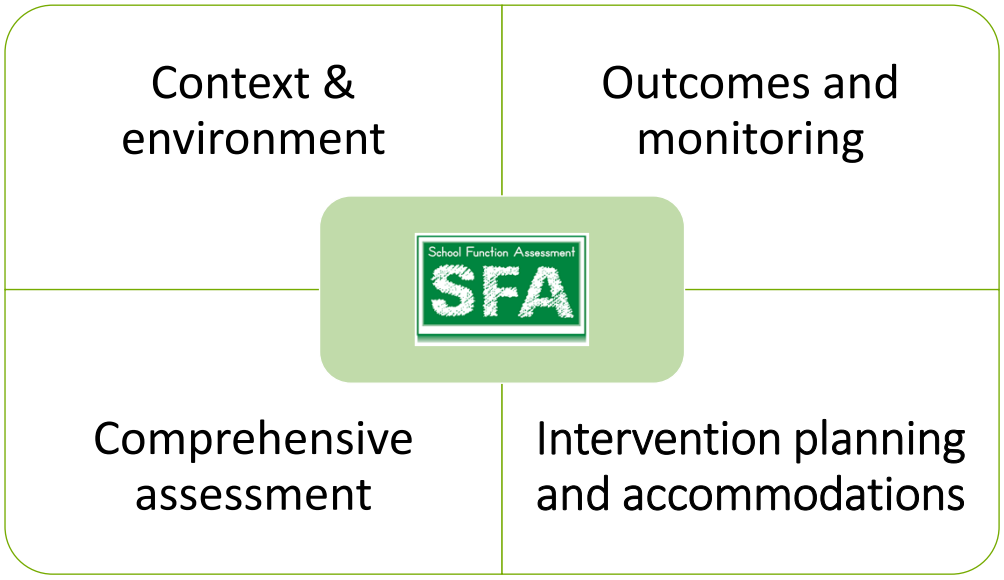

(Coster et al., 1998; Frolek Clark & Chandler, 2013, pp. 406 & 423)

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BOT-2™
Bruininks-Oseretsky Test of Motor Proficiency, Second Edition

- Performance skills
  - Fine motor
  - Gross motor
  - Total Motor
- Brief version available

Q-global™
Better Insights. Anytime. Anywhere.
Telepractice options

(Bruininks & Bruininks, 2005)

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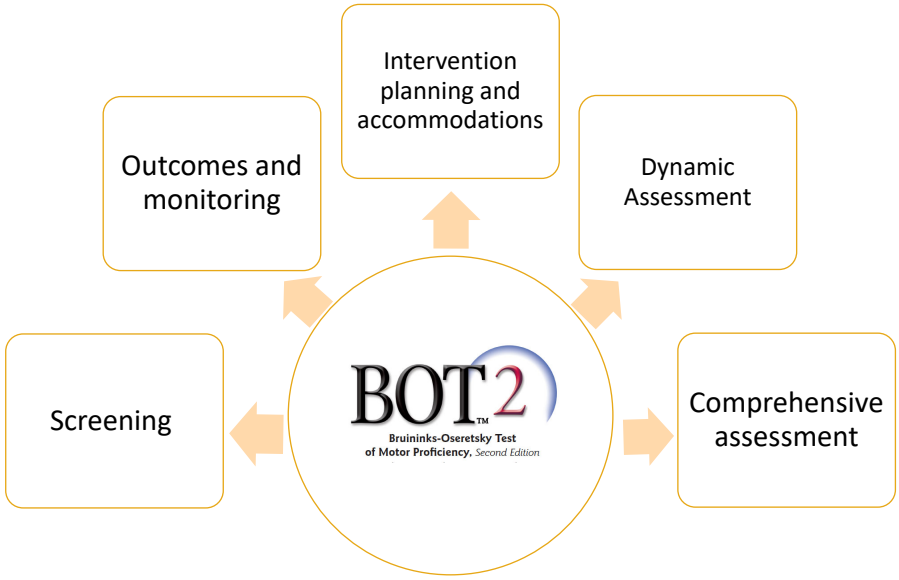

(Bruininks & Bruininks, 2005)

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Dash

Dash 17+

- Performance skills
- Handwriting speed
- Group or individual
- Accommodations

Telepractice options

(Barnett et al., 2007; Barnett et al., 2010)

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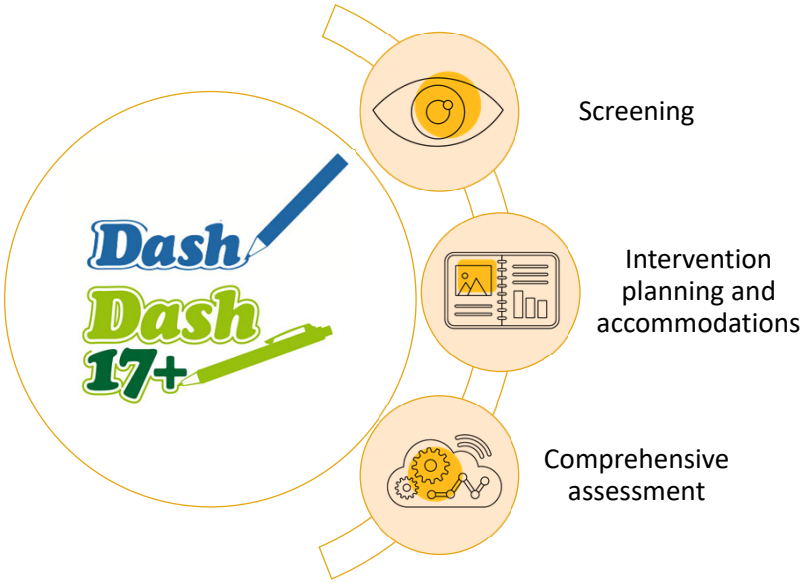

(Barnett et al., 2007; Barnett et al., 2010)

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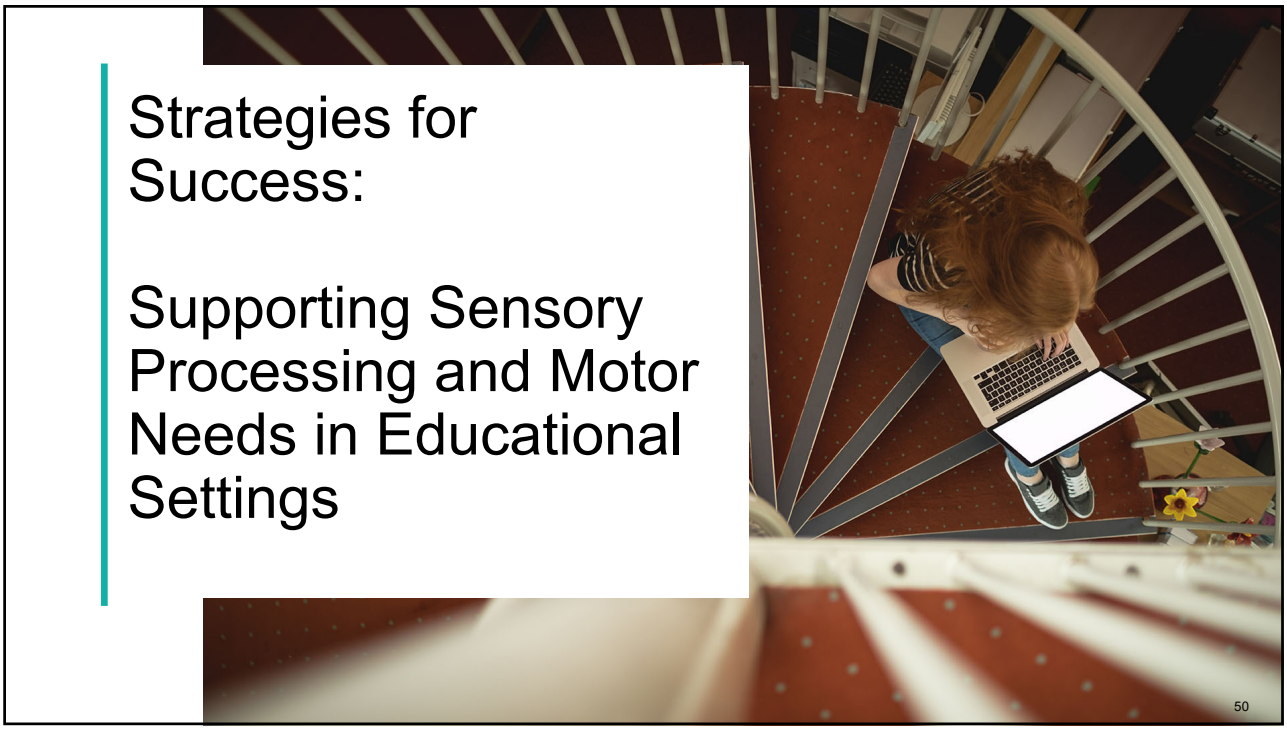

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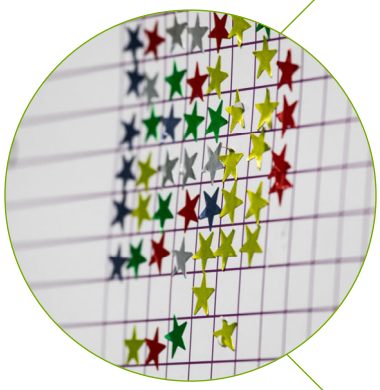
Indicators of Participation in the Educational Setting



- On-task behaviors
- Engagement
- Response time
- Following rules and directions
- Academic performance
- Independent work
- Attention to task
- Collaborative work with peers
- Frequency of classroom contributions

(Grajo et al., 2020)

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Participation in educational settings

Physical Environment

- Design of the buildings
- Sensory qualities of the environment
- Furniture and materials
- Weather

Social Environment

- Proximity of adult support
- Attitudes of others
- Classroom culture
- Rules

Appropriate Services

- Difficulty accessing needed services
- Services not individualized
- Transportation

Task Demands

- Physical
  - Sensory
  - Motor
- Cognitive
- Social

What are the barriers to participation for the student?

(Coster et al., 2013)

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Supporting Participation for Students with Sensory or Motor Needs

- Building on Student's Strengths
- Respecting Student's Preferences
- Understanding the Classroom Culture and Routines
- Observing in Various School Environments
- Identifying Areas for Improvement
- Improving the Fit: Abilities, Task, and Environment

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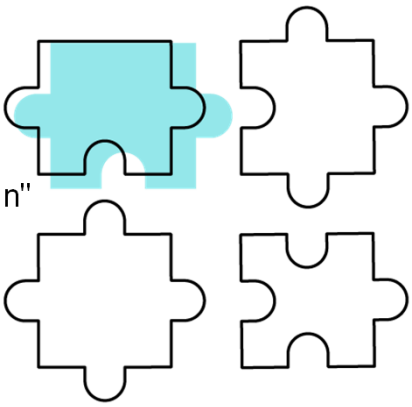
Strengths-Based Approach



- Build on a student's strengths
- Shift away from thinking how a student can "fit in"
- Shift away from deficit-based focus
- Aligns with WHO ICF Model (2007)
- Encourages self-advocacy
- Improves self-determination
- Closing the gap between capabilities and expectations

(Dunn et al., 2017, p. 240)

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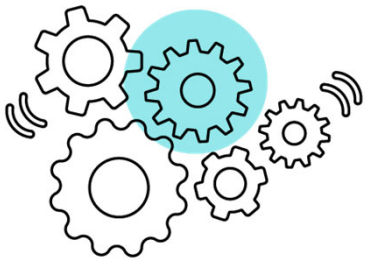
Improving the Fit: Abilities, Tasks, and Environment



- Support students where they learn
- Identify the gaps: student capabilities, task, and setting
- Create a better fit between the context and the person's level of functioning
- Provide accommodations for all when one or more can benefit (Cook & Tankersley, 2013)
- Implement universal design for learning to support all students -- context, instructional materials, and methods (Frolek Clark & Chandler, 2013, pp. 210-211)
- Professional models for this approach
  - Person-Environment-Occupation (PEO) Model used in OT (Law, et al., 2017)
  - Person-Environment Fit model from American Association on Intellectual and Developmental Disabilities (AAIDD; Thompson et al., 2013)

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Supporting Sensory Needs

Universal Design for Learning	Students Identifying Own Preferences	Additional Supports

• **Engagement**
  • Minimizing distractions
  • Providing options for self-regulation
• **Representation**
  • Enhancing the sensory presentation of content
  • Offering alternative presentation of content
  • Supporting information processing and visualization
• **Action and Expression**
  • Allowing various methods for response
  • Consider assistive technology (low or high tech)
(CAST, 2018)
	• Acknowledging all individuals have sensory preferences
	• Providing options for the entire class to allow choice
	• Allowing accommodations for success
	• Ask the student
	• Pay attention to the behaviors that might indicate sensory challenges
	
	(Frolek Clark and Chandler, 2013)
		• Embed sensory supports into student's routines
		  • Sensory Profile 2's Appendices include Intervention Strategies (Dunn, 2014)
		• Tier 1 opportunities for school-wide sensory or self-regulation supports
		• Referring to Related Services
		• Sensory supports for helping students manage behavior (Alexander & Kuhaneck, 2015)

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Common Sensory Supports in the Schools

Movement (Proprioceptive and Vestibular)
- Classroom errands
- Brain breaks, movement breaks, yoga
- Multi-sensory learning

Visual
- Changing lighting to more natural light
- Reduce visual stimuli on walls
- Preferential seating

Auditory
- White noise or classical music
- Preferential seating
- Noise reducing earmuff or ear plugs

Tactile
- Self-care
- Alternative materials and methods (art, etc.)

(Asher, 2017; Bodison & Parham, 2018; Dunn, 2014)

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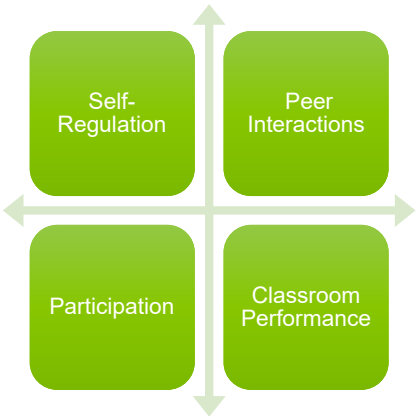
Outcomes of supporting sensory processing in academic settings



(Bazyk et al., 2018; Kinnealey et al., 2012)

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Supporting Motor Needs

Environmental Considerations	Assistive Technology	Skill Development	Additional Supports
• UDL principles • Adapting the environment • Accommodations • Alternative materials • Alternate seating options	• Low tech • High tech • Augmentative communication devices	• Pre-vocational skills • Self care skills • Independent living skills • Functional communication	• Referrals to Related Services provider • Referral to Adaptive PE services where available

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Common Motor Supports in the Schools

Environmental Modifications
- Accessibility and Safety
- Promote participation
- Positioning and seating options

Activities of Daily Living/Self-Care
- Independence and autonomy
- Dignity
- Preparing for transition to post-secondary life

Self-Advocacy
- Student participation in decision making
- Advocating for needs
- Self-determination

Inclusion
- Peer supports and buddy system
- Accommodations and modifications
- Technology

(Asher, 2017;
Cahill & Beisbier, 2020)

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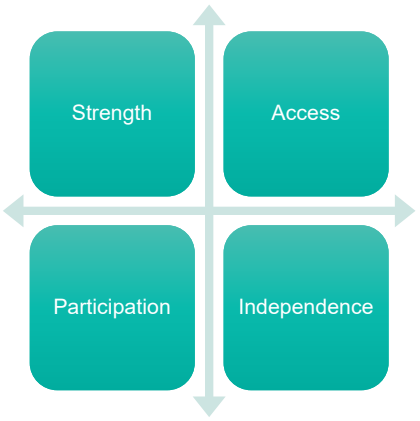
Outcomes of supporting motor needs in education



(AOTA, 2020; Coster et al., 2013)

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Key Take Aways

- Work with the child and not the label
- Use top-down and bottom-up approach to assessment
- Employ a strengths-based perspective
- Provide opportunities to increase self-advocacy and personal choice
- Adapt for success

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