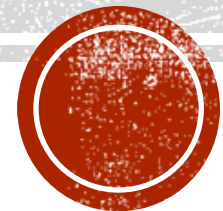
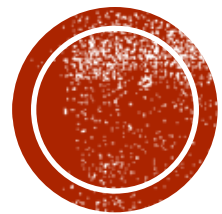


# **NEURODEVELOPMENTAL MODEL OF EVALUATION AND SERVICE**

Elaine Fletcher-Janzen, Ed.D., NCSP, ABPdN

The Chicago School of Professional Psychology





# TRANSLATING NEUROPSYCHOLOGY INTO SCHOOL PSYCHOLOGY PRACTICE



**Neuropsychological and Psychological Practices that Permeate All Aspects of Service Delivery**

**Neuropsychological and Psychological Direct and Indirect Services for Children, Families & Schools**

## Adapted NASP Model

**Student Level Services**

**Systems Level Services**

**Neuropsychological and Psychologically-Informed Data-Based Decision Making & Accountability**

**Neuropsychological and Psychological Interventions & Instructional Support to Develop Academic Skills**

**School-Wide Practices to Promote Neurodevelopmental Aspects of Learning**

**Neuropsychological and Psychologically Informed Consultation & Collaboration**

**Neuropsychological and Psychological Interventions & Mental Health Services to Develop Social & Life Skills**

**Preventive & Responsive Services to Promote Optimum Neurodevelopment**

**Family-School Collaboration Services to Promote Awareness and Support for Neurodevelopment**

**Foundations of Service Delivery**

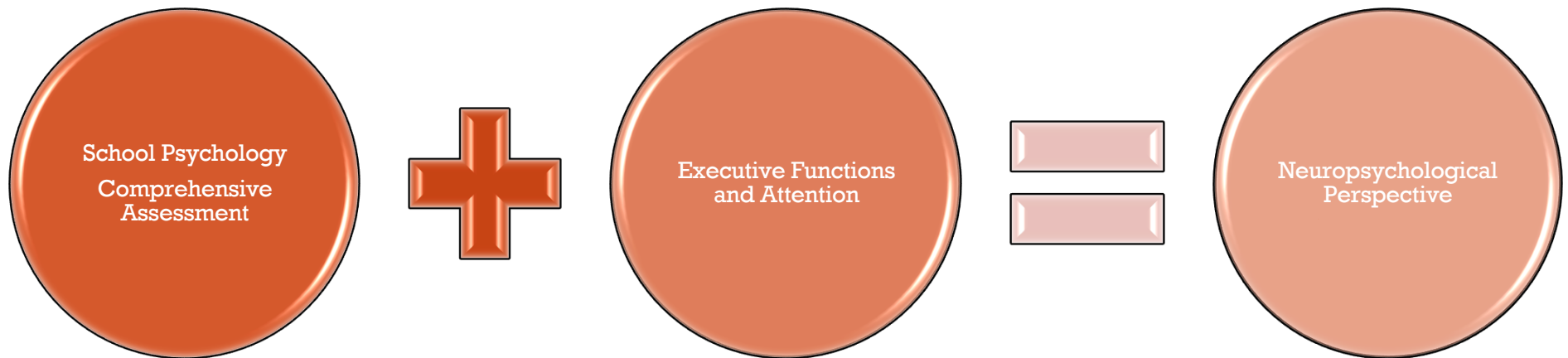
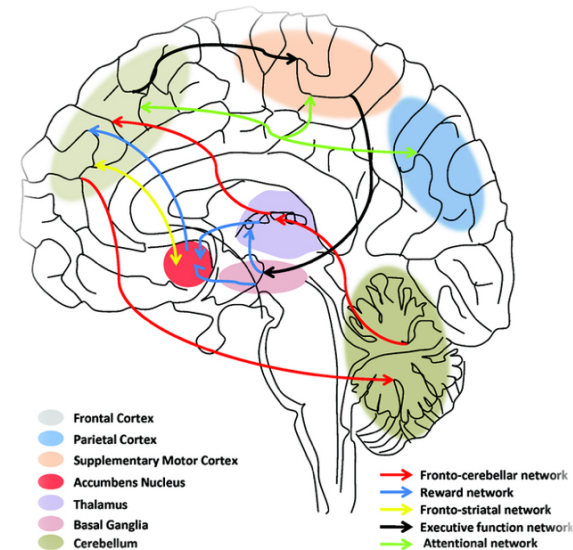
**Neuropsychological and Psychologically Informed Cultural Competency**

**Neuropsychological and Psychological Research and Program Evaluation**

**Neuropsychological and Psychological Legal, Ethical, and Professional Practice**



# ADDITION OF EF & ATTENTION TO SCHOOL PSYCHOLOGICAL ASSESSMENT





# THE NEURODEVELOPMENTAL MODEL OF EVALUATION AND SERVICE

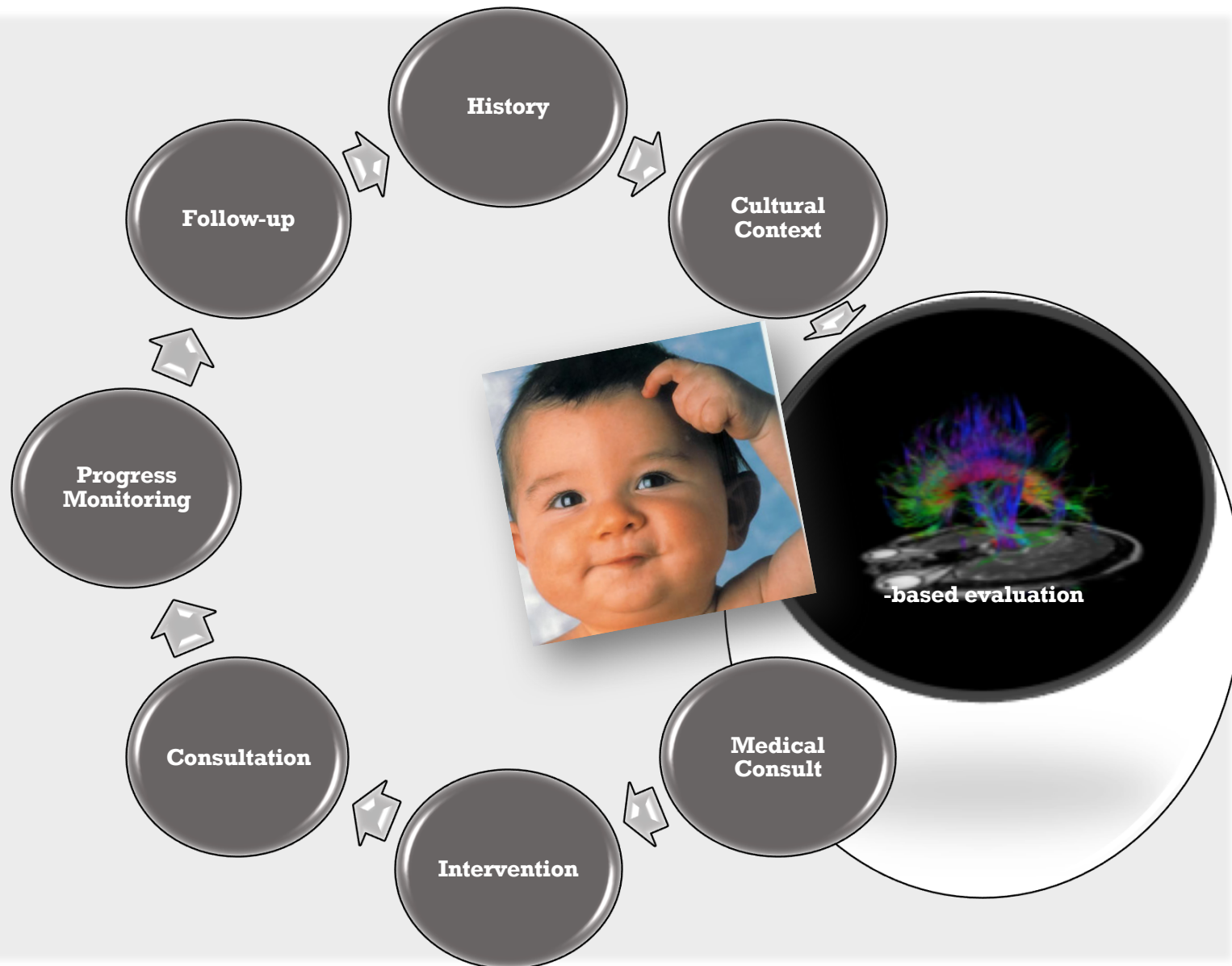


The Neurodevelopmental Model of Evaluation and Service is a framework for the practice of single-case study and treatment in the schools.

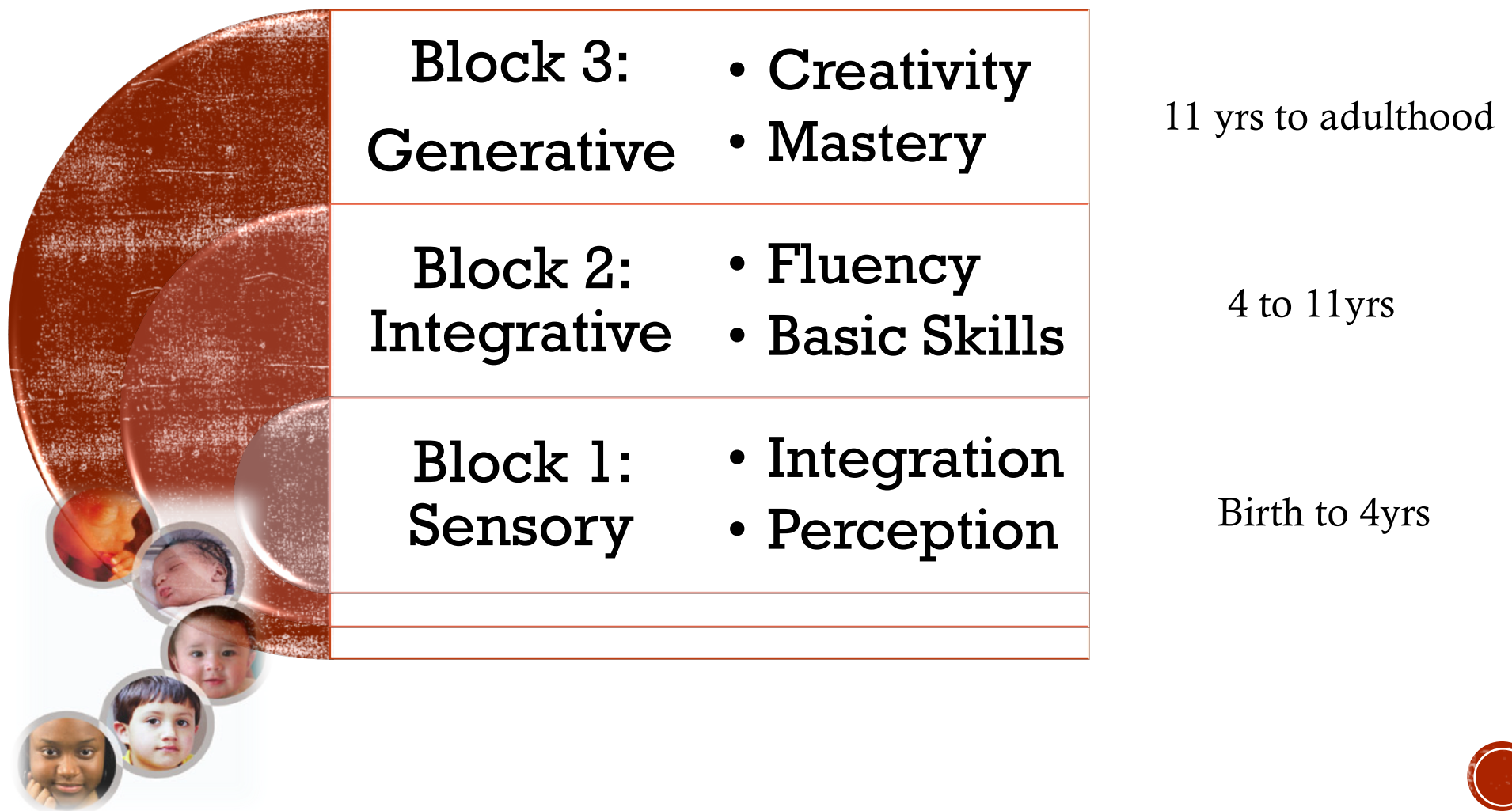
It requires the translation of neuropsychological information to enhance sensitivity and specificity of the determination of disability, and to drive intervention that demonstrates positive outcomes in quality of life.



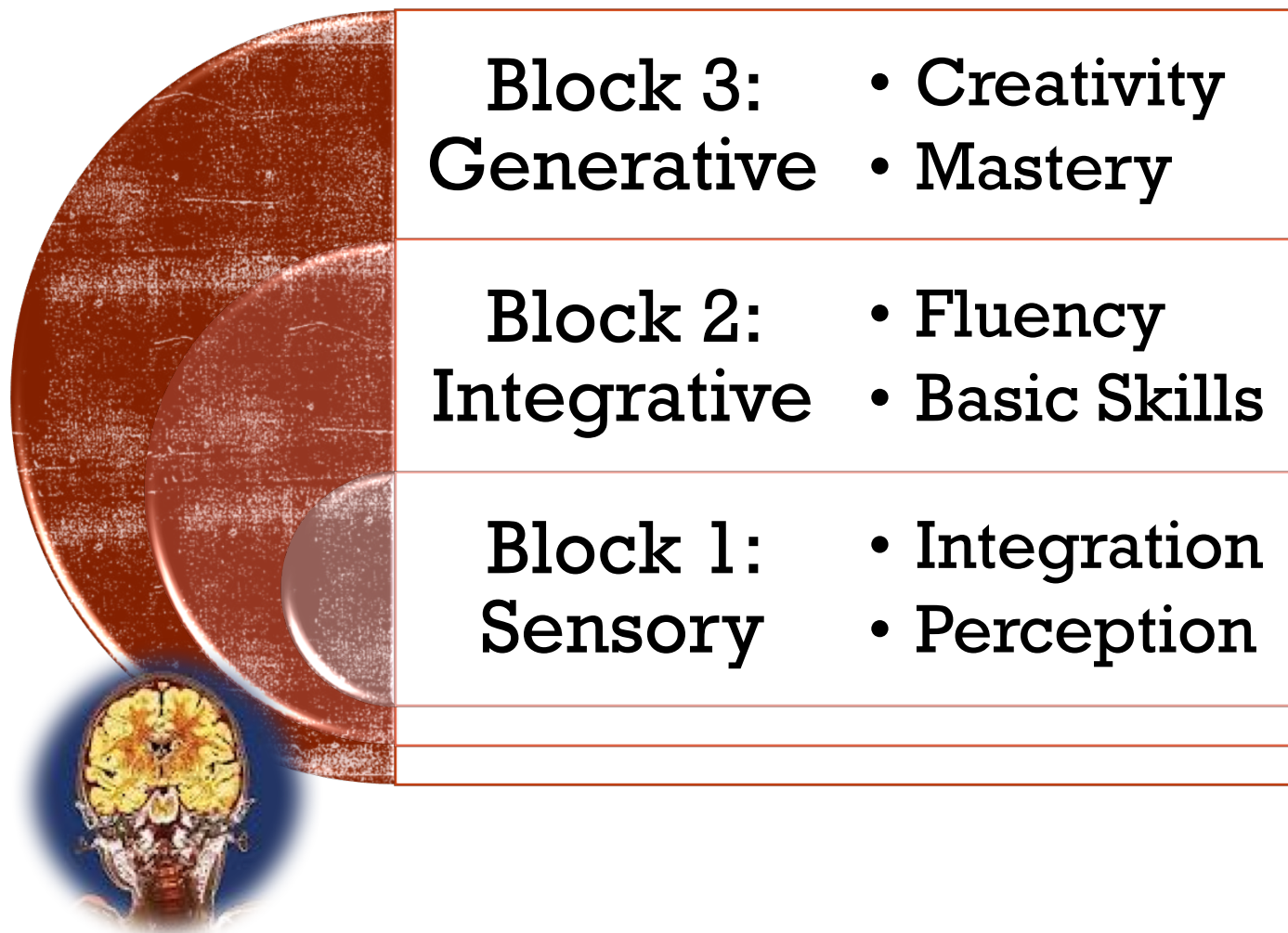
# NEURODEVELOPMENTAL MODEL



# THE COMPREHENSIVE NEURODEVELOPMENTAL EVALUATION



# THE COMPREHENSIVE **NEURO**DEVELOPMENTAL EVALUATION



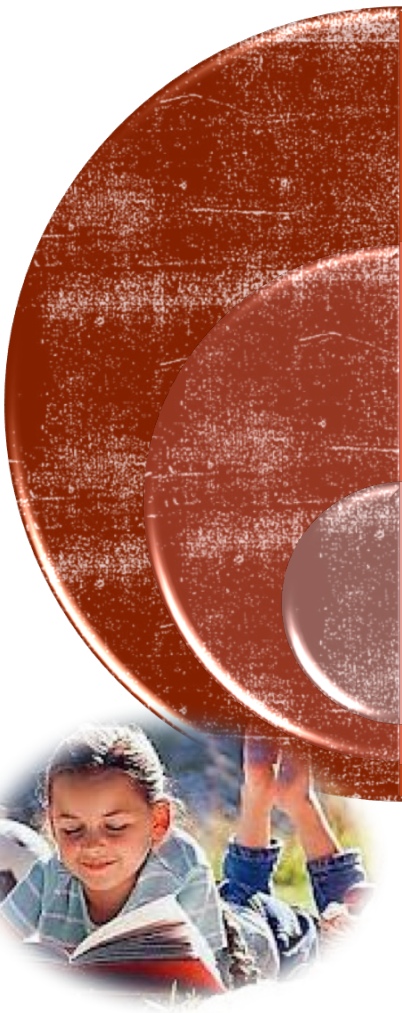
Executive Functions

Integration to Fluency

Visual, Auditory,  
Kinesthetic,  
Attention



# THE COMPREHENSIVE **FUNCTIONAL** NEURODEVELOPMENTAL EVALUATION



<b>Block 3: Generative</b>	<ul style="list-style-type: none"><li>• Creativity</li><li>• Mastery</li></ul>	Reading, Writing, Arithmetic, Social Competence & Innovation
<b>Block 2: Integrative</b>	<ul style="list-style-type: none"><li>• Fluency</li><li>• Basic Skills</li></ul>	Basic academic skills; Beginning school; Playing
<b>Block 1: Sensory</b>	<ul style="list-style-type: none"><li>• Integration</li><li>• Perception</li></ul>	Attention, playing Sensory-Motor, Bonding










# AREAS OF EVALUATION

## **Cognitive processes**

- Auditory processes
- Visual processes
- Motor/kinesthetic processes
- Language
- Attention/Executive Functions
- Memory
- Social/emotional

## **Cognitive product**

- Reading
- Math
- Written Expression
- Social relationships





**Neurodevelopmental Model of Assessment & Intervention**  
**Elaine Fletcher-Janzen**

**Cognitive Processes**


**Cognitive Product**

	Auditory	Visual	Sensory Motor	Language	Executive Attention	Memory	Social emotional	Reading	Math	Writing
Block 3 Generative	Listening comprehension-inferential	Visual problem-solving	Smooth, complex fine and gross motor	Oral expression of abstract reasoning	Insight; Complex problem-solving; Planning; Meta-cognition; Efficiency	Long-term storage & retrieval; Association	Tolerance of ambiguity; Conflict resolution; Humor; Social skills	Reading Comp Inferential; Reading Comp concrete	Math problem-solving; Math formulae	Written express (creative); Written express (concrete) Factual writing
Block 2 Integrative	Listening comprehension-concrete; Auditory perceptual skills	Visual or spatial integration; Visual perception skills	Visual-motor integration; handwriting fluency; Motor planning; Left/Right	Verbal and nonverbal communication; Prosody	Goal selection; Motivation; Basic self-regulation; Sustained attention; Inner speech; Pretend play	Categorical fluency; Semantic fluency; Memory strategies; Working memory-executive	Theory of Mind; Emotional regulation; Perspective-taking	Fluency with prosody; Fluency-word calling Word attack & decoding	Math facts Fluency; Math facts operation	Spelling fluency; Grammar fluency; Spelling vocab
Block 1 Sensory	Auditory perception discrimination; Phonological loop	Visual perception discrimination; Visual sketch-pad	Tactile; Proprioception Oral-motor	Articulation Receptive understanding; Nonverbal gestures; Pragmatic need	Inhibition Attention Salience Orienting Alerting	Prototypic memory; Procedural memory; Phonological loop; Visual sketch-pad STM	Prosody; Affect identification self & others; Face recognition;	Phonological awareness; Alphabetic principle; Orthographic knowledge; Literacy exposure	Number & fact recognition; Number sense; Literacy exposure	Spelling basic words; Basic grammar; Hand-writing

Cognitive Processes

Cognitive Product

		Auditory	Visual	Sensory Motor	Language	Executive Attention	Memory	Social emotional	Reading	Math	Writing
Block 3 Generative		Listening comprehension-inferential	Visual problem-solving	Smooth, complex fine and gross motor	Oral expression of abstract reasoning	Insight; Complex problem-solving; Planning; Meta-cognition; Efficiency	Long-term storage & retrieval; Association	Tolerance of ambiguity; Conflict resolution; Humor; Social skills	Reading Comp Inferential; Reading Comp concrete	Math problem-solving; Math formulae	Written express (creative); Written express (concrete) Factual writing
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	<b>Auditory Processes</b>	<b>Methods of Assessment Examples</b>	<b>Methods of Intervention</b>
<b>Block 3 Generative</b>	Listening comprehension inferential Follow complex directions without visual cues	Listening comprehension subtests (inferential items) Ceiling items on remembering directions subtests Riddles  Observation e.g. excessive or circular responses, long pauses before answering, stalling	<b>Top down</b> Elaborating and improvising use of visual compensatory strategies; note-taking; social skills
<b>Block 2 Integrative</b>	Listening comprehension concrete; Auditory associative memory Auditory processing of phrases & sentences Auditory inflection & intonation & prosody Auditory-phonological loop Auditory working memory	Listening comprehension subtest (concrete items) Memory for stories, immediate and delayed Phonological working memory subtests Subtests for remembering directions Memory for names  Observation e.g. incongruous or off-topic answers; struggles to follow conversation with background noise	<b>Bottom up</b> fluent visual cue use; explicit instruction of visual cue use; advanced prep paraphrasing; pre-teach rehearsal; chunking
<b>Block 1 Sensory</b>	Auditory processing of information and making it salient to task Auditory STM Auditory discrimination-detect difference between speech sounds and sequencing Auditory perception—identify, interpret, and attach sound to meaning Sound localization Sound lateralization Auditory pattern recognition Interpreting competing acoustic signals Pure tone reception	Following simple directives without visual cues Auditory short-term memory tests (e.g. Digit Span) Phonological Awareness measures Dichotic listening Audiological exam School Hearing Screening (including hyperacusis ) Observation e.g. head tilt/orientation, request for repetition, nonresponsive; History review with family (e.g. ear infections; ototoxic medications; tubes)	<b>Depends on age and severity of deficit</b> SLP therapy; slow rate of speech; visual cues; shorten oral directions; quiet environment 

	Visual Processes	Methods of Assessment	Methods of Intervention
<b>Block 3 Generative</b>	Innovative visual design Visual problem-solving Visual long-term storage & retrieval	Creativity measures Block design ceiling items Ravens Progressive Matrices Route finding  Observation e.g. generation of alternate visual ways of representing ideas	<b>Top down</b> Oral rehearsal of procedures; talking through; spontaneous use of tracking tools; support spontaneous compensatory strategies
<b>Block 2 Integrative</b>	Visual-spatial integration Identification of letters, numbers, symbols Design fluency Visual perception skills	Design fluency Block Design, Ravens basic items Rey-Osterrieth & delayed Visual memory subtests Observation e.g. lack of careful analysis of visual stimuli; inconsistent spelling	<b>Bottom up</b> E-notes; overlearning; enhance compensatory strategies; auditory/oral supports
<b>Block 1 Sensory</b>	Visual working memory-sketch pad Visual STM Directionality Spatial memory Spatial awareness Color perception Visual perception: recognition, discrimination; closure Visual efficiency: near point, saccades, pursuits Visual acuity: near & far	Motor-free visual perception test Visual digit span Arrows Spatial memory subtests Matching of designs Color blindness test Eye efficiency screening & Vision screening Hx with family Observation e.g. lack of navigation using visual cues	<b>Depends on age and severity of deficit</b> Books on tape; reduction of visual stimuli; kinesthetic cues; corrective lens



Motor Processes		Methods of Assessment	Methods of Intervention
<b>Block 3 Generative</b>	Smooth complex fine motor Smooth complex gross motor	Handwriting Hand Movements Functional skills Arts & Sports  Observation e.g. self-directed focused practice of problem areas	<b>Top down</b> Computer use; note-taking programs; self-development of compensatory actions
<b>Block 2 Integrative</b>	Motor fluency Handwriting fluency Visual-motor coordination Visual-motor integration Motor planning Left/Right	Motor sequencing: complex Rey-Osterrieth Bender Gestalt Beery Bruininks-Oseretsky Test  Observation e.g. frustration with manipulatives; poor decoding but good phonological awareness	<b>Bottom up</b> PT Keyboarding; music therapy; spatial-video-games; wobble boards
<b>Block 1 Sensory</b>	Eye-hand coordination Proprioception Finger perception Tactile Grip Balance	Tactile recognition Imitating hand movements Manual motor sequences: simple Finger tapping Hx with family  Observation e.g. clumsiness, poor grasp, hand discomfort, excessive pencil pressure	<b>Depends on age and severity of deficit</b> OT & PT services; pencil grips; large line paper; crafts, individual sports




Language Processes		Methods of Assessment	Methods of Intervention
<b>Block 3 Generative</b>	Oral communication of ideas, thoughts, bases for opinions, oral debate; pathos Complex pragmatics Use of metaphor	Verbal expression subtests Absurdities/wit Analogies Ceiling items on Similarities Verbal fluency  Observation e.g. verbosity; focused in oral debate; evidence of paraphasias or word finding difficulties when fatigued	<b>Top down</b> Formal reasoning-logic instruction; bibliotherapy; debate training; speech writing; story-telling
<b>Block 2 Integrative</b>	Basic pragmatics Prosody Sentence formation Oral presentation of ideas/sequencing Receptive directions complex Paraphrase directions Non verbal communication	Pragmatics subtests Grammar subtests Repeating/paraphrasing directions  Observation e.g. awareness of discord between speech and nonverbal cues/body language; mutism; filler words; pragmatics are off;	<b>Bottom up</b>  Bibliotherapy; subtle cueing; guided reading; social coaching SLP guidelines, word banks
<b>Block 1 Sensory</b>	Use of sign Receptive and expressive language: words/sentences Functional pragmatics (need): expressive Functional pragmatics (need): receptive Mimicking speech Babbling Articulation of speech sounds Orientation to speech sounds	Speech & language basic skills Articulation subtests  Observation e.g. unintelligible speech; not following directions; hesitation; excessive copying of peers	<b>Depends on age and severity of deficit</b> SLP therapy; social sensitivity; Cueing (magic word?) 



Attention/Executive Processes		Methods of Assessment	Methods of Intervention
<b>Block 3 Generative</b>	Insight Complex problem-solving Planning Strategizing Organizing Metacognition Cognitive flexibility Efficiency	Ceiling items on IQ tests Ravens Progressive Matrices Wisconsin card sort Category test Rey-Osterrieth Observation e.g. error monitoring; delegating; managing long-term project independently; sequential flow of ideas in work product; correctly predicting obstacles in advance; generating novel solutions	<b>Top down</b> Advanced organizers; assisted strategy formulation; critical analyses of plans
<b>Block 2 Integrative</b>	Goal selection Motivation Basic self-regulation Inhibition Inner speech Executive attention network Divided attention Sustained attention Perseveration Imaginative play	N-backs (2 and up) Continuous attention Color interference Trails A&B Bender Rorschach Observation e.g. ability to regroup after distraction; ability to shift task; transitions; frustration tolerance issues; pretend play	<b>Bottom up</b> Assist development of internal sources of motivation; self-regulation routines
<b>Block 1 Sensory</b>	Inhibition Salience Orienting attention network Alerting attention network Arousal/cognitive tempo	Continuous attention N-Backs 1 Mental status Hx with family Observation e.g. Lack of initiation in routine and novel situations; slow -moving; passive: startle response; hyper-arousal: Hypervigilance (pays attention to everything-too much anticipation)	<b>Depends on age and severity of deficit</b> Attention games; memory activities; stories; Mr. Rogers



Memory Processes		Methods of Assessment	Methods of Intervention
<b>Block 3 Generative</b>	Long-term storage & retrieval Automatic memory strategy generation	Information and crystalized knowledge subtests Reading comprehension, math problem-solving Observation: e.g. perplexity (lack of confidence in recall); excessive use of vague, “filler” words; spontaneous use of memory strategies; self-cuing; circumstantial stories	<b>Top down</b> Encouraging mnemonics, faded prompts of strategies; notebook and note-taking software
<b>Block 2 Integrative</b>	Episodic memory Semantic memory Narrative memory Working memory	Delayed memory subtests Color interference subtests  Observation: e.g. poverty of recall of story themes or details; word finding difficulties; recognition memory is not substantially better than free recall; recurrent intrusion of inaccurate content; frequent “re-starts” or recognition of losing place/thoughts	<b>Bottom up</b> Graphic organizers; state dependent learning; enhancing context cues; errorless learning; chunking
<b>Block 1 Sensory</b>	Short term memory: auditory, visual & haptic	Digit span Visual digit span Hand movements  Observation: e.g. confusion or failure to recognize previously learned material; lack of practice effect; no rehearsal strategies; use of ineffective strategies	<b>Depends on age and severity of deficit</b> Direct instruction of strategies e.g. rehearsal; visual cues; games 

	Social/Emotional Processes	Methods of Assessment	Methods of Intervention
<b>Block 3 Generative</b>	Social skills Humor Conflict resolution skills Appreciation of ambiguity	Broad-based psychological measures Interview Behavioral history  Observation: Comfort with alternative points of view without defensiveness or hostility; Appreciation of learning as a process rather than a product; Compassion to self and other; uses physical feature or habit to discriminate individuals	<b>Top down</b> Self advocacy skills; conflict negotiation; self-cueing, Encourage process rather than product focus; Curious attitude about mistakes, psychotherapy, bibliotherapy
<b>Block 2 Integrative</b>	Theory of mind Perspective-taking Affect regulation Affect expression Affect identification (self) cooperation	Theory of mind subtests Interview Feelings identification subtests Behavioral history Observation: e.g. expresses wants effectively; sought out by other children during play; articulates viewpoint of another; misses social cues; requires external coaching	<b>Bottom up</b> Coaching in actual setting; Affect ID instruction; Affect compensatory strategy instruction
<b>Block 1 Sensory</b>	Theory of mind: awareness Affect recognition: others Facial memory Face recognition	Theory of mind: basic items Affect recognition subtests Facial recognition/memory subtests Observation: e.g. poor eye contact, disinterest in others; fails to look where another is looking or pointing; sticky attention; little imitation	<b>Depends on age and severity of deficit</b> SLP driven; reinforcement for initiated contact



	Reading Processes	Methods of Assessment	Methods of Intervention
<b>Block 3 Generative</b>	Reading comprehension critical analyses Reading comprehension: inferential Reading comprehension: concrete/literal	Reading comprehension achievement subtests  Observation e.g. reads well with prosody but does not comprehend beyond a surface level; complains of not remembering what was read; poor retrieval; does not generalize from one discipline to another	<b>Top down</b> Alternative endings; compare & contrast; multiple readings; self-generation
<b>Block 2 Integrative</b>	Reading fluency with prosody Reading fluency: mechanical Literacy appreciation; enjoyment; motivation	Reading of passages RAN  Observation e.g. losing place in RAN; skipping lines; pausing to decode; no prosody; anxiety for reading aloud	<b>Bottom up</b> Fluency software; practicing prosody in chunks; literacy menu
<b>Block 1 Sensory</b>	Comprehension of phrases and sentences Word attack skills Letter/word identification Orthographic awareness Phonological awareness Alphabetic principle Literacy awareness	Basic reading skills subtests Pseudoword reading Phonological awareness subtests Sound/letter subtests  Observation e.g. poor and inconsistent decoding; poor literacy awareness; lack of motivation & enjoyment about reading	<b>Depends on age and severity of deficit</b> Guided reading; usual basic skills; literacy enjoyment



	Math Processes	Methods of Assessment	Methods of Intervention
<b>Block 3 Generative</b>	Math problem-solving	Math problem solving subtests Reading comprehension subtests  Observation e.g. spontaneous generation of alternate methods to achieve outcome; over-reliance on mapping of components; knows content but cannot generalize	<b>Top down</b> Rehearsal of basics before beginning; strategy of tools needed
<b>Block 2 Integrative</b>	Math fluency: strategies Math fact fluency Generalization of math to settings	Math fluency subtests Math fact knowledge  Observation e.g. inconsistent application of facts; needs prompts; does not check work; anxious about fluency; continued use of visual prompts	<b>Bottom up</b> Rehearsal; same modality in and out; overlearning
<b>Block 1 Sensory</b>	Math operations: awareness Number identification Math literacy appreciation Number sense	Basic math facts Number identification subtests Number sense subtests; basic items on math computation subtests  Observation e.g. inconsistent identification of numbers; loses place when trying to order visual objects; unaware of missing items	<b>Depends on age and severity of deficit</b> Number literacy; place

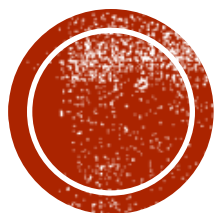


Writing Processes		Methods of Assessment	Methods of Intervention
<b>Block 3 Generative</b>	Written expression: critical Written expression: creative Written expression: concrete	Written expression subtests  Observation e.g. can criticize own work; reworks prose; answers literal questions but not inferential; does not enjoy design	<b>Top down</b> Visual mapping of ideas; research skills; incubation skills; patience
<b>Block 2 Integrative</b>	Spelling fluency Grammar fluency Vocabulary Handwriting/typing fluency	Spelling achievement tests: error analyses Written expression subtests: grammar Vocabulary subtests  Observation e.g. slowing down to spell; poor advanced organizing; erratic grammar & punctuation	<b>Bottom up</b> Parsimony; basic mapping; vocab software; visual practice
<b>Block 1 Sensory</b>	Grammar rules Spelling generative/rule bound Spelling basic Copying written material Literacy appreciation—need to write	Basic written expression and spelling subtests Pencil grip Copying skills Coloring skills  Observation e.g. lack of interest; frustration; poor fine motor; handedness confusion; poor spacing; reversals	<b>Depends on age and severity of deficit</b> Distinguish between literacy and motor

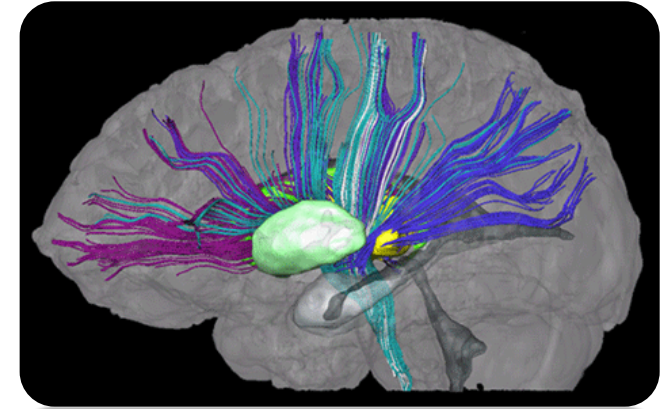




# INTERVENTIONS



# BRAIN PLASTICITY & INTERVENTION



## plas·tic·i·ty definition

■ Pronunciation: /pla-'stis-ət-ē/

Function: *n*

*pl -ties* ; **1**: the quality or state of being plastic

*especially* : capacity for being molded or altered

**2**: the ability to retain a shape attained by pressure deformation

**3**: the capacity of organisms with the same genotype to vary in developmental pattern, in phenotype, or in behavior according to varying environmental conditions

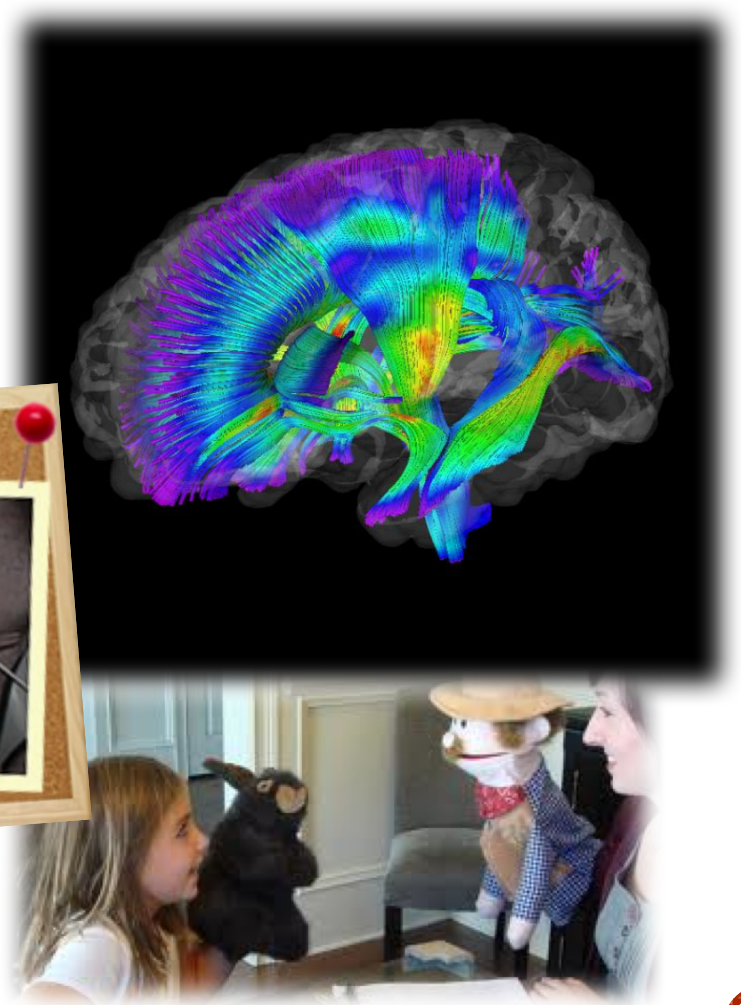
**4**: the capacity for continuous alteration of the neural pathways and synapses of the living brain and nervous system in response to experience or injury that involves the formation of new pathways and synapses and the elimination or modification of existing ones



# TRANSLATIONAL NEUROPSYCHOLOGY: FROM PLASTICITY TO INTERVENTION

Growing body of research...

- Sally & Bennett Shaywitz
- George McCloskey
- Michael Boivin
- Michael Posner
- Bruce Perry
- Jack Naglieri
- Brad Hale
- Cecil Reynolds
- Margaret Semrud –Clikeman
- Jack Fletcher





# INTERVENTIONS

- Basic on research about approaches that are found to be evidence-based with groups AND...
- Tailored or individualized to the case at hand
- Sensitive to cognitive fatigue/reserve
- Ongoing
- Monitored
- Adjusted according to progress



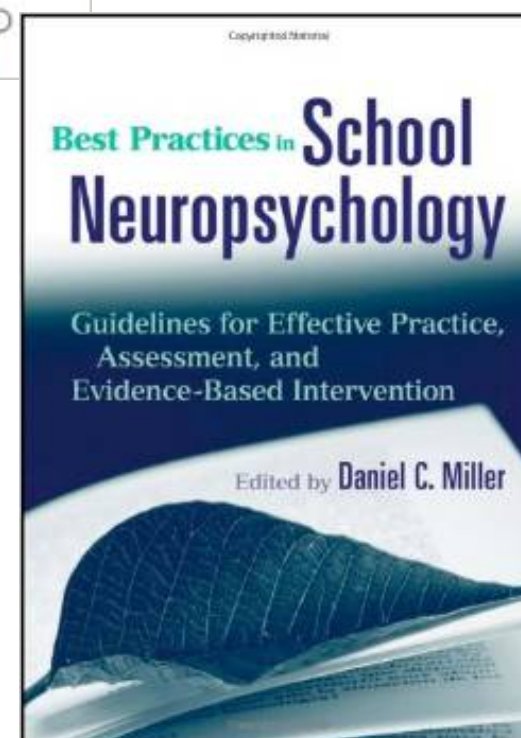
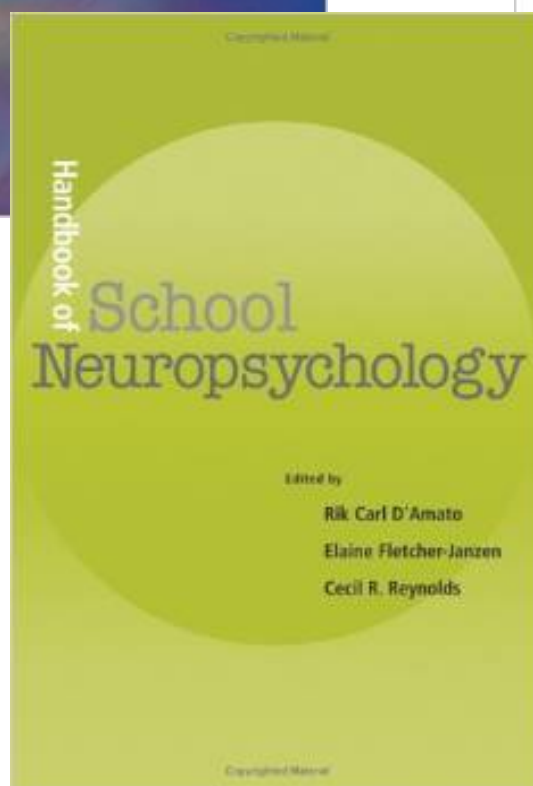
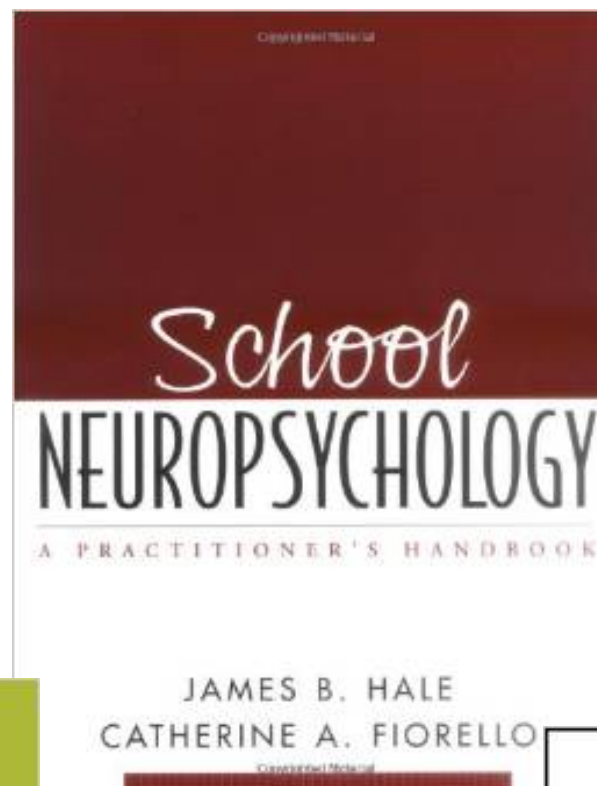
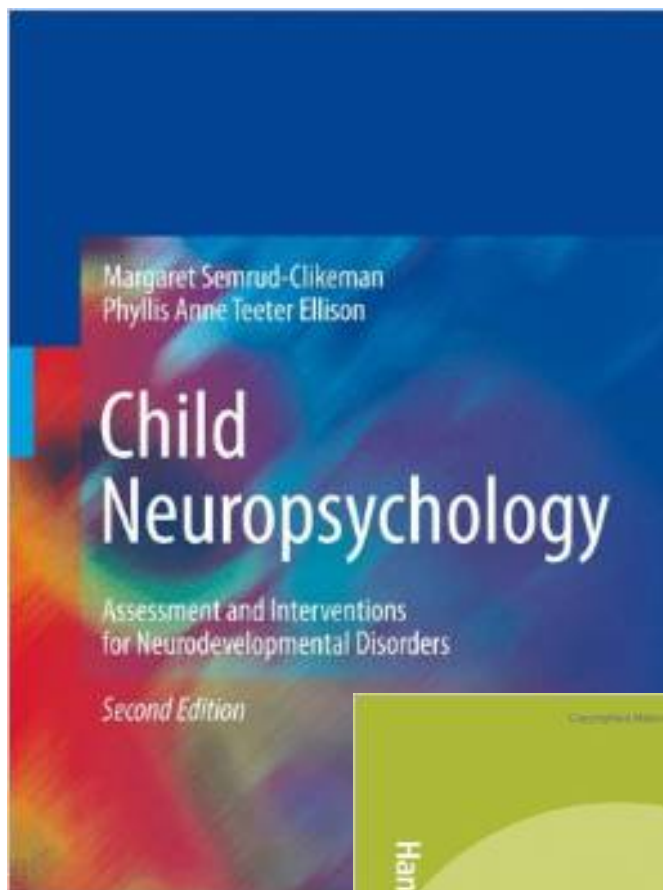


# REVIEW OF PRESENTATION



- Introduction
- Basic brain organization
  - 1. This session will help participants understand basic functional neuroanatomy of brain processes and products.
- Introduction of a neurodevelopmental approach to assessment
  - 2. This session will help participants understand brain processes and products from a developmental perspective
- Translating neuropsychology into school psychology practice
  - 3. This session will help participants understand the relationship between brain processes and academic products.







# CONTACT

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- This powerpoint was developed by Dr. Elaine Fletcher-Janzen
- All Right Reserved

