


**AN INDIVIDUALIZED
APPROACH TO TEACHING
SEQUENCING SKILLS**



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SEQUENCING

- The ability to put together events in chronological or causal order
- Familiar or unfamiliar events
- Dependent on prior knowledge

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SEQUENCING IS NECESSARY FOR...

- Understanding and telling narratives.
- Problem solving.
- Reading comprehension.
- Performing daily routines.
- Interacting appropriately with peers and adults.
- Academic success.

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SEQUENCING REQUIRES...

- Understanding of cause and effect.
- Predicting.
- Understanding time/transition words.
- Knowledge of story grammar.
- Adequate reasoning and planning skills.

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SEQUENCING IS IMPACTED BY...

- Executive functions.
- Memory (semantic or episodic).
- Language.
- Auditory processing.
- Visual processing.



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EXECUTIVE FUNCTIONS

- Ability to solve problems, and monitor, plan, and direct future behaviors
- Mental processes that help link past experiences and prior knowledge to our present actions
- Activated when we begin a novel task or faced with new challenge

• Planning	• Organizing
• Prioritizing	• Shifting
• Memorizing	• Checking

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SEQUENCING AND EXECUTIVE FUNCTIONS

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EPISODIC AND SEMANTIC MEMORY

- Episodic Memory – recall of personal experiences
- Semantic Memory – facts, concepts, and routines. Includes a time component
- Episodes may become generalized and form semantic memories or *schemas*

(Richgels, 1982; Schank & Abelson, 1977; Mattlin, 1998; Bransford & Johnson, 1973)

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LANGUAGE AND SEQUENCING

Executive Function and Language

- Singer and Bashir (1999) reported that “within the early school years, and beyond the fourth grade in particular, the role of language becomes almost inextricably intertwined with executive function and self-regulatory processes.” (p.267)
- Language mediates executive functions.

(Singer & Bashir, 1999; Meltzer, 2004)

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COMPREHENSION OF STORIES

- Macrostructure (i.e., story grammar)
- Microstructure
 - Vocabulary
 - Grammar
 - Cohesive Devices

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MACROSTRUCTURE LEVEL

- Macrostructure = Story Grammar
- The events in stories are related temporally and causally. Schemas provide the framework for this.
- By age 3, identify major events
- By age 5, use temporal concepts
- By age 9, introduce stories, firm grasp on beginning, middle, and end

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MICROSTRUCTURE LEVEL

Vocabulary

- A rich and large vocabulary is highly associated with increased knowledge about the world.
- Sequencing tasks have a specific vocabulary associated with them. For example, *jack* and *spare* are associated with changing a tire.

Grammar

- Verb Tense
- Conditional Clauses
- Reference

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MICROSTRUCTURE LEVEL (CONT.)

- Berman and Slobin (1994) reported that students' organization of narratives improved with increased understanding and use of cohesive devices.
- Cohesion ties sentences together so that a message is communicated efficiently and effectively.

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FIVE TYPES OF COHESIVE DEVICES

- Reference - personal and demonstrative pronouns
- Conjunctive - connective devices
- Lexical - repetitive or synonymous words
- Substitution - using another word for a previous word
- Ellipsis - omission of previously stated words

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MICROSTRUCTURE LEVEL (CONT.)

The Great Pumpkin Carver



Card 1: Shane brought home a pumpkin to carve. First he cut off the top.

Card 2: Shane then cleaned out the pumpkin.

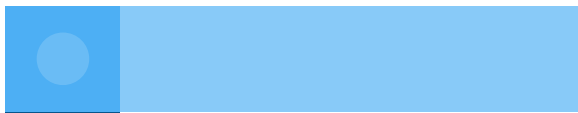
Card 3: Once the guts and seeds were cleaned out, Shane drew a face on the pumpkin.

Card 4: He used the drawing as a guide to cut out the face.

Card 5: After the face was carved, Shane put a candle into the pumpkin and his mom lit it.

Card 6: Finally he put the top back on the pumpkin.

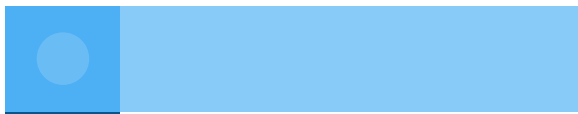
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VISUAL PROCESSING AND SEQUENCING

- Visual discrimination – the ability to compare and distinguish the differences between items
- Visual figure-ground discrimination – discriminating an object from its background
- Visual sequencing – identifying the correct order of words and images
- Visual memory – the ability to remember things that are seen
- Visual closure – the ability to identify an item when only shown a part of it
- Spatial relationships – the ability to know where items are in space. This includes verbal and written descriptions.


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AUDITORY PROCESSING AND SEQUENCING

- Auditory awareness – the ability to detect sound
- Auditory discrimination – the ability to hear differences between sounds
- Auditory identification – the ability to attach meaning to sounds and speech
- Auditory comprehension – the ability to understand longer auditory messages


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COMMON CHARACTERISTICS OF PROCESSING DISORDERS

- Breakdown beyond physical hearing acuity
- Difficulty attending to auditory information (especially in noisy environment)
- Need for extra time to process
- Difficulty retaining verbal information
- Low academic performance
- Problems understanding and retaining multi-level information (multi-step directions)
- Language difficulties
- Behavioral issues
- Difficulty with phonological awareness, reading, and spelling


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DISORDERS AFFECTING SEQUENCING

- Auditory Processing Disorders
- Autism Spectrum Disorders
- Hearing Impairment
- Learning Disabilities
- Specific Language Impairment


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AUDITORY PROCESSING DISORDERS

- Comprehending oral narratives can be particularly difficult for students with auditory processing disorders because they require students to process information accurately, then to understand the information, retain it, and finally organize it.
- Becomes more difficult in noisy environments.

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AUTISM SPECTRUM DISORDERS

- Familiar and unfamiliar events can be challenging because of breakdowns in their executive functions systems.
- Familiar events require a dual focus – students have to attend to steps of an activity and the desired outcome.
- Unfamiliar events are difficult because they may require a new problem-solving strategy.
- Kwon and Pae (2007) reported that students with Asperger’s Syndrome had similar receptive language and were able to express the key elements in a narrative.
- More difficulty using cohesive devices and complex syntax (i.e., microstructure level).

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HEARING IMPAIRMENT

- Younger students (6;0-7;0) have difficulty recalling sequences that are presented verbally with no visual cues, but this improves by age nine.
- In general, students with hearing impairments have difficulty understanding synthesizing and complex syntax and semantic relationships.

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LEARNING DISABILITIES

- Students with learning disabilities' sequencing skills are dependent on their strengths and weaknesses.
- Sequencing pictures may be difficult for a student with visual processing deficits.
- Auditory information may be difficult for a student with auditory deficits.
- Executive function issues may affect the ability to process the information in a sequence and memory deficits may impact recall.

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LEARNING DISABILITIES (CONT.)

- Snart (1988) found that students with learning disabilities were poorer in sequential processing and planning when compared to their peers.
- Silver (2001) reported that students may try to retell a story, but start in the middle, move to the beginning, then try to tell the ending or not finish at all.
- Roth and Spekman (1999) found that students tell shorter stories with fewer details.
- Bradlow, Kraus, and Hayes (2003) discovered that students with LD have greater difficulty perceiving sentences in noise.

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SPECIFIC LANGUAGE IMPAIRMENT

Sentence Comprehension

- Sentence comprehension impacted by verbal working memory. These students are unable to remember or process information quickly enough.
- Unfamiliar grammatical forms and sentence constructions make it difficult to allocate attention to the information in a sentence.
- In general, sentence comprehension decreases as sentence length increases.

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SPECIFIC LANGUAGE IMPAIRMENT (CONT.)

Story Comprehension

- Story retell is dependent on comprehension of information – auditory or visual.
- Students with SLI have significant difficulty with macrostructure and microstructure of stories.
- Students understand factual questions, but have difficulty understanding “why” questions. They don’t understand the causal relationships.
- Difficulty with narrative comprehension impacts literacy skills.

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TEACHING SEQUENCING

Sequencing helps students to . . .

- Learn the steps of a process.
- Know the tools used to complete a process.
- Understand and use specific vocabulary.
- Remember the steps of a process.

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TEACHING SEQUENCING (CONT.)

- Sequencing activities that include the manipulation of pictures, words, and sentences help build important literacy skills like reading left to right, comprehending important details, predicting, and identifying the important parts of a story.
- Nearly every state and the *national Common Core Standards* include educational standards for describing the details of an event at nearly every grade level.

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HEARBUILDER® SEQUENCING

- Grades K-6
- Targets comprehension and critical thinking
- Start with 2-step sequences and progress to 6-step sequences
- Customize options to include/exclude: pictures, audio, text
- Monitor progress and track data for an unlimited number of students
- Sequence Stories or Instructions
- Set levels of difficulty
- Add background noise at any level and adjust volume for each student



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SOFTWARE DEMONSTRATION



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Customizing HearBuilder Sequencing

Student: Andre, 6 years old

- Strengths: motivation, visual skills
- Needs: receptive and expressive language, vocabulary, background knowledge

Student: Alexandra, 8 years old

- Strengths: can sequence and retell in therapy room
- Needs: attention, narrative discourse in classroom



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Customizing HearBuilder Sequencing

Student: Brandon, 7 years old

- Strengths: reading (hyperlexic)
- Needs: functional sequences; recognize beg/middle/end

Student: Casey, 10 years old

- Strengths: listening comprehension
- Needs: reading comprehension



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FEATURES OF THE HEARBUILDER® PROFESSIONAL SOFTWARE SERIES

- Measurable learning objectives for every level
- Customizable
- Set, change, monitor levels of difficulty
- Add background noise
- Data-tracking for unlimited number of students
- Customizable and printable reports

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