Understanding and Addressing Cognitive and Behavioral Flexibility in Students with Autism Spectrum Disorders

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Flexibility
Flexible – synonyms

- Adaptable
- Accommodating
- Open
- Variable
- Compliant
- Changeable
Flexible—antonyms

- Rigid
- Non-conforming
Continuum

Flexible  →  Inflexible

Go with the flow  →  Controlling
Cognitive Flexibility

They only taught me how to think outside of the box. I'm not trained for circles!!!
Cognitive Flexibility

- Cognitive flexibility—being able to respond to the same stimulus differently. To be able to change your response in the presence of the same stimulus (to make a new rule).

- How does this impact our student’s success?
- Cognitive flexibility vs. generalization
Stroop Test

- http://faculty.washington.edu/chudler/java/ready.html
Cognitive Flexibility

- It explains awareness of the fact that each and every problem has a **number** of possible **solutions** and that every individual has a personal opinion that may reflect only one side of an issue.

- Cognitive flexibility also relates to coping skills
  - people’s ability to contemplate different perspectives, opinions and analyze multiple possible solutions.
  - Problem Solving!
  - Perspective taking
  - Creativity?
Where does it go?
Developing Cognitive Flexibility

- For learners to develop cognitive flexibility and to acquire content knowledge structures which can support flexible cognitive processing:
  - **flexible learning environments** are required which permit the **same items** of knowledge to be presented and learned in a variety of different ways and for a variety of different purposes (commensurate with their complex nature). (Spiro, 1996)
Perseverative Responding and Rule Following

- Zelazo & Reznick (1991)– 2.5 year olds had trouble following rules (“put it here if you find it outside/inside the house”). 3 year olds were much more consistent in following the rules.

- Perseveration in card-sorting
  - 3 year olds–
  - Children perseverate with whatever rule they use first, despite:
    - repeated instruction
    - seeming to know what they’re supposed to do
    - repeated negative feedback
  They can follow the rules separately but have difficulty with the switch (e.g., shape to color)

Children begin to make the switch by age 4 (Zelazo, 2004)
Improving Children’s Flexibility

Brace, Morton, & Munakata (2006), Psychological Science
Generalization
Compared performance of children with ASD and typically developing controls on an experimental task–switching variant of the WCST.

There are no indications that a switch will occur, or about the rules that should be applied.

Consistent with the task–switching literature, all participants responded slower on switch than on maintain trials, showing that this task induced a “switch cost” (Monsell, 2003).
Research with Children with ASD
Wisconsin Card Sorting Task, Van Eylen et al (2011)

- 40 individuals with ASD and 40 – control group participated

- 8–18 years old high functioning autism and control group

- When comparing the performance of the ASD and the TD groups, the data revealed that children with ASD tended to make more perseveration errors and had a “higher switch cost” compared to typically developing controls.

- They didn’t switch as easily as their peers did.

- This indicates cognitive flexibility impairments in children with ASD.

- In addition, the reaction time data revealed that both groups responded equally fast on maintain trials. However, children with ASD responded significantly slower on the switch trials.
Applications for Students with ASD
Perseverative Responding
Answering a Question

- Ask a student with ASD a question:
  - How are you doing?
  - Teach response “okay”
  - Then Teach response “not bad”
  - Then Teach response “good”

- What response do they typically give?
- Why?
- Perseveration?
- First one they learned?
- Associated with SR?
- Most recently associated with SR?
Serial vs. Concurrent Learning
Concurrent Schedule Reinforcement/Token Board

OK  NOT BAD  GOOD
Another Example....

- Tell me some animals
- “Dog, Cat, Pig”
- “Dog, Cat, Pig”
A hallmark of intelligence is flexible cognition: adapting to unfamiliar or unexpected situations, creatively combining concepts, and modifying familiar knowledge and habits to produce novel behavior.

Language enhances and permits expression of flexible cognition. It permits us to talk about our thoughts, problem solving, ideas and intentions.
Vocabulary

- It’s important to introduce the child to language that is “flexible” and have them understand the difference....

- Will vs. Could
Sequencing/Predicting
What is she going to do?
What will she do?
What do you think she will do?
What else could she do?
She COULD/She MIGHT

Eat them

Share them

Get some milk

Get a plate
Matching/Categorizing
Matching

- Color, shape, size, number
- Associations – matching
  - Pillow to bed (what else could go with bed?)
  - Hat to gloves (what else could go with hat?)
Associations App—Things that go together

Smart Matching Game for Kids
Help your kids develop critical thinking skills while having fun

Endorsed by parents & teachers
Great for interactivity and learning together
Categorizing

- Ask 1\textsuperscript{st} time: Show/Tell me an animal \(R=\text{“Cat”}\)
- Ask 2\textsuperscript{nd} time: Show/Tell me an animal \(R=\text{“Cat”}\)

Must work on novel responses–
- Give many exemplars, teach “different”
- Find a cat, Find something “different”
- Show me one that is NOT a cat…
- Show me another animal

- Show me/Tell me– a DIFFERENT animal “Cow”
- Which is the better choice– to show the exemplars with pictures or teach “different”?
Tell me an animal... “Frog”
Tell me an animal..."Cow"
Categories
App - Sort and Categorize

THE BEACH
THE DOCTOR

VEHICLES
SCHOOL

TOYS AND GAMES
NATURE

KITCHEN ITEMS
Flexible Categories

- Something could go in a toy category or an animal category (kermit?)
- This car—Vehicle or toy category?