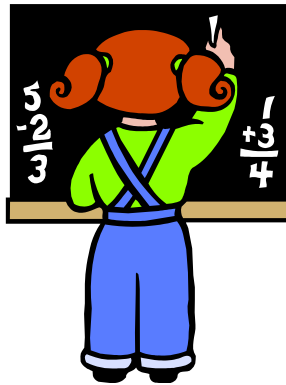


Educational Strategies Handouts



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SUMMARY OF COGNITIVE RESEARCH

- Strengths in vocabulary (Dykens, et al., 1989), long term memory for meaningful and learned information (Freund and Reiss, 1991) and face emotion perception (Turk and Cornish, 1998)
- Weaknesses in attentional control & (Munir et al., 2000), linguistic processing (Belser and Sudhalter, 2001), and visual spatial cognition (Cornish et al., 1998, 1999)
- Both biological (amount of protein produced) and environmental factors predict outcomes of children with a full mutation (Dyer-Friedman et. al., 2002)
- The magnitude of the deficit in FMRP, the basic molecular disturbance in FXS (Kaufmann and Reiss, 1999), is correlated with the severity of cognitive impairment, but not with behavioral disturbances such as ASD (Kaufmann et.al., Bailey et. al., 2001)

Cognitive Profile

Studies of IQ in Males with FXS

Cognitive Features in Fragile X Males (K-ABC)

Kemper et al., 1988

Fra X = 20 (experimental)

Children with Developmental Delays (DD) = 20 (control)

1. FRA-X IQ < than DD controls
2. FRA-X Achievement score > than DD controls
3. FRA-X has more variation across subtests than DD controls
4. FRA-X Simultaneous (mean 71) IQ > Sequential (mean 62) IQ

Dykens et al. 1987

K-ABC N = 14 ages 7-28 Seq < Sim/Achievement

Kemper et al. 1988

K-ABC N = 20 ages 4-12 Seq < Sim/Achievement

Hodapp et al. 1992

K-ABC N = 10 ages 6-10 Seq < Sim/Achievement

Simultaneous Processing

- **Gestalt-like configuration**
- **Global conception**
- **Intuitive method of organization**
- **Multiple stimuli**

Measuring IQ Over Time

- **Early studies reported a decline in IQ over time. However, a number of methodological problems were noted in the studies. For example, insufficient sampling and behavioral deficits were not taken into account (Hay 1994)**
- **A retrospective study done by Wright-Talamante in 1996, indicated that the decline was more likely due to a lack of cognitive development rather than any type of degeneration of the CNS**

Cognitive Weaknesses that Impact Learning

- Need for Closure
- Focus and Concentration Deficits
- Processing deficits to include auditory perception and discrimination which may have been caused by recurrent ear infections
- Executive Functioning Deficits
- Inconsistent Reaction to Stimuli

A person with FXS may ignore a car speeding by, but will notice with great intensity a flickering neon sign in the periphery

- Difficulty Generalizing Learning

Life skills are best taught within a functional context.

What Are Executive Functions?

(Papolos & Papolos, 2002)

- The most advanced and complex functions of the brain
- Linked to intentionality, purposefulness and complex decision making
- Often cited as an area of difficulty in both males and females with FXS (Wilding, Cornish and Munir, 2002)
- Particularly evident when problem solving and fluid intelligence is required as in novel situations
- Executive Function is required whenever going “on automatic” would not be sufficient and especially when it would lead one astray (Adele Diamond, PhD.)
- The ability to direct and switch attention, inhibit repetitious behavior, and inhibit appropriate responses (Wilding, Cornish, and Munir 2002)

To solve a problem, the following executive functions must be recruited:

- Analyze the problem
- Plan and implement the strategy
- Anticipate problems
- Organize the way the strategy will be accomplished (task analysis)
- Monitor the progress and assess what’s working
- Remain flexible and reformulate a new plan if previous one is not working
- Reassess the new strategy’s efficacy
- Follow the adjusted plan thoroughly to complete the task

How does working memory play a role in executive functions:

- Constantly pulling past experience into present task completion
- Bring pieces of information stored in memory into another problem or format

Examples of Memory Tasks

Short-term memory

Digits

Phone numbers

Address

Alphabet

Working memory

Digits to letters

Holding a phone number while manipulating it into another format

Oral math problems

LEARNING CHARACTERISTICS

Executive Functioning Deficit	
Definition:	This neuropsychological term includes the ability to formulate a plan, sum up intention and execute the plan. Executive function requires flexibility in problem solving and the ability to deal with novel information.
Strategies:	<ul style="list-style-type: none">• When the therapist begins the trial or task and asks the child to finish or complete it, the rate of success will increase.• Backward chaining, which begins an exercise by providing the beginning while leaving the end segments unfinished in greater and greater increments, provokes the child to complete the entire answer without additional prompting.
Need for Closure	
Definition:	Experience has demonstrated that children with FXS prefer completion or closure of information. This need for completion can become a hindrance or a compulsion that may override performance anxiety and promote completion.
Strategies:	<ul style="list-style-type: none">• A closure technique can be used to gain information. For example, instead of asking, "Who hit you?" or "Where did this happen?", one may say something like, "Today on the playground you got _____." When you were hit, Susie said _____." As the incident is pieced together by the parent and more information is gradually added to the story line, the incident can be better understood from the child's perspective.• Present an unfinished sample of a written word to promote task completion. Use a hangman format <u> </u> <u> </u> <u> </u> <u> </u> <u>t</u> to teach the spelling of <u>c</u> <u>a</u> <u>t</u>.
Indirect Instructional Strategies	
Definition:	Children with FXS become anxious when asked a direct question. A direct question, in isolation, may force an incorrect response without the benefit of contextual information.
Strategy:	<ul style="list-style-type: none">• Using peers as teaching models can facilitate learning in an indirect fashion. Instructing several children in a group enables the teacher to teach a lesson without worry from the child with FXS that he will be called upon for a response. Another secondary gain is that the challenged peer is more naturally integrated into a social and school community.
Associative Learning Preferences	
Definition:	It is easier for children with FXS to recall information if it is related or associated with a bigger whole. Information that is presented in isolation without association may become distorted or forgotten.
Strategies:	<ul style="list-style-type: none">• Include high interest materials in the school curriculum. An interest inventory, completed by parents, teachers and caretakers, provides educators with ideas from which to create teaching materials.

	<ul style="list-style-type: none"> • Create materials that utilize interest within a traditional teaching format. For example, teach high strength reinforcement words such as Thomas the Train, Taco Bell, Denver Broncos to build sight word vocabulary, attending and response rate.
Long-Term Memory Strengths	
Definition:	Simultaneous processing generates good long-term memory. When the learner is given multiple stimuli within a context the information is more likely to be retained over time.
Strategy:	<ul style="list-style-type: none"> • Use an association (which is often the byproduct of the simultaneous processing style) to conjure up a memory. This association activates a memory of an event or a place which may prompt the initiation of pertinent information.
Focus and Concentration Deficits	
Definition:	Lack of focus and concentration in individuals with FXS have been noted as distinct behavioral features.
Strategies:	<ul style="list-style-type: none"> • Identify when the behavior occurs. Sometimes attention is tied directly to interest. The environment, noise level and routine may contribute to poor attention. • Use proactive strategies outlined below

The following table includes proactive strategies that may be used to increase attending behavior.

PROACTIVE BEHAVIORAL STRATEGIES
Provide small group instruction
Allow seating near an exit
Provide structure and predictability
Reduce the level of environmental noise/sound
Allow additional processing time
Use natural lighting whenever possible
Avoid crowded areas
Predict transitions and signal with visual cues
Provide nonverbal cues and feedback
Role play behavioral consequences
Provide calming activities (S.I. intervention)
Encourage physical activity
Allow removal from stressful events
Encourage breaks and “down time”