Evidence-based Literacy Intervention for Individuals Who Require AAC

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Importance of literacy skills for individuals who require AAC

- Literacy skills
  - Allow fuller participation in education
  - Increase access to employment opportunities
  - Expand communication options
  - Increase self-esteem
  - Facilitate use of technologies (e.g., Internet)
  - Support social relationships (e.g., via email, IM)
  - Change societal expectations

Literacy outcomes for individuals who require AAC

- Historically, many individuals who require AAC have not had the opportunity to participate in appropriate evidence-based literacy instruction
- As a result
  - Many do not have basic literacy skills
  - Many are underachieving compared to typically developing peers

McNaughton & Light, 2009
One of the major factors that has contributed to poor literacy outcomes is the lack of appropriate evidence-based instruction adapted to meet the needs of individuals who require AAC.

Goals of the presentation
- Share the results of a research study that developed, implemented, & evaluated the effects of adapted instruction on the literacy skills of individuals who require AAC
  - Multiple baseline across participants
- Share case illustrations of evidence-based literacy intervention and outcomes

AAC-RERC
- Project is part of the AAC-RERC II
  - Collaborative virtual research center funded by the National Institute on Disability and Rehabilitation Research
  - Grant #H133E030018 (2003-2008)
- For more information
  - http://www.aac-rerc.com to access the literacy webcast or
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Components of effective evidence-based literacy intervention
- Sufficient time allocated for instruction
- Appropriate instructional content
- Appropriate instructional procedures
- Adaptations to allow active participation of individuals who require AAC
A) Sufficient **time** allocated for literacy instruction

- Current best practices recommend
  - All students in grades 1-3 receive at least 90 minutes of literacy instruction per day
  - At risk students should receive an additional 40-60 minutes of instruction per day

- Need to ensure that sufficient time is allocated for literacy instruction
  - Ideally intensive instruction provided
  - However, our research demonstrates significant literacy gains can be achieved in less than ideal conditions

McNaughton & Light, 2009

B) Appropriate instructional content

- Instructional content based on recommendations of National Reading Panel (2000)
  - Reading to individuals who require AAC & talking about texts
  - Phonological awareness skills
    - Sound blending skills
    - Phoneme segmentation skills
  - Knowledge of letter-sound correspondences
  - Decoding skills
  - Sight word recognition skills
  - Reading and understanding books / other texts
  - Early writing skills

McNaughton & Light, 2009

C) Appropriate instructional procedures

- Instructional procedures /teaching methods based on recommendations of National Reading Panel (2000)
  - Direct instruction in basic skills
  - Frequent opportunities to apply these skills in the context of meaningful, motivating literacy activities

McNaughton & Light, 2009

Instruction in basic skills

- **Model**
  - Instructor demonstrates the skill

- **Guided practice**
  - Instructor provides scaffolding support to help student perform skill successfully
  - Gradually fades scaffolding support

- **Independent practice**
  - Student performs skill independently
  - Instructor provides feedback
Instruction in basic skills

- Feedback
  - If student performs skill correctly
    - Instructor provides positive feedback
  - If student is incorrect
    - Instructor directs student’s attention to error
    - Models the correct response
    - Provides guided practice for student to ensure success
    - Provides additional opportunities for independent practice

McLaughlin & Light, 2009

Applying skills in literacy activities

- Provide frequent opportunities to apply skills in literacy activities
  - Demonstrate purpose of instructional activities
  - Establish that reading is meaningful & fun
  - Increase motivation for learning to read
  - Enhance generalization of skills
  - Provide additional opportunities to practice skills & thereby build fluency
  - Provide additional opportunities to practice taking meaning from texts

McLaughlin & Light, 2009

D) Adaptations for individuals who require AAC

- Adapt procedures to accommodate unique needs of individuals who require AAC
  - Eliminate the need for spoken responses
  - Provide insight into areas of difficulty to support instructional decisions
  - Compensate for lack of oral production // rehearsal
  - Provide efficient response method so child can enjoy high level of meaningful participation

McLaughlin & Light, 2009

Eliminate the need for spoken responses

- Adapt tasks to allow alternative response formats
  - Selection of AAC symbols / letters / words from group selected specifically for task
  - Selection of symbols from AAC system
- Provide alternative access techniques
  - e.g., direct selection with hand or finger
  - eye pointing
  - scanning, etc.
Provide insight into areas of difficulty
- Adapt tasks to set up systematic foils to provide insight into cognitive processing
- Provide systematic data collection
- Use error analysis to identify specific difficulties
- Target these areas of difficulty for additional instruction

McAuliffe & Light, 2009

Error analysis (decoding)

- Map

McAuliffe & Light, 2009

Compensate for lack of oral production / rehearsal
- Oral production / rehearsal
  - supports development of early literacy skills
  - serves to reduce working memory demands
- Provide scaffolding support to compensate for lack of speech production
  - Model oral production /rehearsal for student
    - Gradually fade support
  - Encourage internal subvocal rehearsal
    - Say it in your head

McAuliffe & Light, 2009

Components of effective evidence-based literacy intervention
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McAuliffe & Light, 2009
Research results
Outcomes of literacy intervention

- 10 participants to date
  - Range of ages
  - Range of disabilities
    - autism, cerebral palsy, developmental apraxia, Down syndrome, multiple disabilities
  - Require AAC systems
    - Speech /speech approximations, signs, PECS or other light tech systems, speech generating devices (SGDs)

McNaughton & Light, 2009

Research results
Outcomes of literacy intervention

- Positive outcomes demonstrated across wide range of participants
  - From age 3-adolescent
  - With wide range of disabilities
- All participants successfully acquired target skills
- Time to acquisition varied across participants
  - Some participants made rapid progress
  - Others required more time to learn skills
- All participants, families, & schools reported high levels of satisfaction with outcomes

McNaughton & Light, 2009

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  - Decoding skills
  - Shared reading
  - Sight word recognition skills
  - Reading and understanding books
  - Early writing skills

McNaughton & Light, 2009

First steps in literacy instruction

- Read to student regularly & talk about text
  - Build language skills
    - Knowledge of written genres, vocabulary, morphology, syntax
  - Develop foundations for reading comprehension

McNaughton & Light, 2009
Appropriate instructional content

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Instruction in sound blending

- Goal
  - The student will blend 3 target phonemes presented orally in sequence (with each phoneme extended 1-2 seconds), determine the target word, and then point to the correct AAC symbol for the target word

“Braden”

- 4 ½ years old
- Cerebral palsy
- Nonambulatory
- Limited function with hands
- Attending preschool
- Uses vocalizations, light tech communication boards to communicate

Braden, 4 ½,

McLaughlin & Light, 2009
**Appropriate instructional content**

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McNaughton & Light, 2009

**Instruction in phoneme segmentation**

- Goal
  - The student will match a target phoneme presented orally to the AAC symbol of a word that starts with the target phoneme

McNaughton & Light, 2009

**Braden, Phoneme Segmentation**

Braden
Initial Phoneme Segmentation

McNaughton & Light, 2009

**Appropriate instructional content**

- Phonological awareness skills
  - Sound blending skills
  - Phoneme segmentation skills
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- Sight word recognition skills
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McNaughton & Light, 2009
Instruction in letter-sound correspondences

- Goal
  - The student will match a target phoneme presented orally to the letter that represents the target phoneme

Progression of instruction in letter-sound correspondences

- Teach letter sounds, NOT letter names
- Introduce letters/sounds in the following sequence:
  - a, m, t, p, o, n, c, d, u, g, h, f, i, s, b, l, e, r, w, k, x, v, y
  - z, j, q
- Teach lowercase letters first
  - Most words in books use lowercase letters
- Teach letters that are used most frequently first
- Separate letters that are similar
- Teach blends once most single letter-sound correspondences are mastered

Progression of instruction

- Introduce letters incrementally
  - As student masters a letter, introduce a new one
  - Provide regular review of known letters
- Select foils carefully
  - Start with foils that are dissimilar
    - E.g., b, m
  - Once successful, include foils that require finer visual and auditory discriminations
    - E.g., b d

“Krista”
Adapting instruction to meet complex needs

- 8 years old
- Weissenbacher-Zweymuller Syndrome
- Tracheotomy
- Visual impairment; myopia
- Bilateral sensorineural hearing loss
- Uses a power wheelchair for mobility
- Communicates telegraphically using
  - Sign approximations (gestures)
  - Facial expressions
  - SGD
- Academic goals

McNaughton & Light, 2009
Teaching letter-sound correspondences - m

appropriate instructional content

- Phonological awareness skills
  - Sound blending skills
  - Phoneme segmentation skills
- Knowledge of letter-sound correspondences
- Decoding skills
- Shared reading
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- Reading and understanding books
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Decoding Skills

- Once student
  - Is competent with sound blending
  - Knows approximately 6-7 letter-sound correspondences
- Teach single word decoding
  - Requires integration of
    - Knowledge of letter-sound correspondences and
    - Skills in sound blending

Instruction in single word decoding

- Goal
  - The student will decode a single word presented in writing and match the word to the correct AAC symbol

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“Michael”

- 3 years 1 month
- Autism
- Good motor function
- Communicates in telegraphic messages via
  - Signs / gestures
  - PECS system
  - Some speech/ echolalia

McNaughton & Light, 2009

Decoding CVC independent practice

Michael 3:4 - Intervention 3 Months
Decoding CVC Words - Independent

McNaughton & Light, 2009

Decoding cvc words
Guided practice

Michael 3:2 - Intervention 2 Weeks
Decoding Guided Practice

McNaughton & Light, 2009

Appropriate instructional content

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- Reading and understanding books
- Early writing skills
Applying decoding skills in the context of shared book reading

- Provide numerous opportunities for students to apply their decoding skills during shared reading
  - Highlight target words for the student
  - Read sentence out loud and track words with finger; pause at the highlighted target word
  - Student must decode highlighted target word and then select the AAC symbol of the target word from communication display or VOCA

“Ellie”
Early stages of literacy instruction

- 6 years old
- Cerebral palsy
- Nonambulatory
- Able to direct select with index finger
- Attending Kindergarten
- Communicates by means of
  - speech approximations
  - SGD

I Spy

I spy a pin.
I spy a man.

Communication display for decoding during shared reading
Applying decoding skills during shared reading

Lia is a cat.

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Grant is a trash can.

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Communication display for decoding during shared reading

I am a lady bug.

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Applying decoding skills during shared reading
Independent practice

Personalized Books for Shared Reading

Krista’s Summer

I went on a boat with dad.

I hit the ball with mom.
Mom, dad, and I went on a train.

K’s signs
- Summer
- Krista
- on
- Dad
- I
- ball
- Mom

Prairie Days
They sit in a covered wagon.

They eat fish from the river.
Buffalo run in the grass.

K’s signs
- eat
- fish
- river
- go
- get
- jump
- play
- run
- in
- love
- on

Life on the prairie

Appropriate instructional content
- Phonological awareness skills
  - Sound blending skills
  - Phoneme segmentation skills
- Knowledge of letter-sound correspondences
- Decoding skills
- Shared reading
- Sight word recognition skills
- Reading and understanding books
- Early writing skills
Sight Word Recognition

- Incorporate instruction in recognition of high frequency and high motivation sight words early
  - Provide access to shared reading as soon as possible
  - Increase motivation

McAuliffe & Light, 2009

Goal
- The student will listen to a single word spoken by the instructor, and match the word to the correct AAC symbol

McAuliffe & Light, 2009

Appropriate instructional content
- Phonological awareness skills
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  - Phoneme segmentation skills
- Knowledge of letter-sound correspondences
- Decoding skills
- Shared reading
- Sight word recognition skills
- Reading and understanding books
- Early writing skills

McAuliffe & Light, 2009

Reading Books
- Apply skills in the context of meaningful reading activities early on
  - Utilize highly motivating reading materials
  - Focus on personal experiences
    - Enhance motivation
    - Provide context to support understanding

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Jackson

- 5 years old
- Down syndrome
- Uses speech and sign
- Started reading program at 4
- Started “young kids” project at 15 months

McLaughlin & Light, 2009

What do you see?

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I see a red car.

McLaughlin & Light, 2009

George sees a red car!

McLaughlin & Light, 2009
**Appropriate instructional content**

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**“Michael” Building writing skills**

- Skilled writing requires integration of
  - Narrative skills
  - Semantic, syntactic and morphological skills
  - Phoneme segmentation skills
  - Letter sound correspondences
  - Sight word skills / Spelling irregular words
  - Keyboard knowledge

**Writing instruction**

- Teach basic skills
  - Phoneme segmentation skills
  - Letter-sound correspondences
  - Keyboard knowledge
- Provide opportunities to apply skills in meaningful writing activities
  - Telling stories to adults
  - Writer’s workshop
  - Publishing books
    - Use the books for reading activities
    - Share books with others
go dogs go

Go dogs. Go!

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go to womort

Go to Walmart.

McNaughton & Light, 2009

geta blac par ranjr

Get a black power ranger.

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ve ud

The End.

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“Michael” - Outcomes
- Enters Kindergarten as a reader and writer
- Literacy skills exceed those of most typical peers
- Fully included in regular education class
- Full time assistance of aide
- Uses speech and typing as primary means of communication
- Significant reduction in challenging behaviors

Emergent literacy activities
Building the foundation
- Read, read, read!!
  - Read & talk about wide range of books
  - Build language and vocabulary
  - Build comprehension skills
- Provide opportunities to engage in meaningful “writing” activities
  - Telling stories to adults
  - Patterned story telling
  - Publishing books

Building reading comprehension
- Reading comprehension is a complex process that requires
  - track through sentence from left to right
  - decode or recognize by sight each word in sequence
  - access meaning of words
  - process all words in sequence to derive meaning of sentence (or longer text)
  - relate meaning to prior knowledge /experience to comprehend text

The Art and Science of Literacy Intervention
- The art of literacy intervention
  - the belief and the commitment to the right of all individuals to express themselves fully and seek their full potential

McLaughlin & Light, 2009
The science of literacy intervention
- Implementation of evidence-based instructional procedures
  - Research is available to guide in planning and implementing literacy instruction with individuals who use AAC
- Monitoring effectiveness
- Evaluating results

Teaching literacy skills is the single most empowering thing that we can do for individuals who require AAC (Lindsay, 1989)

Publications

- Webcast at http://aac-erc.com
For further information

Visit www.aac-rerc.com for the literacy webcast

E-mail JCL4@psu.edu or DBM2@psu.edu

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