

# Teaching Children who use AAC to use Bound Morphemes

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# Overview

- AAC & Morphological Issues
- Bound morpheme intervention study
  - Method
  - Results
  - Discussion

# AAC & Morphological Issues: Systematic Literature Review of Grammar (Binger & Light, 2008)

- **Receptive Morphology**
  - Some children may have more difficulty with bound morpheme comprehension than receptive-vocabulary matched controls (Blockberger & Johnston, 2003)
  - Other children who use AAC have receptive morphology that is within normal limits (e.g., Binger & Light, 2007; Binger et al., in press)
- **Expressive Morphology**
  - Many children who use AAC can and do use a wide range of bound morphemes
  - Many demonstrate morphological errors
  - Individual differences apparent across studies  
(e.g., Blockberger & Johnston, 2003; Bruno & Trembath, 2006; Kelford Smith et al., 1989; Sutton & Gallagher, 1993)

# AAC & Morphological Issues, con' t

- Bound Morpheme Intervention
  - No experimentally controlled studies located
- Overall findings (Binger & Light, 2008)
  - Children who use AAC tend to have problems with morphology
  - Need experimentally controlled intervention studies

# Method

- Design
  - Single subject multiple baseline across targets
  - Replicated across 2 additional participants

# Participants: Alex, Jessie, & Ian

- Ages 11, 6, and 9, respectively
- Various racial/ethnic backgrounds
- Disabilities
  - Cerebral palsy (Alex & Ian)
  - Childhood apraxia of speech (Jessie)
- Used Vantage or Vanguard (PRC)
- Native U.S. English speakers
- Morpheme comprehension scores above 3;0 age equivalent
  - 6;3, 4;9, & 5;0 on Grammatical Morphemes subtest, respectively

# Materials

- Storybook series chosen by each participant
  - Alex = Scooby Doo
  - Jessie = Muppet Babies
  - Ian = Teenage Mutant Ninja Turtles & Spiderman
- AAC Device
  - Whatever device each child already used
  - All had Vantage or Vanguard (PRC)
- Vocabulary
  - Used pre-programmed vocabulary

# Bound Morpheme Representation

- Each bound morpheme represented with Minspeak™ icons as they appear on Minspeak™ based devices
- Each morpheme represented with
  - Orthographic representation
  - Graphic representation



# Targets

- Alex
  - Aux verb + main verb + **-ing** (I **am running**)
  - Possessive **'s** (Grandmother **'s** couch)
  - 3<sup>rd</sup> person singular **-s** (he runs**s**)
- Jessie:
  - Possessive **'s**
  - Regular past tense **-ed** (She walked**ed**)
  - Plural **-s** (shoes**s**)
- Ian
  - Regular past tense **-ed**
  - Possessive **'s**
  - Aux verb + main verb + **-ing**

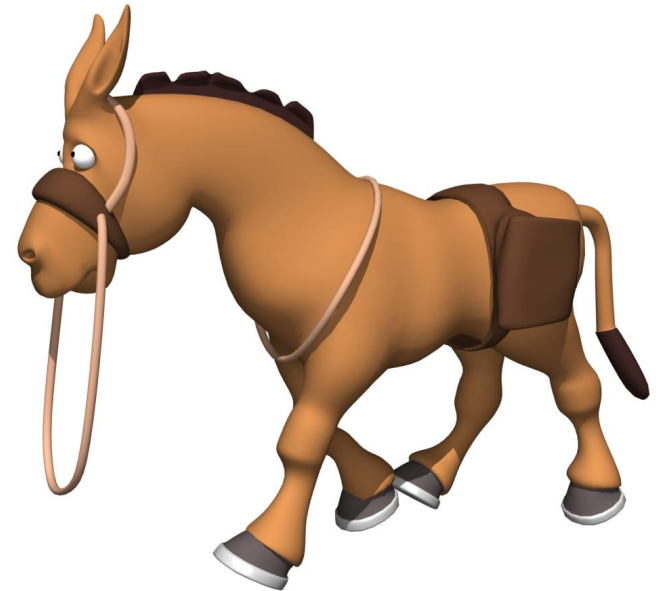
# Dependant Measure: Probes

- Percent correct on 10 probes
  - Pool of 50 probes for each morpheme
  - 10 probes randomly selected and administered at the beginning of each session
  - Clipart figures used for each probe item
  - Figures placed on felt board

# Probe Example: Regular Past Tense **-ed**

– Researcher:

- “The [horse] is going to [walk].”
- [Act out action]
- “He’s all done [walking].  
What did he do? He...”
- Child: *HE WALK + ED*



# Procedures: Baseline

- 10 probes administered in each session
- Minimum of 3 baseline sessions
- Stable baseline required
- No intervention provided

# Procedures: Intervention Probes

- 10 probes administered at the beginning of each session to track progress

# Procedures: Intervention Sessions

- 15 minute story reading sessions
- Primary intervention techniques
  - Aided AAC Models (Binger & Light, 2007)
    - Spoken model +
    - Model on child's AAC Device
    - E.g., Michelangelo is fighting. *HE IS FIGHT + -ING.*
  - Recasting (e.g., Fey, Long, & Finestack, 2003)
    - Ian: *HE IS FIGHT.*
    - Researcher: Let's try, "He is fighting" *HE IS FIGHTING*
- At least 10 models and/or recasts per session
- Models and recasts formulated based on events in the story

# Procedures: Maintenance

- Maintenance probes taken ~ 2, 4, and 8 weeks after intervention
- Additional probes taken in some cases
  - Alex: 4 and 5 months post-intervention

# Procedures: Data Analysis

- Percent correct calculated for all baseline, intervention, & maintenance probes
- All probe data graphed and visually inspected for changed in slope, level, & trend (McReynolds & Kearns, 1983)
- Intervention continued until at least 80% accuracy for 3 consecutive sessions



# Results

- All 3 children acquired all 3 bound morphemes
- All 3 children failed to maintain use of the first morpheme that was taught
  - Jessie fell below criterion for 1<sup>st</sup> two morphemes

# Maintenance Errors

- All of the children
  - Omitted previously ‘learned’ morphemes
  - Demonstrated overgeneralization errors
    - Crossed word classes
      - *SHE KISS’ S* (possessive ‘s on a verb)
    - Inappropriate context
      - *GIRL’ S CLIMB* (possessive ‘s before a verb)
    - Added 2 morphemes
      - *HE LAUGH + ED + S* (plural)
- All made unusual errors that would not be seen with typically developing children

# Intervention Phase II

- Provided additional intervention for targets that fell below criterion
- Used contrastive training (Connell, 1982)
  - Contrasted Target #1 with Target #2 for each child
  - Jessie: Also contrasted Target #2 with Target #3

# Contrastive Intervention

- Contrastive training was successful for all children
- All maintained use of bound morphemes after contrastive training

# Discussion

- All 3 participants (eventually) learned to use all 3 targeted morphemes
- Single subject design allowed for revisions to be made with the intervention
  - Important for trying out new interventions

# Effects of Modeling & Recasting

- Modeling and recasting appeared to have been an effective intervention at first
  - All reached criterion
- But all children failed to maintain use of 1<sup>st</sup> morpheme
  - Children confused 1<sup>st</sup> and 2<sup>nd</sup> bound morphemes
- Contrastive component of intervention seemed to be critical for all 3 children

# Directions for Future Research

- Evaluate
  - Intervention techniques; e.g.,
    - Modeling
    - Recasting
    - Contrastive intervention
    - Correction of incorrect forms
    - Explanation of grammatical rules
- Other contexts
- Other communication partners
  - Adapt partner instruction models (Kent-Walsh & McNaughton, 2005; Binger et al., in press)
- Setting intervention priorities

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