Miccio Cards

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Treatment Program

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- created by Adele W. Miccio and Mary Elbert
- designed to increase the size of phonetic inventory by “teaching” stimulability
- teaching all consonant sounds at once in isolation
- each sound associated with character representing an animal or object on 5x8 colored notecards
  - characteristic body movement or gesture associated with each character and its sound
- focus on nonstimulable sounds
- verbal praise used to reinforce correct speech production
Population

- young children (7 years old and younger) with limited phonetic inventories and most sounds from the inventory are nonstimulable
Review of Characters and Their Sounds

- characters shown to client one by one at beginning of session
- clinician demonstrates character’s sound and associated movement
- presented through intensive modeling
- child is encouraged, but not required to produce the target sounds with the clinician
- target all consonants at once in every session
Stimulability Activities

- play-like, developmentally appropriate activities designed around target sound characters
- opportunity to imitate consonants
- client and clinician take turns
- clinician constantly modeling target sounds and client imitating sounds
- two or three activities per session to maintain joint attention and interest
- ensure successful communication attempts
Go Fish

- child asks for card
- if nonstimulable sound, gesture cues clinician as to what sound client is asking for
- clinician provides appropriate feedback
  - multimodality cue
- include all consonants so child has opportunity to say stimulable sounds
  - nonstimulable sounds receive intervention and stimulable sounds are reinforced and stabilized in sound system
Guess Card

- cards face down in a box and clinician and child take turns picking cards
- when child picks card, clinician guesses name after child gives clue by making associated gesture and attempting to make sound
- depending on what the child produced, clinician will either reinforce production or model sound and provide phonetic placement cues if production is inaccurate
Board game

- place characters around board game with spinner in the center
- take turns spinning
- when spinner lands on character, produce associated consonant and gesture
Measure

- probe sessions
  - determine whether the number of stimulable sounds increased and evaluate generalization to real words
- divide stimulability into three sections and elicit one-third probe at the beginning of each session
- every consonant probed in isolation and syllables with vowel [l] at beginning of one session ([pl], [lpl], [lp])
- next session with [æ] ([pæ], [æpæ], [æp]) in isolation and syllables
- next session with [ɑ] ([pɑ], [ɑpɑ], [ɑp]) in isolation and syllables
Measure (continued)

● entire probe is completed every 3 sessions, with total of five probes including baseline probe
● also divided 104-item probe which contains real words targeting each sound in three word positions into three parts
  ○ at the end of sessions
Case Study

- Stacy: 3;4 - began producing recognizable words at 10 months old, speech delay at 2-3 years old
- typical oral mech exam, hearing, *Peabody Picture Vocabulary Test-Revised, Test of Early Language Development*
- *Goldman-Fristoe Test of Articulation* : <1st percentile
- 104-item subset of the probe developed by Gierut to compile phonetic inventory: limited in production of labial and alveolar stops, nasals, and glides; no fricatives, affricates, liquids
- stimulability tasks: not stimulable for any sounds missing from phonetic inventory
Treatment Sessions

- 12 sessions
- 45 minutes each, twice a week

Table 4. Outline of a Typical “Stimulability” Treatment Session

<table>
<thead>
<tr>
<th>Task</th>
<th>Approximate time (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Elicit one-third of stimulability probe</td>
<td>5</td>
</tr>
<tr>
<td>2. Review of characters and their sounds</td>
<td>5</td>
</tr>
<tr>
<td>3. Stimulability Activity I: Go fish</td>
<td>10</td>
</tr>
<tr>
<td>4. Stimulability Activity II: Guess my card</td>
<td>10</td>
</tr>
<tr>
<td>5. Stimulability Activity III: Spinner game</td>
<td>10</td>
</tr>
<tr>
<td>6. Elicit one-third of generalization probe</td>
<td>5–8</td>
</tr>
</tbody>
</table>
Results

- at end of final stimulability probe, Stacy became stimulable for fricatives \([f, v, \theta, \delta, s, z, ÿ]\), added \([v, η]\) to phonetic inventory, and had emerging productions for \([k, dʒ]\).

<table>
<thead>
<tr>
<th>Table 5. Nonstimulable Sounds Produced Successfully during Probes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stimulability Probe 1 (Baseline): None</td>
</tr>
<tr>
<td>Stimulability Probe 2: (f, v, \theta, s, ÿ)</td>
</tr>
<tr>
<td>Stimulability Probe 3: (f, v, \delta, s, dʒ, \text{and } r) (not treated)</td>
</tr>
<tr>
<td>Stimulability Probe 4: (v, \theta, \delta, s, z, ÿ, tʃ, dʒ)</td>
</tr>
<tr>
<td>Stimulability Probe 5: (f, v, \theta, \delta, s, z, ÿ, \text{and } l) (not treated)</td>
</tr>
</tbody>
</table>
Results (continued)

- Prior to treatment, Stacy reduced CVC syllable structure to CV.
- After 12 sessions, produced more CVC syllable structures and other adult-like syllable structures.

Table 6. Examples of System-Wide Changes Observed in Stacy’s Phonology

<table>
<thead>
<tr>
<th>Phonological change</th>
<th>Example</th>
<th>Pretreatment</th>
<th>Posttreatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syllable structure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final consonant</td>
<td>“Push”</td>
<td>[pʊ]</td>
<td>[put]</td>
</tr>
<tr>
<td>Intervocalic consonant</td>
<td>“Mouthie”</td>
<td>[maʊi]</td>
<td>[maʊti]</td>
</tr>
<tr>
<td>Initial consonant</td>
<td>“Yellow”</td>
<td>[ɛjou]</td>
<td>[ɛjou]</td>
</tr>
<tr>
<td>Glottal/oral distinction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>/ʔ/</td>
<td>“Biting”</td>
<td>[baɾ?ɪn]</td>
<td>[baɾtiɲ]</td>
</tr>
<tr>
<td>/h/</td>
<td>“Hill”</td>
<td>[etou]</td>
<td>[hɪou]</td>
</tr>
</tbody>
</table>
Conclusion

- use for children with limited phonetic inventories and limited sound stimulability
- direct imitation of nonstimulable sounds is more important to generalization than contextual variables
- teaching nonstimulable sounds will introduce the most change into the phonological system
  - results in system-wide change
- increases stimulability, phonetic inventory, generalization, and intelligibility
- stimulable sounds will not be focused on in therapy because if child can produce the sound, he/she may correct phonological errors without intervention and the sound will most likely be added to the phonetic inventory

References (continued)

Resources

http://www.speech-language-therapy.com/pdf/miccio4s.pdf