Testing the Effects of Multiple Exemplar Instruction on the Induction of Joint Incidental Bidirectional Naming in Children Diagnosed with Autism

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Joint Incidental Bidirectional Naming

- AKA Full Naming (Greer & Ross, 2008), Component 2 of Naming (Horne & Lowe, 1996), Feature 2 of Naming (Catania, 1998)
Test for Joint Incidental Bidirectional Naming

- Match-to-Sample (MTS) Procedure (Set of 5 contrived stimuli)
- Test Untaught Behaviours (Listener then SpeakerBehaviour) using same set of contrived stimuli
Multiple Exemplar Instruction (MEI)

- Random rotation of different responses:
  - Match
  - Point to
  - Tact
  - Impure Tact/Intraverbal Tact
- Counter-balanced
Example of a MEI sequence for a training set

<table>
<thead>
<tr>
<th>Teaching Sequence</th>
<th>First Presentation</th>
<th>Second Presentation</th>
<th>Third Presentation</th>
<th>Fourth Presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Match desh</td>
<td>Point to fip</td>
<td>Match kozz</td>
<td>Impure tact mag</td>
</tr>
<tr>
<td>2</td>
<td>Tact jed</td>
<td>Impure tact desh</td>
<td>Point to jed</td>
<td>Tact kozz</td>
</tr>
<tr>
<td>3</td>
<td>Match fip</td>
<td>Point to mag</td>
<td>Impure tact kozz</td>
<td>Point to desh</td>
</tr>
<tr>
<td>4</td>
<td>Tact fip</td>
<td>Impure tact jed</td>
<td>Match mag</td>
<td>Tact desh</td>
</tr>
<tr>
<td>5</td>
<td>Point to kozz</td>
<td>Impure tact fip</td>
<td>Match jed</td>
<td>Tact mag</td>
</tr>
</tbody>
</table>
Published research on MEI & JIBN
## Summary of studies on MEI and JIBN

<table>
<thead>
<tr>
<th>Author(s) &amp; Year</th>
<th>Number of Participants</th>
<th>Age of Participants</th>
<th>Diagnosis of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greer, Stolfi, Chavez-Brown, &amp; Rivera-Valdes (2005)</td>
<td>3</td>
<td>2.5-4 years</td>
<td>Language or developmental delays</td>
</tr>
<tr>
<td>Greer, Stolfi, &amp; Pistoljevic (2007)</td>
<td>8</td>
<td>3-5 years</td>
<td>Speech delay or Pervasive Development Disorder or language and cognitive delays</td>
</tr>
<tr>
<td>Gilic &amp; Greer (2011)</td>
<td>8</td>
<td>2 years</td>
<td>Neuro-typical (from upper middle class professional families)</td>
</tr>
<tr>
<td>Greer, Corwin, &amp; Buttigieg (2011)</td>
<td>Experiment 2 (Part 1) 4</td>
<td>2-6 years</td>
<td>2 children with Autism &amp; 2 neuro-typical children</td>
</tr>
</tbody>
</table>
The Verbal Behaviour Development Theory

- REFERENCE
Pre-Reader Cusps

Book Stimuli Conditioned Reinforcement for Observing

Self-Talk (Rotating Speaker and Listener Roles Within Own Skin)

Say-Do in Speaker-as-Own-Listener Function

Full Naming

Speaker Component of Naming

Transformation of Establishing Operations (Learning Mand or Tact Results in Untaught Function Also)

Independent Mands: (1) Presence of Stimuli, (2) Absence of Stimuli

Echoic-to-Tact (Generalized Reinforcement for at Least Two Tacts)

Echoic-to-Mand (Mand Function of Repeating Word Sounds

Parroting (Speaking Words or Components of Words as Automatic Reinforcement)

Auditory Matching (Selection Responses to Match Spoken Words)

Listener Literacy (Hear-Do, Consonant Vowel Sounds of Others Controls Responding)

Generalized Imitation

Match 2D and 3D Objects

"Capacity for Sameness" Across Senses ("Sameness" as Abstraction Across Smell, Taste, Touch, Hear)

Conditioned Reinforcement for 3D Objects/Visual Stimuli on Desktop

Conditioned Reinforcement for Voices

Teacher Presence Results in Instructional Control Over Child
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Additional Prerequisite?
Purpose of Experiment

- The purpose of this experiment was to test the effects of MEI on the acquisition of JIBN in older children and young adults diagnosed with autism who met the mastery criteria for joint bidirectional naming.

- In addition, an adjustment was made to the test for JIBN where an additional MTS procedure was conducted prior to each test for JIBN throughout the entire experiment.
Participants

- 1 female and 9 male participants.
- Diagnosis of autism and a learning disability.
- Ages ranged from 6-18 years.
- All met the VBDT prerequisite behavioural cusps: all participants met the mastery criteria for echoic-to-tact, independent mands and transformation of establishing operations across mands and tacts.
- Participants were selected based on meeting the mastery criteria for joint bidirectional naming.
Materials

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Procedure
Results
Discussion

- Considerations for the VBDT
- Investigation of extraneous variables within this experiment
- Procedural recommendations for future research
Considerations for the VBDT

- Parametric specification of the listed prerequisites for JIBN & MEI
- Suggested additional prerequisites for JIBN & MEI
VBDT Pre-requisite Behavioural Cusps

- Echoic-to-tact
- Independent mands
- Transformation of establishing operations across mands and tacts

- Consideration for providing specific details for each of the behavioural cusps on the VBDT pre-reader pyramid is advisable.
Joint Incidental Bidirectional Naming

Speaker Incidental Unidirectional Naming

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Joint Bidirectional Naming

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Additional Prerequisite?
Investigation of extraneous variables within this experiment

- Effects of multiple MTS procedures and unintended effects of testing procedures
- Age or instructional history and diagnoses of participants
- Sensitivity of data collection
- Criteria level
- Use of unconsequential trials
Effects of multiple MTS procedures and unintended effects of testing procedures

- We did see evidence of emergent behaviour for a number of participants.
- This emergent behaviour was demonstrated possibly due to the repeated testing procedures with an additional MTS procedure prior to each test for JIBN.
- It is possible that these repeated procedures may have served as a relevant language experience sufficient for the induction of JIBN.
Age or instructional history and diagnoses of participants

- The differences in the instructional histories of the participants may account for the outcomes from the current experiment differing from the outcomes of previously published research on MEI to induce JIBN.
- The contrived stimuli unintentionally contained some features that were actually structurally similar to common items (e.g. car, cupboard, letters of the alphabet).
Age or instructional history and diagnoses of participants
Age or instructional history and diagnoses of participants

- To minimise these effects it may be desirable to discard stimuli during the initial tact probes if participants attempted to provide a name to the item that did have an association with the physical properties.
Sensitivity of data collection

- There were large variations in the types of incorrect responses of the participants.
- A number of incorrect responses shared overlapping properties with the correct responses, e.g. saying “moot” for “moop.”
- Some participants responded with “bozz” or another term without any overlapping properties with the correct response.
- For the purposes of data collection both of these types of responses were scored as incorrect.
- The operational definitions of correct responses did not allow for reporting data that showed successive approximations towards the target response.
Sensitivity of data collection

- We recommend a data collection option to establish an acceptable range of correct responses, e.g. “Mup” or “mop” is also accepted for “moop,” such that the incorrect responses are scored based on the shared properties of the correct responses.

- This adjustment may allow the data collected to be more sensitive to the participants’ verbal behaviour at any point in time.

- E.g. if the correct response is “moop” then score as follows: 5/5 for “moop;” 4/5 for “moo_” or “m_p;” 3/5 for “_oop;” 2/5 for “m” or “oo” or “p;” 1/5 for an attempted response; 0/5 for a non-response.
Participant 10 scored considerably higher scores post-MEI compared to pre-MEI, but he did not meet the mastery criteria for JIBN.
Closer inspection of Participant 5’s data showed that the difference pre-MEI compared to post-MEI is less than the difference pre- and post-MEI for Participant 10.

An adjustment to the criteria levels or an analysis of the difference between scores pre-MEI compared to post-MEI may have generated a more accurate account of levels of emergent behaviour.
Use of unconsequated trials

- Unconsequated trials = emergent behaviour extinguished?
- Participant 8: 8/20 correct responses for emergent listener behaviour
- More in-depth analysis: first 5 responses by the participant were all correct.
- Test for JIBN to be restricted to responding to the different stimuli only once?
- Or: consider reinforcing correct responses so that they are not extinguished?
Procedural Recommendations