CONDITIONAL DISCRIMINATION TRAINING AND TESTS FOR GENERALIZED IDENTITY MATCHING AND DERIVED RELATIONS IN SENIOR CITIZENS AND DEMENTIA PATIENTS

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DETERIORATION IN
COMPLEX HUMAN BEHAVIOR

• Dementia
  • DSM IV / ICD 10

• It is getting well recognized that number of patients with dementia will increase drastically in upcoming years (e.g., Ferri et al., 2005; Prince & Jackson, 2009).
  • 115.4 million in the year 2050
HOW CAN WE STUDY COMPLEX HUMAN BEHAVIOR?

- Conditional discrimination procedures used to study complex human behavior
  - Arbitrary matching-to-sample (MTS)
  - Identity MTS
  - Simultaneous MTS
  - Delayed MTS (DMTS)
Delayed Matching-to-Sample
GREAT
ESSENTIAL BACKGROUND STUDIES

• Sidman, Stoddard, Mohr and Leicester (1971)
• Wilson and Milan (1995)
• Perez-Gonzales and Moreno-Sierra (1999)
• Saunders, Chaney & Marquise (2005)
• Gallagher and Keenan (2009)
HEALTHY OLDER ADULTS

- Steingrimsdottir and Arntzen (in press).
- 32 participants
- The results will be published in The Psychological Record spring 2014

<table>
<thead>
<tr>
<th>Simultaneous Matching-to-Sample</th>
<th>0-s Delayed Matching-to-Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Experimental Condition</strong></td>
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</tr>
<tr>
<td>Identity-Arbitrary MTS</td>
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<td>Arbitrary-Identity MTS</td>
<td>Arbitrary-Identity MTS</td>
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</tbody>
</table>
DEMENTIA PATIENTS AS PARTICIPANTS

• Arbitrary MTS
• Identity MTS
• Participant
  • Female, 84 years old
  • Alzheimer diagnoses
  • MMSE 20 (mild cognitive impairment)
• Conditions
  • Identity MTS, SMTS, 3 comparison stimuli
  • Arbitrary MTS, SMTS, 3 comparison stimuli
  • Arbitrary MTS, SMTS, 2 comparison stimuli
  • Identity DMTS, from 0 – 12-s delay, 3 comparison stimuli
  • TDMTS between 10–12-s
<table>
<thead>
<tr>
<th>Experimental Conditions</th>
<th>Phase</th>
<th>Percentage Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identity DMTS 0-s</td>
<td>Train and Test</td>
<td>99</td>
</tr>
<tr>
<td>Generalized identity MTS 0-s Test</td>
<td>Test</td>
<td>100</td>
</tr>
<tr>
<td>Identity DMTS 3-s</td>
<td>Train and Test</td>
<td>99</td>
</tr>
<tr>
<td>Generalized identity MTS 3-s Test</td>
<td>Test</td>
<td>100</td>
</tr>
<tr>
<td>Generalized identity SIM 9-s Test</td>
<td>Test</td>
<td>100</td>
</tr>
<tr>
<td>Identity DMTS 6-s</td>
<td>Train and Test</td>
<td>80</td>
</tr>
<tr>
<td>Generalized identity MTS 6-s Test</td>
<td>Test</td>
<td>89</td>
</tr>
<tr>
<td>Identity DMTS 9-s</td>
<td>Train and Test</td>
<td>93</td>
</tr>
<tr>
<td>Generalized identity MTS 9-s Test</td>
<td>Test</td>
<td>89</td>
</tr>
<tr>
<td>Generalized identity MTS 9-s Test</td>
<td>Test</td>
<td>83</td>
</tr>
<tr>
<td>Identity DMTS 12-s</td>
<td>Training (no Test)</td>
<td>79</td>
</tr>
<tr>
<td>Identity DMTS 10-s</td>
<td>Training and Test</td>
<td>88</td>
</tr>
<tr>
<td>Generalized Identity MTS 10-s Test</td>
<td>Test</td>
<td>100</td>
</tr>
<tr>
<td>Identity DMTS 12-s</td>
<td>Training (no Test)</td>
<td>75</td>
</tr>
<tr>
<td><strong>TDMTS 10–12-s</strong></td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>
• Participant
  • Male, 80 years old
  • Alzheimer diagnoses
  • MMSE 10 (severe cognitive impairment)
• Conditions
  • Identity MTS, SMTS, 3 comparison stimuli
  • Identity MTS, SMTS, 3 comparison stimuli + prompt
  • Identity MTS, SMTS, 2 comparison stimuli
  • Identity MTS, 2 comparison stimuli, 0-s DMTS
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<th>Percentage Correct</th>
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<tr>
<td>Identity MTS, 3 comparisons</td>
<td>Train</td>
<td>49</td>
</tr>
<tr>
<td>Identity MTS, 3 comparisons + prompt</td>
<td>Train</td>
<td>71</td>
</tr>
<tr>
<td>Identity MTS, 3 comparisons</td>
<td>Test</td>
<td>62</td>
</tr>
<tr>
<td>Identity MTS, 2 comparisons</td>
<td>Train</td>
<td>88</td>
</tr>
<tr>
<td>Identity MTS, 2 comparisons</td>
<td>Test</td>
<td>66</td>
</tr>
<tr>
<td>Identity MTS, 2 comparisons 0-s DMTS</td>
<td>Train</td>
<td>55</td>
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</table>
Correlation Between MMSE Score and Type of Conditional Discrimination Procedures

- Number of comparison stimuli used?
- Programmed consequences or not?
- Responding during extinction condition?

Modes:
- Delayed or Simultaneous Arbitrary MTS?
- Delayed Identity MTS
- Simultaneous Identity MTS
CONCLUSION

• It had been suggested that changes in cognition in older adults could be documented by using conditional discrimination procedures.

• Identity DMTS has already been used within general cognitive psychology to study remembering.

• Behavior analysts can contribute to this field by using in addition the arbitrary MTS procedures and testing for derived relations along with showing the effect of other variables that affect matching-to-sample performance.
Thank you
REFERENCES


