Assessing Executive Function in an Adolescent PAE Population: Examining the Predictiveness of Verbal and Nonverbal Accuracy vs. Response Time for FASD Diagnostic Assessment

Leah Enns, Ph.D., C.Psych. & Nicole Taylor, Ph.D., C.Psych.
MB FASD Centre & Dept. Of Clinical Health Psychology
University of Manitoba, Winnipeg, MB, Canada

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Introduction

- **EF is a broad domain evaluated as part of an FASD diagnostic assessment**
  - Response time vs. Accuracy
  - Applied EF skills

- **Aspects of EF skills in adolescence have been associated with PAE**
  - E.g., information processing, task persistence, following directions, decision-making

- **Age-related differences in PAE and FASD populations**
  - Difficulties with letter fluency, inhibition/switching, word context tasks, trail making tests
  - Deficits in visual scanning and letter sequencing were more predictive of an FASD diagnosis in an adolescent population
Goals and Learning Objectives

- Create subcategories within the executive functioning (EF) domain to better differentiate which EF measures predict an FASD diagnosis within an adolescent PAE population

- Examine which of the following subcategories of EF measures most accurately differentiate adolescents with FASD:
  - Verbal executive functioning measures
    - Accuracy
    - Response time
  - Nonverbal executive functioning measures
    - Accuracy
    - Response time

- Identify the utility of parent versus teacher rating scales of applied executive functioning skills for an FASD diagnostic assessment
Psychology Assessment

Informs Following Domains:
- Cognition
- Academic Achievement
- Adaptive Functioning
- Memory
- Executive Functioning
- Attention
- Affect Regulation

Obtained Through:
- Background Information
- Formal One to One Assessment
- Behavioral Observation
- Parent & Teacher Rating Measures
- Discussion with Other Team Members
N = 90 adolescents
54 (60%) with FASD dx
Mean Age = 14.29 years (12 to 17 years)
49 (54.4%) boys
45 (50%) diagnosed with ADHD
Measures

- Behavior Rating Inventory of Executive Function (BRIEF)
  - Parent and teacher rating scales
  - Global Executive Composite
    - Behavior regulation
    - Metacognitive skills

- Delis-Kaplan Executive Function System (D-KEFS)
  - Verbal
    - Verbal fluency
    - Color-word interference
  - Nonverbal
    - Trail making test
    - Tower test
BLUE   GREEN   YELLOW
PINK   RED     ORANGE
GREY   BLACK   PURPLE
TAN    WHITE   BROWN
Trail Making and Tower Tests

1

2

A

B

Beginning

End
Pre-Analyses

- Combined D-KEFS Scaled Scores into the following subcategories:
  - Verbal EF Total Score; Verbal EF Response Time; Verbal EF Accuracy
  - Nonverbal EF Total Score; Nonverbal EF Response Time; Nonverbal EF Accuracy

- Examined Scaled Scores and T-scores
  - Converted to z-scores for analyses

- Statistical Analyses
  - Bivariate correlations
  - Direct logistic regressions
Logistic Regressions: Do the EF Composites Improve Diagnostic Accuracy?

\[ N = 51-78, \chi^2 = 4.35-10.87, df = 2, p = .11-.004, \text{Nagelkerke } R^2 = .08-.18 \]
Which EF Composites Predicted an FASD Diagnosis?

- **Total Scores**
  - *p = .99 - .05*

- **Response Time**

- **Accuracy**

  - Verbal
  - Nonverbal

  $t$
Which Response Measures Predicted an FASD Diagnosis?

<table>
<thead>
<tr>
<th></th>
<th>Response Time</th>
<th>Accuracy</th>
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<tbody>
<tr>
<td>Verbal</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Nonverbal</td>
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Wald

- Verbal: Wald = 5.1, p = .87
- Nonverbal: Wald = 5.2, p = .02
Which BRIEF GEC Predicted an FASD Diagnosis?

\[ p = .60 - .04 \]
Results Summary

- EF subcategories differentiated adolescents who received an FASD dx from those that did not (except Accuracy)

- Verbal ≈ Nonverbal EF measures
  - Verbal measures > Nonverbal measures (trends)
    - Total Scores; Response Time; Accuracy

- Response Time > Accuracy for both Verbal and Nonverbal

- Teacher ratings of global executive dysfunction > parent ratings
Contributions & Future Directions

- Clearer understanding of the deficits that can be seen when using EF measures in a testing setting
  - Response Time; Verbally-loaded EF skills (trend)
- Improve diagnostic accuracy and procedures
- Specifies deficits to target for intervention and adaptations to environments
- Apply the EF subcategories to a school-age population
- Examine ADHD in conjunction with FASD using these subcategories
- Prospective longitudinal studies
Acknowledgements

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Thank you!

Questions? Comments?