RECENT ADVANCES IN FUNCTIONAL ANALYSIS OF CHALLENGING BEHAVIOR IN THE CLASSROOM

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BEHAVIORS MAY REQUIRE INTENSIVE, INDIVIDUALIZED SUPPORTS

• Persistent, or high risk challenging behavior
• Requires individualized, function-based intervention
• Functional Behavior Assessment (FBA)
  • A process to determine why a behavior is occurring
  • Leads to development of effective function-based behavior support plan
• Behavior support plans based on results of FBAs are more likely to be effective in reducing student challenging behavior
IDEA requires, but does not define, FBA

Quality and process of FBAs in school settings varies widely

Process
- Indirect Assessment
- Descriptive Assessment
- Hypothesis Testing (FA)

Quality
- Thoroughness
- Detail
- Accurate data analysis
TEACHERS REQUIRE SUPPORT

- Westling, 2010
  - 62% of teachers felt they did not have adequate pre-service preparation in challenging behavior
  - 58% of special educators reported they did not receive adequate in-service preparation in FBA
  - Only 27% of special educators reported receiving support from a behavior specialist
CURRENT ISSUES FACING TEACHER FBA INVOLVEMENT

- FBAs at crisis level
- Minimal understanding of functions of behavior and FBA process
- Reliance on outside personnel

- * Poor FBAs
- * Lack of “buy-in”
- * Lack of contextual fit
- * Failure to adhere to BSP
Preparing school personnel to conduct systematic FBAs with fidelity may increase school capacity to meet the needs of behaviors in need of intensive, individualized supports.
A SOLUTION FOR CURRENT ISSUES FACING TEACHER FBA INVOLVEMENT

FBAs as prevention of escalation

Increase teacher understanding of functions of behavior and FBA process

Build school capacity to reduce reliance on outside personnel

Higher quality FBAs
Teacher “buy-in”
Increased contextual fit
Treatment adherence
Identify Behavior of Concern

Indirect Assessment

Descriptive Assessment

Hypothesis Development

Hypothesis testing: Functional analysis

Function-based Intervention Development

Intervention Implementation and Data Collection

Data-based Decisions

Improve FBA Quality
FUNCTIONAL ANALYSIS

- Places student in different social situations to determine what variables trigger and reinforce challenging behavior
- Social situations are based on indirect and descriptive assessments
- Systematically test a hypothesis
- Similar to an allergy test
Functional analysis allows us to identify environmental influences on challenging behavior:
- With fewer false positives
- With more confidence

Functional Analysis can lead to:
- Increased intervention precision
- Effective treatments
- Identify humanistic treatments for problem behavior
TRADITIONAL FUNCTIONAL ANALYSIS OF CHALLENGING BEHAVIOR

• Typically includes 5 – 15 min conditions: attention, escape, tangible, play or alone (control)

• Repeatedly present specific antecedent and contingent consequences for challenging behavior
  • Massed trials A-B-C

• Measures the occurrence of challenging behaviors during each session
  • (e.g. rate of target behavior, percentage of intervals with target behavior)

• Compare levels of challenging behavior across social conditions as well as to a control condition
A FUNCTIONAL ANALYSIS IS A REINFORCER ASSESSMENT

The graph shows the percentage of 10s intervals with vocal stereotypy over sessions. The x-axis represents the session numbers, and the y-axis represents the percentage of intervals with vocal stereotypy. Two lines are plotted: one for demand and one for play.

- Demand line starts at a higher percentage and decreases to about 0% in session 3, then increases again.
- Play line starts lower but rises steadily, reaching its highest in session 7.

The graph illustrates the variability in vocal stereotypy across different sessions and conditions.
• Trial-Based Functional Analysis (Sigafoos and Saggers, 1995)

• Based on distributed trials embedded in ongoing activities and routines

• The participants are exposed to specific antecedents and consequences within the context of ongoing routines and activities in a natural environment

• The presentation of antecedents and consequences is done in discrete format

• Data are collected on the percentage of trials with challenging behavior
TRIAL-BASED FUNCTIONAL ANALYSIS

- Takes place during typical classroom instruction and routines
- Brief assessment
- Systematically tests antecedents and consequences within natural environment
- “Compromise” between descriptive and experimental assessment
  - Can produce clear information as to why the student is engaging in challenging behavior
TRIAL-BASED FUNCTIONAL ANALYSIS

1 minute

Up to 1 minute

Control

Test
ATTENTION CONDITION

- Attention Control
- Attention provided

- Attention Test
- Attention removed
ESCAPE CONDITION

- Control
  - Demands removed

- Test
  - Demands presented
TANGIBLE CONDITION

- Control
- Preferred item available

- Test
- Preferred item removed
IGNORE CONDITION

- Automatic Reinforcement Control
- Automatic Reinforcement Test
TRIAL-BASED FUNCTIONAL ANALYSIS

Indirect assessment and direct observations

Hypotheses

Attention
- 60 s control / 60 s test

Escape
- 60 s control / 60 s test

Tangible
- 60 s control / 60 s test
### TBFA PLANNING TOOL

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity/ Routine</th>
<th>Problem Behavior</th>
<th>Likelihood of Occurrence</th>
<th>Possible Function</th>
<th>Opportunity for Trial</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – Never</td>
<td></td>
<td></td>
<td>1 – Never</td>
<td>Obtain_________________</td>
<td>Attention Y / N</td>
</tr>
<tr>
<td>2 – Rarely</td>
<td></td>
<td></td>
<td>2 – Rarely</td>
<td>Escape_______________</td>
<td>Escape Y / N</td>
</tr>
<tr>
<td>3 – Sometimes</td>
<td></td>
<td></td>
<td>3 – Sometimes</td>
<td>Escape_______________</td>
<td>Tangible Y / N</td>
</tr>
<tr>
<td>4 – Often</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 – Always</td>
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<tr>
<td>1 – Never</td>
<td></td>
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<tr>
<td>2 – Rarely</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>3 – Sometimes</td>
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</tr>
<tr>
<td>4 – Often</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5 – Always</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>1 – Never</td>
<td></td>
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<td>Escape_______________</td>
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<td>3 – Sometimes</td>
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<td>3 – Sometimes</td>
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<tr>
<td>4 – Often</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 – Always</td>
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</tr>
</tbody>
</table>
The emerging literature base on TBFA suggests this model may be more feasible and appealing to teachers.

It has been proposed that conducting a TBFA may require fewer resources than conducting a TFA (e.g. time, personnel, training).

This study evaluated acquisition, generalization, and maintenance across 6 teachers.
A RECENT STUDY EXAMPLE

# Participants

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Setting</th>
<th>Degree</th>
<th>Previous FA Training</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Elementary</td>
<td>Masters in SPED</td>
<td>Coursework</td>
</tr>
<tr>
<td>B</td>
<td>Middle School</td>
<td>Bachelor in SPED*</td>
<td>Coursework</td>
</tr>
<tr>
<td>C</td>
<td>Elementary</td>
<td>Bachelor in SPED</td>
<td>None</td>
</tr>
<tr>
<td>D</td>
<td>District</td>
<td>Masters in School Psych &amp; LSSP</td>
<td>Coursework &amp; PD</td>
</tr>
<tr>
<td>E</td>
<td>Middle School</td>
<td>Masters in SPED</td>
<td>Coursework</td>
</tr>
<tr>
<td>F</td>
<td>Elementary</td>
<td>Bachelor in SPED</td>
<td>None</td>
</tr>
</tbody>
</table>
## DEPENDENT VARIABLES

<table>
<thead>
<tr>
<th>Variable</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementation Fidelity – TBFA</td>
<td>Percentage of Steps Correct</td>
</tr>
<tr>
<td>Implementation Fidelity – TFA</td>
<td>Percentage of Steps Correct</td>
</tr>
</tbody>
</table>
Teacher expected behaviors for Traditional Attention Condition

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Attention Trial 1</th>
<th>Attention Trial 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Educator instructs the child to play with toys and then ignores.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educator turns away from child and ignores appropriate behavior of child.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educator ignores inappropriate behavior other than the target behavior emitted by the child</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educator provides brief attention (express concern and brief physical contact) when the child emits the target behavior</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total correct:

Percentage correct:

Criterion reached? (Y/N)
Teacher expected behaviors for Trial-based Attention Condition

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Attention Control</th>
<th>Attention Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educator instructs the participant engage in independent work or leisure items. Educator does not engage in continuous demands</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educator provides participant with attention at least once every 5 s for a total of 60 s regardless of participant engagement in challenging behavior. Attention does not include demands.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educator instructs the participant to engage in independent work or leisure items</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educator explains that he/she needs to complete some work and turns body away from participant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educator does not speak or look at participant for 60 s unless participant engages in target challenging behavior</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contingent upon challenging behavior, educator turns toward participant and provides verbal attention and statements of concern</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total correct:**

**Percentage correct:**

**Criterion reached? (Y/N)**
<table>
<thead>
<tr>
<th>Condition</th>
<th>Protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>• Read Bloom et al., 2013 for TBFA; Iwata et al. 1982/1994 for TFA</td>
</tr>
<tr>
<td></td>
<td>• Role play with researcher</td>
</tr>
<tr>
<td>Training</td>
<td>• Overview of operant conditioning and functions of behavior</td>
</tr>
<tr>
<td></td>
<td>• Rationale for conducting functional analysis</td>
</tr>
<tr>
<td></td>
<td>• Task analysis of each condition</td>
</tr>
<tr>
<td></td>
<td>• Video examples of each condition presented and discussed</td>
</tr>
<tr>
<td>Post-Training + PF</td>
<td>• Role play with researcher</td>
</tr>
<tr>
<td></td>
<td>• Written &amp; verbal feedback</td>
</tr>
<tr>
<td>In-Situ Probes + PF</td>
<td>• Implemented with a student</td>
</tr>
<tr>
<td></td>
<td>• Written &amp; verbal feedback</td>
</tr>
<tr>
<td>Maintenance + PF</td>
<td>• Role play with researcher</td>
</tr>
<tr>
<td></td>
<td>• Written &amp; verbal feedback</td>
</tr>
</tbody>
</table>
RESULTS – COHORT 1, TBFA

Baseline
Post-training + feedback
0
15
30
45
60
75
90
TBFA Attention
TBFA Demand
TBFA Tangible

Session
Percentage of Steps Correct
In-Situ Maintenance Probes
5 week probes
2 week probes
1 week probes

Teacher A
Teacher B
Teacher C
RESULTS - COHORT 1, TFA
RESULTS - COHORT 2, TFA
RESULTS – COHORT 2, TBFA

Baseline
Post-training
+feedback

TBFA Attention
TBFA Demand
TBFA Tangible

3 week probes
4 week probes
2 week probes
3 week probes
Teacher D
Teacher E
Teacher F

Percentage of Steps Correct
In-Situ Maintenance
4 week probes
## TRIALS TO CRITERION RESULTS

<table>
<thead>
<tr>
<th>Participant</th>
<th>TBFA Mean Trials to Criterion Across Conditions</th>
<th>TFA Mean Trials to Criterion Across Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher A</td>
<td>2</td>
<td>1.25</td>
</tr>
<tr>
<td>Teacher B</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Teacher C</td>
<td>2</td>
<td>1.25</td>
</tr>
<tr>
<td>Teacher D</td>
<td>1</td>
<td>1.25</td>
</tr>
<tr>
<td>Teacher E</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>Teacher F</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td><strong>1 -2</strong></td>
<td><strong>1 – 1.5</strong></td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td><strong>1.5</strong></td>
<td><strong>1.3</strong></td>
</tr>
</tbody>
</table>
AVERAGE TIME SPENT TRAINING

- 1 hour
- 27 minutes

- TBFA Probes and Performance Feedback
- TFA Probes and Performance Feedback
• All participants were able to meet criteria for implementing TBFA and TFA in the classroom following training package
• TBFA model took less than half the time to train than TFA model
Purpose:

- Extend the TBFA to Head Start classrooms
- Validate the putative function of behavior identified in the TBFA by matching function-based treatment in comparison to universal level preventative supports
<table>
<thead>
<tr>
<th>Teacher</th>
<th>Age</th>
<th>Ethnicity</th>
<th>Experience</th>
<th>Highest Degree</th>
<th>Training / Experience with Behavior Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kaitlin</td>
<td>24</td>
<td>Caucasian</td>
<td>1 year – HS 4 years – CC</td>
<td>High school diploma</td>
<td>Received training in function-based intervention</td>
</tr>
<tr>
<td>Darlene</td>
<td>22</td>
<td>African-American</td>
<td>1 year – HS 6 years – CC</td>
<td>Associate’s degree in Early Childhood Education</td>
<td>Received training in function-based intervention</td>
</tr>
<tr>
<td>Kaitisha</td>
<td>35</td>
<td>African-American</td>
<td>10 years – HS 2-3 months – CC</td>
<td>Some college</td>
<td>Received training in function-based intervention, Head Start training on behavior management, has a child with a disability/autism</td>
</tr>
<tr>
<td>Child</td>
<td>Age</td>
<td>Ethnicity</td>
<td>Challenging Behavior</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------</td>
<td>-----</td>
<td>---------------</td>
<td>-------------------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laylana</td>
<td>4 yrs</td>
<td>African-American</td>
<td>aggression towards teachers and object destruction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Juan</td>
<td>4 yrs</td>
<td>Latino</td>
<td>screaming, dropping to the floor, and body flailing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tom</td>
<td>3 yrs</td>
<td>African-American</td>
<td>grabbing objects from other children and screaming</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
TBFA PROCEDURES

- Initial FBA conducted by member of Research Team
- Teacher was trained to conduct TBFA
  - one-on-one didactic training
    - 30 min Powerpoint presentation
    - 30 min role play/performance feedback
    - Role play continued until procedural fidelity reached 100% for 3 consecutive sessions per condition
- Once teachers reached criteria, they were able to conduct trials and collect data in the classroom without supervision
- After TBFA was completed, the intervention comparison was conducted
- Teachers were trained to implement the more effective intervention
Behaviors: object destruction (using objects not as intended/designed) and aggression towards a teacher
## INTERVENTION COMPARISON PROCEDURES

<table>
<thead>
<tr>
<th>Baseline</th>
<th>Function Based</th>
<th>Non-function Based</th>
</tr>
</thead>
</table>
| • Child has access to preferred item/activity | • Functional communication training (FCT):  
  • Most-to-least prompts to have the child state the phrase or exchange the picture card  
  • Descriptive praise and 30 s access to item/activity  
  • Challenging behavior placed on extinction | • Reminder of classroom expectations prior to session  
  • Challenging behavior:  
    • Reminder of expectations to earn for class reward system  
    • FR:2 access to item/activity  
    • If no challenging behavior in session, child earns token for group contingency system |
| • Item/activity is removed | | |
| • Challenging behavior results in brief (30 s) access to tangible | | |
Baseline

NFB

Baseline

FCT

FCT with Teacher

Rate per Minute

Sessions

Challenging Behavior

Functional Communication

Juan
Challenging Behavior
Functional Communication

Baseline
NFB
Baseline
FCT
FCT with Teacher

Rate per Minute
Sessions

0 0.5 1 1.5 2 2.5 3 3.5

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

Tom
Teachers can be trained relatively quickly to implement either a Trial-based or a Traditional functional analysis

- It appears that the logic behind functional analysis may be a key piece in acquiring functional analysis procedures regardless of model
- Potential for sequence effects
- Ongoing performance feedback after teachers have met criterion may need to occur to support maintenance of fidelity of implementation

- Teachers varied in their preference for each model
  - This could be a strength in individualizing functional analysis procedures to fit context, resources, and individual characteristics of target child
WHEN TO CONDUCT FUNCTIONAL ANALYSIS?

- Indirect Assessment
- Functional Analysis
- Direct Observation
- Teacher coaching and planning
- Functional Analysis

- Indirect Assessment
- Functional Analysis

- Indirect Assessment
- Direct Observation
- Functional Analysis

- Indirect Assessment
- Direct Observation
- Teacher coaching and planning
- Functional Analysis
Advantages:

- May build capacity in schools to systematically assess challenging behavior
- May expedite FBA process
- May improve identification of contextual variables and lead to more accurate identification of behavioral functions
- May lead teachers to focus on prevention rather than punishment or coercive strategies
TEACHERS AS FA IMPLEMENTERS

• Disadvantages/Concerns
  • Sophisticated assessment method requires training and ongoing feedback/supervision
  • Decision making to know when and how to conduct FA
    – Designing TBFA conditions may require advanced understanding of behavior analysis
    – Potential solution: FBA teams
WHAT DO TEACHERS THINK?

• Across our work, teachers reported positive views of acceptability and feasibility of FA.

• Teachers also expressed concerns with aspects of the FA process related to:
  • Evoking challenging behavior may disrupt classroom.
  • Reinforcing challenging behavior in front of other students.

• Research is needed to modify the FA model so that it is more acceptable to teachers.
AREAS FOR FUTURE RESEARCH

- Efficient, accurate, and feasible means of identifying function of challenging behavior
- Continue to increase teachers involvement in FBA process
- Alterations to FA models to increase feasibility and acceptability in classroom settings
• Thank you!

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