Functional Behavior Assessment & Function-based Intervention for Children with ASD

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Workshop Overview

• Presentation
  • Problem Behavior
  • Function of Behavior
  • Functional Assessment
  • Function-Based Treatments
  • Case Studies

• Practice (Role Play)
Problem Behavior

• When is behavior a problem behavior?
  • Occurs too much, too little, or in wrong place
  • Interferes with ability to engage in everyday activities

• What happens if problem behavior not addressed?
  • Social rejection, withdrawal, development of serious behavior, removal from home/school, placement in restrictive setting, medications (w/side effects), death
Common Behavior Problems

• **Severe**
  • Self-injurious behavior (SIB)
  • Aggression (AGG)
  • Property destruction (PD)
  • Inappropriate sexual behavior
  • Running away (elopement)
  • Pica (ingestion of inedible objects)

• **Other**
  • Stereotypy
  • Inappropriate verbal behavior
  • Tantrums
  • Noncompliance
Learned Functions of Behavior

- **Function:** What purpose does the behavior serve?
  - Most behaviors learned
  - Adaptive and maladaptive behavior have common functions

- **Positive reinforcement** - *increase in future frequency of behavior due to the addition of something following that behavior*
  - Social (attention, access to tangible materials)
  - Automatic (sensory stimulation)

- **Negative reinforcement** - *increase in future frequency of behavior due to removal of (escape or avoid) something aversive/painful following that behavior*
  - Social (escape from undesirable situation)
  - Automatic (pain attenuation)
Functional Assessment

• **Purpose**
  - Identify what about environment that influences behavior
    - *In what situations does behavior occur & not occur?*
  - Discover “cause-effect” relationships *(Skinner, 1953)*

• **Goals**
  - *Understanding* conditions under which behavior occurs
  - Determine *treatments* likely to be effective
  - *Prevention* of future occurrence of problem behavior
Methods for Conducting Functional Assessments

<table>
<thead>
<tr>
<th>Precision</th>
<th>Simplicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Least</td>
<td>Most</td>
</tr>
<tr>
<td>Least</td>
<td>Most</td>
</tr>
<tr>
<td>Most</td>
<td>Least</td>
</tr>
</tbody>
</table>

- Indirect (Anecdotal) Methods
- Descriptive (Naturalistic) Analysis
- Functional (Experimental) Analysis
Indirect (Anecdotal) Assessment

Characteristics
- Gather information about behavior (no observation)
- Data: verbal report (interview, checklist, rating scale)

Strengths
- Simplicity, no risk to client, structured method to get info

Weaknesses
- Subjectivity, poor reliability, insufficient for treatment development

Suggestions
- Preliminary guide, use multiple informants, follow with descriptive or functional analysis
Descriptive (Naturalistic) Assessment

Characteristics
- Direct observation of circumstances surrounding behavior
- Data: narrative recording, scatterplot, ABC recording

Strengths
- Objective/quantifiable data, may be sufficient for treatment development

Weaknesses
- Identifies only correlational relationships
  - Sneeze ⇒ “Bless you”
- Irrelevant variables may mask relevant ones (attention)

Suggestions
- Objective definitions of behavior & context, observe during relevant activities/contexts, use repeated observations
Functional (Experimental) Analysis (FA)

Characteristics

- Direct & quantifiable observation of behavior
- Conditions of observation are controlled
- Comparison b/w TEST and CONTROL
  - Condition A (test): $\text{Sneeze} \rightarrow \text{"Bless you"}$
  - Condition B (control): $\text{Sneeze} \rightarrow \text{No response}$

Standard FA (Iwata et al., 1982/1994)

- 4 conditions (3 test; 1 control)
- 10-min sessions
- Rapid alternation of conditions
- Conduct sessions until clear results emerge
# Functional Analysis Protocol

<table>
<thead>
<tr>
<th>Condition</th>
<th>Antecedent</th>
<th>Consequence</th>
<th>Contingency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attention</td>
<td>No attention</td>
<td>Attention</td>
<td>Positive Sr (attention)</td>
</tr>
<tr>
<td>Demand</td>
<td>Learning trials (tasks) presented</td>
<td>Termination of learning trials (tasks)</td>
<td>Negative Sr (escape from demands)</td>
</tr>
<tr>
<td>Alone/No Interaction</td>
<td>Alone/no attention</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Play</td>
<td>Toys &amp; attention</td>
<td>N/A</td>
<td>Control</td>
</tr>
<tr>
<td></td>
<td>No learning trials (tasks)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Other Possible Conditions

<table>
<thead>
<tr>
<th>Condition</th>
<th>Antecedent</th>
<th>Consequence</th>
<th>Contingency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tangible</td>
<td>Prior access to preferred items; start of session, items removed</td>
<td>Access to preferred items</td>
<td>Positive Sr (tangible)</td>
</tr>
<tr>
<td>Divided Attention</td>
<td>Attention to others</td>
<td>Attention</td>
<td>Positive Sr (attention)</td>
</tr>
<tr>
<td>Social Avoidance</td>
<td>Attention</td>
<td>No attention</td>
<td>Negative Sr (escape from social interaction)</td>
</tr>
</tbody>
</table>
Functional Analysis

- Identifies source(s) of reinforcement for problem behavior
  - Cause-effect relationship
- Outcomes suggest intervention strategies
- Good reliability and validity (300+ studies across populations and behavior)

***FA of severe self-injury or aggression (tissue damage) should only be conducted under direct supervision of board certified behavior analyst***
Treatment:

Reinforcement-Based Strategies
3 Fundamental Ways To Reduce Behavior

1. Eliminate antecedent event
   - Decrease motivation to engage in problem behavior
     \textit{(reinforcer not as valuable)}

2. Eliminate reinforcer for problem behavior
   - Extinction \textit{(reinforcer not available)}

3. Replace behavior with alternative response
   - Differential reinforcement (DRA) \textit{(more valuable alternative)}
Case Study #1

- Henry
- 3-year-old male
- Profound MR
- Self-injurious behavior (SIB)
  - Head banging
- No productive language
- No instruction following
- Socially responsive
Treatment
Reinforcer/Function = Attention

1. Antecedent event: Deprivation from attention
   • **Treatment**: Noncontingent Reinforcement (NCR)
     - \( NCR = \text{Continuous attention \\ & toys} \)

2. Maintaining reinforcer: Attention
   • **Treatment**: Extinction (EXT)
     - \( EXT = \text{SIB } \Rightarrow \text{Ignore (“planned ignoring“)} \)

3. Behavioral replacement:
   • **Treatment**: Differential reinforcement of alternative behavior (DRA)
     - \( DRA = \text{Handwave } \Rightarrow \text{Attention + Edible} \)
Treatment Results

- **Baseline**
  - SIB

- **NCR/Ext**

- **DRA**
  - SIGN
  - FI 30"
  - FI 60"
  - FI 120"
  - FI 240"

- **Intermittent DRA**

**Responses Per Minute**

**Sessions**
Case Study #2

- Katie
- 7-year-old female
- Autism
- **Self-injurious behavior (SIB)**
  - Head banging
  - Hair pulling
  - Self hitting
- Limited communication skills
- Indirect Assessment: Attention & Escape
- Descriptive Assessment: Attention & Escape
Functional Analysis

RESPONSES PER MINUTE (SIB)

SESSIONS

Demand
Attention
Tangible
Alone
Play
Example: Social Negative Reinforcement
Reinforcer = Escape

1. Antecedent event: Aversive stimulation (task demands)

2. Maintaining reinforcer: Escape (break)
   - **Treatment:** Extinction
     - SIB ≠ Escape (continue task demands)

3. Behavioral replacement:
   - **Treatment:** DRA
     - Mand (request) → Escape (break)
     - Compliance → Opportunity to mand
PRACTICE (ROLE PLAY)

Workshop Packet (handouts)
- Description of FA & TX Conditions
- Behavior (Response) Definitions
- Direct Observation Data Sheet

Form Groups
PRACTICE (ROLE PLAY)

For each FA/TX condition:

- Instruction
  - Verbal description
  - Model by graduate students

- Practice (Role Play w/Feedback)
  - 1 Client
  - 1 Therapist
  - All others are Data Collectors
FA & TX PRACTICE

TARGET PROBLEM BEHAVIOR = SIB
- Any behavior that may cause injury to the client (e.g., head hitting, head banging, skin picking, self scratching)
- Frequency (count each occurrence)

TARGET APPROPRIATE BEHAVIOR = Mand
- Asking for functional reinforcer (attention/tangible/break)
- Frequency (count each occurrence)

THERAPIST Behavior
- Attention – delivery of vocal & physical attention
- Prompt – delivery of each demand
- Escape – providing break (removing demands)
- Tangible – delivery of preferred items
Definition of Target Problem Behavior: *Any behavior that may cause injury to the client (e.g., head hitting, head banging, skin picking, self scratching)*

<table>
<thead>
<tr>
<th>Session #</th>
<th>Condition</th>
<th>Child Behaviors</th>
<th>Therapist Behaviors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Problem Behavior</td>
<td>Mand</td>
<td>Attention</td>
</tr>
<tr>
<td>1</td>
<td>FA - Ignore/Alone (Test)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>FA - Attention (Test)</td>
<td></td>
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<tr>
<td>3</td>
<td>FA - Play (Control)</td>
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<tr>
<td>4</td>
<td>FA - Escape (Test)</td>
<td></td>
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</tr>
<tr>
<td>5</td>
<td>FA - Tangible (Test)</td>
<td></td>
<td></td>
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<tr>
<td>6</td>
<td>TX (Automatic) Noncontingent Reinforcement</td>
<td></td>
<td></td>
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<tr>
<td>7</td>
<td>TX (Attention) FCT + EXT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>TX (Escape) FCT + EXT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>TX (Tangible) FCT + EXT</td>
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</tbody>
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Test for **Automatic Reinforcement**

**Alone/Ignore (no interaction)**

- No toys/materials present (barren environment)
- Ignore all client behavior
Test for **Social Positive Reinforcement**

**Attention**

- Moderately preferred toys available for client
- Ignore client (engage in “work”)
- SIB → brief attention (vocal & physical)
Control Condition

Play

- Highly preferred items freely available to client
- Lots of attention/social interaction
- Ignore SIB
Test for **Social Negative Reinforcement**

**Escape**

- Present demands/instructions using 3-step
  - *Vocal prompt*
  - *Gestural/model prompt*
  - *Physical guidance prompt*
- SIB $\Rightarrow$ escape/break from demands ($\approx 30\text{-s}$)
- Compliance $\Rightarrow$ praise
Test for **Social Positive Reinforcement**

**Tangible**

- Prior to session, moderately preferred items available for client
- Start of session, remove preferred items & ignore client
- SIB ➔ access to preferred items (≈ 30s)
Treatment for **Automatic Reinforcement**

**Noncontingent Reinforcement**

- “Play condition”
- Highly preferred items freely available to client
- Lots of attention/social interaction
- Ignore SIB
Treatment for Social Positive Reinforcement (attention)

DRA + EXT

- Moderately preferred toys available for client
- Ignore client (engage in “work”)
- MAND (“Play with me”) ➞ Attention (DRA)
- SIB ➞ No attention/ignore (EXT)
Treatment for Social Negative Reinforcement (escape)

DRA + EXT

- Present demands/instructions using 3-step
  - Vocal prompt
  - Gestural/model prompt
  - Physical guidance prompt
- Compliance ➔ praise
- Mand (“I want a break”) ➔ escape/break (DRA)
- SIB ➔ no escape/break from demands (EXT)
Treatment for **Social Positive Reinforcement** (tangible)

**DRA + EXT**

- Prior to session, moderately preferred items available for client
- Start of session, remove preferred items & ignore client
- Mand ("Toys please") ➔ access to preferred items (DRA)
- SIB ➔ no access to preferred items (EXT)
Questions?

- How well did data collectors agree?
- Other questions?

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