HEALTH AND SAFETY PROGRAMS:
ABA PROCEDURES AND OUTCOMES

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Orlando, FL

Monday: 1-4 pm room 105
Tuesday: 9-12 pm room 107
WHY HEALTH & SAFETY

- 25 year old female who had not received dental care since early childhood
- 3 year old female who only consumed 2 foods, both of which are not healthy
- 11 year old male never had dental care
- 7 year old male with ear problems and requires surgery who will not tolerate ear exam
- 12 year old male, who needs frequent blood draws, will not tolerate said draws and has to be restrained
- 6 year old male diagnosed with autism drowned last weekend in Seminole County
HEALTH & SAFETY GRANT 2016-2017

Funded By: West Orange Healthcare District

Project Manager: Joy Bennett, MS, BCBA
OUTCOMES MANAGEMENT

- Develop proposal with outcomes
  - Targets
  - Measurement
  - Benchmarks
  - Setup data collection and procedures
- Upon grant award, implement
- Monthly review of outcomes – make adjustments
  - Clinical data
  - Hours tracking
- Quarterly reports to funder
- Final report to funder
PROJECTED OUTCOMES

• Serve >= 14 kids
• Complete >= 25 projects related to health & safety
• Of the >= 25 projects, >= 90% mastered in the community
RESULTS: GRANT PROJECT TARGETS

- Taking pills
- Dental exams
- Medical exams
- Vision exams
- Hair cutting
- Food acceptance
- Blood draws

- Tooth brushing
- Wearing bandaid
- Wearing clothes
- Crossing streets
RESULTS: # OF KIDS SERVED

Cumulative # Kids

West Orange

# West Orange
RESULTS: COMPLETED IN TARGET SETTING

% Complete

Nov-16  Jan-17  Mar-17  May-17  Jul-17  Sep-17  Nov-17
GRANT HOURS TRACKING

Excel Tracker
GENERAL PROCEDURES

ASSESSMENT OF PROBLEM → DEVELOP PLAN → IMPLEMENT PROCEDURE

IMPLEMENT WITH PARENT IN CENTER
IMPLEMENT IN COMMUNITY LOCATION
PARENT IMPLEMENTS IN COMMUNITY
SPECIFIC PROCEDURES:
Escape/Avoidance Hierarchy with H&S-Related Projects
TX OPTIONS

Drugs: (e.g., anti-anxiety)
  • Efficacy?
  • Side effects

General anesthesia:
  • Effective
  • Risk events (death is rare, but 1:100,000)
  • Expensive
TX OPTIONS

Power through these activities

- Emotional behavior
- Risk events
- Often involves restraints
TX OPTIONS

Contracting

• Can be effective
• Long sequences?
GRADUAL INTRODUCTION OF STIMULI

People With Phobias

- Use hierarchies of feared stimuli
  - Least frightening → Most frightening
- Learn relaxation skills
- Apply to hierarchy of feared stimuli
TX OPTIONS

Hierarchy Example

- Sight of picture of a snake
- Sight of snake at 20 ft distance
- Sight of snake at 10 ft distance
- Sight of snake at 5 ft distance
- Sight of snake at 1 ft distance
- Touch snake for 1 sec
- Touch snake for 5 sec
- Touch snake for 10 sec and so on until...
TX PROCEDURES

Teach Participant to Relax then...

- Sight of picture of a snake + relaxation
- Sight of snake at 20 ft distance + relaxation
- Sight of snake at 10 ft distance + relaxation
- Sight of snake at 5 ft distance + relaxation
- Sight of snake at 1 ft distance + relaxation
- Touch snake for 1 sec + relaxation
- Touch snake for 5 sec + relaxation
- Touch snake for 10 sec + relaxation etc
APPLICATIONS TO HEALTH & SAFETY

Social Validity of the Hierarchy: What are the essential steps?

- Interview provider of services
- Interview others who have successful experience
- Go through the experience
  - Such as...Taking a pill...
- Then develop steps and sub-steps
PROCEDURE HIGHLIGHTS

Break down task into small steps

1. Tolerate empty capsule within 1 ft
2. Tolerate empty capsule within 6”
3. Tolerate empty capsule touching lip
4. Accept ½ empty capsule into mouth for 2”
5. Accept ½ empty capsule into mouth for 5”
6. Swallow ½ empty capsule into mouth with chaser
7. Swallow whole empty capsule into mouth with chaser
DATA DISPLAY

Data for Steps in Hierarchy

- Step 1
- Steps 1,2
- Steps 1,2,3
- Steps 1,2,3,4

% Correct vs. Session
PROCEDURES

- Potential Reinforcers:
  - Escape from hierarchy
  - Transition to previous step
  - Contingent breaks with preferred items
- Prompts as needed
- High probability request sequence prior to introducing step
- Modeling steps
PROCEDURES

• Teach request escape
  • Perhaps use differential reinforcement
    • More reinforcers for completing hierarchy vs reinforcer for mand

• Extinction?
  • Escape extinction – prevent termination of the procedure contingent on problem behavior
  • Non-contingent escape
  • If escape for problem behavior is inevitable...
PROCEDURES

Low intensity $\rightarrow$ High Intensity $\rightarrow$ Escape

VS

Low intensity $\rightarrow$ Escape
Case: Food refusal that may result in hospitalization

Facts:
1. 3 year old female with history of food refusal
2. Some mands
3. Consumed food: cookies, M&Ms, Pediasure
FOOD ACCEPTANCE

1. Tx elements
   A. FR 1 for taking bite
   B. Escape extinction – keep food in proximity until criterion met
   C. Simultaneous presentation of preferred and non-preferred food
   D. Sequential presentation of... non-preferred → preferred food
FOOD ACCEPTANCE

1. Tx elements (contd)

C. Hierarchy of food acceptance
   I. Show food
   II. Food on spoon
   III. Food w/in 6”
   IV. Spoon touches mouth
   V. Food in mouth
   VI. Swallow

D. FR 1 escape for refusals: “All done” + push food away $\rightarrow$ Extinction
SCHEDULE EFFECTS AND EXTINCTION

• Preparing for Extinction
  • History of FR 1
  • Then...Extinction

VS

• History of VR 5
• Then...Extinction

Ext After FR 1 History
“Low resistance to extinction”

Ext After VR 5 History
“High resistance to extinction”
VIDEOS

Food acceptance
Case:
1. 12 year old male who would participate in some medical procedures
2. Major procedures (e.g., blood work) done under anesthesia
3. Because of new meds, weekly blood draws scheduled, which required 5 person restraint
PROCEDURES

1. Contracting
2. Checklist of tasks each day
3. Weekly blood draws with restraints as needed
4. Blood draw training with hierarchy
1. Sits in chair with arms
2. Puts arm facing up on arm of chair
3. Tolerates tourniquet on upper arm
4. Tolerates alcohol wipe on skin
5. Tolerates "needle" on vein for 1 s count
6. Tolerates "needle" on vein for 5 s count
7. Tolerates "needle" on vein for 10 s count
8. Tolerates "needle" on vein for 15 s count
9. Tolerates "needle" on vein for 20 s count
10. Tolerates "needle" on vein for 30 s count
11. Tolerates "needle" on vein for 30 s (no count)
12. Tolerates "needle" on vein for 45 s (no count)
13. Tolerates "needle" on vein for 1 m (no count)
14. Tolerates Band-Aid on vein 1.5 m
VIDEOS

Blood draw
HIERARCHY OF STEPS
TERMINOLOGY NOTE

- Desensitization
- Shaping
- Fading
- Chaining
- Gradual Exposure
- Escape/avoidance Hierarchy
- “The” Hierarchy
OPERANT: Escape from medical procedures

- Crying
- Elopement
- Hitting
- Pinching

REINFORCER: Escape from medical procedures
RESPONSE CLASSES

Operant: Escape from medical procedures
- Crying
- Elopement
- Hitting
- Pinching

Reinforcer: Escape from medical procedures

During Training: Compliance
RESPONSE CLASSES

Operant: Escape from medical procedures
- Crying
- Elopement
- Hitting
- Pinching
- Compliance

Reinforcer
Escape from medical procedures

Sprague & Horner, 1992; Shukula-Mehta & Albin, 2005
COMMUNITY PARTNERS

- West Orange Healthcare District
- Florida Institute of Technology
- Rollins College
- Nemours Childrens Hospital
WHY SWIMMING PROGRAMS?

• A 7 year old runs away from home to neighbors pool

• A family is moving to a property with a pond and daughter cannot swim
UNINTENTIONAL DROWNING: HOW BIG IS THE PROBLEM?
DROWNING IN PERSONS DIAGNOSED WITH ASD

- Research indicates that children with Autism Spectrum Disorder (ASD) are at a higher risk of drowning than those in the general population (Shavelle, Strauss & Pickett, 2001).
CHARACTERISTICS AFFECTING WATER SAFETY

• COMMUNICATION
  • DEFICITS IN RECEPITIVE AND/EXPRESSIVE LANGUAGE

• PHYSICAL
  • PERSONS DIAGNOSED WITH ASD ARE MORE LIKELY TO HAVE MOTOR IMPAIRMENTS THAN TYPICALLY DEVELOPING INDIVIDUALS (FOURNIER, HASS, NAIK, LODHA, & CAURAUGH, 2010).

• SEIZURES
  • EPILEPSY IS MORE COMMON IN PEOPLE WITH ASD THAN IN THE GENERAL POPULATION (DANIELSSON, GILLBERG, BILLSTEDT, GILLBERY, & OLSSON, 2005).

• ELOPEMENT
  • IN A STUDY OF OVER 800 PARENTS, AROUND 50% OF CHILDREN WITH ASD BETWEEN 4-10 WANDER AT SOME POINT (ARKY, 2011).

• BEHAVIORAL
  • PROBLEM BEHAVIORS RELATED TO ESCAPE FROM AVERSIVE SITUATIONS (E.G., WATER ON FACE, INSTRUCTIONS, ETC.)
  • BEHAVIORS MAINTAINED BY AUTOMATIC REINFORCEMENT (E.G., WATER IN THE MOUTH)
DID YOU KNOW?

Nearly 50% of people with autism wander or elope from safety.

90% of wandering fatalities are caused by accidental drowning.

50%  

Water safety education is crucial to keeping our community safe!
SWIMMING LESSONS MAY REDUCE RISK OF DROWNING

• FOR CHILDREN AGES 1-4, EXPOSURE TO FORMAL SWIMMING LESSONS WAS ASSOCIATED WITH AN 88% REDUCTION IN THE RISK OF DROWNING WITH CHILDREN. IN CHILDREN AGES 5-19, IT WAS ASSOCIATED WITH A 64% REDUCTION IN RISK OF DROWNING (MCINTOSH, 2009).
HEALTH CONCERNS

• RESEARCH SUGGESTS THAT CHILDREN DIAGNOSED WITH ASD HAVE A TENDENCY FOR A LESS ACTIVE LIFESTYLE (ALEKSANDROVIC, JORGIC, BLOCK, & JOVANOVIC 2015).

• OVER 30 PERCENT OF CHILDREN DIAGNOSED WITH ASD ARE REPORTED AS OBESE (CURTIN ET AL. 2010).
RATIONALE FOR AQUATIC ABA

• EVIDENCE BASED

• PARENT PREFERENCE FOR INSTRUCTORS WITH EXPERIENCE WORKING WITH CHILDREN WITH DEVELOPMENTAL DISABILITIES

• CAN WORK ON BARRIERS AS WELL AS ACQUISITION

• TREATMENT OF PHOBIC BEHAVIOR
EVIDENCE: THE EFFECTS OF A BEHAVIORAL TREATMENT PACKAGE ON THE ACQUISITION OF AQUATIC SKILLS

• EXPLAIN THE EFFECTS OF A BEHAVIORAL TREATMENT PACKAGE ON THE AMERICAN RED CROSS LEARN-TO-SWIM LEVELS 1-2 CURRICULUM.
WHAT ARE THE EFFECTS OF A BEHAVIORAL TREATMENT PACKAGE ON THE AMERICAN RED CROSS LEARN-TO-SWIM LEVELS 1-2 CURRICULUM.

• METHOD:
  
  • PARTICIPANTS
    
    • PARTICIPANT 1, LUKE, IS A 7-YEAR OLD MALE
    • PARTICIPANT 2, HELEN, IS A 4 YEAR-OLD FEMALE
    • PARTICIPANT 3, NEIL, IS A 3 YEAR-OLD MALE
    • PARTICIPANT 4, TARA, IS A 3 YEAR-OLD FEMALE
  
  • SETTING:
    
    • ALL SESSIONS WERE CONDUCTED IN AN INDOOR POOL.
THE EFFECTS OF A BEHAVIORAL TREATMENT PACKAGE ON THE ACQUISITION OF AQUATIC SKILLS

- MATERIALS:
  - DATA SHEET
  - POOL NOODLE
  - POSSIBLE REINFORCERS
  - CAMERA

- SCREENING PROCEDURE FOR TARGET BEHAVIORS
  - AMERICAN RED CROSS LEARN-TO-SWIM LEVELS 1-2 CURRICULUM
DEPENDENT VARIABLES:

• RESPOND TO VARIOUS INSTRUCTIONS
• RESPONSES ARE RED CROSS LEVEL 2 SKILLS
BASELINE
RESULTS: LUKE
RESULTS: HELEN

- Front Glide
- Progress on Wall
- Simultaneous Arms on Back
RESULTS: NEIL

BL Tx

Roll Over

Bob

Back Glide
RESULTS: TARA

Submerge Eyes

Breaststroke Arms

Back Glide
IOA

• IOA WAS COLLECTED ACROSS PARTICIPANTS FOR A MINIMUM OF 30% OF SESSIONS.

• IOA WAS COMPUTED BY NUMBER OF AGREEMENTS/ TOTAL NUMBER OF TRAILS PER SESSION ACROSS SKILLS X 100

• IOA RANGED FROM 96.67%-100%
ULTIMATE TEST: CLOTHES ON TEST

- DRESS CHILD IN STREET CLOTHES
- PUT HIM/HER INTO WATER
- STAY CLOSE BUT OUTSIDE POOL
- OBSERVE IF CHILD MAKES IT TO SAFETY
HOW DOES THIS EXTEND CURRENT LITERATURE?

• ALL SKILLS WERE TAUGHT IN 10 DAYS OR UNDER WITHOUT PREREQUISITE TRAINING.

• THIS STUDY DISPLAYED EVIDENCE THAT A BEHAVIOR SKILLS PACKAGE IS EFFECTIVE IN TEACHING CHILDREN WITH AUTISM SWIMMING SKILLS AT DIFFERENT FUNCTIONING LEVELS.

• THE BEHAVIORAL SKILLS PACKAGE IS EFFECTIVE IN TEACHING A SWIMMING CURRICULUM (AMERICAN RED CROSS LEARN-TO-SWIM).
  • IN TOTAL WE TAUGHT 10 DIFFERENT SKILLS ACROSS PARTICIPANTS
FUTURE DIRECTIONS

• COMPONENT ANALYSIS
• COMPARISON BETWEEN RED CROSS SWIM LESSONS AND ABA SWIM LESSONS
• SWIMMING FOR EXERCISE
• BEHAVIORAL SKILLS TRAINING FOR WATER SAFETY INSTRUCTORS
CURRENT RESEARCH: WHAT ARE THE EFFECTS OF BEHAVIORAL SKILLS TRAINING ON A WATER SAFETY INSTRUCTOR’S BEHAVIOR?

• METHOD:
  • PARTICIPANT
    • KATIE, FEMALE, 22 YEARS OLD, 4 YEARS AS A WATER SAFETY INSTRUCTOR (WSI)
  • SETTING:
    • ALL SESSIONS CONDUCTED IN AN INDOOR POOL.
EFFECTS OF BEHAVIORAL SKILLS TRAINING ON A WATER SAFETY INSTRUCTOR’S BEHAVIOR?

• MATERIALS:
  • DATA SHEET
  • POOL NOODLE
  • POSSIBLE REINFORCERS
  • CAMERA
  • LAMINATED GRAPHS

• INSTRUCTIONS FOR TARGET BEHAVIORS
  • HOW TO CONDUCT DISCRETE TRIAL TRAINING
  • HOW TO ANALYZE GRAPHS
DEPENDENT VARIABLES:

• RESPOND TO VARIOUS INSTRUCTIONS GIVEN BY EXPERIMENTER
  • I.E. “PERFORM DISCRETE TRIAL TRAINING TO THE BEST OF YOUR ABILITY” & “ANALYZE THE GRAPH TO THE BEST OF YOUR ABILITY”
• PERCENT CORRECT ACROSS SKILLS
BASELINE
TREATMENT

- Given instruction
  - Positive praise/Trial ends
    - Positive and informative feedback/BST session ends
    - 3 collection trials
      - Time elapses
        - The staff member then performs the skill without interruption 3x.
        - Rehearsal phase: "Do discrete trial teaching to the best of your ability."
      - Rehearsal phase: "Do discrete trial teaching to the best of your ability."
    - Experimenter gives descriptive feedback
      - Experimenter models the skill 3x and narrates
      - Experimenter sets a 10 minute timer for teaching
      - Positive praise/Trial ends

- Performs the skill at 100%?
  - Yes
    - Experimenter shows previous data, gives a written list of components, and reviews errors
  - No
    - 3 collection trials

- Experimenter shows previous data, gives a written list of components, and reviews errors
## DATA COLLECTION

Sd: Given a graph + "analyze the graph to the best of your ability"

<table>
<thead>
<tr>
<th>Target</th>
<th>Date/Initials:</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. check at 3 ascending data points (1 cm below x axis, 1 cm to the</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td></td>
</tr>
<tr>
<td>right of the session number)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. phase change after 3 decending data points (vertical dashed line</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td></td>
</tr>
<tr>
<td>from x-axis to 1 cm above y axis)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. phase change after 3 flat data points (vertical dashed line from</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td></td>
</tr>
<tr>
<td>x-axis to 1 cm above y axis)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. phase change after ascending to 4 flat (vertical dashed line from</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td></td>
</tr>
<tr>
<td>x-axis to 1 cm above y axis)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. check if 3/5 data points are ascending (1 cm below x axis, 1 cm</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td></td>
</tr>
<tr>
<td>to the right of the session number)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. phase change if 3/5 data points are decending (vertical dashed</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td></td>
</tr>
<tr>
<td>line from x-axis to 1 cm above y axis)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. phase change line inserted after last data point where mastery</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td></td>
</tr>
<tr>
<td>criteria (3 data points at 80% or higher) is met (vertical dashed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>line from x-axis to 1 cm above y axis)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Continue process (steps 1-7) if appropriate</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td></td>
</tr>
</tbody>
</table>

### Percent Correct
### DATA COLLECTION

**Sd:** Given a skill + "teach this skill using DTT to the best of your ability"

<table>
<thead>
<tr>
<th>Target</th>
<th>Date/Initials:</th>
<th>Date/Initials:</th>
<th>Date/Initials:</th>
<th>Date/Initials:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conducts preference assessment</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td>Y N NA</td>
</tr>
<tr>
<td>Clears extraneous materials</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td>Y N NA</td>
</tr>
<tr>
<td>Has reinforcers out of reach</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td>Y N NA</td>
</tr>
<tr>
<td>Attempts to get attention</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td>Y N NA</td>
</tr>
<tr>
<td>Gives instruction (with simultaneous prompts if necessary)</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td>Y N NA</td>
</tr>
<tr>
<td>Verbal prompt (if needed)</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td>Y N NA</td>
</tr>
<tr>
<td>Model prompt (if needed)</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td>Y N NA</td>
</tr>
<tr>
<td>Physical prompt (if needed)</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td>Y N NA</td>
</tr>
<tr>
<td>Provide Consequence</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td>Y N NA</td>
</tr>
<tr>
<td>Record Data</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td>Y N NA</td>
<td>Y N NA</td>
</tr>
</tbody>
</table>

**Percent Correct**

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| Sd: Given a skill + "teach this skill using DTT to the best of your ability"

---

**Target**

- Conducts preference assessment
- Clears extraneous materials
- Has reinforcers out of reach
- Attempts to get attention
- Gives instruction (with simultaneous prompts if necessary)
- Verbal prompt (if needed)
- Model prompt (if needed)
- Physical prompt (if needed)
- Provide Consequence
- Record Data

---

**Date/Initials:**

- Y N NA
- Y N NA
- Y N NA
- Y N NA
- Y N NA
- Y N NA
- Y N NA
- Y N NA
- Y N NA
- Y N NA
- Y N NA
- Y N NA
- Y N NA
- Y N NA
- Y N NA
- Y N NA
BASELINE RESULTS
HOW WILL THIS EXTEND CURRENT LITERATURE?

• GIVES A POSSIBLE TRAINING TOOL.
• MAY SHOW THAT BST WORKS TO TRAIN TEACHERS (WSI) TO USE BEHAVIOR ANALYTIC TECHNIQUES.
EVIDENCE FOR USE: AVOIDANCE OF WATER ACTIVITY: THE EFFECTS OF GRADUAL EXPOSURE ON AQUATIC SKILLS (LAMPERT, 2018)

• WHAT ARE THE EFFECTS OF GRADUAL EXPOSURE ON AQUATIC SKILLS?
MATERIALS

• RULER
• DATA SHEET
• CAMERA
PARTICIPANTS

• PATRICIA
  • 6 YEARS OLD
  • DIAGNOSED WITH ASD
  • EXHIBITED PROTESTS, SCREAMS FOR HELP, FLAILING, AND FORCING HERSELF UNDER THE WATER BECAUSE OF NEAR DROWNING EXPERIENCE

• EZRA
  • 8 YEARS OLD
  • DIAGNOSED WITH ASD
  • RESISTANT TO ALL WATER ACTIVITIES, UNLESS HOLDING ON TO AN ADULT
SETTING

OUTDOOR POOL SUPERVISED BY A LIFEGUARD.
DEPENDENT VARIABLE

• PERCENT OF STEPS COMPLETED IN THE HIERARCHY CALMLY AND WITHOUT ADDITIONAL ASSISTANCE FOR EACH AQUATIC SKILL
### Sample from Ezra’s Hierarchy - “Grab the wall”

1. In 1.85 meters, 0.61 meters away from the wall + "Grab the wall"

2. In 1.85 meters, 1.22 meters away from the wall + "Grab the wall"

3. In 1.85 meters, 1.83 meters away from the wall + "Breathe at least 1 time and grab the wall"

4. In 1.85 meters, 2.44 meters away from the wall + "Grab the wall" (Will breathe at least 1x independently)

5. In 1.85 meters, 3.05 meters away from the wall + "Grab the wall" (Will breathe at least 1x independently)

6. In 1.85 meters, 4.57 meters away from the wall + "Grab the wall" (Will breathe at least 2x independently)

7. In 1.85 meters, 6.09 meters away from the wall + "Grab the wall" (Will breathe at least 2x independently)

8. In 1.85 meters, 6.86 meters away from the wall + "Grab the wall" (Will breathe at least 2x independently)

9. On wall with therapist 3.35 meters out in 1.83 meters of water + "Swim to me" (Will breathe at least 1x independently)

10. On wall with therapist 6.86 meters out in 1.83 meters of water + "Swim to me" (Will breathe at least 2x independently)
### Example 2

**Sample from Ezra’s Hierarchy - “Float on your back”**

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>In 1.85 meters, laying back with full physical prompts + backwards count of 5 seconds</td>
</tr>
<tr>
<td>2</td>
<td>In 1.85 meters, laying back with full physical prompts + backwards count of 10 seconds</td>
</tr>
<tr>
<td>3</td>
<td>In 1.85 meters, laying back with partial physical prompts + backwards count of 5 seconds</td>
</tr>
<tr>
<td>4</td>
<td>In 1.85 meters, laying back with partial physical prompts + backwards count of 10 seconds</td>
</tr>
<tr>
<td>5</td>
<td>In 1.85 meters, laying back with partial physical prompts + backwards count of 15 seconds</td>
</tr>
<tr>
<td>6</td>
<td>In 1.85 meters, laying back, hands are removed + backwards count 5 seconds</td>
</tr>
<tr>
<td>7</td>
<td>In 1.85 meters, laying back, hands are removed + backwards count 10 seconds</td>
</tr>
<tr>
<td>8</td>
<td>In 1.85 meters, laying back, hands are removed + backwards count 15 seconds</td>
</tr>
<tr>
<td>9</td>
<td>In 1.85 meters, laying back + turn over + partial physical</td>
</tr>
<tr>
<td>10</td>
<td>In 1.85 meters, laying back + turn over</td>
</tr>
</tbody>
</table>
BASELINE
TREATMENT
RESULTS:
PATRICIA

Getting To The Wall
Floating On Back
Floating On Front
RESULTS: EZRA
HOW DOES THIS EXTEND CURRENT LITERATURE?

• Both participants were able to complete American Red Cross Learn-To-Swim Exit Assessment
• Both participants were able to perform 1 new skill without formal training
• Generalization to new depth/pool
FUTURE RESEARCH

• Researching the benefits of teaching particular skills first
• Researching the effectiveness of an escape avoidance hierarchy on new skills
• Researching the effectiveness of a 1 trial per day vs. multiple
• Component analysis
POSSIBLE EFFECT OF DECREASING AVOIDANCE

• IS IT POSSIBLE THAT DECREASING AVOIDANCE MIGHT INCREASE RISK OF CHILD SEEKING OUT WATER AND DROWNING?
  • NATURAL CONTINGENCIES DURING HIERARCHY TRAINING MAY PROMOTE “HEALTHY” FEAR OF WATER – MORE SUBTLE SAFETY SKILLS ARE LEARNED (E.G., REFRAIN FROM SWALLOWING WATER, AVOID GOING OUT TOO FAR)
  • THE WORST CASE SCENARIO MAYBE DECREASING AVOIDANCE, BUT NOT TEACHING SWIM SKILLS
  • COMBINATION OF DECREASING AVOIDANCE AND DEVELOPING SWIM SKILLS MAY NOT SUBSTANTIALLY INCREASE RISK
EVIDENCE: COMPARISON OF FADING PROMPTS WITHIN VS ACROSS SESSION

• RESEARCH QUESTIONS
  • WHAT ARE THE EFFECTS OF MOST-TO-LEAST (MTL) PROMPTING ON THE ACQUISITION OF AQUATIC SKILLS?
  • IS IT MORE EFFICIENT TO FADE PROMPTS WITHIN-SESSION OR ACROSS-SESSION?
TARGET SKILLS

• ABBY WAS ASSESSED USING A CRITERION-REFERENCED ASSESSMENT FROM THE AMERICAN RED CROSS (AMERICAN RED CROSS, 2014).
  • TARGET SKILLS SELECTED FOR TREATMENT WERE THOSE THAT WERE NOT PERFORMED INDEPENDENTLY IN THE ASSESSMENT.
DEPENDENT VARIABLES

• PERCENTAGE OF TRIALS CORRECT FOR EACH AQUATIC SKILL, PER SESSION
• SESSIONS TO CRITERIA
• TRIALS TO CRITERIA
• TOTAL NUMBER OF ERRORS DURING TRAINING
EXPERIMENTAL DESIGN

• MULTIPLE BASELINE ACROSS SKILLS
• BETWEEN SUBJECT COMPARISONS
WITHIN-SESSION

Flowchart:
- Intertrial interval
  - Instruction + prompt
    - Performs task?
      - Yes: Reinforcer delivered + less intrusive prompt next trial
      - No: instruction + more intrusive prompt next trial
        - Performs task?
          - Yes: Reinforcer delivered + prompt that worked in next trial
          - No: Intertrial interval

ACROSS-SESSION

Intertrial interval \rightarrow Instruction + prompt \rightarrow Performs task?

Yes: Reinforcer delivered + current prompt level in next trial

No: instruction + more intrusive prompt next trial

Performs task?

Yes: Reinforcer delivered + prompt that worked in next trial

No: Intertrial interval
RESULTS

FADING WITHIN-SESSION

FADING ACROSS-SESSIONS
RESULTS: SESSIONS TO CRITERION

- Within-Session Fading
  - Kicking on front
  - Blowing bubbles
  - Bobbing

- Across-Session Fading
  - Kicking on back
  - Arms on front
  - Rolling

Number of sessions
RESULTS: TRIALS TO CRITERION

- **Within-Session Fading**
- **Across-Session Fading**
RESULTS: # ERRORS

Within-Session Fading

- Kicking on front: Blowing bubbles
- Bobbing
- Kicking on back
- Arms on front
- Rolling

Across-Session Fading

Number of errors
VIDEO
UNIVERSAL SWIMS GRANT OUTCOMES

• Serve 20 children
• Outcomes targets: 50% of participants will pass level 2
• Of the kids who do not pass level 2:
  • 80% will learn the following:
    1. Breath control and submerging
    2. Buoyancy and/or gliding
    3. Will be able to get to the pool side from 2 feet away
OUTCOMES DATA

Level 2 Completion

Non Level 2 Swimmers Who Met Criterion
COMMUNITY PARTNERS:

UNIVERSAL ORLANDO FOUNDATION
YMCA
RDV FOUNDATION
AUTISM SPEAKS
USA SWIMMING
ROTH JEWISH COMMUNITY CENTER GREATER ORLANDO
PROMPT STRATEGIES

Traditional view: Prompts are antecedents used to evoke desired response to permit reinforcer delivery
**TIMING OF PROMPTS: WHEN ARE THEY GIVEN?**

- **SIMULTANEOUS PROMPTS: THE SAME TIME AS, OR JUST AFTER, THE INSTRUCTION**

<table>
<thead>
<tr>
<th>Prompt</th>
<th>Action</th>
<th>Reward</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Pick up the soap”</td>
<td>Gets Soap</td>
<td>Praise</td>
<td>+ Gestural Prompt to soap</td>
</tr>
<tr>
<td>“Please sit down”</td>
<td>Sits down</td>
<td>Praise</td>
<td>+ Gentle physical guidance</td>
</tr>
<tr>
<td>“Say Table”</td>
<td>“Table”</td>
<td>Snack</td>
<td>+ Show picture of table</td>
</tr>
</tbody>
</table>
TIMING OF PROMPTS: WHEN ARE THEY GIVEN?

• DELAYED PROMPTS: AFTER THE LEARNER HAS A CHANCE TO PERFORM THE SKILL – BUT DOES NOT

“Pick up the soap” → Stands there → Gets soap → Praise

Gesture to Soap

“Sit at the table” → Continues playing → Sits at table → Praise

Guidance to table
PROMPTS CAN FOLLOW...

Error correction: Prompts can follow incorrect responses

Functional Analyses: Prompts are terminated following problem behavior

Ergo...What are the effects of prompts as consequences?
PROCEDURE

Control: Child in bathroom with toys but no demands

Physical Prompt: Physical prompt to sit on toilet – remove prompt contingent on tantrum

Verbal Demand: Request to sit on toilet every 5 s – terminate request contingent on tantrum
FUNCTIONAL ANALYSIS

Figure 1. The number of tantrums per session in physical prompt, vocal prompt, and control conditions.
CONCURRENT OPERANTS REPLICATION

- Present prompt
  - White Card: Immediate prompt removal, ITI 30 s
  - Black Card: 10 s prompt on then trial ends, ITI 30 s
CONCURRENT OPERANTS REPLICATION: REVERSAL

Present prompt

Black Card
Immediate prompt removal
ITI 30 s

White Card
10 s prompt on then trial ends
ITI 30 s
RESULTS

Figure 2. The percentage of choice trials in which the white card was selected. Note that in sessions 1 and 3, the white card was associated with FR 1 escape, and in sessions 2 and 4, the black card was associated with FR 1 escape.
FUTURE RESEARCH

• WHAT ABOUT PROMPTS AS POSITIVE REINFORCERS?
• CONCURRENT OPERANTS?
CONCURRENT OPERANTS: PROMPTS AS POSITIVE REINFORCERS

Present tasks concurrently

Prompt to do task

Task

GCR

GCR
ASSESSMENT DRIVEN PROMPT PROCEDURES

Prompts = Negative reinforcers

“Pick up the soap” → Stands there → Gets soap → Praise

Gesture to Soap

Prompts = Positive reinforcers

“Pick up the soap” → Gets soap → Praise

Gesture to Soap
PROMPT MAINTAINED BEHAVIOR?
TEMPORAL LOCUS OF PROMPTS
REVIEW: TIMING OF PROMPTS

- **Simultaneous Prompts:** The same time as, or just after, the instruction

  "Pick up the soap" → Gets Soap → Praise
  + Gestural Prompt to soap

- **DELAYED PROMPTS:** AFTER THE LEARNER HAS A CHANCE TO PERFORM THE SKILL – BUT DOES NOT

  "Pick up the soap" → Stands there → Gets soap → Praise
  [Red Arrow] Gesture to Soap
BASELINE AND TREATMENT

Baseline: Instruction only – no programmed consequences

Treatment:
- Delayed Prompts
- Simultaneous Prompts

<table>
<thead>
<tr>
<th>Math equation and Write From Dictation</th>
<th>Mand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full physical</td>
<td>“Ms Cleo, tie my shoe”</td>
</tr>
<tr>
<td>Touch hand</td>
<td>“Ms Cleo...”</td>
</tr>
<tr>
<td>Gesture</td>
<td>Independent</td>
</tr>
<tr>
<td>Independent</td>
<td></td>
</tr>
</tbody>
</table>
RESULTS
DISCUSSION

- Prompts are most often seen as antecedents

- Prompts can be programmed after incorrects and/or problem behavior

- Prompt termination (and perhaps presentation) may have important effects

- The temporal locus of prompting maybe an important variable
HEALTH & SAFETY TARGETS WITH ADULTS: SKILL VALIDATION SYSTEM
ISSUE

Some professions: Payment is for outcomes

ABA/OT/Speech: Payment is for service
SKILL VALIDATION SYSTEM

Support Plan Goal → Measureable objective → New skill

Bonus and certificate ← Validate the skill ← Monthly monitoring
SKILL VALIDATION SYSTEM

“I want to make money”

Learn 2 new safety skills in the SP year.

Develop new program: Take meds

Certificate and $10 bonus issued

Monthly review

VPM verifies he has mastered the skill

Mastery criterion met

Develop New Skill Program
RESULTS
OUTCOMES DATA TRACKING

✓ Count # people with at least 1 new skill
✓ Track and graph every month
✓ Reset every fiscal year
✓ Change system if data warrants a change
OUTCOMES DATA

% People with >= 1 Validation

% People