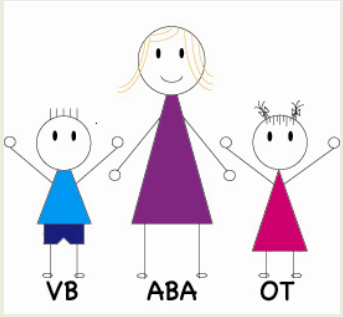
The Role of Occupational Therapists in Autism Support Programs



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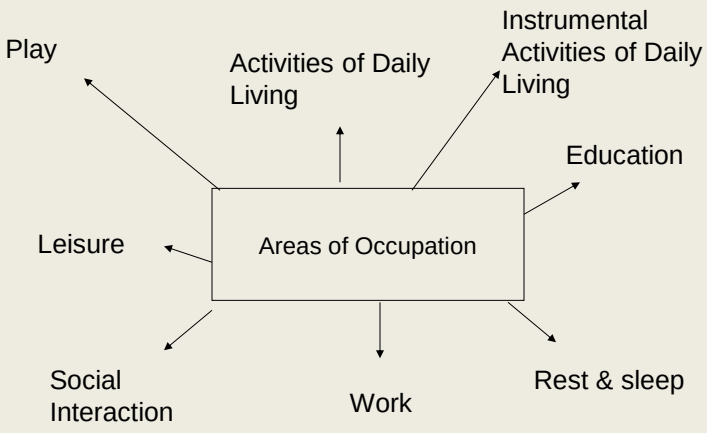


OT Areas of Expertise

- Task analysis
  - Demands of task, pre-requisite skills, motor function, etc.
- Developmental sequence of task acquisition across the lifespan
- Methods of modifying tasks to make them simpler or safer
- Methods of modifying the environment to reduce response effort or increase safety

(Hussey et al., 2007; American Occupational Therapy Association, 2005; American Occupational Therapy Association, 2008)

Activities of Daily Living (ADL)

- Bathing
- Showering
- Dressing
- Eating
- Toileting
- Personal hygiene & grooming

OT's Role in ADL's

- Occupational therapy has been proven effective in teaching independent activities of daily living, such as eating, dressing, and bathing, to individuals with disabilities (Eckman et al, 2008; Gibbons, 2007; Kellegrew, 1998; Shillam et al, 1983)
- OT's may be able to offer a variety of adaptive strategies or adaptive equipment for individuals with persistent ADL difficulties

OT Practice Framework

OCCUPATIONS

- ADL's
- IADL's
- Rest & sleep
- Education
- Play
- Leisure
- Social Participation

PERFORMANCE SKILLS

- Motor & Praxis Skills
- Sensory Perceptual Skills
- Emotional Regulation Skills
- Cognitive Skills
- Communication & Social Skills

Questions to Ask…

- What is age-appropriate?
- What is developmentally appropriate?
- What skills does the team think are most important?
- What skills are critical to health, safety, and independence?

Assessing ADL's

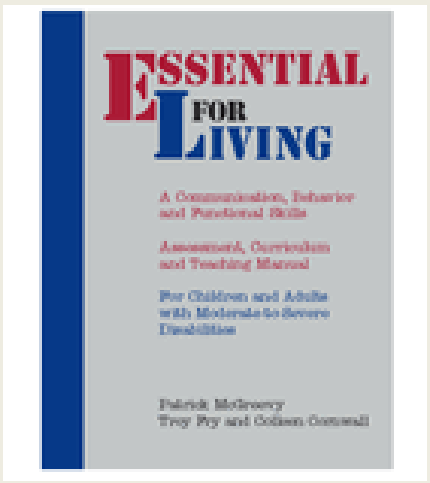
- Checklists / interviews
- Direct observations
- Norm-references assessments

The Roll Evaluation of Activities of Life (REAL) (Roll & Roll)

- Standardized rating scale that provides information on ADL and IADL performance
- Parents or caregivers rate child's performance on a scale of 0-3
- Ages 2:0-18:11
- 15-20 min. to complete

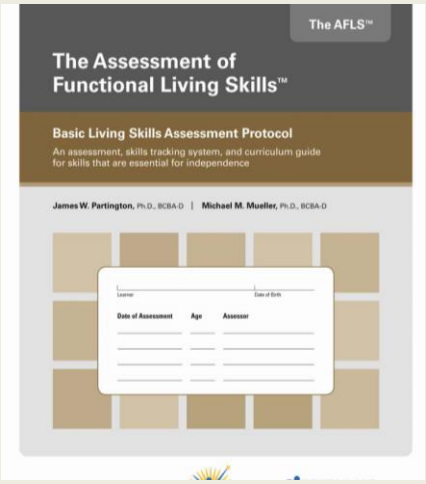
Essential for Living (McGreevy, Fry & Cornwall)

- Criterion-referenced assessment & curriculum for learners with moderate to severe disabilities



Assessment of Functional Living Skills (AFLS) (Partington & Mueller)

- Criterion-referenced assessment, similar in format to the ABLLS
- Separate modules for basic, home, community, and school skills



Analyze the Target Behavior

- Is the behavior discrete or chained?
- Discrete – individually distinctive, typically 1-step
- Chained – involves a sequences of discrete behaviors (multi-step)
- Chained behaviors will require a task analysis

Task Analysis

- Process of breaking down routines into sequential steps
- To conduct a task analysis:
  - Observe the learner and/or others performing the task
  - Ask others for their input regarding the best approach
  - Field-test by making a list of steps and trying them yourself
  - Remember that there is often more than one "right" way to complete a task. Occupational therapists may be particularly helpful in developing task analyses that match a student's strengths

Task Analysis

- Use steps of fairly even size
- Be sure that each step is observable
- Use simple language that any staff member or caregiver would likely understand

Murdoch Center Program Library

- Collection of almost 1,000 task analyses of specific skills which were designed to be used when teaching individuals with disabilities, including intellectual disabilities

How Will We Teach?

- Prompt – a supplemental antecedent stimulus that increases the likelihood that the response will occur
  - Most to least or least to most?
  - Within stimulus or response prompts?
  - Fade by topography or time?

How will we teach?

- Total-task presentation – simultaneously teaching all steps of a stimulus-response chain
- Graduated guidance - combined use of physical guidance and fading, resulting in a systematic gradual reduction of the intensity of physical guidance.

How will we teach?

- Combining several smaller behaviors to form a single complex behavior
- Forward chaining – teach 1st step, then 2nd step, etc.
- Backwards chaining – teach the last step first, then the 2nd to the last step, etc.

Data Collection

Step	Date	Date	Date
Pick up shirt with 2 hands			
Lift over head			
Pull over head completely			
Left arm in			
Right arm in			

Establish Baseline

- Take data across a few sessions/days to ascertain current level of functioning
- Count number of steps independently and correctly completed (can be converted to percentage)

Data Analysis

- Graph data
  - Percent correct? (often used for total-task presentation)
  - Changing criterion / steps completed (often used for chaining)

Prompting Strategies for ADL's

- OT's may be able to recommend strategies that are most conducive for prompting different tasks
  - Physical, visual, verbal, positional

Adaptive Equipment for ADL's

- Occupational therapists can make recommendations for supplemental equipment or modifying stimuli already in the environment to increase independence with ADL's

Recommendations for ITT / NET

- Occupational therapists can make recommendations of activities that can be incorporated into a student's intensive teaching and natural environment teaching to provide additional ADL practice

Instrumental Activities of Daily Living (IADL)

- Communication management
- Community mobility
- Meal preparation & clean up
- Fiscal management
- Health management & maintenance
- Home management
- Safety and emergency maintenance
- Shopping

Prompting Strategies for IADL's

- OT's may be able to recommend strategies that are most conducive for prompting different tasks

Adaptive Equipment for IADL's

- Occupational therapists can make recommendations for supplemental equipment or modifying stimuli already in the environment to increase independence with ADL's

Prompting Strategies for IADL's

- OT's may be able to recommend strategies that are most conducive for prompting different instrumental activities of daily living

Education

- Participating in educational programs
- Written language skills
- Computer use
- Assistive technology
- Participation & transition within school environments such as the classroom, cafeteria, playground, hallways, auditorium, etc.

Assessment

- Some OT assessments that may be useful when assessing educational participation include:
  - PDMS-2
  - M-FUN
  - BOT-2
  - VMI
  - TVPS-3
  - THS-R

Peabody Developmental Motor Scales (PDMS-2)

- Ages 0-5
- Norm-referenced
- Direct testing: 45-60 min.
- Sub-tests include stationary, locomotion, object manipulation, grasping and visual-motor integration

Miller Function & Participation Scales (M-Fun)

- Ages 2.0-7.11
- Norm referenced
- Direct testing, 45-60 min.
- Functional, play and school-based activities

Bruininks-Oseretsky Test of Motor Proficiency (BOT-2)

- Ages 4:0-21:11
- Norm referenced
- Direct testing: 45-60 min.
- Fine manual control, manual coordination, body coordination, strength & agility

Beery-Buktenica Test of Visual Motor Integration (VMI)

- Ages 2:0-99:11
- Norm referenced
- Direct testing – approximately 20 min.
- Visual motor integration, motor coordination, visual perception

Test of Visual Perceptual Skills (TVPS-3) (Martin)

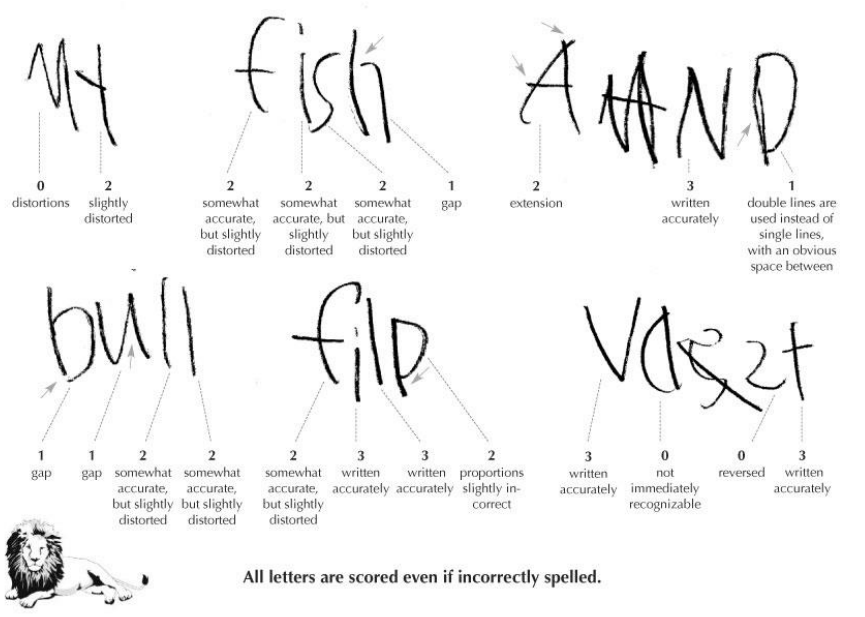
- Ages 4-18
- Norm referenced
- Direct testing: 30-40 min.
- Visual discrimination, memory, visual-spatial relationships, form constancy, sequential memory, figure-ground, visual closure

Test of Handwriting Skills Revised (THS-R) (Milone)

- Ages 6:0-18:11
- Norm referenced
- Testing/scoring: 25 min.
- Printing or cursive
- Copying vs. dictation
- Letters, numbers, words, sentences

APPENDIX F

Manuscript – Annotated Scoring Key for Practice Test Booklet Page



All letters are scored even if incorrectly spelled.

Prompting Strategies for Educational Tasks

- OT's may be able to recommend strategies that are most conducive for prompting different tasks

Adaptive Equipment, Assistive Technology & Environmental Adaptations

- Occupational therapists can make recommendations for supplemental equipment or modifying stimuli already in the environment to increase independence with educational activities

ITT and NET Recommendations

- OT's can make ITT and NET recommendations for practicing skills needed for educational participation

Work

- Employment interests and pursuits
- Employment seeking and acquisition
- Job performance
- Volunteer exploration
- Volunteer participation

Work

- Assessments
- Matching skills to potential vocational opportunities
- Simulating work settings
- Adaptive equipment and environmental adaptations

Play and Leisure

- Independent play / leisure
- Social play / leisure
- Exploring new interests
- Participating in activities across settings

Play & Leisure

- Occupational therapists can help:
  - Identify potential reinforcers
  - Explore matched stimulation to expand interests
  - Modify play/leisure activities to match skill sets

Social Participation

- Appropriate interactions with others (e.g. family, peers, friends, community workers, etc.)
- Social competencies
- Responding to novel situations
- Management of problem behavior

Communication Skills

- The development of functional communication skills is not unique to speech language pathologists, but is also shared by occupational therapists and behavior analysts
- Communication/Interaction skills are included in the 2008 Occupational Therapy Framework
  - Essential to occupational domain of social participation
- Behavior analytic texts and journals have been dedicated to the study and teaching of verbal behavior

Communication Skills

- AOTA included 20 terms to describe communication skills in the first version of OT Practice Framework (contacts, gazes, gestures, articulates, asserts, asks, expresses, shares, sustains, etc.) These terms were not widely adopted by clinicians, and are less stressed in the 2008 Practice Framework.
- Skinner's analysis of verbal behavior is likely ideal for cross-disciplinary collaboration (fewer terms, more research, already used by BCBA's and some SLP's)

Incorporating Mands into Daily Routines

- Importance of mand training throughout the day
  - Repetition; generality/generalization
- Manding during ADL's
- Manding during play
- Manding during work / educational activities

Modifying Signs

- Occupational therapists can play an important role in modifying signs for learners who are not yet echoic
- Initially, it may be necessary to make signs topographically different, but whenever possible, keep as close to standard ASL sign as possible.
- Modifying aspect of signs
  - Location
  - Hand shape
  - Movement

Modifying Signs: Location

- "Ground" the sign so that it contacts part of the body
- Move to forehead, chin, on / in front of the trunk
- Expand surface area (e.g. forearm vs. wrist)

Modifying Signs: Hand Shape

- Simplify the hand shape to 5, G, A, or B
- Ground the hand shape so that fingers contact another part of the body

Modifying Signs: Movement

- Substitute a bi-directional movement (“bounce” the sign)
- Move towards a point of contact
- Simplify signs to a single movement, rather than a chain of movements
- Rely on gross rather than fine movements
- Rely on mass rather than specific movements

Remember that modifying a sign should be a temporary step, and can change/limit the effect on an unfamiliar listener.

Emotional Regulation Skills

- Emotional regulation skills are included in the 2008 OT Practice Framework
- **"Responding** to the feelings of others by acknowledgment or showing support"
- **"Persisting** in a task despite frustrations"
- **"Controlling** anger toward others and reducing aggressive acts"
- **"Recovering** from a hurt or disappointment without lashing out at others"

Behavioral vs Non-Behavioral Explanations

- ABA uses antecedents / consequences to explain behavior
  - This is helpful, because we can manipulate cause & effect patterns
- Other fields may explain behavior in ways that are not helpful
  - Nominal fallacy
  - Reification
  - Affirming the consequence

Nominal Fallacy

Explaining behavior by naming it

Explosive Personality Disorder

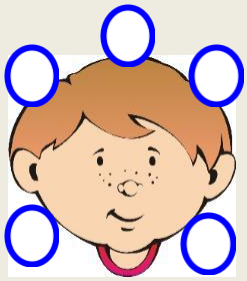
Hitting

He hits because he has EPD.

He has EPD because he hits.

Reification

Explaining behavior by appealing to an entity whose existence cannot be proven



Circles of communication

"Billy does not talk because his circles of communication are not wide enough."

Affirming the Consequence

- If A, then B. B exists, therefore: A.
- Example:
  - People who have brain tumors have headaches. (true)
  - I have a headache, therefore, I have a brain tumor. (NOT necessarily true!)

Management of Undesired Behaviors:

- Determine:
  - Why is this person engaging in a given behavior? (FUNCTION)
  - How can we manipulate the environment to decrease the future frequency of this behavior? (Should be based upon function)
  - What replacement behaviors can be taught to meet this person's needs?

Topography vs. Function

- Topography – the form a behavior takes
  - Hitting, laughing, jumping, drawing, etc.
- Function – the reason why a person is engaging in a behavior
- ***A very, very important concept***:
  - Behavioral topography is NOT indicative of behavioral function (McGill, 1999).

Social vs. Automatic

- Social – someone else is required to provide reinforcement
  - Socially mediated positive
  - Socially mediated negative
- Automatic – reinforcer for behavior is the direct effect of the behavior itself
  - Automatic positive
  - Automatic negative

Extinction

- Extinction – failure to reinforce a behavior that has been reinforced in the past, ultimately leading to a decrease in the future frequency of that behavior
- Extinction is not the same as ignoring!
- Loosely speaking, it involves doing the opposite of what you have done in the past
- Extinction may not stop the behavior immediately. In fact, it is likely to get worse before it gets better (extinction burst)

(Iwata et al., 1994)

"Sensory" Behaviors

- Behavior analysts and occupational therapists often strongly disagree regarding how to best treat "sensory behaviors" or stereotypy
  - Don't ask, "Is it sensory or is it behavior?"
  - Instead ask, "What is s/he doing?" and then, "Why is s/he doing it?"

"Sensory" Behaviors: Socially Mediated Positive

- May have emerged under the control of automatic reinforcement, then "accidentally" shaped (Durrand & Carr, 1987)
  - Teach mands as a replacement behavior

"Sensory" Behavior: Automatic Positive

- Satiate MO (Rapp, 2004)
- General environmental enrichment (Vollmer et al., 1994; Ahearn, Clark, DeBar, & Florentino, 2005)
- Sensory extinction (Rincover, 1978; Rincover et al., 1979; Iwata, Pace, Cowdery, & Miltenberger, 1994; Rapp, Dozier, Carr, Patel, and Enloe, 2000)
- Matched stimulation (Piazza et al., 2000)

"Sensory" Behavior: Automatic Positive

- Response blocking (Tarbox et al., 2007)
- Earn opportunities to engage in the behavior (Haag and Anderson, 2004; Hanley et al., 2000)
- DRO (Harris & Wolchik, 1979)
- Response cost (Falcomata et al., 2004)

"Sensory" Behavior: Automatic Negative

- Address the MO
- Teach replacement behaviors / mands

(Rapp & Vollmer, 2005)

"Sensory" Behavior: Socially Mediated Negative

- Stimulus fading / escape extinction (Freeman & Piazza, 1998)

Tolerating Non-Preferred Stimuli

- Challenge: Teach and reinforce compliance (sitting still quietly)
- Need to start with "baby steps" using an escape extinction hierarchy
- Start with the easiest step the learner can tolerate
- Count aloud to show passage of time
- Stop count (but not the non-preferred stimuli) if problem behavior occurs
- When count is complete, reinforce (escape + something fun)

Stimulus Fading / Escape Extinction

- Modify the hierarchy based upon each learner
- The smaller the steps, the less problem behavior you are likely to see.
- Practice many times per day
- This protocol can be used for "desensitization" of other things the learner does not like (certain clothes, getting hands messy, non-preferred foods, medical procedures, etc.)

Sensory / Perceptual Reinforcers

- Lovaas, Newsom, and Hickman (1987) described the properties of sensory and perceptual reinforcement
- They reported that some forms of auditory, kinesthetic, gustatory, olfactory, and tactile stimulation have been shown to serve as reinforcers for behaviors exhibited in animals as well as humans.
- They recognized that although all reinforcers provide some form of sensory stimulation, they proceed to describe a special class of reinforcers that they termed, "perceptual reinforcers"

Characteristics of Perceptual Reinforcers

1. Controlled directly by the behaver, rather than the social environment.
2. Considered primary reinforcers, because their reinforcing effects are attributed to the organic predisposition of the central nervous system.
3. Possess some degree of conditional generality across a particular population, meaning that members of a particular population tend to react similarly to specific forms of sensory stimulation (Lovaas, Newsom & Hickman, 1987)

Reinforcing Effects of Sensory Stimuli

- Ferrari and Harris (1981) used various sensory stimuli as reinforcers
  - Vibration reinforced behavior, to varying degrees, across participants
- Rincover, Cook, Peoples, and Packard (1979) identified sensory reinforcers that maintained behavior in children with autism
  - Used sensory extinction to reduce inappropriate behavior
  - Taught functionally equivalent play responses

Deep Pressure as a Reinforcer

- Reinforcing effects of deep pressure have not yet been studied
- Some studies suggest sensory stimuli, such as deep pressure, may have an effect upon the behavior of individuals with developmental disabilities

Research Aim

- This study sought to determine if deep pressure serves as a positive reinforcer for some children with autism and related developmental disorders.

Participants

- 3 children with autism & related developmental disorders
  - History of apparently favorable responses to deep pressure
  - No specific verbal or motor skills prerequisites, other than the ability to reach forward to touch a shape

Bennett

- 7 years old
- Diagnosis – autism, hypertonia
- Communication response form: Vocal + ASL
- Verbal repertoire:
  - At least 50 mands, over 100 tacts of items, 8 colors, & 5 shapes
- Weekly services:
  - 25 hours of ABA
  - 1 hour of speech therapy
  - 2 hours occupational therapy

Logan

- 5 years old
- Diagnosis – autism
- Communication response form: Vocal approximations of words
- Skill repertoire:
  - At least 10 mands, strong receptive repertoire
- Weekly services:
  - 3 hours of ABA
  - 4 hours of speech therapy
  - 1 – 2.5 hours occupational therapy

Carter

- 2 years old
- Diagnosis – PDD
- Communication response form: primarily ASL
- Skill repertoire:
  - At least 20 mands, imitation of signs, intraverbal signs
- Weekly services:
  - 15 hours of ABA
  - 1 hour of speech therapy

Variables

- Dependent variable – number of times the participant touches a circle and a triangle mounted on a plastic folder
- Independent variable - consequence of deep pressure

Materials

- Deep pressure
  - Pillows – used to push down on child
  - Blanket – used to swaddle child
  - Gloves - to be worn on the therapist's hands while manually delivering deep pressure
  - Gym mat – used to "sandwich" and squeeze a child

Materials

- Video camera
- Plastic yellow folder with purple circle and purple triangle

Preference Assessment

- Preference assessment to establish preferred means of deep pressure
  - Multiple array without replacement
  - Highest ranking item used throughout study
  - Logan & Carter = therapy mat “sandwich’
  - Bennett = rolled in thick blanket (“burrito”)

Baseline (A)

- 20 trials – “Pick one”
- Criteria = 4 sessions with a steady state or no clear trend
  - Circle touches
  - Triangle touches
  - No touches
- Bennett = consistently touched circle
- Logan = consistently did not touch either shape
- Carter = consistently touched triangle

Intervention B

- 10 Forced exposure trials (5 circle, 5 triangle) in semi-randomized order
- 20 trials (“Pick one”)
- Bennett & Logan
  - Circle touch = deep pressure
- Carter
  - Triangle touch = deep pressure
- Criteria = 4 stable data points, or positive trend in touches that resulted in deep pressure

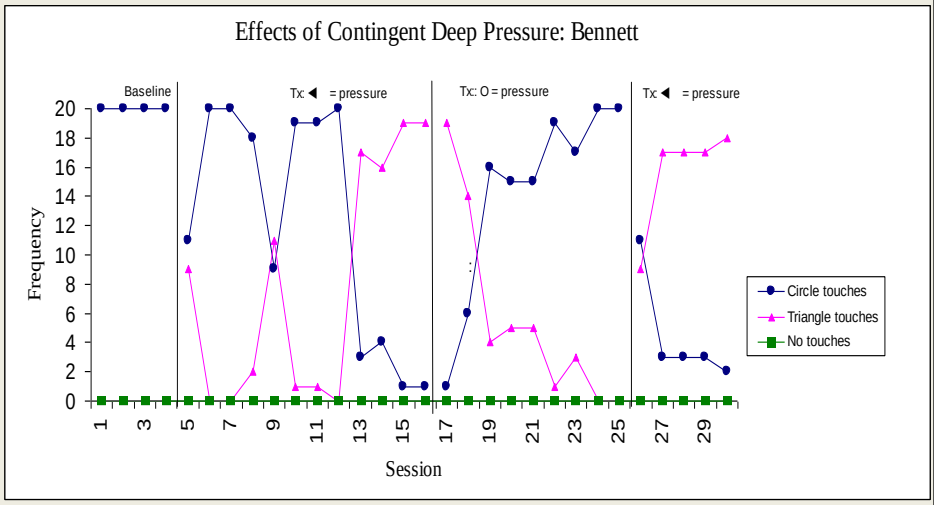
Reversal (C)

- 10 Forced exposure trials (5 circle, 5 triangle) in semi-randomized order
- 20 trials (“Pick one”)
- Bennett & Logan
  - Triangle touch = deep pressure
- Carter
  - Circle touch = deep pressure
- Criteria = 4 stable data points, or positive trend in touches that resulted in deep pressure

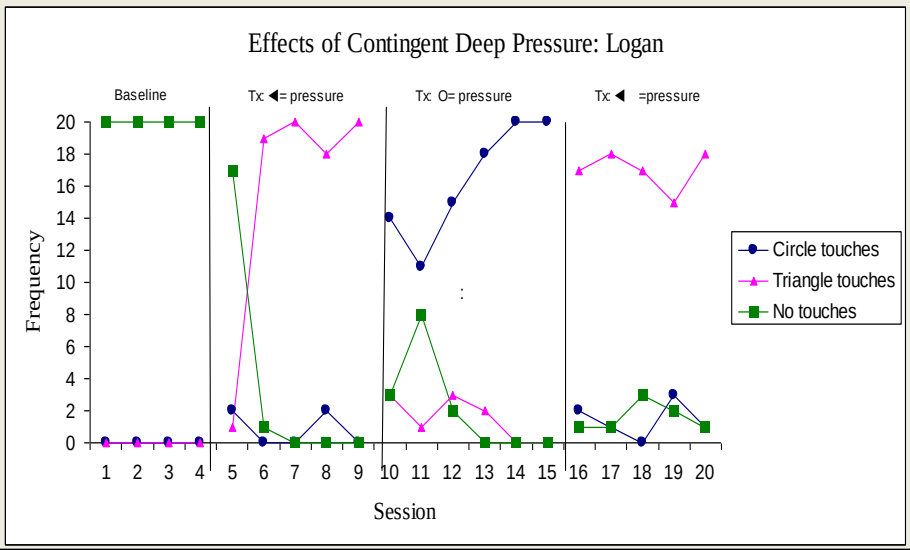
Return to Original Intervention (B)

- 10 Forced exposure trials (5 circle, 5 triangle) in semi-randomized order
- 20 trials (“Pick one”)
- Bennett & Logan
  - Circle touch = deep pressure
- Carter
  - Triangle touch = deep pressure
- Criteria = 4 stable data points, or increasing trend in touches that resulted in deep pressure

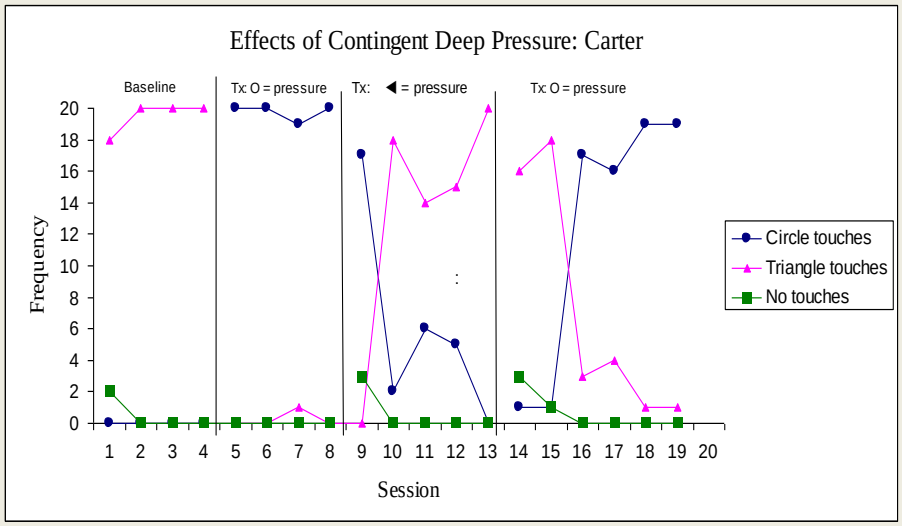
Bennett's Results



Logan's Results



Carter's Results



Implications for Clinical Practice

- Data suggest that deep pressure reinforced the behavior of Bennett, Logan, and Carter
- Can be used as a positive reinforcer in acquisition programs
  - Cheap, easily accessible, healthy
- Can teach ways to access deep pressure, as a means of preventing stereotypy, SIB, or aggression

Implications for Clinical Practice

- Incorporating deep pressure touch into NET may create new opportunities to teach language
- Occupational therapists should consider the potential reinforcing effects of deep pressure when designing sensory diets
- Recognition that some occupational therapy treatments may produce relevant changes in behavior

Classifications of Sensory Stimuli

- Visual, auditory, olfactory, gustatory
- Tactile: information provided primarily through skin about the texture, shape, and size of objects,
- Vestibular: information provided through the inner ear related to gravity, space, and head/body position
- Proprioceptive: information provided through muscles/joints regarding body position and movement

(Ayers, 1979)

Potential Visual Reinforcers

- Behaviors that may be maintained by visual stimuli: spinning objects, lining up objects, squinting, scanning
- Spinning
  - Pinwheels
  - Tops
  - Gears
  - Spin art
  - Kaleidescope

Potential Visual Reinforcers

- Lining up/stacking objects
  - Blocks
  - Dominoes
  - Lego
  - Objects with numbers/letters
- Scanning
  - iPod / iPad
  - Computer
  - Trains
  - Car or marble ramp
  - View master

Potential Auditory Reinforcers

- Music
- Instruments
- Computer / ipod games that produce sound
- Books with sound effect strips
- Pre-recorded tracks of idiosyncratic noises (with headphones)

Potential Tactile Reinforcers

- Messy play with paint, shaving cream, etc.
- Putty, clay, or play-doh
- Sand
- Water
- Vibration
- Textured rubbery toys
- Jewelry or keychains
- Various textures of material to touch with hands, feet, face
- Ball pit

Potential Vestibular Reinforcers

- Swinging
- Spinning in office chair
- Balance board
- Balance beam
- See-saw
- Rolling on ball, in tunnel, across mat
- Scooterboard

Potential Proprioceptive Reinforcers

- Run & crash
- Wheelbarrow walk
- Deep pressure: hugs, swaddling, weights
- Vibration
- Squeezing/popping bubble wrap
- Elastic bands
- Moon shoes; trampoline

Writing Goals

- All therapeutic goals should be written in simple, concrete terms
- Goals should be measurable
- Goals should be meaningful and functional within the context of the learner's daily life

Tips for Writing Goals

- Performance skill domains can be mentioned within the goal, but should not be the behavior targeted for change
  - "Joey will demonstrate increased fine motor skills by holding his pencil with a functional grasp pattern across 9/10 opportunities."
  - "Joey will demonstrate improved fine motor skills."

Tips for Writing Goals

- Avoid combining multiple behaviors together in a single goal
  - "Joey will demonstrate increased self care skills by washing his hands, feeding himself with utensils, and putting on his shoes."
  - "When told to wash his hands, Joey will complete all steps of washing and drying his hands independently across 3 consecutive opportunities."

Tips for Writing Goals

- Specify level of independence
- If applicable:
  - Specify accuracy (percentage or number of trials)
  - Specify latency
  - Specify duration
- Specify criteria for mastery

Tips for Writing Goals

- Avoid the use of flowery language or hypothetical constructs:
  - "Beth will increase her self esteem"
  - "Mark will increase the depth and width of his circles of communication"
  - "Sara will take ownership of her own locus of control"

Tips for Writing Goals

- Avoid passive goals
  - "Katie will be exposed to 3 new toys."
  - "Joey will tolerate sitting in a chair"
  - "David will be taught to write his name"
  - "TJ will be prompted to complete morning routines"

Example of Good Goal

- "Ian will independently cut a cm-thick vertical line on a piece of construction paper or computer paper, deviating no more than ½ cm from the line across 3 consecutive opportunities."
  - Independence
  - Materials
  - Accuracy
  - Measurement / mastery