Discrete Trial Training
Autism Academy 2010
Georgia Department of Education

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Today:

- Goals
  - Provide brief background and overview of Applied Behavior Analysis
  - Basic behavior management
  - Provide training to implement DTT
  - Learn data collection procedures
  - Learn to use data to make decisions
Today cont ....

- Provide hands on training and performance feedback during implementation of DTT programs
- Practice data collection
- Review graphing and decision making
Part 1
Applied Behavior Analysis
Applied Behavior Analysis

- Scientific study of socially relevant behaviors
  - Scientific study is guided by theory and philosophy
    *Behaviorism*
- Scientific study follows a logical problem-solving process
  - A method for examining variables and determining progress with respect to a given set of goals
Behaviorism is the philosophy

- Applied Behavior Analysis
  - A method, for which behaviorism provides the theoretical underpinnings, for studying behavior of social significance, to better lives of those for whom it is utilized.
Applied Behavior Analysis

- APPLIED: ABA focuses on the implementation of basic principles to behaviors of significance to the participants involved.
- BEHAVIORAL: ABA focuses on behavior in its own right as a target for change.
  - We change behavior in *many* different forms
    * Increase appropriate or educational skills
    * Decrease inappropriate or problematic skills
**Applied Behavior Analysis**

- **ANALYTIC:** ABA seeks to identify *functional relations* between *behavior* and *environmental events* through scientific study.
  - We analyze situations so that we understand *why* behaviors are changing.
- **TECHNOLOGICAL:** In ABA, procedures are completely and precisely defined.
  - We are precise in our methods so we are confident in our outcomes.
GENERALIZED: Behavior analysts attempt to discover procedures that can be applied effectively in many settings and with many people.

- Behavior analysts attempt to use procedures that promote generalization and maintenance of behavior change.
Applied Behavior Analysis

- Has been called:
  - behavior modification
  - operant conditioning
  - behavioral analysis
  - consequence learning
  - etc…
Within the autism community, Applied Behavior Analysis has been misrepresented as being synonymous with Discrete Trial Training (DTT), Lovaas therapy, incidental teaching, pivotal response training, and other teaching procedures.
Applied Behavior Analysis

- Diverse field
  - Vast numbers of procedures
  - Vastly different problems are addressed
- No single approach
  - But common principles
- Data-based/Research proven results
  - What we do works and we collect data to be vigilant so that we may change the things that do not work
Part 2
Key Terms and Principles
Terminology

- Target behavior
- Antecedent events
- Consequent events
- Positive reinforcement
- Negative reinforcement
- Punishment
ABA is a method for studying behavior
These principles apply to increasing appropriate behavior as well as decreasing inappropriate behaviors
They can be relatively simple in scope
They can be immensely complex
Target Behavior

- Behavior of interest
- Definition
  - Empirical
    Must be able to see the behavior to record it
  - Use terms to describe observable events, not mentalistic constructs
  Can’t see “feelings”
  Can’t observe “states of mind”
We need to define very precisely

Precise definitions of terms and procedures lead to:
  – Accurate data collection which leads to…
  – Reliable measurement which leads to…
  – Confidence in clinical and educational decision making
Very simple behaviors can be difficult to define

“Stranger Test”
A description of behavior should be precise or descriptive enough so that a stranger could observe and determine if the response was or was not being demonstrated.

“Dead Man’s Test”
Goals should convey what a child will do, not what a child will not do. If a dead man can meet the goal, it does not pass the test.
Target Behavior

- Acquisition
  The desired response

- Behavior management

- Examples:
Examples:

Bad: “loses control”
Better: “cries and tantrums”
Best: “cries and sobs, flops to the floor, kicks, pounds objects/fist on the floor, all of which is defined as a tantrum”
Examples:

Bad: “doesn’t listen”
Better: “does not do what she is told”
Best: “does not initiate compliance within 10 seconds of a staff request”
Antecedents

- Antecedents are things that occur prior to a target behavior (events that precede a behavior in time)
- Antecedents can help determine and control why a behavior is occurring
- If used consistently, can reliably predict a behavior
Antecedents can make behaviors occur
  –Occasion, set up, trigger
There is always an antecedent
Understanding antecedents can lead to
behavior management and effective
acquisition of skills
Antecedents in behavior management

- Present a non-preferred work demand
  *could precede aggression

- Take away a preferred toy
  *could precede crying
Antecedents in skill acquisition

- Skill acquisition to teach new skills
  - Present a cue, child responds, consequence follows

- Present some “cue” to the child
  - This will serve as the antecedent to the child’s response
  - This cue will serve as a reliable predictor that a certain behavior, when demonstrated, will lead to the delivery of a preferred stimulus
A cue will serve as a stimulus that “discriminates for” preferred items if a certain behavior is demonstrated.

If Johnny hears “touch blue” when a blue block and a red block are present:
- touching blue will lead to a preferred item;
- touching red will not

“Touch blue” is a cue that a certain response leads to a certain consequence.
Antecedents

- That type of antecedent event or “cue” has a technical name: Discriminative Stimulus or “Sd”
  - An Sd is used to provide a child with information about which response leads to reinforcement in the presence of which item
  - An Sd can be verbal, pictorial, visual, or tangible
Consequences are things that occur following a target behavior (events that follow a behavior in time)

- Consequences can make behavior more or less likely to occur in the future
- Can include anything and everything that could possibly occur following a target behavior
Consequences

- Can make behaviors
  - Increase
  - Decrease
  - Stay the same
- There is always a consequence
- Understanding consequences can lead to effective behavior management and skill acquisition
Consequences in behavior management

- Joey hits the teacher which produces...
- Joey tantrums during meals which leads to...
- Joey puts everything in his mouth which leads to...
- Joey hits Johnny and Johnny walks away which gives Joey...
- Joey cries loudly in the check-out line at Wal-Mart which leads to...
After an Sd is followed by a response from a child, a teacher can deliver a consequence:
- praise
- preferred items
- preferred activity
- corrective response
- additional prompting

Different consequences can have different effects on behavior.
A–B–C

- Antecedents – Behaviors – Consequences
- All behaviors comply to the model
- A’s and C’s affect future behavior
  - some interactions increase behavior
  - some interactions decrease behavior
Positive Reinforcement

- The addition of some stimulus condition following a behavior which results in the increase of that behavior in the future.
- The addition – POSITIVE
- Increase – REINFORCEMENT
- Positive reinforcement is defined by it’s effect on behavior
George points to the truck when he hears “point to truck”
Receives praise, hugs, high 5’s
Continues to point to correct stimulus when presented in the future

George does not point to truck anymore
Was not positive reinforcement

**Again, defined by it’s effect on behavior**
Positive Reinforcement

- Jake hits another child
  You yell at him.
  *He hits more….what does that mean?

- Positive – add something
- Reinforcement – behavior increases in the future
Behaviors are reinforced

Kids are not!!

“Reinforcers” are those stimuli, that when provided contingent on a target behavior, increase that target behavior.
Negative Reinforcement

- The removal or termination of some stimulus condition following a behavior which results in the increase in that behavior in the future

- The removal – NEGATIVE
- Increase – REINFORCEMENT
- Defined by it’s effect on behavior
Negative Reinforcement

- Chris is having a tantrum – you give him a break from work
- A tantrum is more likely to occur in the future (negative reinforcement)
- A tantrum does not occur again (was not negative reinforcement)
- Defined by it’s effect (increase) on behavior
Negative Reinforcement

- Raining – open umbrella – removes rain

- Common stimuli that serve as reinforcers: breaks, changes in activity, work removal, avoiding social conflict, avoiding certain situations
Reinforcement increases behavior
Punishment decreases behavior
Addition (positive) or removal (negative) of a stimulus condition that results in the decrease in that behavior in the future
  * positive punishment
  * negative punishment
Reinforcement

Some things to think about:
- immediate
- contingent
- varied
- satiation/deprivation
- reinforcing for that individual
Reinforcement

- readily available
- easily consumable
- age appropriate
- fade to natural reinforcement as soon as possible
- provide behavior specific praise
- unpredictable and novel
Choosing reinforcers:

- Reinforcer assessment
  - Ask parents
  - Observe
  - Ask the student!!
- Allow choice
  - Paired choice
  - “Box of tricks”
How long should he have access?
- short amounts of time relative to work time
- usually recommended – 20 seconds or time to consume

Should he choose after each trial or at the beginning of the session?
- You choose, but be consistent.
Should he/she be able to access these items during free play time?
- No, to avoid satiation, these items should only be available contingent on task completion.

Do we have to use the same reinforcer for each compliance/long term?
- Let the data determine this.
- Is the response increasing?
Part 3
Prompting Strategies
Why use prompting strategies?

- Lease to most intrusive prompt hierarchy
- Always gives a chance for compliance
- Always prevents escape
- Students learn to comply earlier and earlier in the sequence
- Must follow through every time
Prompts

- Many different kinds of prompts
- Prompts assist learner through providing more information or move the goal within reach

Placement
Visual
Verbal Prompt
Position
Prompting Sequence Components

- Obtain or maintain attention
  Important (especially for new skills)
  “Look at me”
  Physically guide
  For some children, attention can be gained without eye contact.
- Give instruction (deliver cue)
  “Do this.” “Point to _____.” “Match.”
- Response
  5 second average wait time (can vary depending on the student)
  Determine what you will count as correct/incorrect
- Consequence
  - Following prompting hierarchy
  - Provide reinforcement
Prompting Sequence Components

- No response within 5 seconds or incorrect responses are followed by following through with prompting hierarchies
- Correct responses are immediately followed by reinforcement
  - access to items
  - praise
  - primary reinforcers
  - tokens
Today’s prompting strategy...

Errorless Learning Prompting Sequence
- Verbal
- Gestural/model
- Physical

- AKA …3 step prompting
- Tell – Show – Do
Tasks require a verbal prompt

Different kinds of verbal prompts:
- Partial verbal response ("r" for "red")
  - deliver small amount of reinforcer
- Provide full model ("It’s red." “Say red.”)
Gesture/Model Prompts to Physical Prompt

- Deliver verbal prompts (“Sit down.”)
  **wait 5 seconds**
- Repeat verbal as a gesture/model is provided (“Sit down.. like this.”/while sitting then standing again)
  **wait 5 seconds**
- Physical Guidance (“Sit down.”/while physically guiding the child to the seat)
Part 4
Discrete Trial Training/Teaching
Discrete Trial Training/Teaching

- This is a style of teaching in which opportunities to respond (trials) are presented one at a time (discretely) so that the specific components are discernable to the learner, and so that an accurate recording of the learner’s responses can be made.
- Most likely, you already use some form of this style of teaching.
- DTT emphasizes many commonly used techniques to produce a very powerful method of increasing skills.
Discrete Trial Training

- Discrete trial – small unit of instruction (usually) implemented in a 1:1 environment
- The most widely studied approach for teaching children with autism
- Surgeon general endorses DTT for children with autism
Trial
- one individual learning sequence

Session
- several trials

Program
- one objective achieved through running multiple sessions
Benefits of DTT

- Obvious start and finish to each trial
- Tasks initially short then
- Motivation through reinforcement
- Stimulus control: clear, consistent, repetitive, less confusion
- Teaches new forms of behavior
- Teaches discrimination
- Promotes generalization since generalization can be directly addressed through different settings and situations (table top, small group, playground, anywhere)
DTT Components

- Obtain attention (Very important)
- Deliver Sd (give instruction)
- Response
- Consequence
- Intertrial Interval
Instruction

- Present a clear, simple instruction or question
- Present only one instruction at a time (until ready to chain)
- Prompts can be used simultaneously or immediately following the instruction to assist with error correction (if needed)
- Sd for each program will be different
- Consistency is the key – use the EXACT wording each and every time to avoid issues with acquisition and data collection
Following the Sd, the child will do something or not do something
5 seconds average wait time
Correct or incorrect response is given
Determine if correct/incorrect
Either reinforce (immediately) or move through prompting sequence (corrective feedback)
Intertrial Intervals

- Time between the end of one trial and the onset of the next trial
- Reinforcer consumption
- Prepare for next trial
- Data collection
What if programs are not working?

- The process to teach new behaviors can sometimes be very long
- We can set a number of sessions (or days) as a limit before looking at modifying a program
- Persistence is the key
- Can break the task into smaller units
- Is everyone teaching the same way?
Items of importance:

- Use short, simple instructions
- Evaluate response as correct/incorrect
- Prompt
- Reinforce immediately
- Record data
Limitations:

- Prompt dependency
- Generalization must be programmed
- Labor intensive
DTT Training Protocol:

- Goal/criteria for mastery
- Materials needed
- Sd
- Definition of correct response (target behavior)
- Prompting procedure
- Steps for training
More important points...

- Always praise and/or otherwise reinforce correct responses (Even if it is something expected, others can learn from seeing others get reinforced.)
- Always give at least 5 seconds for the student to respond.
- Always plan out delivery before you start.
  – eliminates down time
  – get materials, know how many trials, seating arrangement
- Always ignore inappropriate behavior
  – Focus on the task
  – No verbal comments
  – Do not allow escape
- Keep task moving until complete
- Make yourself a reinforcing stimulus
- Try to end on a good note
Part 5
Generalization and Maintenance
Generalization

When correct responses occur when stimuli are different than in training:

- Across people
- Across materials
- Across environments
- Across time
- Across responses
Generalization

- How might you plan for generalization?
- Can it happen on its own?
- After a skill is mastered with one set of stimuli present
  - run sessions with different people
  - in different areas
  - at different times
Maintenance

- Maintenance is when correct responding persists without reinforcement in place
- Programming periodical review of mastered objectives
- If the behavior falls back to below 80% across 3 (or 5) consecutive sessions, put back into acquisition programming
Part 6
Data Collection
Why we collect and graph data:

- Baseline
- Treatment comparisons
- To monitor whether or not an intervention is working
- To monitor skill acquisition
- To monitor behavior
- To make changes to existing programs
Data Collection

- There are several different data collection systems
- Different systems are used to most effectively record relevant information about a behavior
  - duration
  - frequency
  - interval
We are going to focus on 1!!!

All correct responses must be operationally defined

Baseline

– measurement of skill prior to intervention
– collect 3–5 baseline data points
Intervention or Treatment Phase

- Daily session data is monitored to evaluate progress, check for mastery, check for skill decrease
- Data should drive all programming decisions
Data Collection

- Generally, a response will be recorded for each trial
- A + will be used to record a correct/incorrect response
- Record the type of prompting used to correct the response
- V = verbal; M/G = model/gesture; P = physical
Your data sheet:

- Child’s name
- Program
- Date
- Session number – specific to the program
- Therapist
- Trial
- Criteria for Mastery
- Score
- Total correct
- Percentage correct (to be graphed)
Graphs

- Visual aid in decision making
  - trend (increase or decrease)
  - variability
  - accountability

- Make decisions about:
  - mastery of skill
  - moving to a new step (criteria)
  - moving a program to maintenance
Finally...

- Seek supervision
- Ask questions
- This can be a hugely complex undertaking
- Not expected to be perfect right away
- Everyone goes through a learning/comfort curve
- Practice with your team to make sure you are all on the same page
- It is ok to make mistakes
- Be consistent and organized
Part 6
Practice and Role Play
Resources

**Resources**


**GA DOE does not endorse any specific product specific in this current presentation.**