

# Discrete Trial Training

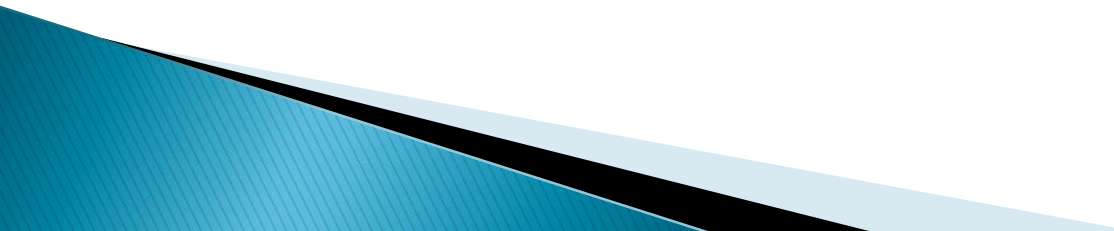
Autism Academy 2010

Georgia Department of Education

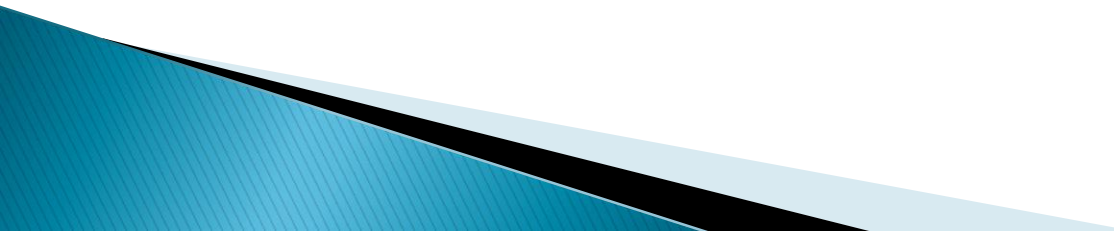
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Douglas County Schools

# Today:

## ▶ Goals

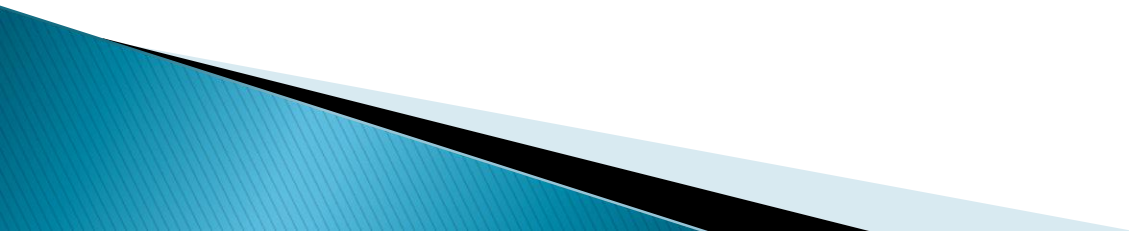
- Provide brief background and overview of Applied Behavior Analysis
  - Basic behavior management
  - Provide training to implement DTT
  - Learn data collection procedures
  - Learn to use data to make decisions
- 

# 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.



# Applied Behavior Analysis

- ▶ 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...

# Also referred to as...

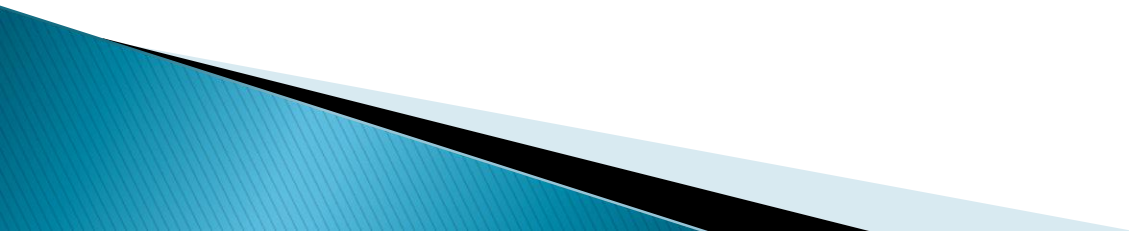
- ▶ Within the autism community, Applied Behavior Analysis has been misrepresented as being synonymous with Discrete Trial Training (DTT), Lovaas therapy, incidental teaching, pivotal response training, and other teaching procedures.

# Applied Behavior Analysis

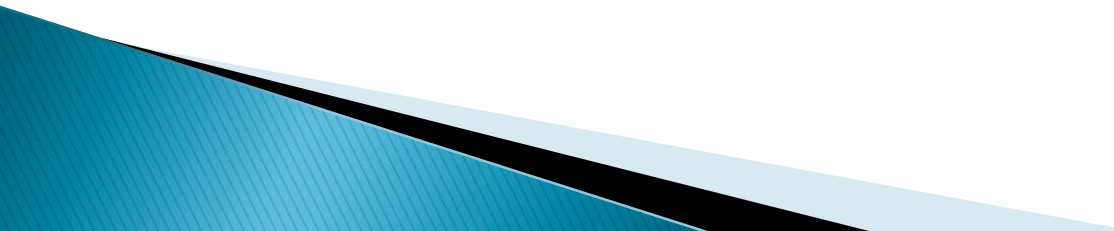
- ▶ Diverse field
  - Vast numbers of procedures
  - Vastly different problems are addressed
- ▶ No single approach
  - But common principles
- ▶ Data-based/Research proven results
  - What we do works and we collect data to be vigilant so that we may change the things that do not work

# Part 2

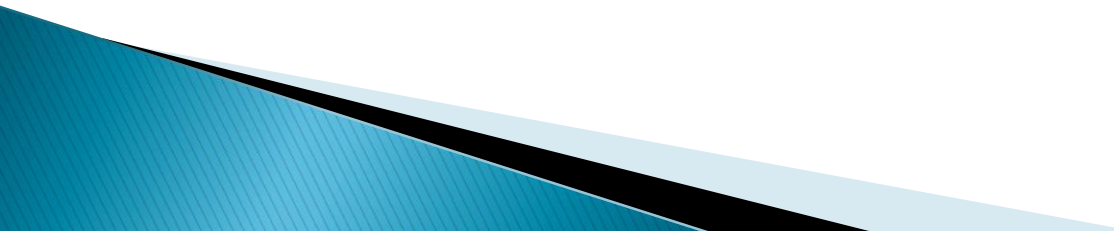
## Key Terms and Principles



# Terminology

- ▶ Target behavior
  - ▶ Antecedent events
  - ▶ Consequent events
  - ▶ Positive reinforcement
  - ▶ Negative reinforcement
  - ▶ Punishment
- 

# Please remember...

- ▶ 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
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# Target Behavior

- ▶ Behavior of interest

- ▶ Definition

  - Empirical

    - Must be able to see the behavior to record it

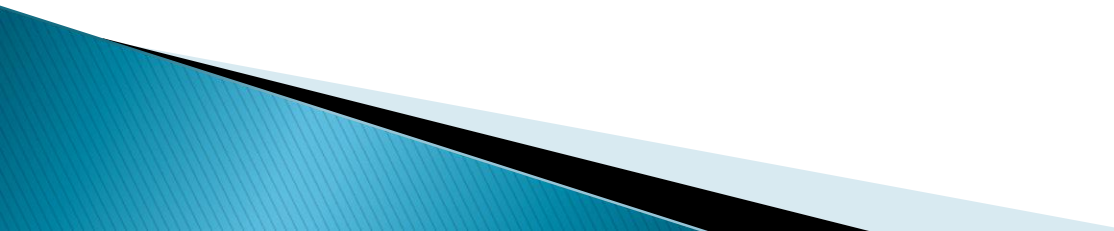
  - Use terms to describe observable events,  
not mentalistic constructs

    - Can't see “feelings”

    - Can't observe “states of mind”



# Target Behavior

- ▶ 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
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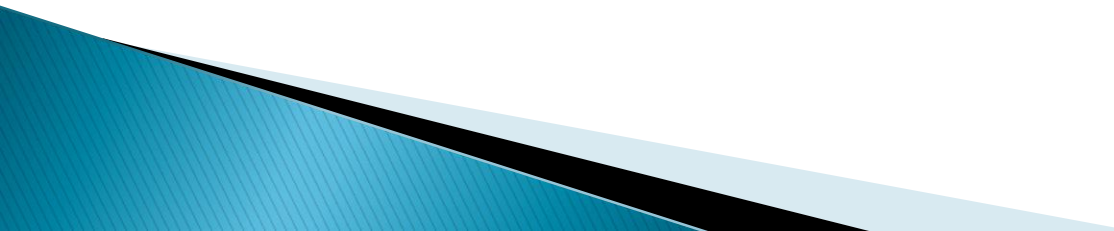
# Target Behavior

- ▶ 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”

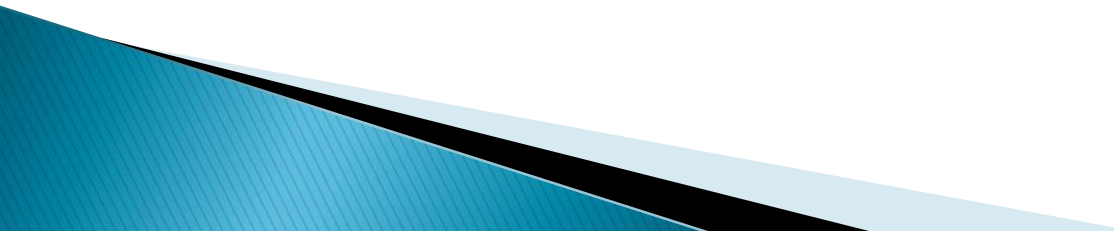
# Examples:

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

- ▶ 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

# Antecedents

- ▶ 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

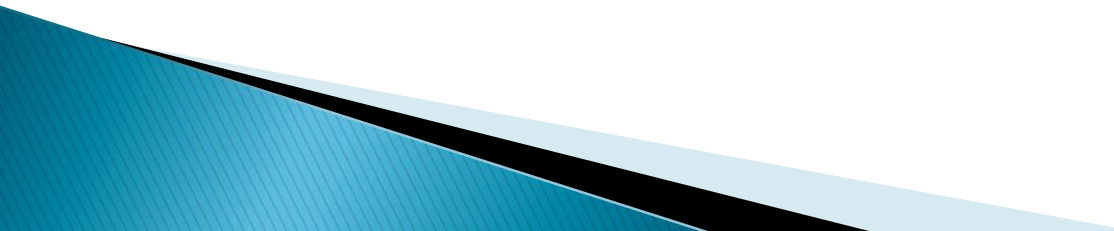
- ▶ That type of antecedent event or “cue” has a technical name

Discriminative Stimulus or “Sd”

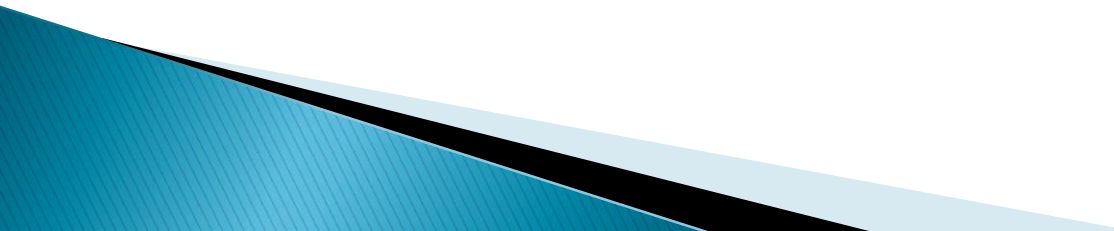
An Sd is used to provide a child with information about which response leads to reinforcement in the presence of which item

An Sd can be verbal, pictorial, visual, or tangible

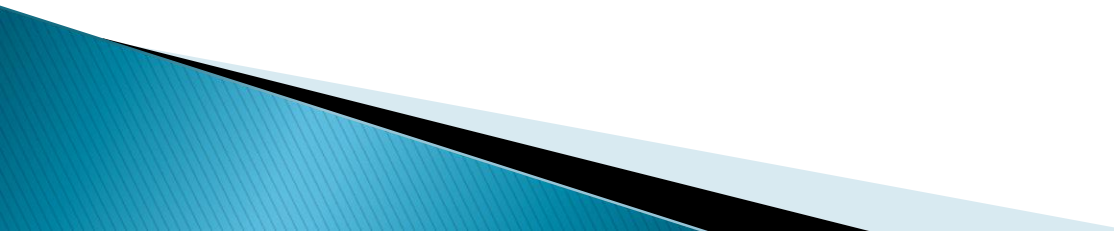
# Consequences

- ▶ 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...
- 

# Consequences in skill acquisition

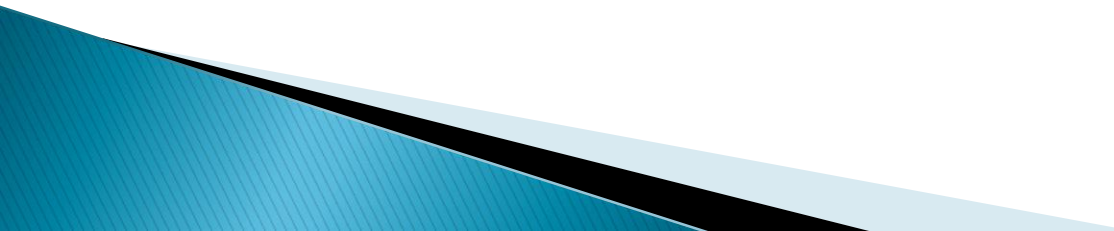
- ▶ After an Sd is followed by a response from a child, a teacher can deliver a consequence
  - praise
  - preferred items
  - preferred activity
  - corrective response
  - additional prompting
- ▶ Different consequences can have different effects on behavior

# 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



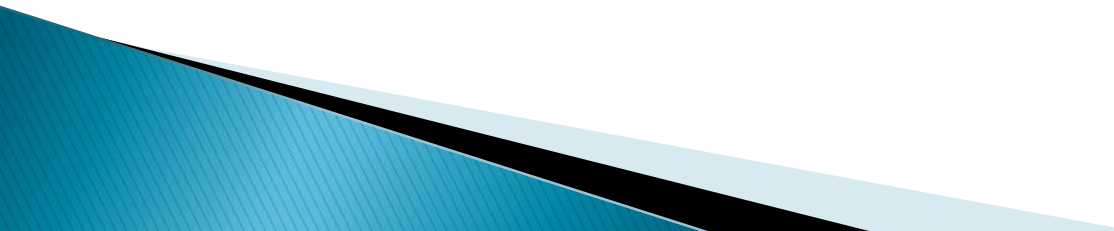
# Positive Reinforcement

- ▶ 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
- 

# Positive Reinforcement

- ▶ 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

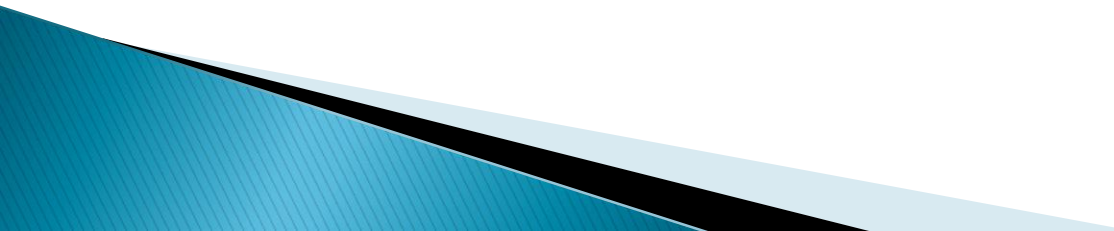
# Positive Reinforcement

- ▶ Jake hits another child  
You yell at him.  
\*He hits more....what does that mean?
  - ▶ Positive – add something
  - ▶ Reinforcement – behavior increases in the future
- 

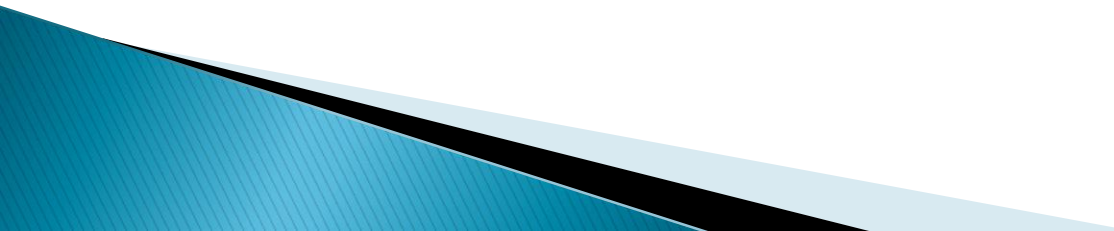
# Positive Reinforcement

- ▶ 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
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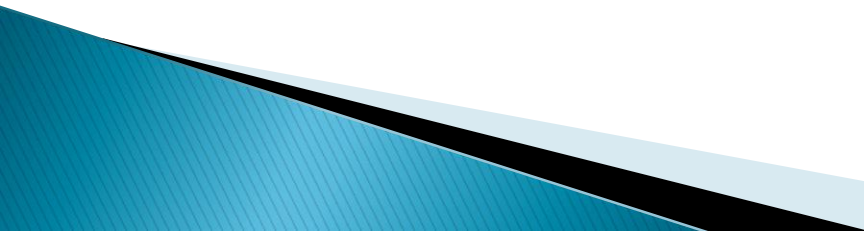
# Negative Reinforcement

- ▶ 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

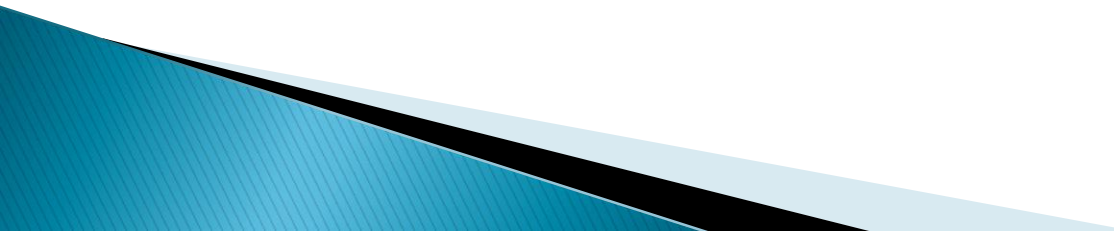
# Reinforcement vs. Punishment

- ▶ 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
- 

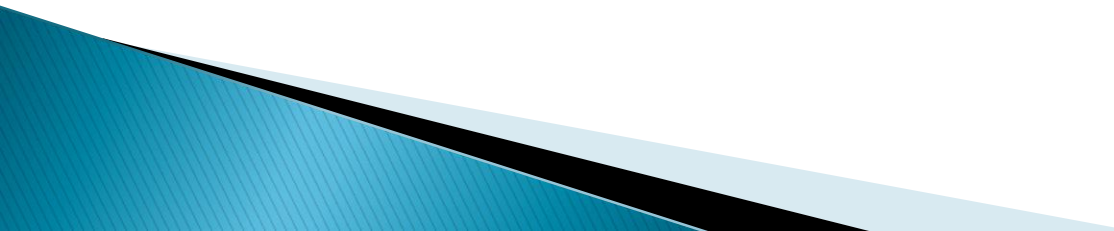


# Reinforcement

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”

# Reinforcement ?

- ▶ 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.

# Reinforcement ?

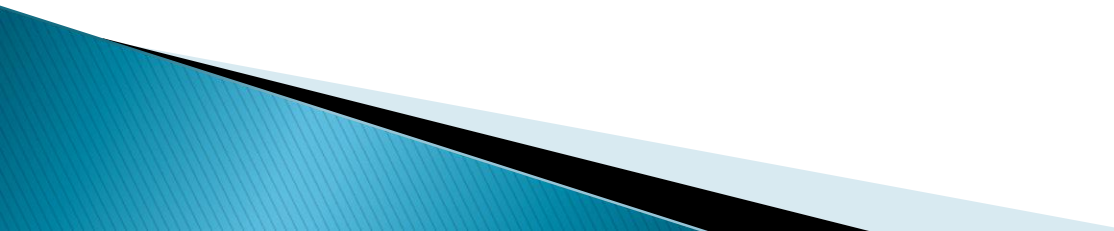
- ▶ Should he/she be able to access these items during free play time?
  - No, to avoid satiation, these items should only be available contingent on task completion.
- ▶ Do we have to use the same reinforcer for each compliance/long term?
  - Let the data determine this.
  - Is the response increasing?

# Part 3

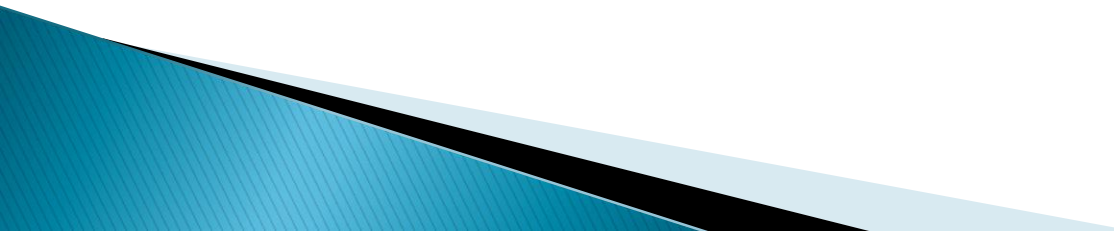
## Prompting Strategies



# Why use prompting strategies?

- ▶ Least 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

- ▶ 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

# Verbal prompting

- ▶ Tasks require a verbal prompt

Different kinds of verbal prompts:

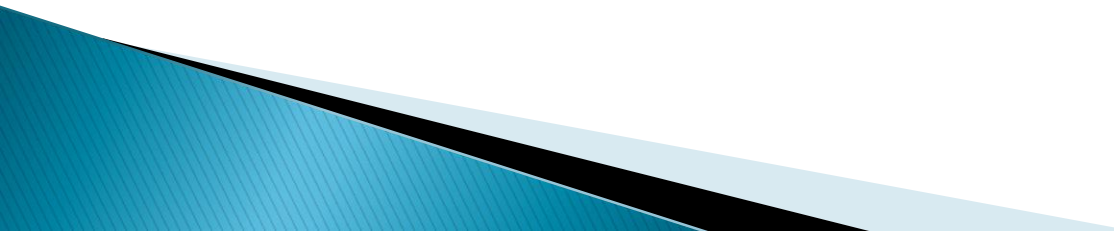
- ▶ Partial verbal response (“r” for “red”)
  - deliver small amount of reinforcer
- ▶ Provide full model (“It’s red.” “Say red.”)

# Gesture/Model Prompts to Physical Prompt

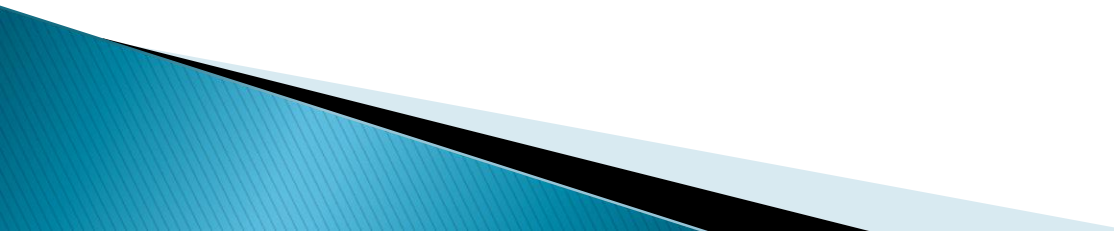
- ▶ Deliver verbal prompts (“Sit down.”)  
\*\*wait 5 seconds\*\*
- ▶ Repeat verbal as a gesture/model is provided (“Sit down.. like this.”/while sitting then standing again)  
\*\*wait 5 seconds\*\*
- ▶ Physical Guidance (“Sit down.”/while physically guiding the child to the seat)

# Part 4

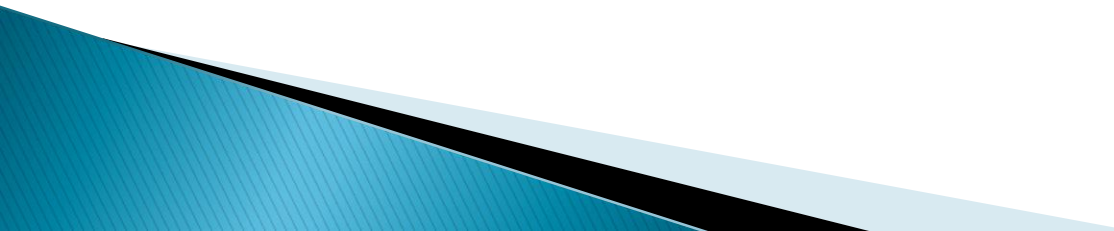
## Discrete Trial Training/Teaching



# 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.
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# Discrete Trial Training

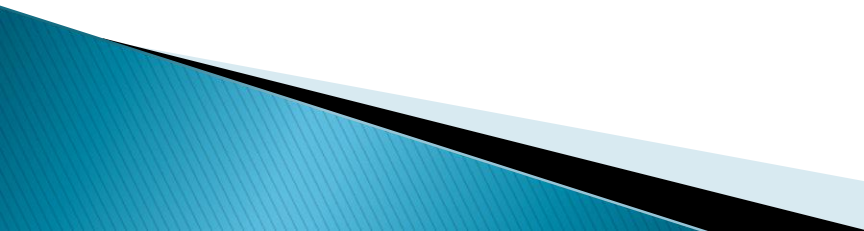
- ▶ Discrete trial – small unit of instruction (usually) implemented in a 1:1 environment
  - ▶ The most widely studied approach for teaching children with autism
  - ▶ Surgeon general endorses DTT for children with autism
- 



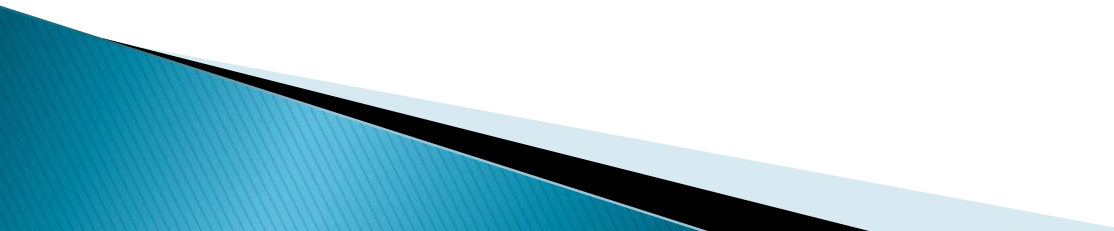
# DTT Terms

- ▶ Trial
  - one individual learning sequence
- ▶ Session
  - several trials
- ▶ Program
  - one objective achieved through running multiple sessions

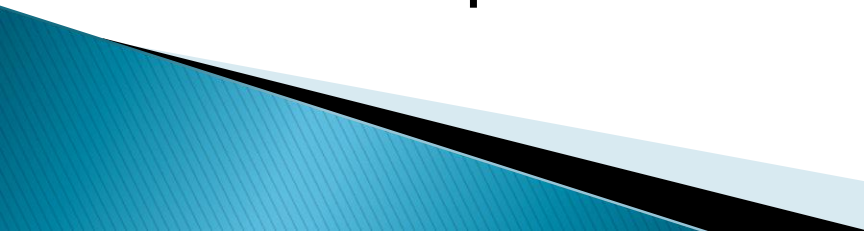
# Benefits of DTT

- ▶ 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)
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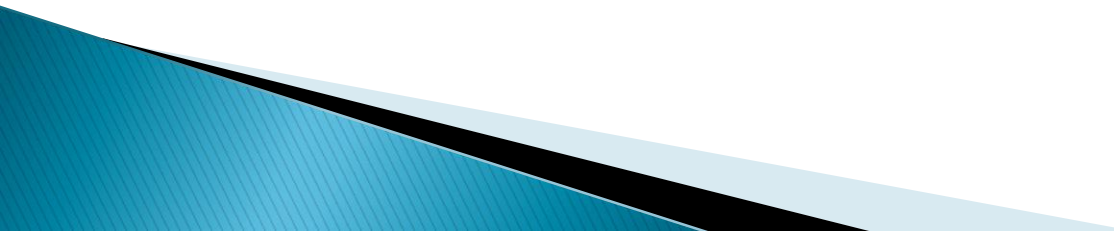
# DTT Components

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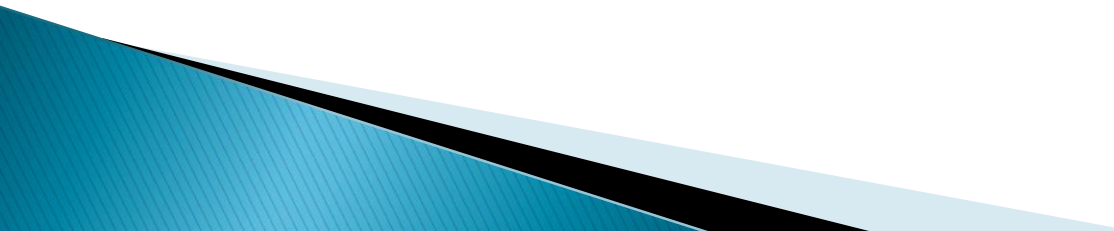
# Instruction

- ▶ 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
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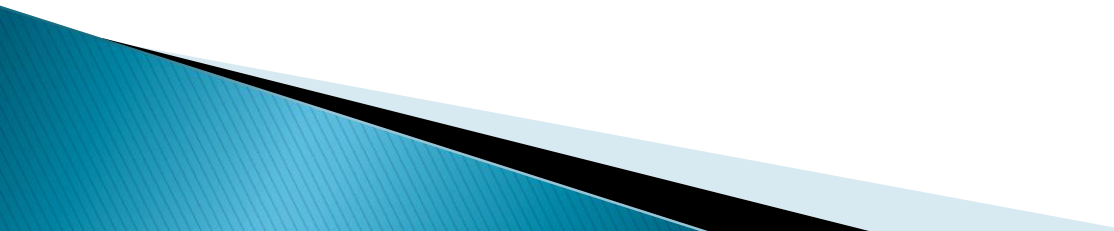
# Response

- ▶ 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)
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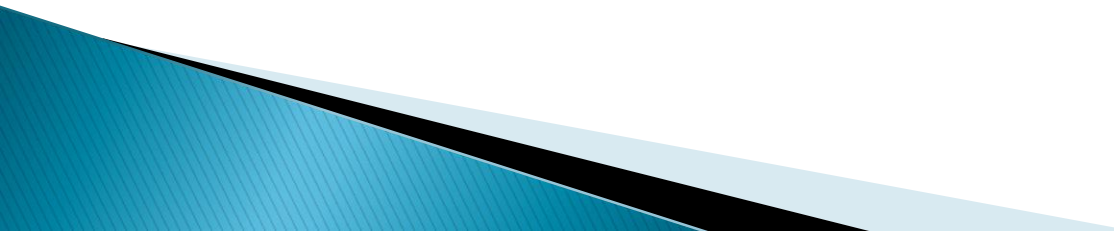
# Intertrial Intervals

- ▶ 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?

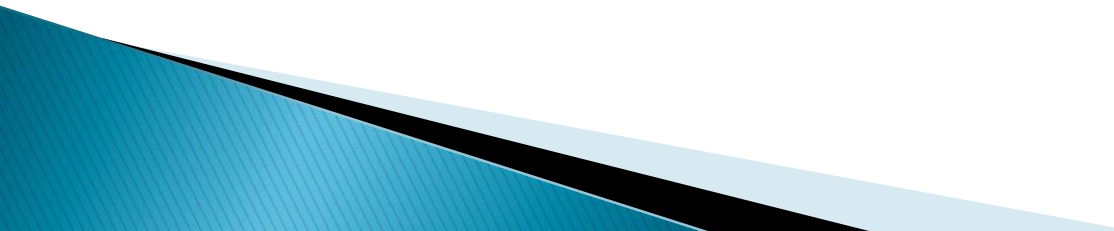
- ▶ The process to teach new behaviors can sometimes be very long
  - ▶ We can set a number of sessions (or days) as a limit before looking at modifying a program
  - ▶ Persistence is the key
  - ▶ Can break the task into smaller units
  - ▶ Is everyone teaching the same way?
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#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

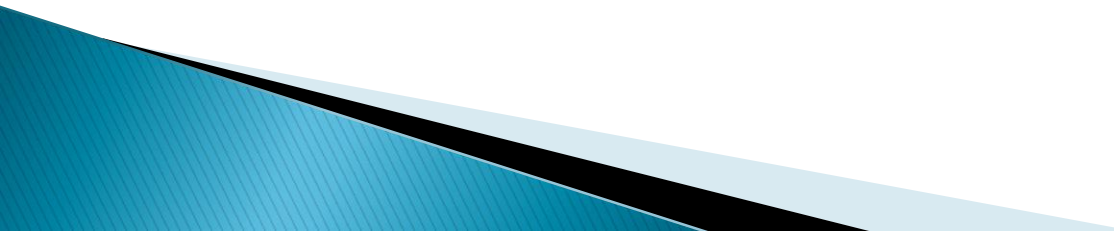
- ▶ Use short, simple instructions
  - ▶ Evaluate response as correct/incorrect
  - ▶ Prompt
  - ▶ Reinforce immediately
  - ▶ Record data
- 



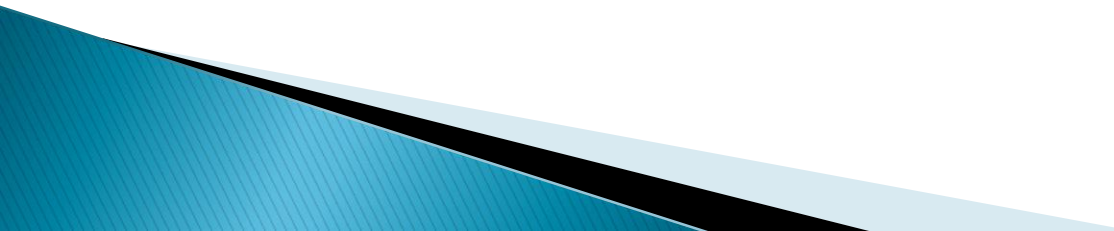
# Limitations:

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

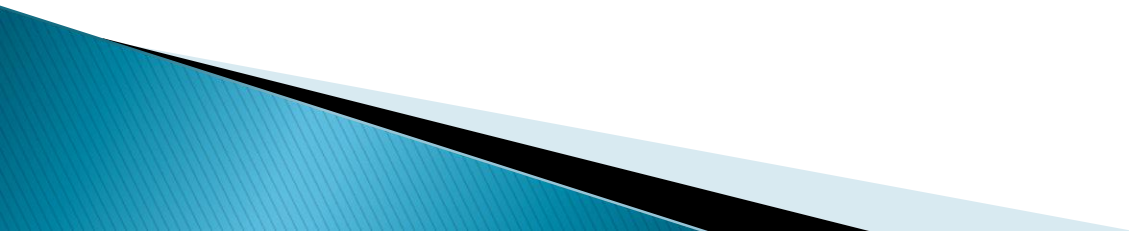
- ▶ Goal/criteria for mastery
  - ▶ Materials needed
  - ▶ Sd
  - ▶ Definition of correct response (target behavior)
  - ▶ Prompting procedure
  - ▶ Steps for training
- 

# 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
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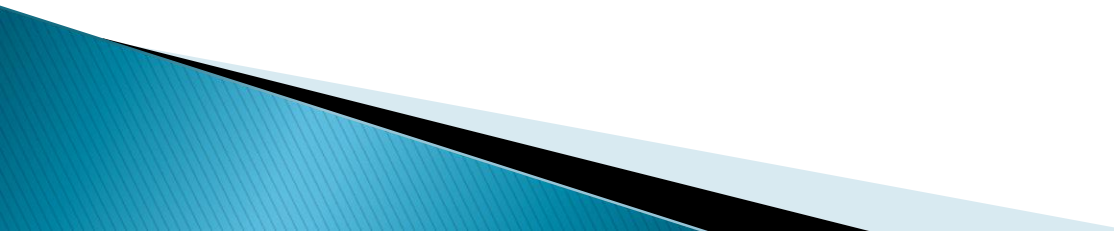
# Part 5

## Generalization and Maintenance



# Generalization

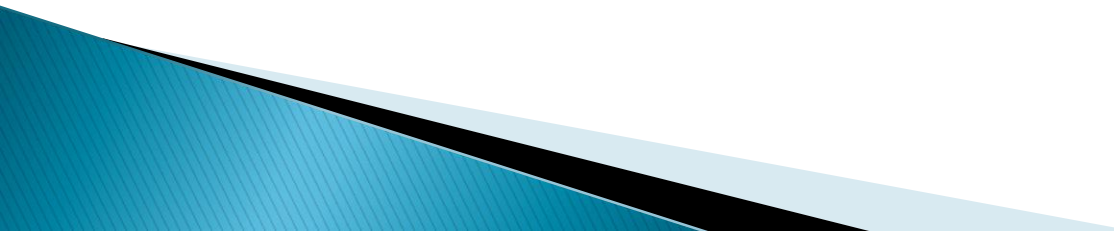
When correct responses occur when stimuli are different than in training:

- ▶ 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
- 

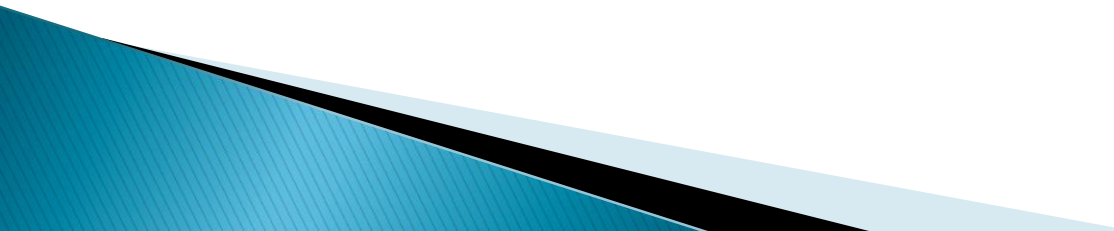
# Part 6

## 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
- 

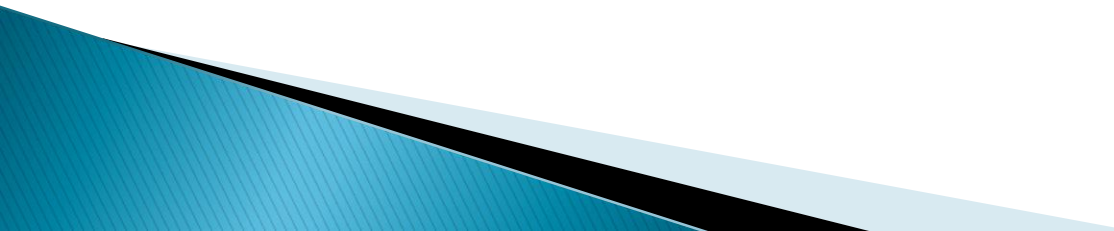
# Data Collection

- ▶ There are several different data collection systems
- ▶ Different systems are used to most effectively record relevant information about a behavior
  - duration
  - frequency
  - interval

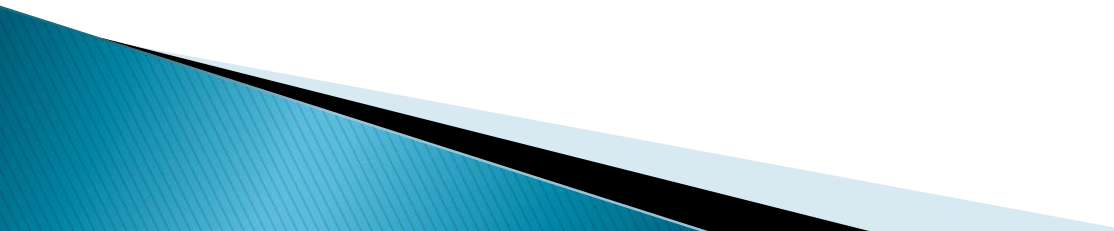
# Data Collection

- ▶ 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

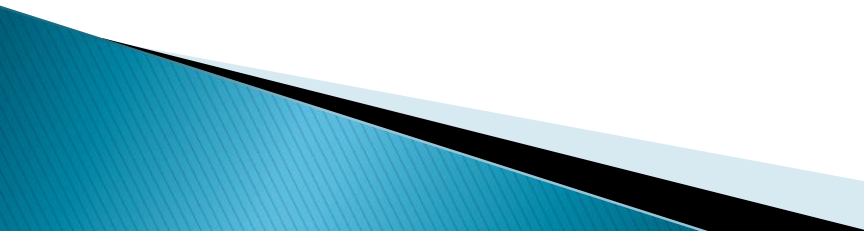
# Intervention or Treatment Phase

- ▶ 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
- 

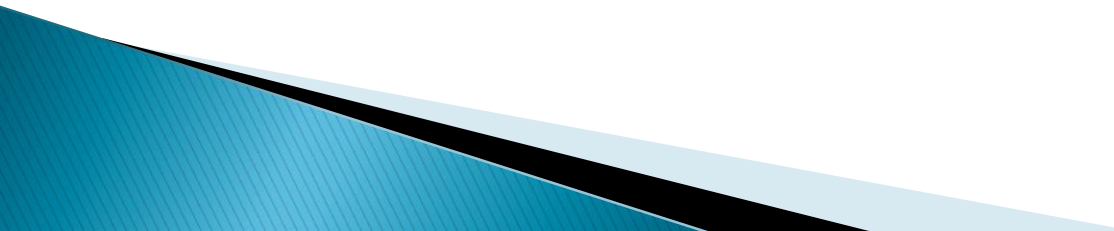
# Your data sheet:

- ▶ 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

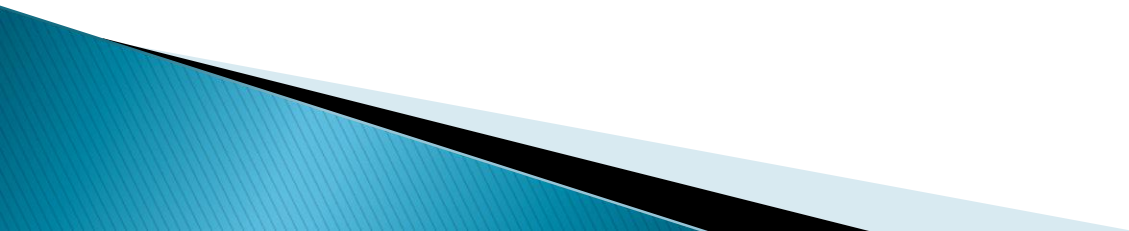
# Finally...

- ▶ 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

- Alberto, P.A., & Troutman, A. C. (2006). *Applied behavior analysis for teachers*. New Jersey: Pearson Education, Inc.
- Cooper, J.O., Heron, T.E., & Heward, W.L. (1987). *Applied behavior analysis*. Englewood Cliffs, NJ: Prentice-Hall, Inc.
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# Resources

- Hodgdon, L. A. (1995). *Visual strategies for improving communication: Practical supports for school and home*. Troy, Michigan: QuirkRoberts Publishing.
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- Partington, J.W., & Sundberg, M.L. (1998). *The assessment of basic language and learning skills*. Danville, CA: Behavior Analysts, Inc.
- Skinner, B.F. (1957). *Verbal behavior*. New York: Appleton-Century-Crofts.
- \*\*GA DOE does not endorse any specific product specific
- in this current presentation.