Behavioral Intervention for Students with Autism

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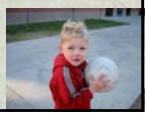


ASSERT Program Aims

1. Education: Provide effective educational and behavioral early intervention using research-based best practices
2. Research: Conduct research to improve educational and behavioral interventions for children with autism
3. Training: Serve as a model training classroom for USU preservice special education teachers and other educational professionals throughout the state of Utah who are interested in learning to work effectively with children diagnosed with autism spectrum disorders

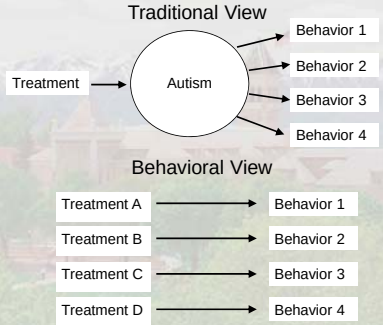
Autism: What is it?

- Autism is a severe developmental disability, marked by impairments of communication and social/emotional functioning that is often accompanied by significant behavior problems and restricted patterns of interest
- Autism is defined in by the Individuals with Disabilities Education Act (IDEA) as:
  - A developmental disability affecting verbal and nonverbal communication and social interaction, generally evident before age three, that affects a child performance .
  - Other characteristics often associated with autism are engagement in repetitive activities and stereotyped movements, resistance to an article change or changing daily routines, and unusual responses to sensory experiences .
  - The term does not apply if the child's educational performance is adversely affect it primarily because the child has a serious emotional disturbance

Autism: How is it diagnosed?

- Autism is diagnosed behaviorally-we observe the child and record behavioral excesses (e.g., self-stimulatory behaviors, echolalic speech, aggression or self injury, rigid adherence to routines) and behavioral deficits (lack of normal speech, lack of normal social skills, unresponsiveness to social contact)
- If a child meets a predetermined criteria that is based on the previous experiences of diagnosticians, then he/she is diagnosed with autism
- While it is commonly agreed that it is a neurological disorder and there is some evidence for its heritability, there is no blood test, genetic test, or neurological test that can detect autism

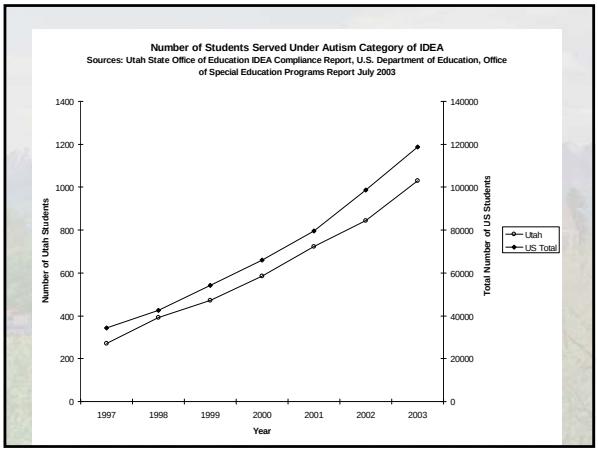
Medical vs. Behavioral Views of Autism



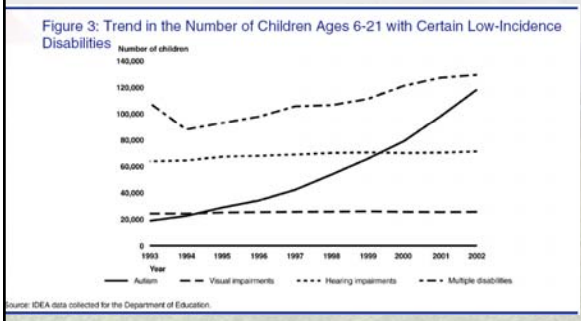
Autism: Prevalence

- 1 in 149 births (1 in 133 in Utah)
- equally distributed across races
- 4:1 ratio of males to females (7:1 in Utah)
- It is the fastest growing disability category in the United States.
- Since 1998, Utah's school enrollment of children with autism has jumped 900% to 1,799 students in 2005-2006.

Sources: Centers for Disease Control (CDC), 2007 (http://www.cdc.gov/mmwr/), Utah State Office of Education



Rates of Autism Compared to Other Low-Incidence Disabilities



Autism: Prevalence

- There is considerable disagreement between researchers about whether the increase in the number of children diagnosed with autism represents a true "epidemic" of autism or whether improvements in diagnostic procedures and public awareness can account for the observed change in the numbers
- It is probable that the answer lies somewhere between the two extremes
- Irregardless of the answer to this question, the fact remains that more students with autistic characteristics are entering the public school system

Autism: Causes

- While over the years there have been a variety of claims about what causes autism (bad parenting, MMR vaccine, mercury, too much TV, etc.), to this point, researchers have not identified a reliable cause
- Bottom line: While recent research has confirmed that autism is organic/biological in origin, **we don't know what causes autism**

Autism: Education and Treatment

- While researchers have thus far been unsuccessful in identifying the cause of autism, they have developed effective methods for treating the disorder
- Research has shown that while children with autism do not learn readily from typical educational environments, they can learn a great deal when the environment is appropriately constructed
- Research has consistently demonstrated that successful treatments for children with autism are those based on principles of Applied Behavior Analysis (ABA)
- Research has also shown that behavioral interventions are most effective when they are intense (30-40 hours per week) and started at a young age (3-5 years of age)
- These same strategies, however, have been used successfully with older students as well

What is "ABA"?

- Over the past 50 years, scientists have demonstrated through countless research studies that the environmental events that surround behavior directly impact on how likely that behavior is to be repeated in the future
- Behavior Analysis is the name of the scientific field that studies behavior and the environmental events that influence it
- Applied Behavior Analysis (ABA) is the branch of the field that takes basic behavioral principles learned in the research laboratory and applies them to improve the human condition

ABA and Special Education

- ABA has a rich and productive history in special education
- While many are familiar with the "behavioral" techniques for reducing challenging behavior that are based on ABA principles, they are less familiar with instructional techniques based on ABA
- The principles of ABA are relevant and useful for understanding all student behaviors, not just those that are dangerous or problematic

Applied Behavior Analysis and Autism

- One area in which ABA principles have been successfully applied is in early intervention for children with ASD
- In fact, the ABA approach to treating ASD has been so successful that some people have come to think of "ABA" simply as a treatment for ASD
- While the ABA-based techniques for children with autism have been successfully used to help many individuals with ASD, the science of Applied Behavior Analysis has many other applications
- ABA is not one specific teaching or behavioral technique, it is an approach to studying and changing behavior that is composed of many different techniques, even for children with autism

Levels of Scientific Evidence

- What constitutes "research"? What kinds of research must be done on a particular technique before it is considered "research-based"?
- Generally speaking, controlled, experimental research needs to be conducted multiple times in order for a technique to be considered "research-based"
- Case studies and anecdotal reports are not sufficient for establishing an approach as research-based
- Group design studies using control groups or multiple single-case experimental design studies are necessary

Research on Early Intensive ABA

- Over 550 studies published from 1960-1995 (Matson et al., 1996) document the effectiveness of ABA techniques for building skills in individuals with autism
- Documentation of the effectiveness of a comprehensive early intensive ABA program in a controlled study with long-term follow-up by Lovaas (1987) and McEachin, Smith, & Lovaas (1993)
- Multiple partial and systematic replications of Lovaas model have taken place since 1993
- Various state and federal agencies have acknowledged the proven effectiveness of EIBI (New York State Dept. of Health, Maine Administrators of Services for Children with Disabilities, U.S. Surgeon General Report on Mental Health, 1999)
- Additionally, review panels of professional associations such as the American Academy of Child and Adolescent Psychiatry, the American Academy of Neurology, and the American Academy of Pediatrics report that EIBI is highly effective in meeting the needs of children with autism

Are other treatments effective?

- To date, no other treatment approaches have been demonstrated, through controlled research, to produce comparable student gains to early intensive ABA
- This has not stopped the development of "fad" interventions (e.g., Secretin therapy, sensory integration therapy, megavitamin therapy, special diets, holding therapy, dolphin therapy, mercury detoxification, etc.) and other systematically designed interventions (e.g., TEACCH, Floortime, etc.) that either have not been subjected to controlled research or have failed to produce comparable effects to ABA

Characteristics of a "State of the Art" ABA Program for Children with Autism

- Curriculum-based assessments are used to create an individualized instructional and behavioral program for each student that addresses all behavioral deficits and excesses (e.g., social, communicative, academic, behavioral, etc.)
- Complex skills are broken down into their component parts and simple skills are built into more complex ones
- Students are provided with many learning trials to practice emerging skills and these skills are practiced in both structured and unstructured environments
- Multiple research-based instructional techniques are used to provide learning trials (e.g., discrete-trial teaching, incidental teaching, prompting and prompt fading procedures, social scripts and script fading procedures, naturalistic language techniques, etc.)

Characteristics of a "State of the Art" ABA Program for Children with Autism

- Correct responses are followed by reinforcers that have been systematically identified and are appropriate for the individual at that time
- Over time, primary reinforcers (e.g., edibles) are faded and replaced with social reinforcers and access to age appropriate play materials
- Students are taught over time to tolerate delays before receiving reinforcement (e.g., using simple token systems to gain access to preferred toys/games)
- Emphasis is on making the learning process enjoyable for the child
- Curriculum decisions are based on objectively defined and measured student data

Characteristics of a "State of the Art" ABA Program for Children with Autism

- Aberrant behavior is addressed through functional assessment and intervention techniques (i.e., aberrant behavior placed on extinction and replacement behavior taught and reinforced)
- There is no "down time". Instruction is embedded into every activity during the day
- Steps are taken to promote generalization and maintenance of student skills including having the student regularly receive instruction from multiple instructors and in multiple environments
- Parents are taught how to address aberrant behavior and support emerging appropriate behavior in the home
- The program is directed by individuals with graduate training in behavior analysis and specific training and experience in behavioral interventions for students with autism (we now have international certification for behavior analysts: www.bacb.com)

Characteristics of a "State of the Art" ABA Program for Children with Autism

- The overall emphasis is on teaching the child to learn from his/her natural environment (like typical kids do)
- As the student develops the necessary skills, instruction is gradually changed from strict, intensive 1:1 instruction to settings and instructional styles that approximate typical educational environments (e.g., small- and large-group instruction, social and delayed reinforcement, fewer specific instructions)
- As the student develops the necessary skills, he/she engages in structured social/play activities with typically developing peers
- When students are transitioned out of intensive ABA programs into traditional regular or special education programs, the transition is planned, systematic, and takes place over time in response to the student's needs

Basic ABA Principles

- Research tells us that the consequences produced by behavior have a dramatic impact on future rates of behavior
- The behavioral process by which behavior is strengthened is called *reinforcement*
- *Positive Reinforcement* is the behavioral operation of providing a consequence following a behavior that results in that behavior being more likely to occur in the future
- In discrete trial teaching, we provide the student with repeated opportunities to receive positive reinforcement for engaging in desired behaviors, thus making these behaviors more likely to occur in the future
- Undesired behaviors are not followed by reinforcement, making these behaviors less likely to occur in the future.

Relativity of Reinforcement

- Reinforcers (and punishers for that matter) are defined by their effects
- A stimulus, event, or condition is only a reinforcer if it increases the future probability of the behavior it follows
- What is reinforcing for one person may not be reinforcing for another
- In fact, things that most people find quite aversive can function as reinforcers for some people

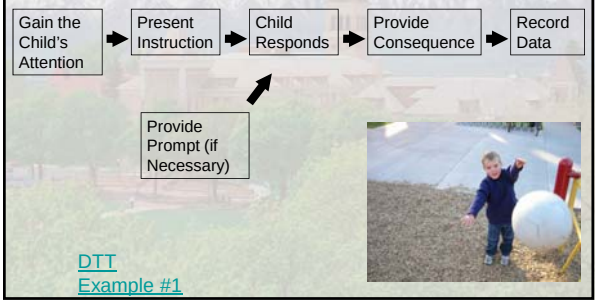
ABA-Based Teaching Techniques

- Discrete Trial Teaching
- Social Scripting/Script Fading
- Activity Schedules
- Mand Training
- Video Modeling
- Naturalistic Teaching Techniques
- And many others…

Discrete Trial Teaching

- Discrete Trial Teaching (DTT) is the most common ABA-based treatment approach for children with ASD
- In the DTT approach, students are provided with many repeated opportunities (called learning "trials") to practice specific skills and receive direct feedback from an instructor
- Instruction is rapidly paced and each student usually has their own individual instructor
- When students need extra help to perform specific learning tasks, the instructor prompts, or cues, them to make the correct response and then provides a positive consequence
- Theses prompts are then removed over time so that the student can perform the skill independently
- DTT has been repeatedly shown to be an effective teaching technique for students with ASD and can be used to teach many different kinds of skills

Discrete Trial Teaching



DTT Example #1

Appropriately Gaining the Child's Attention

- Before giving a child an instruction, it is important to gain the child's attention.
- The best indicator that a child is attending is when he/she is looking you in the eyes.
- The child's attention can be gained by doing a variety of things, including:
  - saying the child's name (however, it is important not to say the child's name on every trial or the child may stop paying attention when his/her name is called)
  - making some other sound that attracts the child's attention
  - by placing open hand at the side of their head to block visual stimuli
  - by gently touching the child
  - by waiting for the child to naturally make eye contact with you Video example

How not to gain a child's attention

- Do not forcefully turn their head or body toward you
- Do not snap your fingers in the face or next to their ear
- Do not rapidly repeat attention getting stimuli
  - Give the child enough time to process your request and respond by looking at you
  - Change your attention getting strategy if the child does not respond

When Using Instructional Materials

- Be sure the work space is clear of all other materials
- Place the materials an equal distance from the child and from each other
- Doing this ensures that we are not inadvertently using positional prompts.

Making Verbal Instructions Effective

- After you have the student's attention (the child is giving you eye contact or attending to the task materials), the next step is to provide an instruction
- How you state the instruction can directly influence whether or not it will be followed
- The instruction should be clear, concise, and *given only once.*
- It should be stated in a clear tone of voice without excess emotion or inflection

Making Verbal Instructions Effective

- Filter out the "verbal noise"
- If the instruction contains too many words, the child may not attend to the ones that are important
  - Bad: "John, will you please stop wiggling and come over here and sit down so that daddy can button up your shirt?"
  - Good: "John, sit down."
- When a child is first learning to respond to a particular instruction, it is important to keep the wording the same each time it is given.
- Once the child has learned the response and can reliably produce it when the instruction is given, the wording can be changed and varied from trial to trial to promote generalization.

Prompting

- Sometimes, when a child is learning a new response, it may be necessary to give the child extra help in addition to the instruction in order for the child to correctly perform the response.
- This extra help is given in the form of *prompts.*
- A prompt is given *before* the child initiates his/her response.
- Prompts can take many forms:
  - Verbal (e.g., saying the correct response so that the child can repeat it)
  - Physical (e.g., guiding the child's hand to the appropriate object)
  - Gestural (pointing to the correct item)
  - Position
  - Time delay

Prompting

- A general rule is to provide the minimum amount of prompting that will allow the child to make the correct response.
- As the child begins to learn the response, prompting should be decreased so that the child will respond on his own rather than relying on help from the instructor.
- Prompting video examples
- Beware of unintentional prompts!!!

The Child's Response

- Following the instruction (and prompting, when necessary) the child will respond in one of three ways: correctly, incorrectly, or no response.
- The way that the child responds will dictate what type of consequence the instructor provides.
- As a general rule, the child should be allowed **five seconds** to initiate a response.

Provide Appropriate Consequences- Correct Responses

- Following the child's response (or lack of response) the instructor provides a consequence.
- If the response is correct, the instructor should immediately (within 2 seconds) provide enthusiastic verbal praise in combination with other identified reinforcers (e.g., hugs, high-fives, candy, tickles, access to a preferred toy).
- Praise should always follow a correct response and the amount and type of other reinforcement provided will vary depending on the needs of each individual child.

Positive Reinforcement: Our Primary Teaching Tool

- Positive reinforcement is our most powerful tool for changing student behavior
- In addition to being highly effective, it has many advantages:
  - Students like having their behavior changed via positive reinforcement
  - They also like the teachers that give them positive reinforcement
  - If students are receiving enough positive reinforcement in the classroom for good behavior, problem behaviors will often decrease

Guidelines for Using Positive Reinforcement Effectively

- Positive reinforcement is most effective when it is delivered immediately following the behavior we are trying to increase
- Use the most powerful reinforcers for the most important/difficult behaviors
- Praise/acknowledgement is only a positive reinforcer if it increases the behavior it follows
- Reinforcement is also most effective when it is varied-don't just deliver the same consequence (including praise) over and over again; mix things up!

A Note on Effective Praise…

- Praise is most effective when it is *varied*
- You should vary what is said (use different praise statements each time) as well as how it is said (vary the tone, pitch, loudness, and speed)
- Simply saying "good job!" over and over is not likely to be effective

Shaping Correct Responses

- Sometimes, when a response is particularly difficult, the child may not initially be able to perform the full response correctly.
- When this is the case, a technique called *shaping*, in combination with heavy prompting, is employed.
- In shaping, an approximation to the correct response is reinforced. Gradually, the child is reinforced for making closer and closer approximations to the full response.
- For example, suppose you were teaching a child to say the word "sat." Using shaping, you would first reinforce the child for making just the "s" sound. When the child could reliably make this sound, you would then reinforce the child for making the "sa" sound. Finally, you would reinforce the child for saying the full word, "sat." Each time the response requirement was increased (e.g., moving from saying "s" to "sa"), you would use prompting to help the child make the correct response.

Responding to Errors

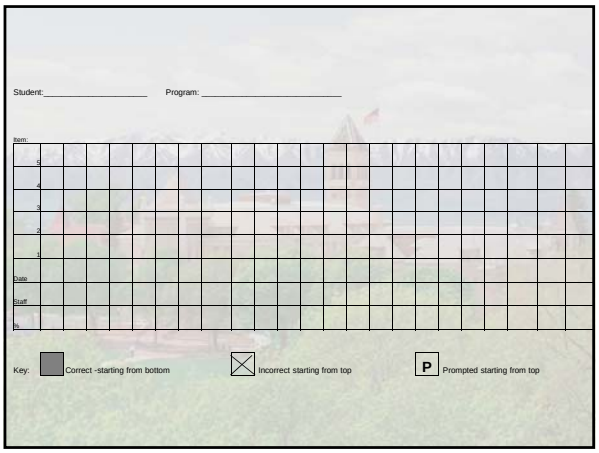
- When a child makes an incorrect response, the instructor provides feedback that indicates that the response was incorrect.
- The instructor may indicate this by saying something such as "try again" or the instructor may ignore the incorrect response, pause for two seconds while breaking eye contact, and simply move on to the next trial
- It is generally wise to avoid using the word "no" because it has usually been associated with negative events in the child's past and can elicit emotional behavior such as crying or tantrumming.

Ongoing and Accurate Data Collection and Analysis: A Hallmark of ABA Programs

- Collecting ongoing and accurate data is critical for a DTT program
- Student data inform the teacher when changes are necessary to the teaching program
- Data are most accurate when they are collected immediately following a trial rather at a later time
- Trying to remember how a student performs during an instructional program and then recording the data at the end of the teaching session does not typically produce accurate data
- If data aren't accurate, why bother collecting them?

Data Collection for DTT Programs

- While we collect data on every teaching trial, we only analyze the first five trials to determine when a skill is mastered
- Our mastery criterion is 80% accurate (4 of the first 5 trials for each skill are performed correctly) for three consecutive days across at least two different people
- We also perform maintenance checks (2-trial probes) at 2- and 6-weeks to make sure the student is retaining the skills he/she is learning
- If the skill is not maintained, it is re-taught
- Even after a skill is mastered, we continue to practice it periodically



Discrete Trial Teaching: Summary

- The techniques of Discrete Trial Teaching described here have been demonstrated to be effective in teaching children with autism and other developmental disabilities.
- A key feature of discrete trial methods is the many repetitions of learning trials.
- This provides the child with many opportunities for learning.
- As the children are taught skills that will allow them to interact effectively with their environment, they can come into contact with the natural reinforcers that maintain the behavior of normal-developing children.

DTT to Teach Advanced Skills

- DTT for advanced skills example

Behavioral Intervention for Children with Autism

- Discrete Trial Teaching (DTT) is only one type of instructional strategy based on principles of behavior analysis
- DTT is a component of most "state-of-the-art" behavioral intervention programs for children with autism
- There are many other research-based approaches (that we can discuss some other time!)

Behavioral Intervention for Children with Autism: Future Directions

- While much research has been done, there remain many unanswered questions about best practices for the education of children with autism
- Areas that we are currently investigating:
  - Strategies for improving spontaneous language
  - Teaching complex question asking
  - Developing curriculum materials
  - Strategies for decreasing self-stimulatory behaviors

For more information…

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