Applied Behavior Analysis (ABA) 101: What is it & how does it help people?

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SEND ALL ABA REFERRALS TO THE BH UNIT

CONTRA COSTA
HEALTH PLAN

A Division of Contra Costa Health Services

A Culture of Caring for 45 Years

Our US & CA Treatment System for Autism

In Autism & related disorders, identify child's strength & needs; Train parents.

Most widely used: ***ABA = Applied Behavior Analysis, a branch of behavioral psychology.***

Dr. Ivar Lovaas; UCLA Young Autism Treatment project pioneered ABA for young children with autism; landmark studies.

Cochrane Review on ABA says solid evidence for improving function in the core symptoms of Autism.

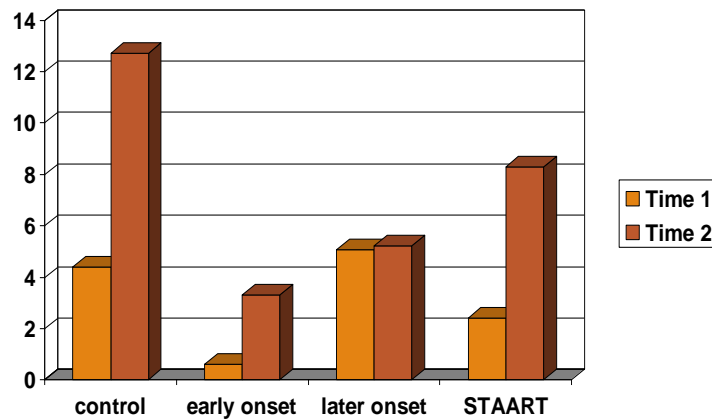U.S. Surgeon General in 1999 concurred.

Early detection & intervention for developmental delays gives better prognosis & improved language, social & adaptive/self-help skills with fewer problem behaviors (PBx).

◦ (Harris & Handleman, 2000; Howard et al., 2005; Lord & McGee, 2001; Myers, Johnson et al, 2007; Eldevik et al., 2009; Sallows & Graupner, 2005, Fein et al. 2006; Dawson et al. 2010)

Early intervention works for social, language & adaptive skills: STAART Toddler Tx study (n=49)
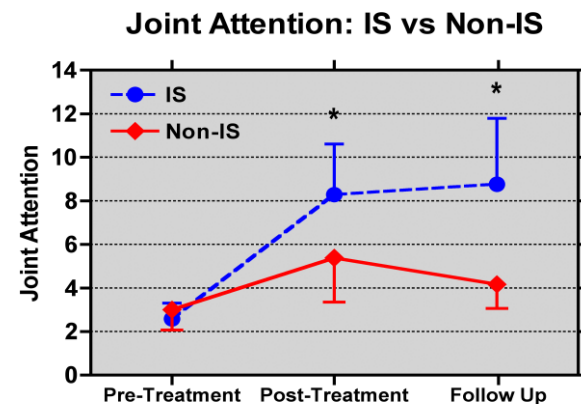## Rebecca Landa CCC/SLP, Ph.D.

IS = Intensive Services

Joint Attention: IS vs Non-IS

Gain=8

In 10m

Gain=6

in 6 m

ABA & Autism

Oct. 2007: Management of Children with Autism Spectrum Disorders (ASDs). http://www.pediatrics.org/cgi/content/full/peds.2007-2362v1

By Scott Myers and colleagues: strong support for ABA in treatment of ASD

CA-DDS & other Autism-Related foundation of Evidence Base of ABA for Autism

NATIONAL STANDARDS PROJECT, NATIONAL AUTISM CENTER

LED BY S. WILCZYNSKI PHD, BCBA

- Comprehensive review of 1957-2007 scientific literature on behavioral-educational interventions

- 1060 peer reviewed articles

- 615 met all inclusion criteria & retained for full review

STANFORD ASD TREATMENT RESEARCH PROJECT (L. HUFFMAN MD ET AL)

- Comprehensive Review of 1994-2007 scientific literature on pharmacologic/CAM interventions

- 841 peer reviewed articles

- 115 articles met all inclusion criteria & retained for full review

Behavior Analysis is a Natural Science

Its subject matter is behavior interacting with environmental events

Applied Behavior Analysis applies scientific principles & procedures discovered by basic & applied research to improve socially important behaviors to a meaningful degree.

Research since the 1960s shows efficacy for scores of ABA procedures-singly & in various combos-to build useful skills & reduce problem behaviors in clinical & non-clinical populations.

ABA treatments are effective to decrease symptoms, develop adaptive behaviors & reduce maladaptive behaviors to enhance healthy, successful functioning; prevent regression or worsening in patients with many disorders such as developmental disorders: Autism, Intellectual & other developmental disabilities, ADHD, brain injuries, & movement, feeding or behavior disorders.

Define Evidence-Based for Behavioral Treatments/ABA

1. Based on consensus of scientific information.

2. Behavioral treatment plans must be based on good science, not "treat & hope".

3. Board certified behavior analysts (BCBAs) = ethically obligated to practice in a scientific manner, using research-proven methods; keep data on target behaviors & results of treatment.

4. BCBAs obtain certification through the national Behavior Analysis Certification Board (BACB):Website: www.bacb.com

SB 946 Law: Access to behavioral treatment for ASD

- Treatment plans must be prescribed by a licensed physician, surgeon or developed by a licensed psychologist.

Primary Care Provider is a "medical home" *-key* to getting services (In CCHP, send all ABA referrals to the BH Unit; not ABCD)

Licensed physicians & psychologists might not be trained in the science of Behavior Analysis.

◦ Good to network with BCBAs (M.S., M.A., PhD, PsyD)

In 2018, under EPSDT for Medicaid, California expanded insurance coverage of ABA for diagnoses beyond autism: severe communication disorders, complex ADHD with learning disabilities, severe behavior problems, Other

Let's learn more about the science of ABA

BEHAVIOR ANALYSIS HAS EXPERIMENTAL & APPLIED DIVISIONS: RECOGNIZED BRANCH OF PSYCHOLOGY PER AMERICAN PSYCHOLOGICAL ASSOCIATION- NOT JUST A "BAG OF TRICKS"

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ABA treatments

FOCUSED:

Addresses a **small number** of adaptive &/or maladaptive behaviors (Bx)

Assessment describes specific levels of Bx at baseline to inform selection of treatment goals

Target current & future socially important Bx

Establish small units of Bx built systematically toward larger change to improve health, safety, independent functioning

COMPREHENSIVE

Addresses a **large number** of adaptive behaviors in multiple domains, as well as maladaptive behaviors (Bx)

Assessment describes specific levels of Bx at baseline to inform selection of treatment goals

Target current & future socially important Bx

Establish small units of Bx built systematically toward larger change to improve health, safety, independent functioning

Behavior is "lawful" =
There are laws of behavior

1. The lawfulness of behavior is good news!

    - Behavior is NOT magical, random, irrational, unpredictable, "willy nilly" or just "out of the blue".

2. In order to command nature, you must first obey it.

    -Through research & understanding laws of behavior: Obtain better guidance of behavior.

3. There's always a reason for the behavior (Bx). Find the controlling factors & functions of Bx. The behavior that works, stays. Take data!

Associative learning: Timing is Key!

Classical (Respondent) conditioning: Pavlov: the ability to associate a predictive stimulus (conditioned stimulus, CS) with a subsequent salient event (unconditioned stimulus, US). Bell ring is a CS that can be paired with smell of food (UCS) for dogs.

Operant conditioning: the ability to associate an expressed behavior with its consequences.

These two forms of associative learning allow predictive behavioral responses to a changing environment (Neuroscientists: Lorenzetti, Baxter & Byrne, 2011)

Goals of ABA as a Science:

A science provides description, prediction & control: Baer, Wolf & Risley-1968:

◦ 7 dimensions of ABA:

◦ applied - focus on areas of social significance;

◦ behavioral in that behavior changes;

◦ analytic by demonstrating believable control with data;

◦ technological-allow for replication;

◦ effective;

◦ conceptually systematic based on validated principles

◦ and show generalization (across contexts)

Strategies in ABA:

Applied Behavior Analysis (ABA):

<u>Stimulus-Response-Consequence</u>: a framework for understanding factors that elicit & control behavior (Bx).

- ◦ Positive Reinforcement: "r+" always increases Bx it follows
- ◦ Negative Reinforcement: successful escape- r+ increases Bx
- ◦ Differential Reinforcement
  - ◦ Planned Ignoring + Positive Reinforcement
- ◦ Token Economy Systems: to deliver doses of r+
- ◦ Discrete trial training: Simple Command-Child's Response- Immediate Feedback (reinforcing praise & event or gentle correction)

Powerful learning theory in Behavior

Classical & Operant conditioning occur in all animals, including humans. These 2 conditioning processes are the foundation for all learning.

These events even occur in the sea slug, *Aplysia, whose brain can be readily probed with electrodes*.

Conditioning occurs at the level of the individual organism, and…

Powerful-even at cellular & neural network levels

And at the level of brain cells: Neurons.

Lorenzetti, Mozzachiodi, Baxter & Byrne (2006). Cellular correlates of classical conditioning on synaptic properties:

(intracellular recordings from B51 Neuron of *Aplysia* show conditioned stimulus-evoked complex Post-Synaptic Potential (cPSP) following paired & unpaired training (in vivo & in vitro)

c   Paired
        Pre-test   Post-test

B51

                                            5 mV
                                            2 s

Unpaired
        Pre-test   Post-test

B51
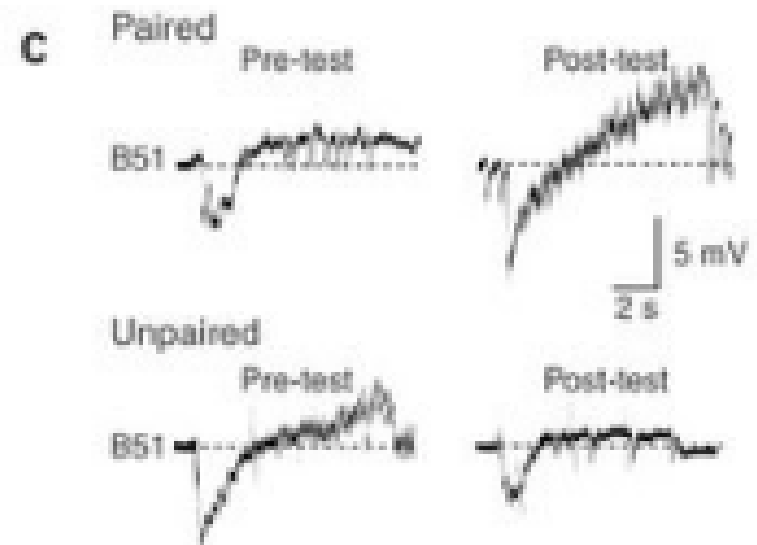
Selection by Consequences

1. A causal explanation for behavior (& learning) that relates behavior to environment.

2. Occurs on 3 levels:
   ◦ A. <u>Natural selection</u>: genetic inheritance is selected by the consequences of reproduction.
   ◦ B. <u>Ontogenetic selection</u>: selection of an individual's behavior based on consequences experienced over a lifetime.
   ◦ C. <u>Cultural selection</u>: selection of group practices based on consequences for group.

Operant Conditioning

We are born with sensitivities to consequences (especially those that occur within a half-second of our behavior! Timing is important).

2. Consequences that occur immediately after a behavior & the setting in which the behavior occurred become <u>paired</u> with that behavior & setting.

3. Pairing in time is an important mechanism for how behavior gets conditioned: 2 basic types of conditioning are Classical or "Reflexive" (not flexible) & Operant (very flexible).

4. Operant conditioning = pairing of a consequence after a bit of behavior. Each moment of our lives we experience such conditioning.

Learned or Unlearned Consequences?

1. Some consequences don't have to be learned.

2. If an unlearned consequence reinforces a behavior, this is called an unconditioned reinforcer, because it doesn't have to be paired with something else to have its reinforcing value (e.g. smell of food for dogs).

3. Food, drink & sleep are unconditioned, primary reinforcers. We are <u>born</u> sensitive to such primary reinforcers (genetically).
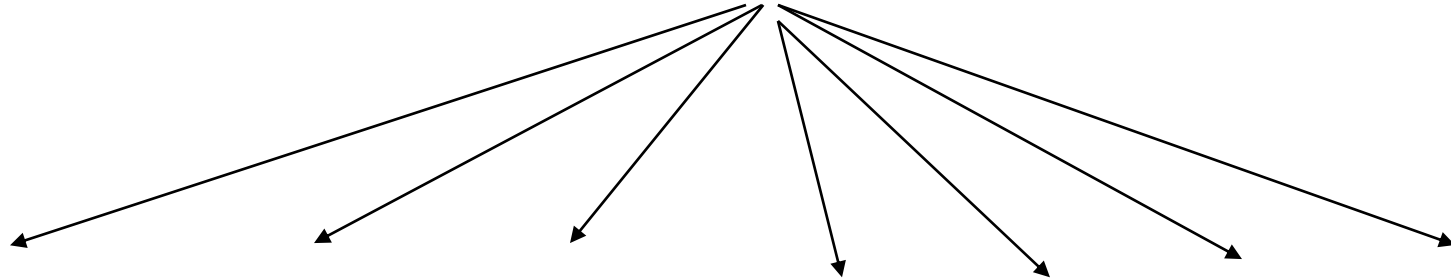
Conditioned Reinforcers

1. Other consequences have to be learned.

2. These are called conditioned reinforcers.

3. They are learned through pairing in time with other reinforcers. An example is the learned value of praise as a conditioned reinforcer, or the value of paper money!

Applied Behavioral Analysis

Task Analysis Shaping	Forward & Backward Chaining	Interrupt the Chained Response	Discrete Trials (DTT)	Time Delay	Prompt Fading	Technology PECS PRT Errorless Learning

Large Array of ABA procedures include but are not limited to:

Different "doses" or schedules of reinforcement

Differential reinforcement (what does & does not get reinforced & how powerfully reinforced)

Shaping behavioral skills in small steps

Chaining skill steps together to complete the skill

Behavioral momentum

Prompts & prompt-fading

Functional Assessments

Preference Assessments

Behavioral Skills Training

Functional Communication Training

Extinction- remove reinforcement for PBx

Discrete Trials Training (DTT)

Incidental & Naturalistic teaching

Self-Management & use of behavioral self-checklists

Activity Schedules

Generalization procedures & Maintenance procedures to generalize or maintain skill sets

Others

ABA helps parents guide their child in a positive manner

1. Structure routines & the day to prevent potential problems: Consider use of a visual schedule or daily chart of activities.

2. Give children positive attention for good behaviors & give specific praise.

3. Prompt new behaviors to redirect children from poor choices; teach new skills.

4. As much as possible, ignore attention-seeking undesirable behavior (problem behavior) unless it is a danger to the child and/or to others (Planned Ignoring).

5. Good parenting naturally employs skilled applying of behavioral principles, even if the parent doesn't know the science of Behavior Analysis.

Catch your child being good!

1. Promote enjoyable interactions between children & parents. Help children become skilled & independent.

2. Use praise & attention as reinforcement contingent on a bit of good behavior.

3. All evidence-based Parent-training programs in Mental Health use these principles: Triple P, PCIT, Incredible Years, Parent-Child Psychotherapy, Others

Power of Praise

Research supports:

Keep praise specific, totally positive, give it immediately (but don't interrupt the good Bx)

Incredible work, dude!

Awesome helping!

Great example for others!

You're a champ for sharing!

Check out www.youthonline

101 Ways To Praise A Child

101 Ways to Praise A Child

The behavior that works, stays!

1. Consequences matter!

2. We learn our good skills & our poor habits & misbehavior in the same way: through reinforcement.

3. Reinforcement is a type of consequence that we experience from our environment. It is any event, experience or item that follows a bit of behavior that will encourage more of that behavior in the future under similar circumstances.

The reinforcement guarantee

1. Any time a specific behavior recurs periodically in a child's "behavioral repertoire", that means that behavior is getting reinforced.

2. Behavior is lawful & predictable. Every behavior we do serves a function for us, & the function relates to the reinforcement we get for the behavior.

What is behavior?

Behavior is anything the person does: it involves movement. Focus of ABA is on behaviors that can be seen & measured (thoughts & feelings are private behavior).

A   B   C

Antecedent   Behavior   Consequence

The "ABC"

Think of behavior as a 3-part interaction or flow:

A	B	C
Antecedent	Behavior	Consequence

This is the fundamental "unit" of all behavior. It puts behavior in context & allows to be scientifically studied in a systematic way.

Be specific in defining the behavior. Avoid general terms that can't be directly seen.

More on the ABCs

Antecedents include events that set the stage for behavior (the setting): i.e. stimulus or trigger cues & motivating factors.

A   B   C

Antecedent   Behavior   Consequence

Work on antecedent events may allow prevention of some problem behaviors.

The critical "C" in ABC

Consequences are the motor that drives the chances that behavior will happen again

A	B	C
Antecedent	Behavior	Consequence

We are most sensitive to consequences that occur within ½ second of our behavior (timing in our nervous system).

ABA has pioneered EIBI:
Early Intensive Behavioral Intervention for young children, such as those with autism (but there are many other clinical applications across the life span)

Use developmentally appropriate curriculum starting at child's *developmental level (*regardless of age)

Skills taught in small, progressive steps: Use evidence-based procedures from ABA

EIBI follows a time-line of when to teach specific skills

The set of strategies to teach needed skills is called an ABA "program". Create many opportunities for a child to respond to specific learning tasks with repeated trials, keeping DATA.

Essential components of EIBI

EIBI is most effective if: > or = 4-5 days per week, multiple hours per day (up to 25-40 hours per week if family's schedule allows)

Probe initial skill levels for readiness to learn & in all developmental areas (receptive & expressive communication, gross & fine motor, problem-solving, personal-social).

Use gentle, effective error-correction procedures for child's errors.

Programs must be supervised by trained BCBA with the relevant clinical experience.

Quality ABA treatment

Meets the developmental needs for child & family, works toward catch-up gains & replacement of problem behaviors (PBx) with functional alternatives.

Collects progress data that should show substantial clinical & functional progress

Treatment is child & family focused- Aims to minimize core deficits & PBx while maximizing functional communication, independence & quality of life (Myers et al. 2007)

More on ABA treatment

Parental involvement & training strongly emphasized:

◦ Parents as expert on their child = high level of knowledge of their child's needs & what reinforces their child's behavior.

◦ "Train the trainer" model: Train parents to collect data, implement successful teaching strategies; promote generalization of child's skills across wide variety of settings.

◦ Train skills, reduce serious PBx (aggression, self-injurious behavior or "SIB", wandering away (eloping, running), property destruction, unsafe behaviors, other)

Resolving a Problem Behavior (PBx) and/or Teaching a Skill

Find Function of PBx. Change environment to address the function.

Teach acceptable replacement behavior that <u>serves same function.</u>

Break skills down into small steps: Teach each step with immediate reinforcement & error-free learning (prompt for success; plan on how to fade prompts).

Decrease behavioral excesses & increase skills.

Importance of Environment

1. Our environment supports our behavior. When there is a need for a change in behavior, change relevant aspects of the environment

2. We are in moment-by-moment interaction with our environment.

3. However, a problem behavior initially got started, there is something happening in the immediate environment that keeps the behavior going (some consequence that follows the behavior).

4. But screen for ACEs (Adverse Childhood Experiences), use Trauma-Informed Care strategies to build resilience & network with Mental Health counselors when needed to address the whole person.
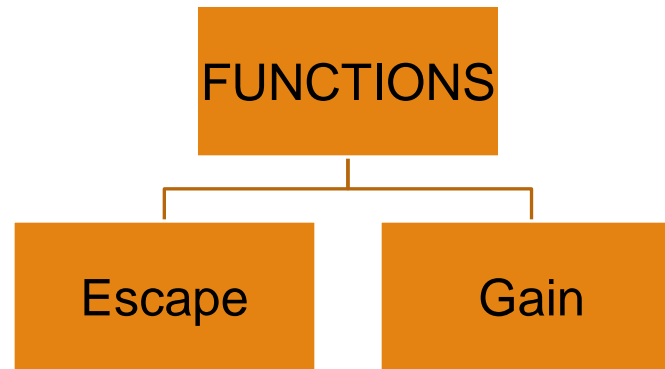
Functional Analysis

Identifies the environmental contexts in which problem behavior is likely & unlikely.

Identifies the consequences that reinforce & maintain the behavior (PBx).

Used to prescribe effective treatments.

Main functions of behavior

Escape: from harm, pain or from a disliked task or event.

 Gain: 1) sensory input, 2) tangible, material things, 3) attention, 4) power or control

5) relief- as in relief of anxiety and/or pain

Always start with the function!

The function of a person's behavior is valid for that person, but how they go about getting that function or need met may be problematic.

Prompt good, alternative behaviors that serve the same function, equally well or better.

Build skills! Don't assume the child already has the skills-they may not.

Common Functions of SIB

Social Positive Reinforcement (Attention, Tangible items)

Social Negative Reinforcement (Escape)

Automatic Reinforcement (e.g., Sensory Stimulation)

Many ABA strategies to reduce problem behavior: Here are 2

Planned Ignoring: for attention-seeking PBx

1. Planned ignoring is not really ignoring! It involves not responding to misbehavior that serves an attention-seeking function & it only works on attention-seeking Bx. Remove the reinforcement for the PBx.

2. Some misbehavior gets accidentally reinforced by paying too much attention to it. Some kids don't care if they get "good" or "bad attention."

Time Out: Concept was discovered by Behavior Analysis
◦ Give Time-out as a discipline when serious PBx such as aggression occurs. Never ignore aggression!

Interventions that don't address function of Problem behaviors (PBx) likely fail!

Social attention in the form of verbal disapproval significantly worsens self-injury (SIB) in ~ one-fourth of cases.

Time out significantly worsens SIB in ~ one-third of cases.

Extinction

1. Planned Ignoring is a type of Extinction Procedure. You want the PBx to extinguish by not attending to it, removing the attention that was reinforcing the behavior.

2. It only works on behavior _maintained by attention._

3. It's hard to do. Never use Planned ignoring for dangerous behaviors, or when you are not in complete control of the reinforcer.

4. Giving in & attending to an attention-maintained misbehavior will only strengthen the misbehavior for the future, making it relatively resistant to extinction.
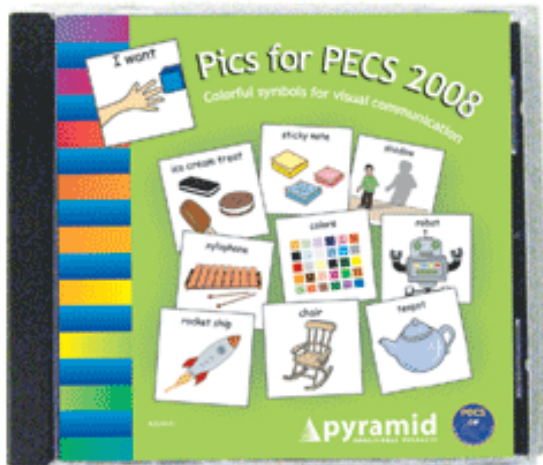
Teach communication- Many Strategies! PECS (Picture Exchange Communication System)

Andy Bondy Ph.D. & Lori Frost M.S., CCC-SLP

Studies show increase in functional communication for non-verbal kids.

6 phases of PECS; 1st phase must be taught with 2 people

Many clinical uses of ABA

ADHD- Teach impulse-control; how to tolerate waiting to make better choices

Traumatic Brain Injury- FCT, re-teach self-help skills, decrease PBx

Geriatric Medicine & Dementia: FCT, decrease PBx

Psychiatric Hospitals: ABA was first applied in Adult psychiatric wards in the 1960s to make psychiatric nursing easier, decrease patient PBx
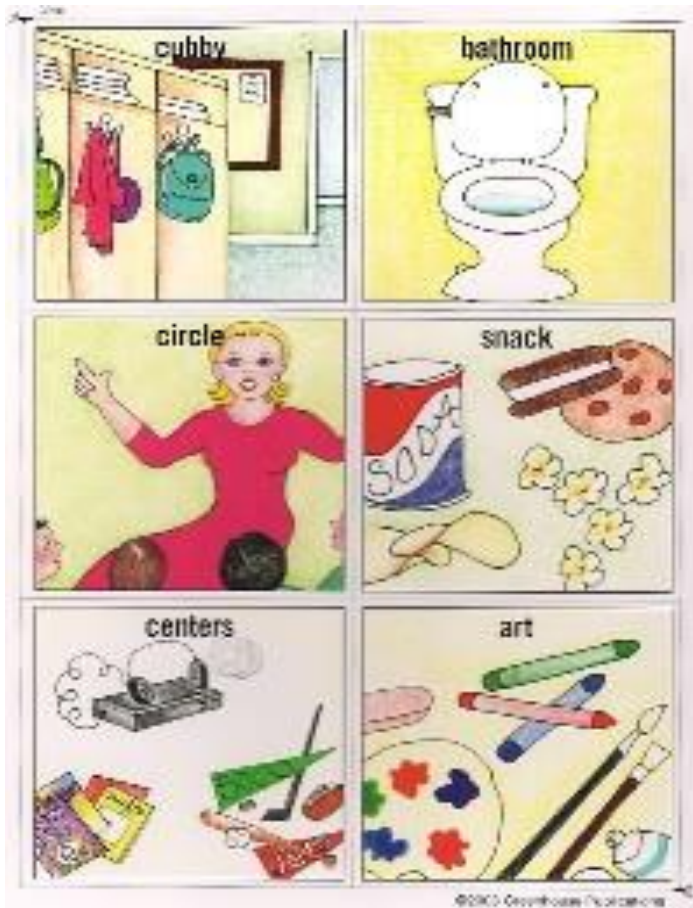
Other

Important to work in a multi-disciplinary fashion

Use Visual Supports: Schedules

Set the deal with the child.

All children need to know where they are going, what they are supposed to do, how do they know when they are done, what they get for it & what comes next.

Visual Schedules

First: the required task or activity, modified as needed.
Then, earn preferred activity.

Token Boards:

1. Token boards give a visual way for both parent & child to count good behaviors.

2. Tokens become a conditioned reinforcer, paired with immediate praise.

3. Timing is important.

Social Competence versus Deficits

Social Competence: complex set of skills:

Includes effective peer interactions (McConnell & Odom, 1986) & ability to make friends.

Childhood social deficits correlate with later adjustment problems, mental health issues, alcoholism & other interpersonal problems (Strayhorn & Strain, 1986; Bellini, 2006).

Often, a lack of "know-how" more than true lack of "social interest" in persons with ASD (social deficits may relate to severe anxiety). Social skills also an issue in ADHD & other conditions.

Functional Social Behaviors we need

Greetings; Eye contact

Initiate, respond to Joint Attention

Initiate play; pretend play & socio-dramatic play

Appreciate humor

Answer yes/no questions

Answer simple questions with 1-2 word reply

Answer open-ended questions

Good listening skills

Respond to non-verbal cues

Respond to a statement with a question

Respond to a question with brief statement and reciprocal question

Respond to a statement with a statement followed by a question.

Conversational manners (turn-taking; staying on-topic; topic transitions, voice modulation)

Label emotions in self & others

Give & seek comfort

Show empathy & social judgment

Solve conflicts: Relationship-repair

Strategies to teach social competence

Dr. Scott Bellini, University of Indiana: "5-Step Model":

1. Assess social functioning

2. Find Skill Acquisition & Performance Deficits

3. Select Intervention

   Strategies

4. Implement Intervention

5. Evaluate & monitor

   progress; aim for

   generalization.

Pivotal skills (PRT)

Incidental teaching

Cooperative learning groups

Peer-Mediated (modeling; tutoring = "buddy")

Thoughts & Feelings Activities; Social scrip

Social Stories (Carol Gray)

Role Playing/Behavioral Rehearsal

Video Modeling (**VM**) and Video Self-Modeling (**VSM**)

Self-management programs

Other

Peer-mediated techniques

1) Proximity (peer modeling): place typical, socially competent peers with children with special needs (ADHD, autism, other).

2) Prompt/reinforce interventions: training peers

to prompt social behaviors & reinforce them.

3) Peer initiation training teaches typical peers

how to initiate to the child with special needs: teach peers to comment, not just make requests/ask questions.

(Note: data shows 2 & 3 are more effective than proximity alone. Peer modeling often lacks salience for children with autism)

Strategize to generalize!

Stokes & Baer "An implicit technology of generalization", **JABA 1977; 10(2): 349–367.** :

◦ Actively program for generalization

◦ Avoid reliance on only "Train and Hope"

◦ Listed 8 strategies contributing to technology of generalization (with more added as technology has evolved): involves such things as train "loosely" & not under strict control of very specific stimuli; teach multiple examples of the thing being taught; train across different people & different environments; train in the natural setting or with things from natural settings)

Generalizing social competence

Studies that resulted in successful generalization of social skills most often targeted:

◦ 1. Initiations to Peers.

◦ 2. Conversation with Reciprocal Interaction

◦ 3. Responding to & sharing with Peers

(Chandler et al., JABA, 1992, 25, 415-428)

More on generalization

Chandler et. al: Most successful social skills trainings plan generalization:

◦ Address functional target behaviors

◦ Specify a fluency criterion

◦ Use reward contingencies child can't easily predict (i.e. if child rewarded for being on-task every 5 minutes, they may goof off until end of 5 minute interval!)

◦ Train across settings, people and tasks; train loosely & NOT under tight control.

Video Modeling Resources & Research

Model Me Kids programs, with many DVDs at www.modelmekids.com

Watch Me Learn programs, at www.watchmelearn.com

Video Self-Modeling

Research:

Charlop & Milstein JABA 1989, 22, 275-285

Bellini & Akullian, Exceptional Children, 3/22/2007.

SENSE Theatre

SENSE Theatre is a 501(c)(3) non-profit organization

Founded by Dr. Blythe Corbett, Vanderbilt

SENSE Theatre
A Stage of Hope For Children With Autism

Sense Theatre
Wizard of Oz

Behavioral therapy can be fun!

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Many Helpful Books:

GENERAL:

Evidence-based treatment for children with Autism: the CARD model by Dr. Doreen Granpeesheh et al.

Getting Started: Developing critical learning skills for children on the autism spectrum by Dr. James Partington

Behavioral intervention for young children with Autism by Drs. Catherine Maurice & Gina Green.

SOCIAL SKILLS:

Navigating the Social World by Jeanette McAfee M.D.

The Unwritten Rules of Friendship by N. Elman & E. Kennedy-Moore.

Teaching Social Skills to Youth by T. Dowd and J. Tierney

Building Social Relationships by Scott Bellini Ph.D.

Books by Michelle Garcia Winner; Steven Gutstein Ph.D. & others

Thank you!