Evidence-Based Interventions for School and Home

Blythe A. Corbett, Ph.D.
James G. Blakemore Chair and Professor,
Vanderbilt University Medical Center

Cyprus September 2024

1

Evidence-Based Interventions

- Scientific Evidence How to Identify Evidence-Based Practices (EVP)
- Review several EVP Strategies for use in the School and Home
- Peer Instruction, Modeling and Video Modeling
- Brief overview of Applied Behavior Analysis

2

Hume et al., Evidence-Based Practices for Children, Youth and Young Adults with Autism

Journal of Autism and Developmental Disorders (2021) 51:4013–4032

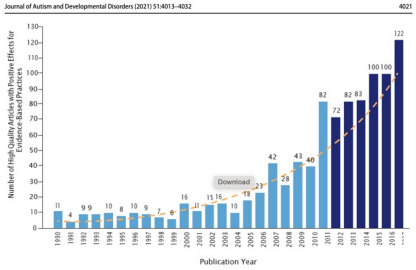


Fig. 3 Increase in accepted articles across time

3

Scientific Evidence

Scientific evidence is obtained through observation, collection and documentation of behavior through an experiment

An **experiment** means intentionally delivering a treatment to a group of participants to determine the effect

Experimental design is the process of conducting research in an objective and controlled manner that is precise, in which conclusions can be drawn based on hypotheses.

4

Design Components

Steps: research question, testable hypothesis, control variability, sample from a population, assign to experimental conditions, and select empirical measures.

Randomization: randomly assign study participants who are similar in key characteristics to two or more conditions (e.g., experimental vs. control group).

Experimental Group: the participants receive the intervention

Control group: the participants do not receive the intervention

Objective measures: measured consistently, be quantified and without bias.

Replication: reproducing a study to determine if achieve the same results

5

Evidence-Based Practices (EBP)

Evidence-based practice is based on empirical, scientific evidence that examines the efficacy of an intervention

Focused intervention practices: selection and use of specific instructions or strategies that address an individual learning goal (Hume et al., 2021).

Teachers and providers select strategy based on child and learning goal.

Comprehensive program models: package or set of practices to target a broad developmental goals (e.g., early behavioral intervention programs).

6

Evidence-Based Practices

The National Clearing house on Autism Evidence and Practice Review Team (Steinbrenner et al., 2020) and Third Generation Review (Hume et al., 2021).

Reviewed 31,779 abstracts, 972 studies of practices individuals < 22 years.

Defined scientific evidence as "*peer-reviewed journal of an experimental study of acceptable methodological quality that addresses the efficacy of a focused intervention practice.*"

Identified 28 evidence-based practices showing positive effect with autistic children and youth.

7

28 Evidence-Based Practices

Antecedent-Based Interventions	Reinforcement	Prompting
Naturalistic Intervention	Differential Reinforcement	Technology aid
Ayres Sensory Integration	Response Interruption/Redirection	Time Delay
Parent-Implementation	Direct Instruction	Modeling
Augmented Alternative Communication	Social Narratives	Video Modeling
Peer-Based Instruction & Intervention	Exercise & Movement	Music Mediated
Behavioral Momentum	Social Skills Training	Visual Supports
Prompting	Functional Communication	Extinction
Cognitive Behavioral Strategies	Functional Behavioral Assess	Task Analysis

8

28 Evidence Based Practices

Antecedent-Based Interventions	**Reinforcement**	**Prompting**
Naturalistic Intervention	Differential Reinforcement	Technology aid
Ayres Sensory Integration	Response Interruption/Redirection	Time Delay
Parent-Implementation	Direct Instruction	**Modeling**
Augmented Alternative Communication	Social Narratives	**Video Modeling**
Peer-Based Instruction & Intervention	Exercise & Movement	**Music Mediated**
Behavioral Momentum	**Social Skills Training**	**Visual Supports**
Prompting	Functional Communication	**Extinction**
Cognitive Behavioral Strategies	Functional Behavioral Assess	**Task Analysis**

9

Reinforcement

The application of a consequence following a learner's use of a desired response or skills that increase the likelihood that the learner will use the response/skills in the future.

A response following a student's use of a desired behavior or skill that increases the likelihood that the behavior or skill will occur again.

Examples: praise, access to preferred activity

10

Examples of Positive Reinforcement in the Classroom

- Giving praise – "*Great job sitting quietly!*"
- Using token economy systems
- Giving prizes, stickers, privileges, etc. for desired behavior

11

Reinforcement vs Bribery?

What's the difference?

Reinforcement is presented AFTER the behavior has occurred

Bribery is presented BEFORE the behavior occurs in an attempt to coax the individual to perform the behavior

12

Factors Influence Effectiveness of Reinforcement

- **Immediacy**
  A stimulus will be more effective as a reinforcer when it is delivered immediately following the behavior.
- **Contingency**
  A stimulus will be more effective as a reinforcer when it is delivered contingent on the behavior. Should use behavior specific praise.
- **Motivating Operations**
  Deprivation and satiation will make a stimulus more or less effective as a reinforcer at a particular time.
- **Characteristics of the consequence**
  Reinforcers vary from person to person. Generally, a more intense stimulus will be a more effective reinforcer.

13

Side Effects of Positive Reinforcement

- Allows the person to explore options and/or curiosities
- Allows for faster generalization to occur across behaviors and settings
- Transform neutral settings into positive ones
- Learning occur faster

14

2. Negative Reinforcement
   - Avoidance or escape of an undesirable event immediately follows a behavior that increases the likelihood of avoidance or escape behavior in the future

Avoid - = ↑ behavior

15

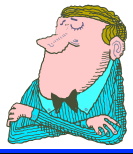
Examples of Negative Reinforcement in the Classroom

- Taking away a homework assignment for good behavior
- Shortening class time if students behave well during the lecture
- Removing attention from an undesirable behavior (e.g., whining)

16

Extinction

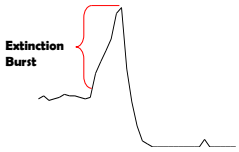
- When reinforcement is no longer delivered following a behavior, the behavior will no longer be engaged in. In other words it will be extinguished.
- This can be in the form of minimizing attention, planned ignoring or not allowing access to an item/activity.



17

Extinction Burst

- When an extinction procedure is in place, extinction bursts may occur before a subsequent decrease in behavior.



18

Extinction Bursts

- Extinction bursts can escalate already difficult to deal with behaviors
- Behaviors in extinction bursts can be dangerous and difficult to deal with clinically and ethically.
- For this reason, avoid using extinction for intense/physical behaviors in this setting

19

Task Analysis

- Observe behavior to be learned
- List components in order of occurrence
- List subskills required for successful performance

20

Example of Task Analysis in Classroom

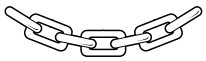
- Task: End of school departure routine
- Components:
  - Put away anything on your desk
  - Get backpack from hook
  - Put lunch box and take-home folder in backpack
  - Close backpack
  - Sit at desk until teacher tells class to line up

21

Chaining

Behavior already in the repertoire reinforced in a sequence to produce a more complex chain of behaviors

Forward (e.g., counting 1-10) or backward (e.g., putting on pants)



22

Example of Chaining in Classroom

Behavior = Unzip backpack

Chain

- Unzip backpack
- Take out folder
- Bring folder to desk
- Sit down at desk

23

Shaping

Start with elements of a behavior in which the individual will immediately be successful – an "approximation" of the behavior

Reinforce closer approximations

24

Example of Shaping in the Classroom

Goal = student sits quietly for 20 minutes

Start by reinforcing student for sitting quietly every 2 minutes

Increase time interval between reinforcements until goal of 20 minutes is reached

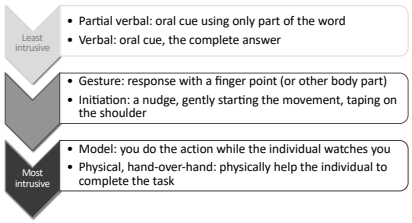
25

Prompts & Fading

- Verbal, gestural, or physical assistance given to learners to support them in acquiring or engaging in a targeted behavior or skill.
- Prompts are added to lead the individual to the correct response
- Fade prompts in small, gradual steps
- Prompts should use the least intrusive level possible – don't over prompt!

26

Prompt Levels



27

Behavioral Momentum

Presenting a series of instruction with high probability of compliance (*point to toy*) immediately before instruction of a low probability behavior (*share toy*) (Davis et al., 1994).

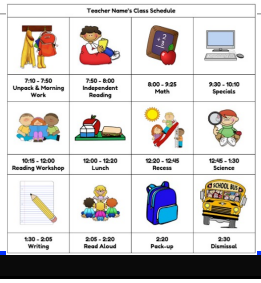
28

Schedules

- Presentation of a task list that communicates a series of activities or steps required to complete a task. Often supplemented with other interventions, such as reinforcement.
- Examples include:
  - ✓ Written words
  - ✓ Pictures
  - ✓ Work stations

29

Visual Schedules in the Classroom



30

First-Then Boards

A visual support that includes reinforcement.

First-Then Boards can be use for a variety of behaviors and activities, such as:

- Non-preferred activities
- Independent work time
- Task completion

FIRST complete the non-preferred activity THEN receive preferred activity

31

TN-TAN | Vanderbilt Kennedy Center Treatment and Research Institute for Autism Spectrum Disorders

First	Then

32

Naturalistic Teaching Strategies

- This intervention uses primarily person-directed interactions.
- Examples include:
  - Stimulating environment
  - Modeling how to play
  - Encouraging conversation
  - Providing choices
  - Reinforcing approximations…shaping.

33

Peer Training Packages

- Interventions involving teaching individuals without disabilities strategies for facilitating play and social interactions for individuals on the autism spectrum
- Examples include:
  - Peer networks
  - Circle of friends
  - Buddy skills

34

Story-Based Intervention Package

- Written description of the situation under which specific behaviors are expected to occur.
- Examples include:
  - Social Stories™
  - Answer "who", "what", "where", "when" and "why" questions in order to improve perspective taking.

35

Story-Based Examples in the Classroom

36

Modeling

- Adult or peer providing demonstration of the desired behavior that should result in imitation.
- Examples include:
  - Prompting and reinforcement
  - Video modeling
  - Live modeling

37

Peer-Based Instruction and Intervention

Interventions in which peers directly promote autistic children's social interactions and/or individual learning goals.

Peers can also help teacher organize the social context, provide support, help child engage in social interactions:

- play groups, social network groups, recess

- prompts, reinforcement

38

Peer Criteria

Peer Selection:

- Be similar in age
- Motivated to participate
- Accepting of children with autism
- Strong social communication skills
- Reliable

Peer Training:

- Teach peer about autism
- Share about students likes, strengths, challenges
- Teach strategies like reinforcement, turn-taking, modeling

39

Peer Activities & Support

Activities:
- Short structured activities
- Provide prompts as needed
- Praise peer for use of strategies, support, maturity, patience
- Praise autistic child for use of social skills, engagement

Fading:
- Fade support once peer engagement is appropriate and comfortable
- Provide periodic reinforcement
- Be available for questions and guidance

40

Video Modeling

A video-recorded demonstration of the targeted behavior or skill shown to the learner to assist learning in or engaging in a desired behavior or skills.

41

Video Modeling

- Video modeling has yielded better results than live modeling in some people with autism (Charlop-Christy, Le, & Freeman, 2000; Haring, Kennedy, Adams and Pitts-Conway, 1987).
- Improve emotion perception (Corbett, 2003)
- Restrict field of view, facilitates repetitive learning, enhances generalization, children inherently motivated by medium (Corbett & Abdullah, 2005)

42

Observational Learning
Bandura,1986

Four processes necessary for observational learning
(learning by observing others)

1. ATTENTION 2. RETENTION

3. PRODUCTION 4. MOTIVATION

43

Video Modeling Facilitates Observational Learning in autism by:

- Attention: selectively focusing autistic child's behavior on relevant stimuli
- Retention: maintain learned material through repetition

Corbett & Abdulla 2005

44

Video Modeling Facilitates Observational Learning by:

- Production: reproducing observed behavior through rehearsal and practice
- Motivation: rewarding all attempts and progress

45

Generalization of Skills

- To other people, situations, settings
- Methods that facilitate:
  - *Incidental teaching* (natural situations)
  - *Time delay* (prompt gradually delayed)
  - *Video modeling*

46

28 Evidence-Based Practices

Antecedent-Based Interventions	Reinforcement	Prompting
Naturalistic Intervention	Differential Reinforcement	Technology aid
Ayres Sensory Integration	Response Interruption/Redirection	Time Delay
Parent-Implementation	Direct Instruction	Modeling
Augmented Alternative Communication	Social Narratives	Video Modeling
Peer-Based Instruction & Intervention	Exercise & Movement	Music Mediated
Behavioral Momentum	Social Skills Training	Visual Supports
Prompting	Functional Communication	Extinction
Cognitive Behavioral Strategies	Functional Behavioral Assess	Task Analysis

47

Questions?

48