Discovering Evidence-Based Practice: What Does Research Tell Us?

John D. Molteni, Ph.D. BCBA-D
Saint Joseph College
Outline for Today

• Discuss how one should read and understand research

• Discuss how one determines evidence-based practice

• Discuss the current state of research in ASD Interventions
Introductions

- Who I am
- Who are you
- Questions right off the bat?
Evidence-based practice is (Hoagwood et al, 2001)

- A body of scientific knowledge about service practices (e.g. referral, assessment, treatment)
- Knowledge base created from applying scientific method to practices that impact the individual and/or family
- The quality, robustness or validity of scientific evidence
Why do we care?

- Evidence-based practice allows for a common ground for practitioners, caregivers and the individuals to discuss potential treatment effects.
- Allows for delivering scarce resources to those treatments that, when implemented with fidelity, will lead to positive outcomes.
- Evaluating effectiveness is a legal requirement:
  - IDEA
  - Insurance funding
Domains of Evidence (Kazdin, 1999)

- Theoretical
  - Is there a theory to relate a mechanism of a particular clinical issue

- Basic Research
  - Assess validity of mechanism

- Preliminary Outcome Research
  - Intervention leads to change

- Process-Outcome Connections
  - Evidence that outcome was due to intervention
Criteria

  - Supported by group or single-subject design
  - Clearly described characteristics of subjects
  - Two or more group studies must show
    - Better than medication, placebo, or alternative treatment
    - Equivalent to already established treatment
  - Nine single subject studies that demonstrate better or equivalent outcomes
Assessing Interventions

- Peer reviewed journal
- Group Design
  - Randomized, controlled studies with blind raters
- Single Subject Designs
  - Withdrawal, multiple baseline, or variations
- Defined Participants
- Defined target behaviors
- Reliability of observers/Procedural Integrity
Assessing Interventions

- Theoretical framework
  - Supported or conceptual
- Defined procedures
- Repeated measurements
- Control of other influences
- Functional outcomes
- Clinical vs. Statistical Significance
- Discussion of limitations/future research
Assessing Interventions

• Overlap in techniques used in interventions should be identified
  ▫ Example: “Contemporary” ABA and developmental approaches

• Hypotheses of “private” or subjective mechanisms
  ▫ Difficulty in measurement

• Correlation vs. Causation

• Importance of replication
NYS Dept of Health

- Criteria for inclusion of studies
  - Evaluate functional outcomes
  - Group design with random assignment, control group and equivalent measure
  - Single subject design with defined procedures (external validity), discussion of threats to internal validity and an approved design:
    - Reversal
    - Multiple Baseline
    - Alternating or Simultaneous Treatments
  - 3 or more subjects
- Applicability – Age of children studied within Report range
Criteria

• Strong Evidence – Evidence from 2 or more studies that meet criteria of adequate evidence about efficacy
• Moderate Evidence – At least one study that meet criteria for adequate evidence
• Limited Evidence – One study with adequate evidence and minimal applicability
Program Recommendations

Strong Evidence

- Target behaviors be clearly identified and defined with developmentally appropriate mastery criteria
- Baseline data and ongoing monitoring
- If intervention not effective within a time period, intervention should be modified or changed
- Appropriate supervision of paraprofessional support and coordination to achieve goals
Behavioral and Educational Intervention

Strong Evidence

• Applied Behavior Analysis
  ▫ Minimum 20 hrs per week
  ▫ Parents active participants in goals setting and intervention

• Techniques
  • Prompting
  • Modeling
  • Fading
  • Reinforcement

• No use of aversives
Behavioral Educational Intervention
Limited Evidence

• Communication Instruction
  ▫ Prompting and reinforcement for improving language skills
  ▫ Training of parents to prompt and reinforce approximations in the natural environment
  ▫ Training of peer models
  ▫ Augmentative communication systems (PECS, sign language) to support language
Other Interventions

- **DIR Model (Floortime)**
  - No evidence of effectiveness but some common characteristics of effective programs
  - Intensity may take away time from other proven interventions

- **Sensory Integration**
  - No evidence of effectiveness, may be benefits from physical activity involved in SI
Other Interventions

- **Auditory Integration Therapy**
  - Lack of efficacy and expense

- **Facilitated communication**
  - Messages coming from facilitator
  - Emotional distress of families from messages

- **Music Therapy**

- **Gluten/Casein Free Diets**
  - Useful if identified food allergy

- **Secretin**
  - Weak theoretical link, no efficacy data
National Research Council (2001)

- Review of Literature

- Recommendations
  - Full day, 5 day program (25 hours minimum)
  - Include parent training
  - Defined objectives
  - Measurement
  - Areas of intervention – Communication, social, play, cognitive, problem behavior, and functional academics

- Nonspecific intervention recommendations
National Autism Center (2009)

- Review of literature from 1957 – 2007
- Inclusionary and exclusionary criteria for inclusion in review
  - 1,060 peer reviewed studies
  - Individuals under 22 years of age
  - Behavioral and educational interventions
- Scientific Merit based on type of research and outcome achieved
  - Well controlled variables
- Outcomes described in terms of skill area, age and diagnosis where evidence is available
Established Treatments

- Scores of 3, 4 and 5 on Scientific Merit ratings
  - 2 group or 4 single subject designs w/ 12 participants
  - 3 group or 6 single subject designs w/ 18 participants
- Included
  - Behavioral interventions
    - Antecedent Interventions, Behavioral Package, Comprehensive behavioral treatment for young children, naturalistic teaching strategies
  - Joint Attention Intervention
  - Schedules
  - Self-management
  - Story–based interventions – (e.g., Social Stories)
Emerging Treatments

• Score of 2 on Scientific Merit Scale
  ▫ Based on 1 group or 2 single subject w/ 6 participants
• Included
  ▫ AAC
  ▫ Developmental – relation based interventions (e.g., Floortime, RDI)
  ▫ Exercise
  ▫ Exposure therapy
  ▫ Massage/touch therapy
  ▫ PECS
Unestablished

• Scores of 0 or 1 on Scientific Merit
  ▫ No supported research or research of poor quality
  ▫ Pseudoscientific approaches – testimonials or clinical speculation
  ▫ Ineffective or adverse treatment effects

• Included
  ▫ Auditory integration therapy
  ▫ Facilitated communication
  ▫ Sensory Integration
  ▫ GFCF Diet
  ▫ Academic Interventions
Ineffective/ Harmful

- Score of 3 on Scientific Merit
  - Same criteria for numbers of studies and subjects as established treatments
  - No beneficial treatment effect or adverse treatment effects
- Included
  - None!
What does this mean?

• More research needed
• Interventionists must treat intervention as an experiment
• Flexibility of approach
• Define goals and techniques
• Outcomes must be functional
• Control for confounds – One thing at a time
Science, Pseudoscience, Anti-science

- **Science**
  - Proposes hypotheses, evaluates them empirically
  - Supported by objective data, not impressions

- **Pseudoscience**
  - Science-”ish”
  - Use complex language, “experts” and testimonials rather then evaluating their claims

- **Anti-science**
  - No objective truth, only personal interpretations
  - You can’t measure me!
Additional Considerations

- **Professional/ Clinical Input**
  - Necessary to determine when best to use a particular evidence-based intervention
  - Insufficient as only means of determining intervention
  - Must have a foot in the research literature

- **Student/Client/Patient concerns**
  - Social Validity and face validity of treatments

- **Capacity to carry out interventions**

- **Understanding mechanisms that underlie interventions**
  - Proposed mechanism may be explained more parsimoniously by another
Don’t just stand there, teach something (that has an evidence base)!
Questions and Answers