Measuring the Effectiveness of School-Based Interventions for Children with Serious Behavior Problems

Mary Wagner, Ph.D., W. Carl Sumi, Ph.D., Michelle Woodbridge, Ph.D.
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Outline of Presentation
- Describe purpose of the Behavior Research Centers (BRC) and the National Behavior Research Coordination Center (NBRCC).
- Provide overviews of each BRC
- Provide overview of the NBRCC including:
  - Data coordination
  - Data synthesis
  - Data analyses
  - Dissemination of findings

Purpose of Behavior Research Centers (BRCs)
- To support rigorous efficacy and effectiveness evaluations of empirically based interventions designed to reduce severe behavior problems.
- To promote achievement and positive social development among children with severe behavior problems.

Purpose of National Behavior Research Coordination Center (NBRCC)
- To coordinate, synthesize, and analyze data and findings from the four BRCs.
- To foster dissemination of knowledge on effective practices to consumers, practitioners, and policymakers.

Behavior Research Center (BRC) Overviews

University of Oregon
University of South Florida & University of Colorado at Denver
University of Washington
Vanderbilt University, University of Minnesota, & Virginia Commonwealth University

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University of Oregon

- Hill Walker, Ph.D., Principal Investigator
- First Step to Success
  - Secondary-level intervention
  - Includes three components:
    - Universal screening
    - Classroom intervention
    - Family-based intervention
  - Approximately a 3-month process
  - Implemented in Albuquerque Public School district.
  - 256 students in 1st through 3rd grade from 16 elementary schools.

University of Oregon

- Universal Screening
  - Systematic Screening for Behavior Disorders (SSBD)
    - Teacher nominates and rank orders behaviors of each student in the classroom.
    - Three students in each classroom are expected to be identified as exhibiting severe externalizing behavior problems.
    - One student (and his/her family) will be selected from each class to participate in the First Steps intervention.

University of Oregon

- Classroom Intervention
  - Teaches young children the behaviors and approaches to learning that will lead to school success.
  - Behavior coach instructs the student on appropriate social behavior for a period of one week.
  - Provides feedback and rewards for positive behavior.
  - Teacher assumes control under the supervision and support of the behavior coach after the first week.
    - Student continues to receive feedback and positive reinforcement for the remaining 11 weeks.
    - In final 10 days of the intervention, the student receives no points or rewards.

University of Oregon

- Family-based intervention
  - Intervention is implemented concurrently with the classroom component.
  - Behavior coach teaches the parents how to work with the child:
    - To interact positively with teachers and peers
    - To complete school work.
  - Parents receive reports about their child’s progress at school.
  - Six home visits are conducted over 11 weeks.

University of South Florida & University of Colorado at Denver

- Drs. Don Kincaid, Glen Dunlap, and Phil Strain, Principal Investigators
- Prevent-Teach-Reinforce (PTR)
  - Tertiary-level intervention
  - Builds on Positive Behavior Support (PBS) in the schools and standardizes the approach in five steps:
    - Team development
    - Goal setting
    - PTR assessment
    - PTR intervention
    - Evaluation
  - Implemented in Fort Collins and Grand Junction, Colorado and Hillsborough and Pinellas Counties in Florida.
    - 200 students in 1st through 3rd grade from 15 elementary schools
### University of South Florida & University of Colorado at Denver

- **Goal Setting**
  - Team engages in a process to develop a shared vision for:
    - Academic/curricular objectives
    - Social development
    - Behavioral adjustment
    - Educational setting
  - Team defines short term objectives in operational and measurable terms.
  - Team obtains baseline data on target behaviors related to short term objectives.

### University of South Florida & University of Colorado at Denver

- **PTR Assessment**
  - Team conducts a functional assessment.
    - Each team member independently answers a series of questions related to:
      - Observed antecedents of target behaviors
      - Functions of the target behaviors
      - Consequences ordinarily associated with the target behaviors
  - Synthesized answers lead logically to the development of intervention components in the three elements (prevent, teach, reinforce).

### University of South Florida & University of Colorado at Denver

- **PTR Intervention**
  - Team selects appropriate intervention components from a menu of options.
    - Interventions are rated on expected effectiveness, ease of use, and likelihood of implementation.
  - At least one intervention strategy is selected for each of the PTR components (prevent, teach, reinforce) based on ratings and match to functional assessment information.
  - PTR Consultant provides up to 12 hours of on-site assistance and coaching to the implementer(s).
  - PTR Consultant completes fidelity ratings.
    - If fidelity ratings are low (< 80%), PTR consultant provides additional coaching or meets with team to reevaluate and identify alternative interventions that align with functional assessment outcomes.

### University of South Florida & University of Colorado at Denver

- **Evaluation**
  - Primary implementer and other team members, as appropriate, complete daily observational ratings.
  - After implementation with high fidelity, post-implementation evaluations include a review of:
    - Implementer’s ratings of effectiveness, fidelity, and acceptability
    - PTR Consultant’s fidelity rating
    - Direct Observation Rating Forms

### University of Washington

- **Doug Cheney, Ph.D., Scott Stage Ph.D., Co-Principal Investigators**

- **Check, Connect, and Expect (CC&E)**
  - Secondary-level intervention
  - Modeled after “Check and Connect” and the “Behavior Education Program”
  - Includes two components:
    - Check, Connect, and Expect (CC&E)
    - Functional Behavioral Assessment (FBA)
  - Implemented in three school districts in Washington State.
    - Nearly 400 students in 1st through 3rd grade from 18 elementary schools.
University of Washington

- Functional Behavioral Assessment (FBA)
  - If first level of intervention (CC&E) is not potent enough, students progress to this more intensive and individualized tertiary-level.
  - Daily Progress Report results identify students with excessive challenging behaviors.
  - Triggers the implementation of the Teacher Functionally-Behavioral Assessment Checklist (T-FBAC).
  - After 3 T-FBACs, the behavior specialist summarizes data in a functional behavioral hypothesis, including 4 possible interventions:
    - Differential reinforcement for teacher attention
    - Differential reinforcement for escape
    - Group contingency for peer attention
    - Social skills instruction

Vanderbilt University, University of Minnesota, & Virginia Commonwealth University

- Classroom Organization and Management Program (COMP)
  - Comprehensive professional development program designed to create classroom environments more conducive to learning.
  - Primary goal is to equip teachers with the skills necessary to systematically plan for, implement, and maintain effective instructional strategies.
  - Teachers become better managers of their classrooms and thereby maximize student learning.
  - Grounded in four foundational premises:
    - Effective classroom management is proactive, not reactive.
    - In effective classrooms, management and instruction work together.
    - Students are active participants in the learning environment.
    - Teachers working together synergistically help one another.
  - COMP will be supplemented by training teachers in self-monitoring procedures, focused on the frequency of praise statements and opportunities to respond.

Vanderbilt University, University of Minnesota, & Virginia Commonwealth University

- Academic Tutoring
  - Uses an accelerated Direct Instruction reading program, Horizons Fast Track A-B
  - Empirically demonstrated as effective with students with disabilities
  - Quick-paced and provides colorful and visually appealing instructional materials
  - Via a repeated reading strategy, the curriculum targets:
    - Word attack (letter sounds, phonemic awareness, word reading, story reading, and comprehension)
    - Letter printing
    - Spelling
    - Sentence writing
    - Fluency training

Vanderbilt University, University of Minnesota, & Virginia Commonwealth University

- Peer Group Contingency Intervention: “Good Behavior Game”
  - A group contingency classroom management procedure
  - Designed to reduce problem behavior in the classroom
  - Decreases levels of aggression, disruption, and shy behavior
  - Increases on-task behavior during instructional times

National Behavior Research Coordination Center (NBRCC) Overview

- Drs. Joe Wehby, Jennifer McComas, and Kevin Sutherland, Principal Investigators
  - Secondary-level, classroom-based intervention directed toward:
    - Students receiving special education services in self-contained classrooms
    - Students in general education classrooms who are at risk
  - Implemented in three school districts in Tennessee, Minnesota, and Virginia
  - 360 students in 1st through 3rd grade from 24 elementary schools

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NBRCC Objectives

- Facilitate a collaborative partnership with the BRCs and other Executive Board members to:
  - Enhance the designs of the interventions and their evaluations
  - Create opportunities for learning and sharing ideas.
- Contribute methodological expertise to:
  - Enhance the rigor of BRC research
  - Ensure research meets high standards
- Conduct a multimethod, cross-site evaluation to assess context, implementation, impacts, and social validity

NBRCC Executive Board Members

- BRC Principal Investigators
  - Mark Dynarski, Mathematica Policy Research
- Russell Gersten, Instructional Research Group
- Frank Gresham, Louisiana State University
- Kimberly Hoagwood, Columbia University
- Gayle Porter, Mental Health Resource Specialist
- Russ Rumberger, University of California, Santa Barbara

Purpose of NBRCC Executive Board

To assist NBRCC to:
- Review and refine BRC designs
  - To optimize research significance, rigor, and integrity
- Develop guiding research questions
- Select and develop cross-BRC instrumentation
- Establish cross-BRC data collection and analysis procedures
- Advise on dissemination strategies and formats
- Review draft, interim, and final research reports

NBRCC Research Questions

Effects
- Do the examined interventions improve the behavior at school of students with severe behavior problems?
- Do the examined interventions improve the academic performance and participation of students with severe behavior problems?
- Are the effects of the examined interventions sustained for one year?
- How do these effects vary across the examined interventions?
- For whom do the examined interventions work best? Least well? (E.g., student grade level, gender, severity of behavior problems.)
- In what contexts (classroom, school) do the examined interventions work best? Least well? (E.g., schools with behavior support systems, more highly-qualified teachers.)

Implementation
- How does fidelity (i.e., procedural adherence, quality, and dosage) and social validity from the teacher’s perspective vary across the examined interventions?
- How do variations in fidelity relate to outcomes?
National Behavior Research and Coordination Center Overview
SRI International

Coordinated Data Collection

Randomization Strategies and Implications
- BRCs examine data on distribution of students with disabilities within districts (by age and category of disability) to aid in school selection.
- BRCs match schools willing to participate on critical variables and then randomly assign pairs of schools to treatment and comparison groups.
- Matching technique:
  - BRCs ordinaly rank schools on criteria, including:
    - Percentage of student population with disabilities.
    - Presence of self-contained classrooms/centers at school.

Core Sample Selection Criteria
- Students begin intervention in grades 1 through 3.
- BRCs use a standardized screening instrument and procedure:
  - Administer Systematic Screening for Behavior Disorders (SSBD).
  - Eligible students must pass Gates 1 and 2.
  - Students in self-contained classes administered Gate 2 only.
  - BRCs include students with externalizing behavior problems in core sample.
  - All students are eligible, regardless of special education status or disability.
  - If more students identified than needed, BRC selects student with highest teacher ranking.
  - If consent is not obtained for that student, BRC selects student with next highest ranking.

Measurement
- Goal: An economical set of measures that supports answers to research questions while minimizing burden.
- Measures related to:
  - School/classroom context
  - Academic outcomes
  - Student behavior
  - Implementation

Measurement of School/Classroom Context
- School-wide Evaluation Tool (SET)
  - Interview and observation protocol assesses extent to which school implements positive behavior supports.
  - Administered once, each year a student is assessed.
- Classroom Atmosphere Rating Scale (CARS)
  - One 30-minute classroom-wide observation in intervention classrooms to assess level of disruption, cooperation, and engagement.
  - Reliability estimates conducted on 25% of observations.
  - Administered once, each year a student is assessed.
- Teacher/Classroom and School Characteristics Surveys
  - Developed by NBCC using relevant subscales of the Teacher Knowledge and Skill Survey and SEELIS/PAHELSE predictive items.
  - Items include instructional practices, student composition, teacher experience, and classroom supports.
  - Administered once, each year a student is assessed.
  - Supplemental with data derived from the Common Core of Data (National Center for Educational Statistics).

Measurement of Academic Outcomes
- Woodcock-Johnson III, Letter-Word Identification subtest
  - Assesses student’s symbolic learning and letter/word identification.
  - Administered at baseline, posttest, and follow-up.
- Oral reading fluency
  - Student reads about two passages.
  - Scores are based on the number of words read correctly in one minute.
  - Administered at baseline, posttest, and follow-up.
- Social Skills Rating System (SSRS)–Teacher Form, Academic Competence subscale
  - Teachers rate reading and mathematics performance, general cognitive functioning, motivation, and parental support.
  - Administered at baseline, posttest, and follow-up.

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Measurement of Student Behavior

- Student Record Survey
  - Developed by NBCCC.
  - Items include discipline referrals, absences, suspensions, and expulsions.
  - Administered once, each year a student is assessed.
- SSRS-Teacher Form
  - Teachers rate social skills and problem behaviors.
  - Administered at baseline, posttest, and follow-up.
- Academic Engaged Time (AET) observations
  - Two 15-minute individual student observations.
  - Reliability estimates are conducted on 20% of observations in intervention classrooms.
  - Administered at baseline, posttest, and follow-up.
- Office Discipline Referrals (ODRs)
  - Severity (major/minor), category (e.g., fighting, defiance), and date of occurrence.
  - Collected at posttest and follow-up.

Measurement of Student Participation

- Student Record Survey
  - Relevant items include:
    - IEP/504 Plan status (i.e., referred/identified for or declassified from special education or 504).
    - Instructional settings (i.e., percent of instructional time in general education classes).
    - Absences

Measurement of Implementation

- Fidelity
  - Measured repeatedly throughout intervention for formative feedback.
  - Adherence—Whether each procedure specified for an intervention is implemented.
  - Quality—How competently each procedure is implemented.
  - Dosage—Amount of staff time dedicated to “child-specific tasks.”
- Social validity from teachers’ perspectives
  - Acceptability—general support for intervention.
  - Perceived positive effects—for participating student(s), classroom.
- Alliance—perceptions of relationships between implementer and “client” (e.g., teacher).

Measurement of Fidelity

- Adherence
  - Multiple measures taken during implementation.
  - Dichotomous measures—e.g., procedural checklist.
  - Ordinal measures—e.g., teacher provides praise statement “never,” “some of the time,” “much of the time,” or “always” when there is an opportunity to do so.
  - Sum or average score compiled.
    - For each procedure.
    - Across procedures for components.
    - Across components for overall intervention.

- Quality
  - Measured at procedural level.
  - Reduced to variable ranging from 0 to 1.
    - 0 = delivery approach poor enough to expect no benefit to recipient.
    - 1 = implemented in every way with competence envisioned by developer to achieve maximum effect.
  - Procedural competence averaged across procedures for components and across components for overall intervention quality value.
Measurement of Fidelity

- Combining measures of fidelity
  - Dose-Independent Fidelity (DIF)
    - Adherence: x quality.
    - Assesses how well an intervention is being implemented without reference to the dosage delivered.
    - Measures the aspects that are most under the control of implementers.

Measurement of Social Validity

- Common underlying dimensions to BRC local instruments:
  - Acceptability/overall support.
  - Generation of positive effects.
- All items record responses on a 5-point Likert scale.
- NBRCC will collect item responses from each scale and calculate a mean value across all items related to acceptability and positive effects.

Social Validity: Core Items by BRCs

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acceptability</td>
<td>Recommend program to other teachers.</td>
</tr>
<tr>
<td></td>
<td>Use the program with other students.</td>
</tr>
<tr>
<td></td>
<td>Acceptable regarding concerns.</td>
</tr>
<tr>
<td></td>
<td>Like the procedures.</td>
</tr>
<tr>
<td></td>
<td>Reasonable given problems.</td>
</tr>
<tr>
<td></td>
<td>Acceptable procedures.</td>
</tr>
<tr>
<td></td>
<td>Positive reaction to program.</td>
</tr>
<tr>
<td>Positive</td>
<td>Effective teaching appropriate behavior.</td>
</tr>
<tr>
<td>Effects</td>
<td>Positive effect on peer relationships.</td>
</tr>
<tr>
<td></td>
<td>Satisfied with change in behavior.</td>
</tr>
<tr>
<td></td>
<td>Noticed change in behavior quickly.</td>
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<tr>
<td></td>
<td>Likely to make permanent improvements.</td>
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<tr>
<td></td>
<td>Confidence in effectiveness.</td>
</tr>
<tr>
<td></td>
<td>Likely to be effective for individual.</td>
</tr>
<tr>
<td></td>
<td>Overall: effectively dealt with problems.</td>
</tr>
<tr>
<td></td>
<td>Components effective for meeting goals.</td>
</tr>
</tbody>
</table>

Measurement of Alliance

<table>
<thead>
<tr>
<th>Teacher/Consultant Alliance Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>The teacher and I agree on what the most important goals for intervention are.</td>
</tr>
<tr>
<td>The teacher communicates effectively.</td>
</tr>
<tr>
<td>The teacher and I trust one another.</td>
</tr>
<tr>
<td>The teacher and I are working together collaboratively to improve the situation.</td>
</tr>
<tr>
<td>The teacher has shown a sincere desire to understand and improve the situation.</td>
</tr>
<tr>
<td>The time spent working with the teacher was effective and productive.</td>
</tr>
</tbody>
</table>

Data Collection Schedule

- Baseline measures can occur throughout the school year.
- Students are temporally yoked (based on grade level and other salient characteristics) across intervention and comparison groups.
- Delays in administration of baseline and posttest are mirrored.
- Baseline and posttest measures are administered at the same time for students in the intervention and comparison groups.
- Posttest administration may vary with intervention duration, but follow-up occurs one year after posttest.
Core Measures by Measurement Intervals

<table>
<thead>
<tr>
<th>Variable</th>
<th>Fall 2005-06</th>
<th>Fall 2006-07</th>
<th>Fall 2007-08</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enrollment</td>
<td>100</td>
<td>150</td>
<td>200</td>
</tr>
<tr>
<td>Attendance</td>
<td>80%</td>
<td>85%</td>
<td>90%</td>
</tr>
<tr>
<td>Engagement</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
</tr>
</tbody>
</table>

Measurement Timing by Intervention Model

- Year 1: Fall, Spring, Fall, Spring
- Year 2: Fall, Spring, Fall, Spring
- Year 3: Fall, Spring, Fall, Spring

Data Synthesis, Analysis, and Dissemination

NBRCC Website
- NBRCC website located at [http://nbrcc.sri.com](http://nbrcc.sri.com)

- Includes:
  - Purpose, design, funding support, personnel, and Executive Board members.
  - Purpose, research base, and components of each BRC’s intervention.
  - Published reports (in development).
  - Frequently asked questions, contact information, and links to federal centers.

NBRCC Analysis Plan
- NBRCC Analysis Plan includes a description of the analyses to be conducted for each research question and timelines for completion, including:
  - Analysis of representativeness (participants in sample compared to all eligible students and group equivalence participants in comparison sites compared to participants in intervention sites)
  - Analysis of intervention effects, sustainability, and moderators
  - HLM regression model approach
  - Comparison of intervention effects, social validity, and alliance
  - Meta-analytic technique to test for between-center differences in intervention and interaction effects

Proposed Dissemination Plan / Approach
- Purposes:
  - Bridge research-to-practice gap by reaching diverse practitioners, policy, consumer, advocacy, and research communities through existing dissemination channels.
  - Ensure sensitivity to cultural traditions and cultural barriers.
  - Produce and actively disseminate new knowledge regarding “what works” in improving the behavior and academic performance of students with severe behavior problems.
  - Dissemination plans will be finalized as IES develops broad approaches to dissemination for its studies.
  - All dissemination will occur based upon the IES review policies for the release of products and data.
Proposed Dissemination Outlets / Formats

- Easily accessible, multimedia materials may consist of:
  - Web-based information and links to reports
  - Conference presentations
  - Academic manuscripts
  - Two-page briefs on key models and effective practices
  - Descriptions of effective models and practices with how-to implementation guides
  - Brief vignettes
  - Detailed descriptions of intervention implementation

Next Steps

- BRCs are currently in their first year of data collection and will be collecting data through the 2007-2008 school year.
- Data are submitted periodically to NBRCC and reports will appear on the website as they become available (http://nbrcc.sri.com).
- Other dissemination materials also will be distributed as the projects move forward.