NATIONAL BEHAVIOR RESEARCH COORDINATION CENTER

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

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NATIONAL BEHAVIOR RESEARCH COORDINATION CENTER

Behavior Research Centers and National Behavior Research Coordination Center
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Institute of Education Sciences (IES)
U.S. Department of Education

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Jennifer McComas, Ph.D.
Phil Strain, Ph.D.
Kevin Sutherland, Ph.D.
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Joe Wehby, Ph.D.

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

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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.

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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.

NATIONAL BEHAVIOR RESEARCH COORDINATION CENTER

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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
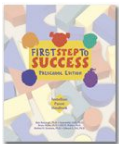

University of Oregon

- 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.

Continued… 7

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.

Continued… 8

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.

Continued… 9

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.

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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

Continued… 11

University of South Florida & University of Colorado at Denver

- Team Development
  - Teams can include:
    - Teacher who has the child for the majority of the day
    - Special educator if the child receives part-time services in special education
    - Behavior specialist who has expertise in functional assessment and behavior analysis
    - Others, such as family members, paraprofessionals, or special area teachers

Continued… 12

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.

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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).

Continued… 14

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.

Continued… 15

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

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University of Washington

- Doug Cheney, Ph.D., Scott Stage Ph.D.,   Co-Principal Investigators
- Check, Connect, and Expect
  - 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.

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University of Washington

- Check, Connect, and Expect (CC&E)
  - A coaching model with the purpose of developing attached relationships and social skills
  - Staff includes:
    - District-level behavior specialist to supervise program
    - School coaches to implement program
  - Elements include:
    - Staff development for the teachers in each school
    - Daily positive interactions between student, coach, and teacher
    - Close monitoring of students' academic and social performance
      - Instruction of important social skills
      - Prompting and positive reinforcement to meet academic expectations
    - Discouragement of problem behavior through quick, effective consequences
    - Parent involvement through information sharing and delivery of reinforcements
    - Movement from adult monitoring to student self-management.

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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 (TFBAC).
    - After 3 TFBACs, 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

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Vanderbilt University, University of Minnesota, & Virginia Commonwealth University

- 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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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.

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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

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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

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National Behavior Research Coordination Center (NBRCC) Overview

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

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NBRCC Objectives

- Develop a web-based data system to:
  - Track, enter, and process data efficiently across BRCs
  - Minimize burden on data managers
  - Make data accessible in real time for analyses and reporting
- Produce high-quality, compelling, and accessible products for a wide range of audiences to:
  - Communicate research findings
  - Promote a deeper understanding and wider application of evaluation findings
  - Influence local and national practices and policies

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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

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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

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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.)

Continued…
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NBRCC Research Questions

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?

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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 ordinally rank schools on criteria, including:
    - Percentage of student population with disabilities.
    - Presence of self-contained classrooms/centers at school.

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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.

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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

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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 20% of observations.
  - Administered once, each year a student is assessed.
- Teacher/Classroom and School Characteristics Surveys
  - Developed by NBRCC using relevant subscales of the *Teacher Knowledge and Skill Survey* and SEELS/SPeNSE predictive items.
    - Items include instructional practices, student composition, teacher experience, and classroom supports.
  - Administered once, each year a student is assessed.
  - Supplemented with data derived from the Common Core of Data (National Center for Educational Statistics).

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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 aloud 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 NBRCC.
    - 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.

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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

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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).

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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.

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Measurement of Fidelity

- 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.

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Measurement of Fidelity

- Dosage
  - Measured in metric appropriate to procedure or component (e.g., minutes/hours of tutoring, number of home visits, number of praise statements).
  - Sum or average of multiple measurements compiled:
    - For each procedure or component.
    - Across components for intervention.

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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.

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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.

Continued…

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Social Validity: Core Items by BRCs

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

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Measurement of Alliance

- Common scale developed for use across all BRCs to examine the relationship between the teacher and intervention "consultant"
- Scale developed by Joe Wehby (Vanderbilt University), with reference to these sources:
  - Gaston, L. (1991)
  - Gutkin, T. (1986)
  - Horvath, A., & Greenberg, L. (1989)
  - Knoff, H., Hines, C., & Kromrey, J. (1995)

Continued…

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Measurement of Alliance

Teacher/Consultant Alliance Items
The teacher and I agree on what the most important goals for intervention are.
I feel confident of the teacher's ability to help the situation.
The teacher communicates effectively.
The teacher and I trust one another.
The teacher is approachable.
The teacher and I are working together collaboratively to improve the situation.
I feel satisfied with the utility and practicality of the suggestions and ideas provided by the teacher.
The teacher followed through with commitments and responsibilities.
Overall, the teacher has shown a sincere desire to understand and improve the situation.
The time spent working with the teacher was effective and productive.

5-point Likert scale: 1 = Never, 2 = Seldom, 3 = Sometimes, 4 = Often, 5 = Always

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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 1 year after posttest.

Continued…

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Core Measures by Measurement Intervals

Baseline (BL)	Intervention Time 1 (IN1)*	Intervention Time 2 (IN2)*	Posttest (PT)	Follow-up (FU)
Student Enrollment (SSBD)				
School Characteristics		School Characteristics		
CARS		CARS		
SET		SET		
Classroom/Teacher Survey		Classroom/Teacher		
Student Record Survey		Student Record		Student Record Plus
Oral Reading Fluency (The Pool & the Fair)	Oral Reading (Visiting Granny & Piano Lessons)		Oral Reading (The New Student & The Ghost)	Oral Reading (Summer Camp & Sara's Operation)
WJ III	WJ III			WJ III
AET	AET		AET	AET
SSRS	SSRS		SSRS	SSRS
	ODR		ODR	ODR
	Social Validity & Alliance		Social Validity & Alliance	
	Fidelity Measures**	Fidelity Measures**	Fidelity Measures**	
			Costs	

* For 2-year interventions
** May be administered repeatedly through the intervention period.

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Measurement Timing by Intervention Model

|	Y2 (2005-06)		Y3 (2006-07)		Y4 (2007-08)	
	Fall	Spring	Fall	Spring	Fall	Spring
1-Year Model	Cohort₁ Baseline	Cohort₁ Posttest	Cohort₂ Baseline	Cohort₂ Posttest		Cohort₂ Follow-up
				Cohort₁ Follow-up		
2-Year Model	Baseline	Intervention Time 1	Intervention Time 2	Posttest		Follow-up

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Data Synthesis, Analysis, and Dissemination

NBRCC Website

- NBRCC website located at 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.

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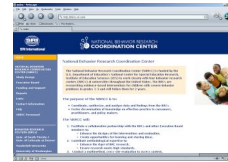
NBRCC Analysis Plan

- 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

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Proposed Dissemination Plan / Approach

- Purposes:
  - Bridge research-to-practice gap by reaching diverse practitioner, policy, consumer, advocacy, and research communities through existing dissemination channels.
  - Ensure sensitivity to cultural traditions and cultural barriers.
  - Maintain up-to-date website with variety of products targeted to specific audiences.
  - 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.

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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

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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.

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