Direct Behavior Rating (DBR) sensitivity to change: Outcomes across consultation cases

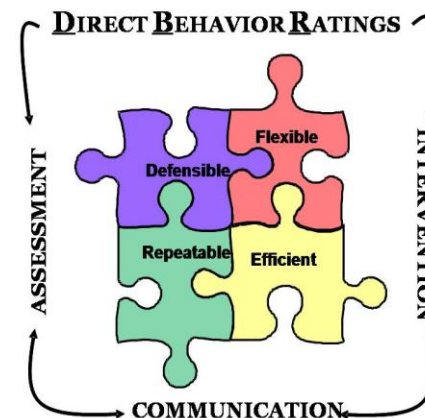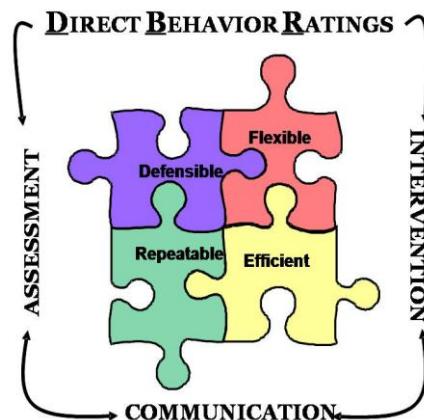Sandra M. Chafouleas, Ph.D.

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Center for Behavioral Education and Research

Presentation at the 2010 Conference of the National Association of School Psychologists

Purpose:

- To review the logic and process of behavioral consultation

- To introduce Direct Behavior Rating (DBR) as an assessment method for progress monitoring of student behavior

- To review options for evaluating student behavioral response to intervention

- To demonstrate how DBR can be used to evaluate outcomes from consultation cases
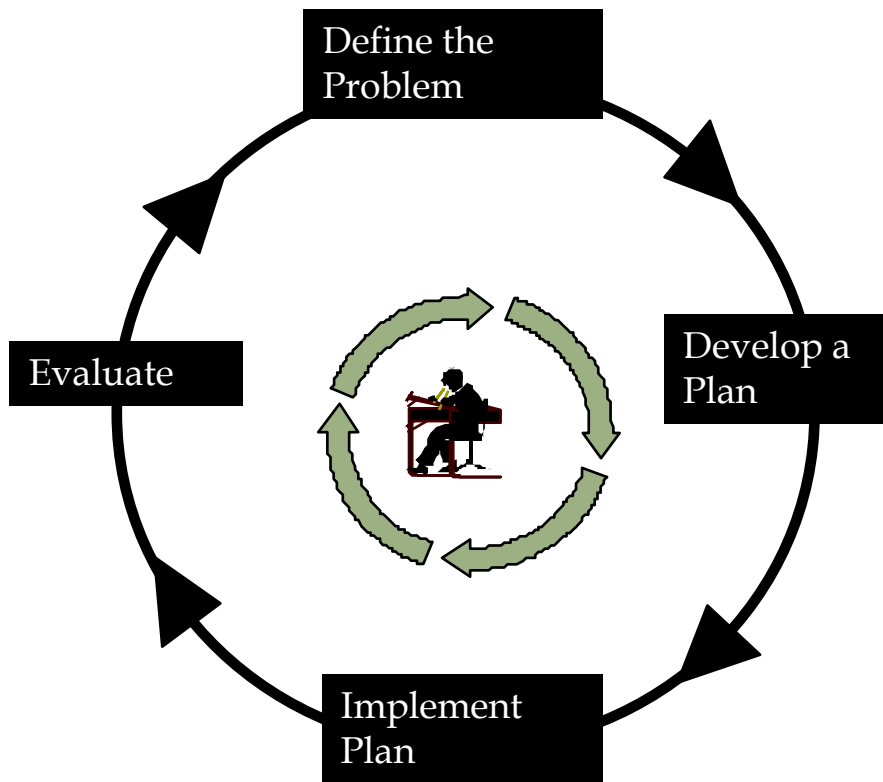
REVIEW: Why do we need data?

Purposes of Assessment

- Screening
- Progress Monitoring
- Diagnosis
- Evaluation

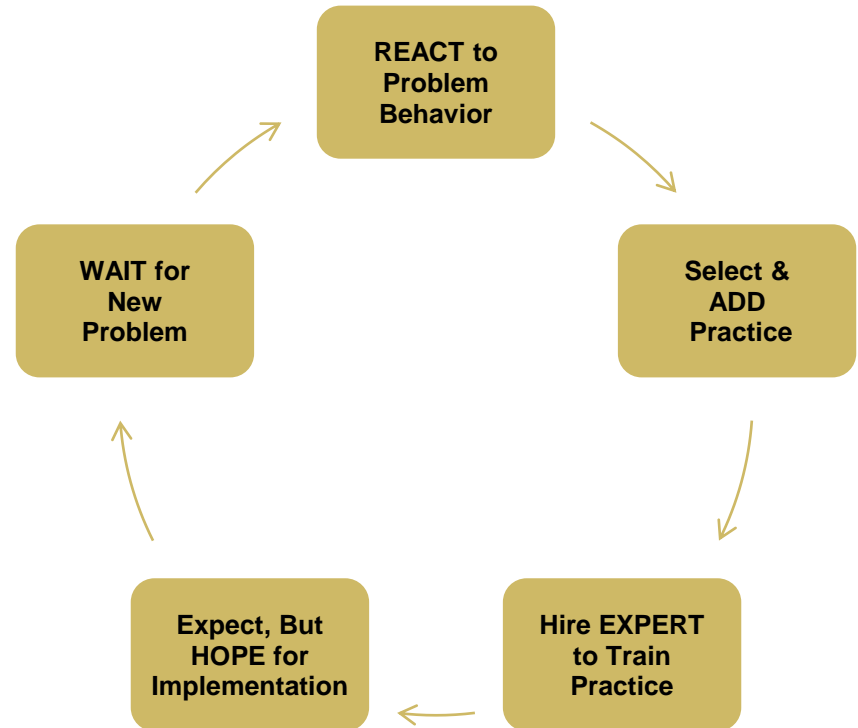Emphasized within a problem-solving framework

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Foundations for Problem-Solving Models

Problem Solving Model	"Train and Hope" Model

Problem Solving Model (cycle):
- Define the Problem
- Develop a Plan
- Implement Plan
- Evaluate

"Train and Hope" Model (cycle):
- REACT to Problem Behavior
- Select & ADD Practice
- Hire EXPERT to Train Practice
- Expect, But HOPE for Implementation
- WAIT for New Problem

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What is "response to intervention"?

BASIC QUESTION: How do we know if X is working?

- Foundations within *data-based decision making*

- Roots of data-based decision making come from *the problem-solving model*

- *Process* involved in "problem-solving" is ancient
  - model became clearly articulated within psychology and then education through applied behavior analysis --- behavioral consultation

> **What is the problem?**
> **Why is it occurring?**
> **What should we do about it?**
> **Did it work?**

(Bergan, 1977, Bergan&Kratochwill, 1990; Tilly, 2009; Reschly& Bergstrom, 2009)

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Definitions: desirable features of assessment tools within PSM

- **Defensible**
  - established through psychometric research to provide evidence of reliability and validity for interpretation and use
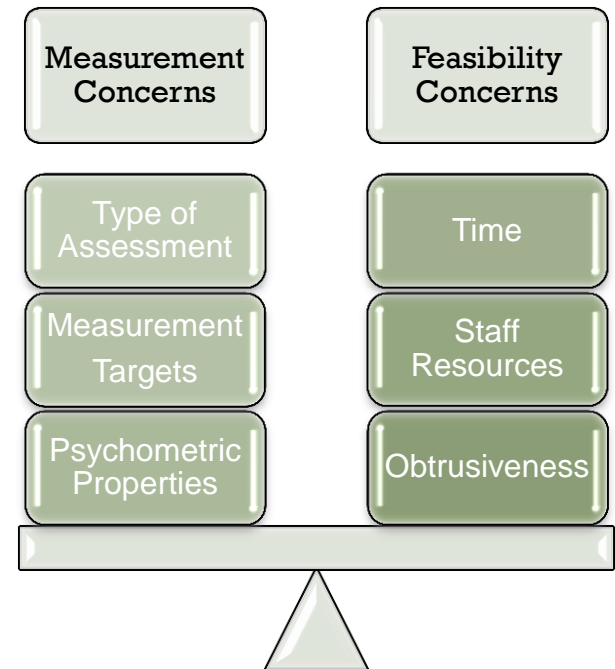
- **Flexible**
  - established by methods useful in guiding a variety of assessment questions and situations

- **Efficient**
  - established by methods that require relatively few resources (feasible <u>and</u> reasonable)

- **Repeatable**
  - established by methods that yield necessary time series to evaluate intervention effectiveness

Measurement Concerns	Feasibility Concerns
Type of Assessment	Time
Measurement Targets	Staff Resources
Psychometric Properties	Obtrusiveness

Adapted from Briesch & Volpe (2007)

BUT for behavior… it is complicated!

- Absence of a gold standard criterion

- One measure can't do it all
  - Multiple measures are needed to evaluate different facets

- Co-morbidity of "problems"
  - What are the most relevant problem features?

- Multiple perspectives are valuable yet agreement may (will) be low!

- Moderators matter…

(Adapted from Kazdin, 2005)

+ What are the possibilities?

Possible Methods? Systematic direct observation, behavior rating scales, permanent products, Direct Behavior Rating

Possible Metrics? Visual analysis, reliable changes in behavior (RCI, percent change from baseline, PND, effect size), social validation, changes on social impact measures (e.g. dropout)

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Direct observations are costly

Universally-accepted GOM for social behavior does not exist

Traditional behavior rating scales not sensitive to change, not contextually relevant

Permanent products lack defensibility

Methods

?

There are no social behavior "benchmarks"

PND Does not index strength of response

Decision rules for judging RTI not established
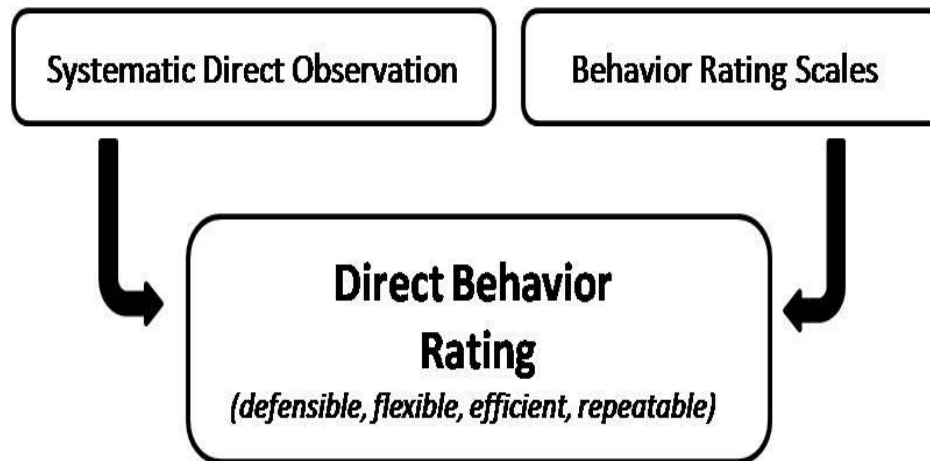
Metrics

Visual analysis does not allow "quantification"

Effect sizes are often uninterpretable in SSD

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DIRECT BEHAVIOR RATING : What is DBR?

- An <u>emerging alternative</u> to systematic direct observation and behavior rating scales which involves *brief rating* of target behavior following a specified observation period

```
┌─────────────────────────────┐      ┌─────────────────────────┐
│ Systematic Direct Observation│      │  Behavior Rating Scales │
└─────────────────────────────┘      └─────────────────────────┘
              │                                    │
              ▼                                    ▼
          ┌────────────────────────────────────────────┐
          │            Direct Behavior
                             Rating
           (defensible, flexible, efficient, repeatable) │
          └────────────────────────────────────────────┘
```

Chafouleas, Riley-Tillman, & Christ (2009); Chafouleas, Riley-Tillman, & Sugai (2007); Chafouleas, Riley-Tillman, & McDougal (2002); Christ, Riley-Tillman, & Chafouleas (2009)

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A little background…

Other Names for DBR-like Tools:

- Home-School Note

- Behavior Report Card

- Daily Progress Report

- Good Behavior Note

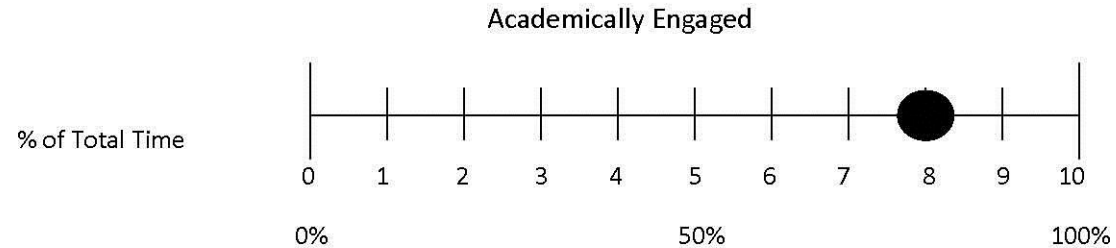- Check-In Check-Out Card

- Performance-based behavioral recording

Contemporary Defining Features:

SDO

BRS
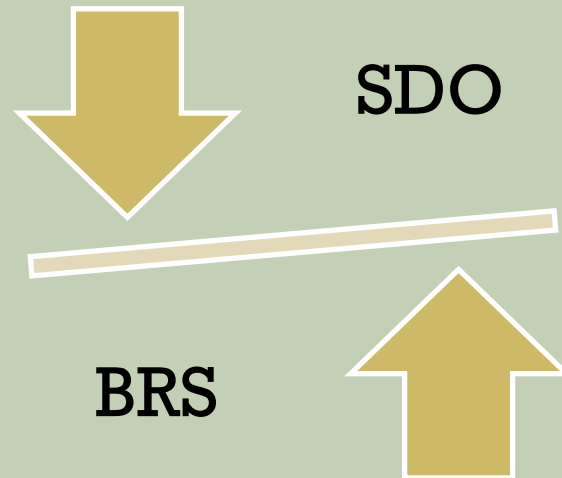
Used repeatedly to represent behavior that occurs over a specified period of time (e.g., 4 weeks) and under specific and similar conditions (e.g., 45 min. morning seat work)

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Example DBR scales

Single Item Scale

Academically Engaged

% of Total Time

0   1   2   3   4   5   6   7   8   9   10

0%   50%   100%

Interpretation: The student displayed academically engaged behavior during 80% of the observation period.

Multi-Item Scale

	Never		Always
Did the student follow class rules?	0	(1)	2
Did the student follow teacher directions?	0	1	(2)
Did the student do his/her best work?	0	1	(2)

Total number of points earned: ___5___

Interpretation: The student earned 84% (5/6) of possible points during the observation period.

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Project VIABLE:
Validation of Instruments for Assessing Behavior Longitudinally & Efficiently

GOAL: Develop and Evaluate DBR

Phases I & II: Develop instrumentation and procedures; evaluate defensibility of DBR in decision-making
- Large datasets; repeated observations of student behavior
- Understanding critical factors (e.g. scale, behavior targets)
- Pilot testing various aspects with classroom teachers

Phase III: evaluate feasibility and utility of DBR in school settings.
- Packaging what we have learned to then train teachers
- Establish groups of teachers willing to participate in DBR training
- Implement the training and provide feedback to researchers

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www.directbehaviorratings.com

Example DBR – Single Item Scale

- Ratings should correspond to the **percentage of time** that the student was observed to display the target behavior.

  - Ex: When rating after 40-minute Independent Reading Block, if the student was engaged for 20 minutes, then the student receives a rating of 5 on the DBR.

Academically Engaged

Never |———|———|———|———|———|———◯———|———|———|———|———| Always

0   1   2   3   4   5   6   7   8   9   10

0%   50%   100%

40 minutes

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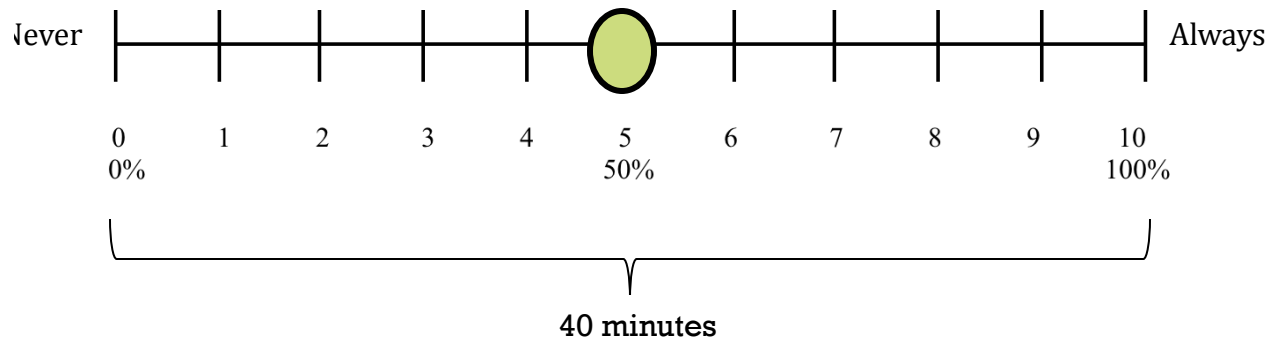
DBR – Single Item Scales (DBR-SIS)

- **Academically Engaged**

- **Respectful**

- **Non-Disruptive**

Academically
Engaged

**KEYS TO
SUCCESS**

Respectful

Non-
Disruptive
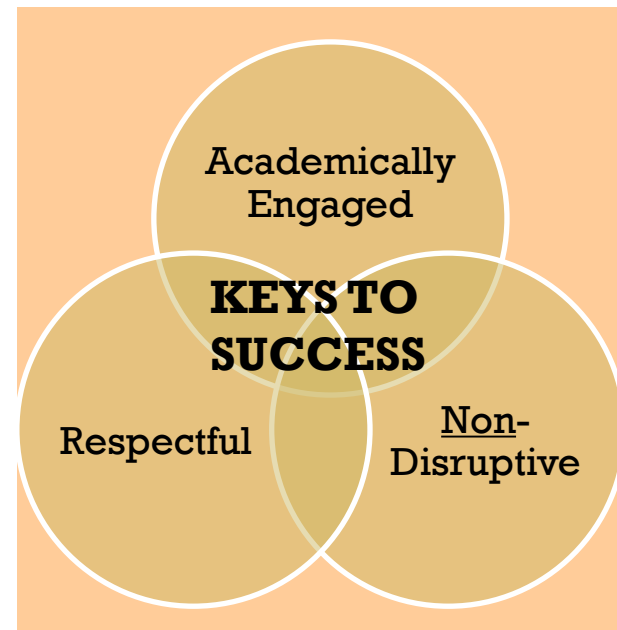
Current Standard Form

Downloadable at
www.directbehaviorratings.com

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Direct Behavior Rating (DBR) Form: 3 Standard Behaviors

Date: M T W Th F	Student: Rater:	Activity Description:
Observation Time: Start:_____ End: _____ ☐ Check if no observation today	Behavior Descriptions: **Academically engaged** is actively or passively participating in the classroom activity. For example: writing, raising hand, answering a question, talking about a lesson, listening to the teacher, reading silently, or looking at instructional materials. **Respectful** is compliant and polite behavior in response to classroom rules, adult directions, and/or peer interactions. For example: follows teacher direction, pro-social interaction with peers, positive response to adult request, conformity to classroom rules and norms. **Disruptive** is student action that interrupts regular school or classroom activity. For example: out of seat, fidgeting, playing with objects, acting aggressively, talking/yelling about things that are unrelated to classroom instruction.	

Directions: Place a mark along the line that best reflects the percentage of total time the student exhibited each target behavior. Note that the percentages do not need to total 100% across behaviors since some behaviors may co-occur.

Academically Engaged

% of Total Time

0 1 2 3 4 5 6 7 8 9 10

0% .... 50% 100%

Never .... Sometimes .... Always

Respectful

% of Total Time

0 1 2 3 4 5 6 7 8 9 10

0% .... 50% 100%

Never .... Sometimes .... Always

Disruptive *

% of Total Time

0 1 2 3 4 5 6 7 8 9 10

0% .... 50% 100%

Never .... Sometimes .... Always
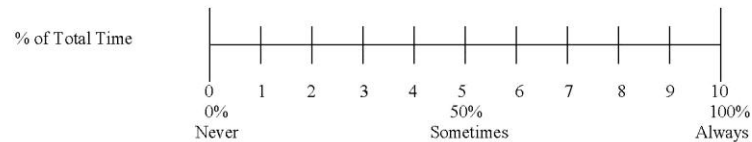
* Remember that a lower score for "Disruptive" is more desirable.

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Summary: Characteristics of DBR-SIS

- **Repeatable**

- **Efficient**

- **Flexible**

- **Defensible**

  Psychometric comparisons at single point

  Evaluating sensitivity to change

Are DBR single item scales (SIS) sensitive to behavioral change?

Collaborative research project between

Dr. Lisa Sanetti & Dr. Sandy Chafouleas

with a school psych. consultant team involving Steve Kilgus, Katie Gritter, Rose Jaffery, Lindsay Beck, Lisa Dobey, Teri LeBel

& special guest appearances by Dr. Dan Maggin

Participants

- Participants included 20 teacher-student dyads

- Dyadic data was included if the teacher had completed DBR across 4 baseline and 10 intervention days.

Activity	Number of Students	Number of Datapoints			
		Baseline		Intervention	
		M	Range	M	Range
1	20	6.25	4-12	17.40	11-21
2	19	6.32	4-11	17.63	10-24
3	18	6.17	4-11	16.78	10-24

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Participants cont'd: Teachers

Teacher Character...

Teacher age

Years teaching

Gender
Teacher Race/Ethnicity

Not Reported, 2

Hispanic, 2

African-American, 1

Caucasian, 15
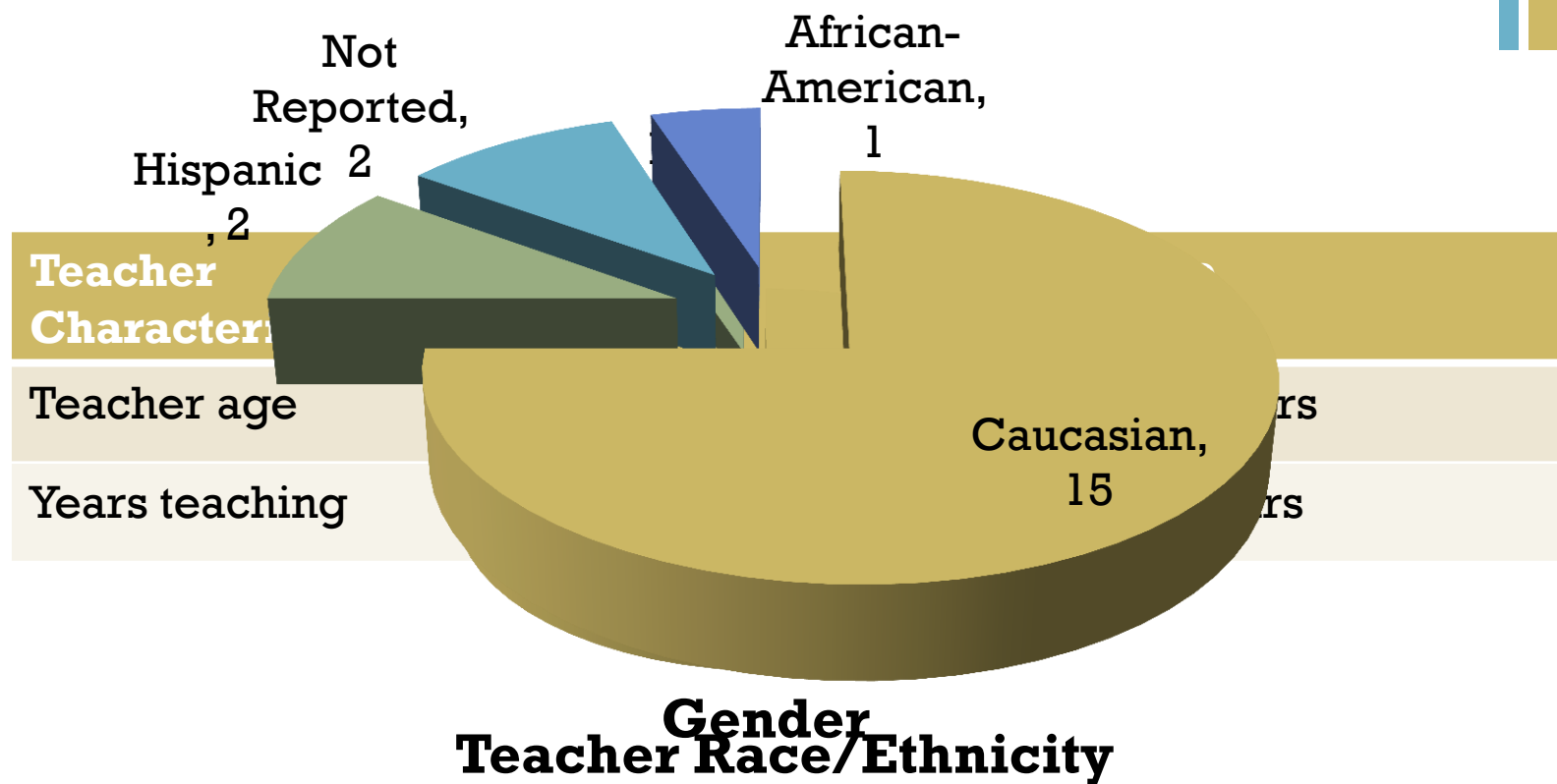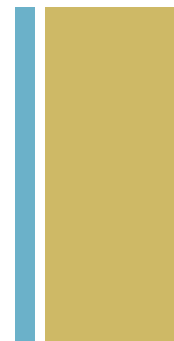
Participants cont'd: Students

Gender

African-American
1

Not Reported, 2

Hispanic, 2

Male, 1

Student Race/Ethnicity

Student	Mean	Range
		yrs

	Yes	No
Academic problems	10	9
Behavior problems	20	0
Special Education	4	16

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...
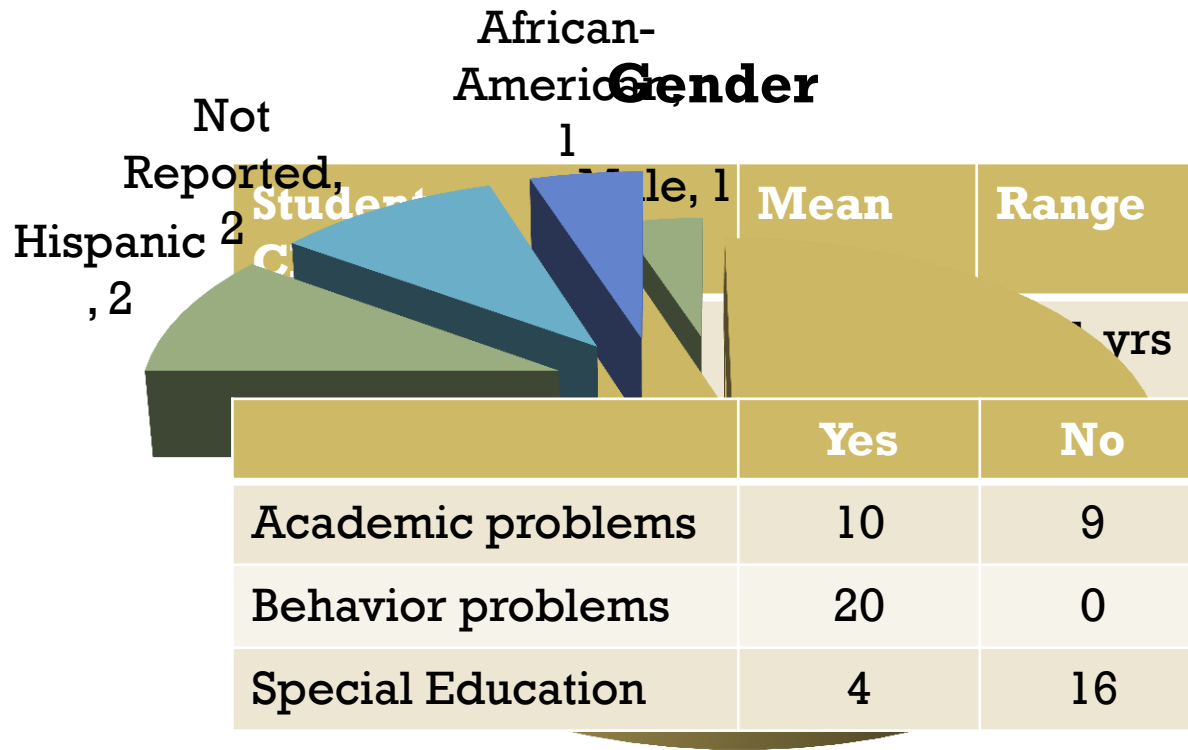
Intervention Rating Profile-Adapted

BEHAVIORAL OBSERVATION OF STUDENTS IN SCHOOLS (BOSS)

Academic Subject:

DBR Form

	Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly Agree
1. This would be an acceptable intervention for the child's problem behavior.	1	2	3	4	5	6
2. Most teachers would find this intervention appropriate for behavior problems in addition to the one described.	1	2	3	4	5	6
3. This intervention should prove effective in changing the child's problem behavior.	1	2	3	4	5	6
4. I would suggest the use of this intervention to other teachers.	1	2	3	4	5	6
5. The child's problem behavior is severe enough to warrant use of this intervention.	1	2	3	4	5	6
6. Most teachers would find this intervention suitable for the behavior problem described.	1	2	3	4	5	6
7. I would be willing to use this intervention in the classroom setting.	1	2	3	4	5	6
8. This intervention would *not* result in negative side-effects for the child.	1	2	3	4	5	6
9. This intervention would be appropriate for a variety of children.	1	2	3	4	5	6
10. This intervention is consistent with those I have used in classroom settings.	1	2	3	4	5	6
11. The intervention was a fair way to handle the child's problem behavior.	1	2	3	4	5	6
12. This intervention is reasonable for the behavior problem described.	1	2	3	4	5	6
13. I like the procedures used in this intervention.	1	2	3	4	5	6
14. This intervention was a good way to handle this child's behavior problem.	1	2	3	4	5	6

	Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly Agree
15. Overall, this intervention was beneficial for the child.	1	2	3	4	5	6
16. I understand how to use this intervention.	1	2	3	4	5	6
17. I am knowledgeable about the intervention procedures.	1	2	3	4	5	6
18. I would know what to do if I was asked to implement this intervention.	1	2	3	4	5	6
19. The directions for using this intervention are clear to me.	1	2	3	4	5	6
20. I understand the procedures of this intervention.	1	2	3	4	5	6
21. I would have no idea how to implement this intervention.	1	2	3	4	5	6

Comments:

Responsiveness to Intervention

% of Total Time

	0	1	2	3	4	5	6	7	8	9	10
	0% Never					50% Sometimes					100% Always

Total Intervals Observed

S A
S P
S OFT-M
S OFT-V
OFT-P

% OFT-M
% OFT-V
% OFT-P

S OFT-M
S OFT-V
S OFT-P

% OFT-M
% OFT-V
% OFT-P

Teacher

Total Intervals Observed

M

D

D

Be SI

Se

Ir
19

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Procedure

- A series of consultative interviews were conducted to establish:
  - Which teacher-nominated students may benefit from use of the DRC intervention
  - The three activities within which the target student's behavior was most problematic
  - Which 3-5 behaviors should be targeted for intervention:
    - Did I follow class rules?
    - Did I follow teacher directions?
    - Did I do my best work?
    - 2 optional student-specific behaviors
  - A menu of titrated rewards the student may earn and choose from each day if enough

Procedure cont.

- Baseline
  - Teachers completed DBR after each of the three specified activities each day for at least 5 days.
  - Consultants conducted the BOSS 2-3 times

- Intervention
  - At the end of each activity:
    - Teachers reviewed the DRC with student
    - Teachers were to complete the DBR immediately after DRC review
  - At end of school day/last activity:
    - Teachers reviewed the completed DRC with the student
    - Students could earn one of three levels of rewards depending on the number of "Yeses" they received.
  - During the 4th school week or in the last 5 days of intervention:
    - Consultants conducted the BOSS 2-3 times

Data Analysis

- Change Metrics (Gresham, 2005)
    - Absolute Change
    - Percent of nonoverlapping data
    - Percentage of change
    - Effect size
    - Reliable change index

- Spearman's rho correlations
    - BOSS & DBR-SIS absolute change scores
    - DBR-SIS change metrics

- Pearson's product-moment correlations
    - BOSS & DBR-SIS (collapsed across phases & activities)
    - DBR-SIS metrics & IRP-A

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Change Metrics

- Absolute change
  - Intervention mean – Baseline mean

- Percent of nonoverlapping data (PND)
  - Number of intervention data points that exceeded the highest baseline data point (or fell below the lowest data point for DB), divided by the total number of intervention data points

- Percentage of change
  - (Intervention mean – Baseline mean)/Baseline mean

- Effect size
  - (Intervention mean – Baseline mean)/Baseline SD

- Reliable change index (RCI)
  - (Intervention mean – Baseline mean)/ SE_{diff}

Results

Descriptive statistics across scales and phases

			Mean	SD	Range
DBR-SIS[1]	Disruptive Behavior	Baseline	4.26	1.97	0.36 - 7.83
		Intervention	2.58	1.41	0.00 - 5.55
	Academic Engagement	Baseline	4.97	2.28	0.63 - 9.14
		Intervention	6.82	1.50	1.90 - 9.65
	Compliance	Baseline	5.74	1.93	2.25 - 9.25
		Intervention	7.34	1.31	4.53 - 10.00
BOSS[2]	On-task	Baseline	69.98	19.76	14.00 – 98.00
		Intervention	81.94	14.22	46.00 – 100.00
	Off-task	Baseline	44.82	21.01	4.00 – 94.00
		Intervention	28.69	18.54	2.00 – 77.00

1 – DBR-SIS ratings correspond to percentages (e.g., a DBR-SIS rating of 1 corresponds to 10%).

2 – Results are in the form of percentages.

+

Results
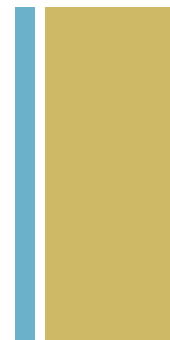
Descriptive statistics for change metrics across DBR-SIS

Change Metric	Disruptive Behavior			Academic Engagement			Compliance		
	M	SD	Range	M	SD	Range	M	SD	Range
Absolute Change	-1.68	1.80	-6.83 – 2.72	1.85	1.74	-1.02 – 6.27	1.59	1.53	-1.13 – 4.75
Percent Change	-0.32	0.49	-1.00 – 1.56	0.78	1.32	-0.14 – 8.59	0.41	0.47	-0.15 – 1.77
PND	0.30	0.29	0.00 – 0.95	0.32	0.33	0.00 – 1.00	0.27	0.34	0.00 – 1.00
Effect Size	-0.82	1.02	-3.56 – 1.32	1.49	2.60	-1.12 –13.34	1.03	1.41	-0.60 – 5.98
RCI	-1.33	1.66	-5.77 – 2.15	2.41	4.21	-1.82 – 21.64	1.66	2.29	-0.97 – 9.70

Results

Spearman's rho correlations between DBR-SIS and BOSS absolute change metrics

BOSS Scale	DBR-SIS		
	Disruptive Behavior	Academic Engagement	Compliance
On-task	-.458	.441	.299
Off-task	.487*	-.582*	-.554*

* - Statistically significant at the .05 level

+ Results cont.

- *Spearman's rho correlations amongst DBR-SIS change metrics*
  - Analyses were kept within SIS. For example, disruptive behavior change metrics were only compared to other disruptive behavior change metrics.
  - Results revealed strong, statistically significant correspondences (at the $p = .001$ level) between each of DBR-SIS change metrics.
  - A sole exception was the correlation between the percent change and PND metrics for the disruptive behavior DBR-SIS, which did not reach statistical significance ($\rho = -.21, p = .118$)

- *Pearson's product-moment correlations between SDO and DBR.*
  - SDO-AE & DBR-AE → r = .344, p = .001
  - SDO-OT & DBR-DB → r = .292, p = .007

+ Results

	Change Metric				
	Absolute	Percentage			
DBR-SIS	Change	of Change	PND	Effect Size	RCI
Disruptive Behavior	-.05	-.03	.04	-.06	-.06
Academic Engagement	.13	.03	.08	.05	.05
Compliance	*.29	.21	.21	*.31	*.31

Correlations between DBR-SIS change metrics and average IRP-A score

* - Statistically significant at the .05 level

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Discussion

- DBR-SIS and BOSS descriptive data indicate change in student behavior across phases, in the expected direction.

- High correspondence between DBR-SIS and BOSS absolute change metrics suggests that students were ranked similarly across the two measures with regard to responsiveness to the DRC intervention.
  - Provides preliminary support for further research into the use of DBR-SIS to differentiate between those who have or have not responded to intervention.

- High correlations amongst DBR-SIS change metrics indicates that each affords similar information.
  - Yet, conceptual limitations of some metrics may hinder their usefulness.

Discussion

- Low (yet statistically significant) association b/w DBR & SDO
  - Suggests similarity across the methods with regard to summative evaluations?

- Small/non-existent association between teacher perceptions (acceptability/effectiveness)and student RTI
  - Consistent with literature indicating teachers don't have to like an intervention for it to work (e.g. Axelrod, 1996)?

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Discussion

- **Absolute change** may be good, but level of change indicative of "adequate response" is not consistent across DBR scale.

- Due to floor and ceiling effects, **PND** is not a good indicator.

- **Percentage of change** was not as interpretable as others have found (e.g., Cheney et al., 2008). However, should DBR cut scores be established, may become more useful.

- **Effect size** may be a good indicator given the ability to interpret magnitude of effect. However, challenges with interpretation are apparent, but may be good for low stakes decisions.

- In accordance with past recommendations and findings (Cheney et al., 2008; Gresham, 2005), **RCI** seems a bit too stringent of a criteria. However, may be suitable for higher stakes decisions.
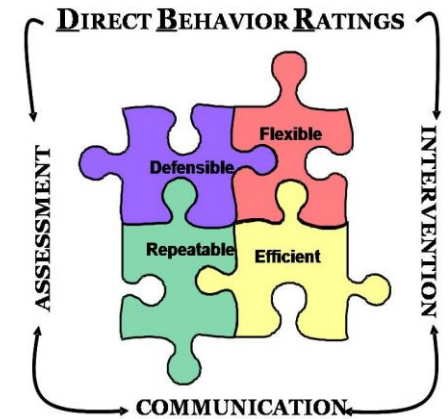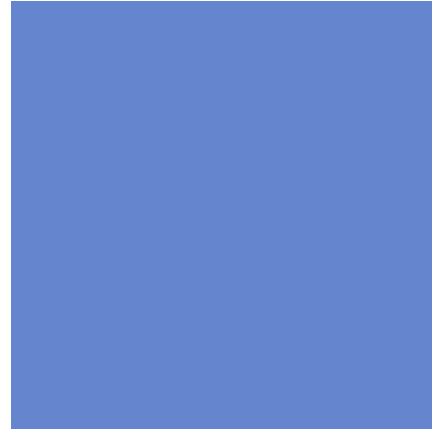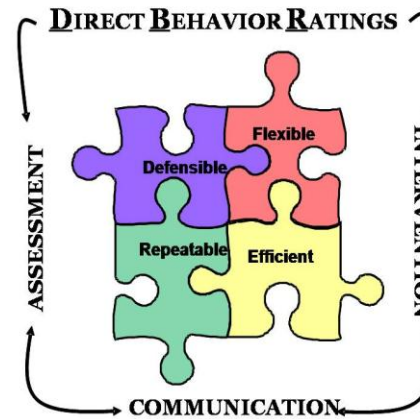
Questions/Comments...

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