Data rich, but information poor? Not anymore!

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University of Iowa
Acknowledgements
Multi-tiered Systems of Support

Academic Systems (RTI)
- Intensive, Individual Interventions
  - Individual Students
  - Assessment-based
  - High Intensity
- Targeted Group Interventions
  - Some students (at-risk)
  - High efficiency
  - Rapid response
- Universal Interventions
  - All students
  - Preventive, proactive

Behavioral Systems (PBIS)
- Intensive, Individual Interventions
  - Individual Students
  - Assessment-based
  - Intense, durable procedures
- Targeted Group Interventions
  - Some students (at-risk)
  - High efficiency
  - Rapid response
- Universal Interventions
  - All settings, all students
  - Preventive, proactive

Data-based Decision-Making: Using screening, diagnostic, and progress monitoring assessments to guide instruction and intervention
Importance of data collection
(Alberto & Troutman, 2013)

- Data collection serves to:
  - Determine the effects of an intervention on behavior
  - Provide formative and summative evaluation
  - Make decision about the allocation of school-based services
  - Promote communication between stakeholders
  - Promote accountability
    - Every Student Succeeds Act (ESSA)
Data are important, but

- Behavior specialists have unmanageable caseloads
  - Expectations of classroom teachers do not align with job description
- Clinical settings and university support not an option for everyone
What happens in student support team meetings? How do you know if a student is making progress?
What happens in student support team meetings?
And then, LET’S USE THE DATA!!!
Data are important, so

"In God we trust; all others must bring data."
- W. Edwards Deming
Because

Without data you're just another person with an opinion.

W. Edwards Deming
However, we need to keep in mind...
But let’s not get overwhelmed

Data are not about adding more to your plate. Data are about making sure you have the right things on your plate.
So today, we are going to

KEEP CALM AND USE DATA WISELY
Today’s Objectives

We will learn about

a) data-based individualization (DBI) and why it is important
b) how to evaluate student progress within behavioral interventions, and
c) actual teacher applications of DBI and their perceptions of the process.
Rationale for Prevention & Intervention
Rationale for Intervention: Prevention for students at-risk for and with disabilities

- Students with disabilities have a history of poor outcomes, compared to their peers without disabilities, in several areas:
  - Academic achievement
  - High school completion
  - Postsecondary education
  - Employment
  - Involvement with the criminal justice system
Rationale for Intervention: Prevention for students at-risk for and with disabilities

- Dropout Rates:
  - All students: 7.4%
  - All students with disabilities: 26.2%
    - Learning disabilities: 25.1%
    - Emotional disturbance: 44.9%
    - Intellectual Disability (formerly mental retardation): 22.3%
    - Other health impaired: 23.4%
Rationale for Intervention: Prevention for students at-risk for and with disabilities

Average hourly wage

- All out-of-high school young adults with disabilities: $9.40 (0.31)
- All out-of-high school young adults in the general population: $13.20 (0.26)***

(***p < .01; Sanford et al., 2011, p. 27)
Rationale for Intervention: Prevention for students at-risk for and with disabilities

- Interaction with the Criminal Justice System

<table>
<thead>
<tr>
<th>Criminal justice system involvement</th>
<th>Speech/language impairment</th>
<th>Mental retardation</th>
<th>Emotional disturbance</th>
<th>Hearing impairment</th>
<th>Visual impairment</th>
<th>Orthopedic impairment</th>
<th>Other health impairment</th>
<th>Autism</th>
<th>Traumatic brain injury</th>
<th>Multiple disabilities</th>
<th>Deaf-blindness</th>
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</thead>
<tbody>
<tr>
<td>Arrested one or more times</td>
<td>22.3 (3.34)</td>
<td>16.5 (2.92)</td>
<td>12.5 (2.71)</td>
<td>49.4 (4.41)</td>
<td>10.3 (3.12)</td>
<td>7.9 (3.12)</td>
<td>7.5 (2.48)</td>
<td>22.4 (3.49)</td>
<td>6.2 (2.54)</td>
<td>23.2 (6.41)</td>
<td>8.1 (3.14)</td>
</tr>
<tr>
<td>Parole one or more times</td>
<td>11.8 (2.59)</td>
<td>6.3 (1.91)</td>
<td>5.2 (1.82)</td>
<td>34.0 (4.18)</td>
<td>3.0 (1.75)</td>
<td>2.9 (1.94)</td>
<td>3.6 (1.76)</td>
<td>12.4 (2.76)</td>
<td>2.2 (1.55)</td>
<td>19.2 (5.98)</td>
<td>5.0 (2.51)</td>
</tr>
</tbody>
</table>

Twenty-three percent of young adults with disabilities have been arrested at least once, approximately twice the rate for youth in the general population (12%; $p < .001$).

(Sanford et al., 2011)
What do these data mean?

- Students with disabilities
  - Continue to have low academic achievement
  - Drop out of school at unacceptably high rates
  - Low wage work and high incarceration rates put them at risk for a lifetime of difficulty in work and life
What can we do?

• Provide high-quality, individualized intervention!
Data-Based Individualization
Data-Based Individualization (DBI)

• DBI is “a systematic method for using data to determine when and how to provide more intense (or less intense) intervention”
  – DBI is a process, NOT a single intervention or strategy
  – DBI is NOT a one-time fix
  • On-going process of intervention and assessment adjusted over time
Adapted DBI
Step 1: Collect Baseline Data

- What is baseline data?
  - Data collected prior to intervention being in place

- Why collect baseline data?
  - Comparison to intervention data—is intervention working?

- When and how long do I collect baseline data?
  - No rules, 3-5 days recommended

- How do I collect baseline data?
  - Select method of measurement (intervention dependent)
Methods of Measurement

• Options:
  – Direct Behavior Ratings
  – Direct Observation
  – Intervention-Based Measures

Selection depends upon the intervention being implemented
Direct Behavior Rating: Standard Form

- DBR: teacher rating of student behavior on 0-10 scale immediately at end of observation session

- Each behavior has operational definition with examples and nonexamples

- Other option: Fill in with your own target behaviors

*Lower score for disruptive is more desirable

www.directbehaviorratings.org
Direct Observation

• Direct measure of student behavior in real time (i.e., recording behavior as it occurs in the setting of concern)
  – Generally regarded as the gold standard for behavioral assessment measures
    • Teacher Options: Frequency, Momentary Time Sampling

<table>
<thead>
<tr>
<th>Interval</th>
<th>Occur</th>
<th>Did not Occur</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>3</td>
<td>X</td>
<td></td>
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<tr>
<td>4</td>
<td></td>
<td>X</td>
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<td>5</td>
<td>X</td>
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<td>9</td>
<td>X</td>
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<tr>
<td>10</td>
<td>X</td>
<td></td>
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</tbody>
</table>

Larry: 

Bobby: 

Tony: 

Linda: 

10/10 = 100% 

Ideally 20

Graph this %
Intervention-Based Measures

- Data that are collected within the intervention

Sample CICO Card

<table>
<thead>
<tr>
<th>Score Board</th>
<th>Name ________________</th>
<th>Date ________________</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Safe</td>
<td>Responsible</td>
</tr>
<tr>
<td>Morning Work</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Reading</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Lunch/Recess</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Math</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>PE/Music/Block</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Today's goal</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Today's total points</td>
<td>Today's total points</td>
<td>Comments:</td>
</tr>
</tbody>
</table>
Step 2: Implement Intervention

- Plan, Prep, & Practice
- Did the student receive adequate training on the intervention?
  - Teach, Model, Practice
- Has the intervention been implemented for a sufficient amount of time to determine response?
  - Create calendar
- Has the intervention been implemented with fidelity?
  - ALL components, ALL the time

“Don’t do two things half-ass. Do one thing whole-ass.”
-Jon Lester
According to student data, is the student responding to intervention?

Is the intervention being implemented with fidelity?

No

Need better implementation prior to placing student in more intense level of intervention. Provide training to interventionists.

Yes

The student may need (a) a different or more intense intervention, or (b) further assessment and evaluation.

Is the intervention being implemented with fidelity?

No

There are likely factors outside of the intervention contributing to improved student behavior.

Yes

Keep implementing the intervention as designed, and then begin to fade the intervention to promote maintained behavioral change.

Treatment Fidelity Decision Model (Bruhn, Hirsch, Gorsh, & Hannan, 2013)
Step 3: Progress Monitor

- Do data indicate the student is responding to intervention?
  - Graph data and observe graph to determine:
    - How does the behavior compare to baseline?
    - Is the behavior better or worse?
    - Is the behavior stable?
Step 3: Progress Monitor

- Do data indicate the student is responding to intervention?
  - No = nonresponder
  - Yes = responder

What now???
Step 3: Progress Monitor

- Do data indicate the student is responding to intervention?
  - No = nonresponder
  - Yes = responder

What now???
Step 4: Intervention Adaptation

- Nonresponders = intensify intervention
- Responders = fade intervention (or continue as is and progress monitor)

We should NOT be doing the same thing for responders and non-responders!
## Step 4: Intervention Adaptation

### NONRESPONDERS

- **Goal**
  - Lower the goal
- **Frequency**
  - Increase the frequency of intervention
- **Feedback**
  - Increase the frequency of feedback
- **Reinforcement**
  - Add a reward for meeting the daily goal
  - Provide reward choice
- **Add Components**
  - Self-graphing
  - Prompts/incidental teaching
  - Check-Ins

### RESPONDERS

- **Goal**
  - Raise the goal
- **Frequency**
  - Decrease the frequency of intervention
- **Feedback**
  - Provide less frequent feedback
- **Reinforcement**
  - Increase the contingencies (e.g., must meet goal 3 days in a row to receive reward)
  - Change the reward, provide choice
  - Fade to praise only
- **Remove Components**
Step 5: Diagnostic/FBA for Nonresponders

- **Academic assessments**
  - CBM
  - Other standardized tools

- **Behavioral screening tools**
  - SDQ
  - BASC-2
  - SSIS

- **Functional Behavior Assessment (FBA)**
  - Interviews
  - Records review
  - Direct observation (A-B-C)
Data-Based Individualization

- DBI is “a systematic method for using data to determine when and how to provide more intense (or less intense) intervention”
  - DBI is a process, NOT a single intervention or strategy
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DBI Using a Self-Monitoring App: Real-World Examples
Self-Monitoring Intervention App
Henry

- 6th grade student
- Special education services in Level II/III classroom
- Long, complex behavior history (e.g., eloping, tantrums, police, etc.)
  - 21 ODRs in previous year
  - SDQ: scored in abnormal range on conduct problems and hyperactivity/inattention
  - SSIS: bottom 1% for social skills, 82%ile for problem behavior
- Beginning reader (BR) according to Scholastic Reading Inventory (SRI)—schoolwide reading screener

Bruhn, Vogelgesang, Fernando, & Lugo, 2016
Trey

- White, 7th grade, male
- Poor home life
- Lack of engagement
- SDQ: total difficulties = slightly raised to high risk

Bruhn, Woods-Groves, Fernando, Choi, & Troughton (in press)

TI Soc St = 100%
TI Science = 100%
IOA AE = 90-100%
IOA DB = 94-100%
Anna

- White, 6th grade, female
- IEP with reading & math goals, no behavioral goals (despite ADHD, OCD, PTSD)
- Lack of engagement, highly disruptive & defiant
- SDQ: Total difficulties = very high risk

TI Science = 93-100%
TI Math = 67-100% (X = 91%)
IOA AE = 90-99%
IOA DB = 91-100%

Bruhn, Woods-Groves, Fernando, Choi, & Troughton (in press)
“Improving Intervention Implementation Using Data-Based Individualization”

- 16 gen ed/sped teachers (4th-6th grade) attending 5-part professional development series (Nov-Mar)
  - All running their own single-subject designs (e.g., AB, multi-tx, changing criterion) with a student demonstrating challenging behavior
  - Graduate assistants collecting fidelity data 1x/wk
  - Mixed-method analysis (Student outcomes = single-subject, Teacher outcomes = qualitative)
DBI

DATA-BASED INDIVIDUALIZATION (DBI) FORM

<table>
<thead>
<tr>
<th>Instructional Activity/Content Area:</th>
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<tr>
<th>Intervention Implementation Decisions</th>
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<td>Date</td>
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Teacher Perceptions of DBI

Assessed after Sessions 1, 3, & 5

– Conceptual understanding
– Self-efficacy
– Usability/Feasibility

• Adapted from Lane, Menzies, Bruhn, & Crnobori, 2010

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Session 1: Nov. 8
• Pre-assessment
• Learn about self-monitoring
• Select student

Session 2: Dec. 6
• Learn about DBI
• Practice DBI using case studies

Session 3: Jan. 17
• Mid-assessment
• Review DBI
• Analyze baseline data
• Intervention planning

Session 4: Feb. 7
• Analyze intervention data
• Discuss DBI decisions

Session 5: Mar. 9
• Post-assessment
• Summative analysis discussion

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COLLEGE OF EDUCATION

Leaders. Scholars. Innovators.
DBI Conceptual Understanding

0 = I do not understand this concept.
1 = I understand this concept a little, but probably not enough to explain it to others.
2 = I understand this concept.
3 = I understand this concept and could explain it to others.

Adapted from Lane, Menzies, Bruhn, & Crnobori, 2010)
DBI Self-Efficacy

0 = I do not have the ability to use this in my classroom yet.
1 = I may be able to use this in my classroom, but I need more training.
2 = I can use this in my classroom.
3 = I can definitely use this in my classroom and help others use this as well.
DBI Usability & Feasibility

0 = This is not useful and/or practical in my classroom.
1 = This has the potential to be useful and/or practical in my classroom.
2 = This is useful and practical in my classroom.
3= This is useful and practical in my classroom and I would recommend it to other teachers.

Adapted from Lane, Menzies, Bruhn, & Crnobori, 2010)
Overall

Conceptual Understanding
Self-Efficacy
Usability & Feasibility

Session 1  Session 3  Session 5
Teacher Perceptions of DBI

Focus groups after sessions 4 & 5
- Open-ended questions related to understanding, implementation, self-efficacy, practicality, and future directions

Session 1:
Nov. 8
- Pre-assessment
- Learn about self-monitoring
- Select student

Session 2:
Dec. 6
- Learn about DBI
- Practice DBI using case studies

Session 3:
Jan. 17
- Mid-assessment
- Review DBI
- Analyze baseline data
- Intervention planning

Session 4:
Feb. 7
- Analyze intervention data
- Discuss DBI decisions

Session 5:
Mar. 9
- Post-assessment
- Summative analysis discussion

Collect baseline data
Obtain consent
Implement intervention & make adaptations
How did using the app and data-based individualization fit into the structure and flow of your classroom?

- Due to the very hands-on nature of the class it has been a little tricky.
- It could be interrupting if used while teacher is physically teaching and speaking to class.
- It fits well but it does become hard to monitor actively when I’m with a guided reading group.
- It interrupted the flow slightly sometimes I have to stop working with a group or student to score.
- I could see it being more challenging during whole group instruction.

- It fits in easily and is very accessible no matter what we are doing in the classroom.
- It has been good during independent work time.
- Seamless at this point!
- It was great for me because I got a good picture of how the student was doing in the general classroom and I don’t always get much time for that.
- I feel making data-based decisions has been valuable. When we reflect on meeting the goal, you can see the student beam with pride.
Next Steps

• Session 5: Summative analysis
• Analyze data from entire project
• Develop expert system: what if we could get the app to help teachers with DBI by providing data-based recommendations?
Project SCORE IT: Developing and Evaluating Interactive Technology to Support Self-Monitoring and Data-Based Decision-Making

**Year 1**
- Plot digitizing and data analysis of 80 self-monitoring studies
- Develop decision rules and apply them to existing data
- Teacher focus groups
- Reprogramming of app into “expert system”

**Year 2**
- Usability & feasibility testing across sites
- Adjustments to decision rules/programming

**Year 3**
- Randomized control trial across sites
- Adjustments to decision rules/programming
Time for questions

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