Overview

1. Provide a definition of sustainability
2. Share results from a line of research regarding sustainability
   - A measure to predict and enhance sustainability
   - A cluster analysis of school responses
   - Perceptions of features related to sustainability
   - Factors predicting sustained implementation

Definition

- Common perception that sustainability is an ethereal, theoretical concept (Vaughn et al, 2000)
- We all have experiences with it
- The same principles of individual behaviour still apply to systems…
- **Sustainability**
  - Durable implementation of a practice at a level of fidelity that continues to produce valued outcomes (McIntosh, Horner, & Sugai, 2009)
Research on Sustainability

- Descriptive information about what we think promotes sustainability
  - Based on theory
  - Based on some anecdotal observations
- Clear descriptions of examples of non-sustainability
  - (Gersten & Chard, 2000; Santangelo, 2009; Sindelar et al., 2006; Vaughn et al., 2000)

Overview

- The SUBSIST is a 50 item survey assessing the variables that enhance or prevent sustainability of school-based behaviour interventions
- Developed through content validity and pilot studies

A Measure to Assess Sustainability of School-based Behaviour Interventions

School-wide Universal Behaviour Sustainability Index – School Teams (SUBSIST)


Survey Description

- 50 items representing critical features theorized to enhance or impede sustainability
  - Items selected based on a literature review
- Four questions per item
- Open-ended questions
Content Validity Study

- Participants
  - 21 experts in sustainable implementation of SWPBS and school-based systems change

- Procedures
  - Experts rated the importance of each item, clarity of wording, response format, overall content, and any items that should be added

- Analysis and Results
  - Interrater reliability = .97
  - Content Validity Index = .95

Pilot Study

- Participants (n = 25)
  - 11 Coaches
  - 14 Team Facilitators
  - 11 intact dyads

- Procedures
  - Participants asked to complete the survey twice within two weeks
  - Participants also rated the survey validity and suggested rewording of specific items

SUBSIST Psychometrics

- Internal Consistency
  - .77 to .94 (n = 25)

- Test-retest Reliability (two-week)
  - .96 (n = 19)

- Interrater Reliability
  - .95 (n = 11)

- Concurrent Validity (with SET)
  - .68 (n = 13 [7 schools])

A Measure for School Teams

- The SUBSIST Checklist
  - A self-assessment and action planning tool for school teams and coaches
  - 50 critical features based on SUBSIST items
  - An integrated action plan for sustainability
  - Available for free at: http://bcpbs.wordpress.com/evaluation
Cluster Analysis of Schools


Research Questions

- Can schools be classified into subgroups based on their responses to the SUBSIST measure?
  - What items are critical for cluster formation?
  - What are the features of schools that form a cluster?

Respondents \((N = 217)\)

- Role
  - 43% school team leaders
  - 32% school administrators
  - 12% school team members
  - 9% district coaches
  - 4% other/no answer

Schools \((N = 217)\)

- Representation
  - 14 US states
  - 90 districts (cluster \(M = 2\), range = 1 to 18)
- Level
  - 50% elementary, 16% middle, 5% high
- Free/Reduced Price Lunches
  - 53% had over half of students receiving FRL
- Years of SWPBS Implementation
  - \(M = 5.4\) years, \(SD = 3.2\), range = 1 to 15
- Implementation level (year of response)
  - 64% implementing at fidelity criterion
Recruitment

- Two methods of recruitment
  - State SWPBS coordinator contacts
  - List of schools from PBIS center database
    - 32% response rate
  - Pilot study schools added (n = 15)

Procedures

- Two-step Cluster Analysis
- Variables: 39 Sustainability Index Items from the SUBSIST survey

Clusters

- 2 distinct clusters
  - Cluster 1 (n = 78)
  - Cluster 2 (n = 139)

Critical Item

- The most critical item that contributed to cluster formation:
  - “DATA ARE USED FOR PROBLEM SOLVING, DECISION MAKING AND ACTION PLANNING (TO MAKE SWPBS MORE EFFECTIVE &/OR EFFICIENT)”
  - Predictor Importance = 1.00
Critical Items

Other items that were critical in cluster formation:

- "THE SCHOOL TEAM IMPLEMENTING SWPBS IS WELL ORGANIZED AND OPERATES EFFICIENTLY"
  Predictor Importance = 0.67

- "SCHOOL PERSONNEL PERCEIVE SWPBS AS EFFECTIVE IN HELPING THEM ACHIEVE DESIRED OUTCOMES"
  Predictor Importance = 0.66

- "SWPBS HAS BEEN EXPANDED TO OTHER AREAS (E.G., CLASSROOMS, BUSES, STUDENTS WITH INTENSIVE NEEDS, PARENTING WORKSHOPS)"
  Predictor Importance = 0.62

Mean Item Scores by Cluster

<table>
<thead>
<tr>
<th>Item</th>
<th>Cluster 1 (n = 78)</th>
<th>Cluster 2 (n = 139)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Data are Used for Problem Solving&quot;</td>
<td>2.71</td>
<td>3.87</td>
</tr>
<tr>
<td>&quot;School team is well organized and Operates Efficiently&quot;</td>
<td>2.79</td>
<td>3.74</td>
</tr>
<tr>
<td>&quot;School personnel perceive SWPBS as effective in helping achieve desired outcomes&quot;</td>
<td>2.62</td>
<td>3.54</td>
</tr>
<tr>
<td>&quot;SWPBS has been expanded to other areas&quot;</td>
<td>2.55</td>
<td>3.60</td>
</tr>
</tbody>
</table>

* Items rated on a scale of 1-4

Demographics of Schools by Cluster

<table>
<thead>
<tr>
<th>Cluster 1</th>
<th>Cluster 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location of Schools</td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>14%</td>
</tr>
<tr>
<td>Suburban</td>
<td>35%</td>
</tr>
<tr>
<td>Sm/Med City</td>
<td>22%</td>
</tr>
<tr>
<td>Urban</td>
<td>29%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>% of Students Receiving Free/Reduced Lunch</th>
<th>Cluster 1</th>
<th>Cluster 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;20</td>
<td>13%</td>
<td>&lt;20</td>
</tr>
<tr>
<td>20-49</td>
<td>32%</td>
<td>20-49</td>
</tr>
<tr>
<td>50-74</td>
<td>16%</td>
<td>50-74</td>
</tr>
<tr>
<td>75-100</td>
<td>40%</td>
<td>75-100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grades</th>
<th>Cluster 1</th>
<th>Cluster 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elementary</td>
<td>65%</td>
<td>Elementary</td>
</tr>
<tr>
<td>Middle</td>
<td>18%</td>
<td>Middle</td>
</tr>
<tr>
<td>K-8</td>
<td>7%</td>
<td>K-8</td>
</tr>
<tr>
<td>High School</td>
<td>10%</td>
<td>High School</td>
</tr>
</tbody>
</table>
Discussion

- Two distinct clusters.
- The most significant factor in cluster formation was the use of data for problem solving.
- Schools that reported more effective use of data also reported higher SET and BOQ scores.

Perceived Importance of Contextual Features for Sustainability of SWPBS


Research Questions

1. What features were perceived as most and least important for (a) initial implementation and (b) sustainability?
2. What features were rated as significantly more important for sustainability than for initial implementation?

Method

- Sample: 257 respondents from 14 US states
  - 49% Elementary
  - 16% Middle
  - 5% High School
  - Average implementation: 6 years (1 to 15)
- Measure
  - SUBSIST perceived impact questions
Most Important Features for Sustainability
1. School administrators actively support SWPBS
2. School administrators describe SWPBS as a top priority for the school
3. A school administrator regularly attends and participates in SWPBS team meetings
4. The SWPBS school team is well organized and operates efficiently
5. The school administrators ensure that the SWPBS team has regularly scheduled time to meet

Less Important Features for Sustainability
1. Other initiatives are present that compete with SWPBS
2. School personnel are opposed to SWPBS because it goes against their personal values
3. High levels of administrator turnover
4. High levels of school personnel turnover
5. High levels of SWPBS “champion” turnover

More Important to Sustainability than Initial Implementation
- Parents are actively involved in the SWPBS effort (e.g., as part of team or district committee)***
- SWPBS is viewed as a part of systems already in use (as opposed to being an “add-on” system)***
- SWPBS has been integrated into new school or district initiatives***
- A vast majority of school personnel (80% or more) support SWPBS***

Note. ***p < .001
Research Questions

1. What factors emerge from the items on the SUBSIST?
2. How do these factors predict sustained implementation of SWPBS?

Measure: SWPBS Implementation

- School-wide Evaluation Tool (Sugai, Lewis-Palmer, Todd, & Horner, 2001)
- Schoolwide Benchmarks of Quality (Kincaid, Childs, & George, 2005)
- PBIS Self-Assessment Survey (Sugai, Horner, & Todd, 2001)
- Team Implementation Checklist (Sugai, Horner, & Lewis-Palmer, 2001)

Analysis: Multi-Level Structural Equation Modelling (ML-SEM)

- Analyses conducted using Mplus 6.1 (Muthén & Muthén, 2010)
- Mean and variance adjusted weighted least squares (WLSMV) estimator
  - Used with categorical data
- Analyses used
  - Measurement Model (Exploratory Factor Analysis with Geomin rotation, Parallel analysis, COMPLEX)
  - Predictive Model (COMPLEX)

Results: Measurement Model (School-level)

- Model fit indices acceptable (except $\chi^2$)
  - $\chi^2$ (434) = 575.41, $p < .001$, CFI = .97, TLI = .97, RMSEA = .04
- Priority (20 items, reliability = .94)
  - Staff support, administrator support, perceived effectiveness, perceived efficiency, integration into new initiatives
- Implementation (11 items, reliability = .94)
  - School team/staff skill, functioning, regular meetings, data collection, use of data for decision making, presenting data to staff and community
Results: Measurement Model (District-level)

- Model fit indices acceptable
  - $\chi^2 (19) = 27.47, p = .09$, CFI = .93, TLI = .90, RMSEA = .05
- **District Priority** (5 items, reliability = .72)
  - District support, state support, funding, district policy, promoted to external organizations
- **Capacity Building** (3 items, reliability = .73)
  - Access to district coaching, yearly professional development, connection to a community of practice

Results: Zero-order Correlations

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Priority (School-level factor)</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Implementation (School-level factor)</td>
<td>.78***</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. District Priority (District-level factor)</td>
<td>.60***</td>
<td>.53***</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>4. Capacity Building (District-level factor)</td>
<td>.39***</td>
<td>.59***</td>
<td>.58***</td>
<td>--</td>
</tr>
<tr>
<td>5. Sustained PBIS Fidelity (Outcome)</td>
<td>.39***</td>
<td>.58***</td>
<td>.19</td>
<td>.51***</td>
</tr>
</tbody>
</table>

Note. $n = 217$  
*p < .05  **p < .01  ***p < .001

Results: Predictive Model

- Model fit indices acceptable (except $\chi^2$)
  - $\chi^2 (731) = 881.55, p < .001$, CFI = .96, TLI = .96, RMSEA = .03
- $R^2 = .45$
- Factors
  - **Priority** ($B = .14, SE = .39, ns$)
  - **Implementation** ($B = .61, SE = .24, p < .05$)
    - 1 SD increase = fidelity 1.6 times as likely
  - **District Priority** ($B = -1.14, SE = .66, ns$)
  - **Capacity Building** ($B = .98, SE = .43, p < .05$)
    - 1 SD increase = fidelity 1.5 times as likely

Note. School and District levels were analyzed in the same model. Error terms, fixed loadings, and factor covariances removed for figure clarity.
District Level (Between Subjects) Variables

- District Priority Variables
- Capacity Building Variables

Sustained PBIS Fidelity

Note. School and District levels were analyzed in the same model. Error terms, fixed loadings, and factor covariances removed for figure clarity.

Discussion

- School team functioning (esp. use of data for decision making) was strongly related to implementation
  - No significant independent contribution of school administrator, staff support, perceived effectiveness, perceived efficiency, braiding
- District coaching, professional development, and connection to a community of practice were effective district supports
  - No significant independent contribution of active support, general funding, policy

Limitations

- Response rate adequate but not high
- Sample was primarily elementary and school based
- Small number of districts and schools per district
- Results are exploratory and require replication
- Results are specific to SW-PBS

Implications

- School teams can use the SUBSIST Checklist to assess sustainability and identify next steps
- School teams can benefit from training in running meetings and using data
- Districts can support schools by supporting school-level implementation
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Selected References


