SWPBS, SCHOOL SIZE, AND MATH ACHIEVEMENT

6TH INTERNATIONAL CONFERENCE ON POSITIVE BEHAVIOR SUPPORT

Jane M. Stephenson, Ed.D.
March 26, 2009

GENESIS OF STUDY

STUDY OVERVIEW

- Exploratory, correlational study
- Examine relationships among SWPBS, school size, and math achievement.
- Purposeful sample (26 schools) in a large, diverse mid-Atlantic school district
- Two data sources: data from school records, and principal opinion survey
- Simple regression analysis of school records data; descriptive and qualitative analysis of survey item responses.
**SELECTION OF DISTRICT AND SCHOOL SAMPLE**

- Large district, standardization, technology, PBS coordinator, proximity to university
- District SWPBS history
- School sample criteria - elementary, 2 plus years implementation

**RESEARCH VARIABLE MEASUREMENTS**

- School Size - student count June 2007
- SWPBS Implementation - Team Implementation Checklists (TIC)
- SWPBS Effectiveness - Out of School Suspensions (OSS)
- Math Achievement - state standardized standard of learning (SOL) math test
- Principal Perceptions - Opinion Survey

**DESCRIPTIVE STATISTICS SCHOOLS SAMPLE**

<table>
<thead>
<tr>
<th>School Variables</th>
<th>8</th>
<th>Mean</th>
<th>SD</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total # Students</td>
<td>26</td>
<td>670.2</td>
<td>218.2</td>
<td>343</td>
<td>1,248</td>
</tr>
<tr>
<td>Free/Reduced</td>
<td>26</td>
<td>33.4%</td>
<td>22.7%</td>
<td>2%</td>
<td>78%</td>
</tr>
<tr>
<td>ESOL</td>
<td>26</td>
<td>19.6%</td>
<td>12%</td>
<td>1%</td>
<td>46%</td>
</tr>
<tr>
<td>SPED</td>
<td>26</td>
<td>14.5%</td>
<td>4.3%</td>
<td>7%</td>
<td>28%</td>
</tr>
<tr>
<td>OSS</td>
<td>26</td>
<td>.11</td>
<td>16.95</td>
<td>-44</td>
<td>55</td>
</tr>
<tr>
<td>Math SOL</td>
<td>26</td>
<td>3.65</td>
<td>8.15</td>
<td>-12</td>
<td>-19</td>
</tr>
</tbody>
</table>
DATA COLLECTION AND ANALYSIS

- Schools records and principal survey simultaneously
- Survey Response Rate- 96%
- Simple Regression on Schools record data
- Descriptive statistics principal survey

RESULTS SECONDARY ANALYSIS OF RECORDS

RQ - Is school size an effective predictor of SWPBS effectiveness as measured by out of school suspensions (OSS)?
A- No, given an $\alpha$ is equal to .05, the results are not statistically significant, $F(1, 24) = .494$, $p = .489$, and do not lend support to a statistically significant relationship between school size and SWPBS effectiveness.

RESULTS

RQ- Is SWPBS effectiveness an effective predictor of math achievement in schools overall and when school size is grouped into small, medium, and large?
A- When schools of all sizes are grouped together, no, SWPBS effectiveness does not predict math achievement, $F(1, 24) = 1.701$, $p = .204$
RESULTS

- Small-size schools- no significant relationship between SWPBS effectiveness and math achievement, F (1, 2) = .90, p = .443.
- Medium-size schools- YES SWPBS effectiveness is a statistically significant predictor of math achievement, F (1, 16) = .446, p = .002. Indeed, the statistics indicate that close to 45% of the variance in math achievement can be explained by SWPBS effectiveness.

- Large-size schools- No statistically significant relationship between SWPBS effectiveness, F (1, 2) = .666, p = .500.

SWPBS PRINCIPAL SURVEY
EFFECTIVENESS SCALE

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Somewhat Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Percent</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>2a. School climate has improved in my school overall since implementing SWPBS.</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>28</td>
<td>32</td>
<td>92</td>
<td>4.88</td>
<td></td>
</tr>
<tr>
<td>2b. Schoolwide discipline has improved at my school since implementing SWPBS.</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>16</td>
<td>44</td>
<td>36</td>
<td>96</td>
<td>5.12</td>
</tr>
<tr>
<td>2c. Fewer minor (inappropriate language, disobeying teacher) student misbehavior incidents are reported since implementing SWPBS.</td>
<td>0</td>
<td>0</td>
<td>20</td>
<td>16</td>
<td>48</td>
<td>20</td>
<td>80</td>
<td>4.64</td>
</tr>
</tbody>
</table>
2d The number of negative consequences, such as time out or removal from recess, has reduced for students in my school since implementing SWPBS.

2e SWPBS has made a positive impact on student behavior.

2f SWPBS has a positive impact on teachers’ behavior management skills.

2g SWPBS has provided a system for organizing interventions for students with mild to severe problem behaviors.

2h Students with disabilities benefit from SWPBS at my school.

2i School staff are utilizing a greater number of positive behavioral supports for students.

2j Teachers spend less time during, before, or after school on student misbehavior.

2k Teachers spend less time on discipline related paperwork and/or record keeping.

2l School administrators spend less time on student misbehavior.

2m School administrators spend less time on discipline related paperwork and/or record keeping.
### IMPLEMENTATION SCALE

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Agree</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
<th>Percent Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a. My school implements SWPBS with a high degree of fidelity.</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>16</td>
<td>32</td>
<td>28</td>
<td>95</td>
</tr>
<tr>
<td>1b. Teachers and staff implement small group, targeted interventions for students who do not respond to the schoolwide discipline plan.</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>8</td>
<td>40</td>
<td>44</td>
<td>92</td>
</tr>
<tr>
<td>1c. Since implementing SWPBS, there has been an increase in the number of administrator, teacher, and/or staff contacts with mental health and social agencies to access more intensive interventions for students.</td>
<td>4</td>
<td>8</td>
<td>32</td>
<td>13</td>
<td>29</td>
<td>8</td>
<td>50</td>
</tr>
</tbody>
</table>

### PRINCIPAL SURVEY SWPBS EFFECTIVENESS AND SCHOOL SIZE

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Agree</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
<th>Percent Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>3c. The size of my school has impacted the SWPBS effectiveness as measured by reduced OSS.</td>
<td>6</td>
<td>16</td>
<td>16</td>
<td>24</td>
<td>20</td>
<td>8</td>
<td>52</td>
</tr>
<tr>
<td>All Schools</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>33</td>
<td>0</td>
<td>67</td>
<td>100</td>
</tr>
<tr>
<td>Large Schools</td>
<td>0</td>
<td>25</td>
<td>0</td>
<td>75</td>
<td>0</td>
<td>0</td>
<td>75</td>
</tr>
</tbody>
</table>

### PRINCIPAL SURVEY SWPBS EFFECTIVENESS, SCHOOL SIZE, AND MATH ACHIEVEMENT

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Agree</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
<th>Percent Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>3i. The implementation of SWPBS has resulted in increased student engagement in math instruction.</td>
<td>0</td>
<td>4</td>
<td>26</td>
<td>35</td>
<td>30</td>
<td>4</td>
<td>69</td>
</tr>
<tr>
<td>All Schools</td>
<td>33</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>67</td>
<td>67</td>
<td>100</td>
</tr>
<tr>
<td>Large Schools</td>
<td>0</td>
<td>25</td>
<td>0</td>
<td>75</td>
<td>0</td>
<td>0</td>
<td>75</td>
</tr>
</tbody>
</table>
SWPBS Effectiveness and Math

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Somewhat Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Percent Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>3k. The implementation of SWPBS has resulted in increased time for math instruction.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All Schools</td>
<td>4</td>
<td>4</td>
<td>22</td>
<td>30</td>
<td>30</td>
<td>69</td>
</tr>
<tr>
<td>Large Schools</td>
<td>33</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>67</td>
<td>67</td>
</tr>
<tr>
<td>Small Schools</td>
<td>0</td>
<td>25</td>
<td>0</td>
<td>75</td>
<td>0</td>
<td>75</td>
</tr>
</tbody>
</table>

Math Interventions

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Somewhat Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Percent Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>3g. Additional math interventions are incorporated into the SWPBS framework at my school.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>24</td>
<td>12</td>
<td>24</td>
<td>16</td>
<td>4</td>
<td>44</td>
</tr>
</tbody>
</table>

Discussion: SWPBS and School Size

- No prior SWPBS and school size studies
- Statistical results do not support relationship between school size and SWPBS, but do support school size research indicating that school size does not typically impact student outcomes, except in low-socioeconomic schools (Overbay, 2003; Roeder, 2002)
- Principals believe more resources and time may needed due to school size
DISCUSSION SWPBS EFFECTIVENESS

- Survey principal responses very positive
  - 80% or more agreement all items
  - 100% agreement 3 items
  - 96% agreement 3 items
- OSS reductions 11 schools (42%)
  decreased by 1-44 days, ave. of 11.4 days less than in prior studies.

DISCUSSION SWPBS EFFECTIVENESS, SCHOOL SIZE, AND MATH

- Regression analysis indicated SWPBS effectiveness predicted improved math achievement in medium size schools
- Above finding strongly supported by principal responses
- 16 (61%) SWPBS schools improved math scores by 9.3 pts

THEORETICAL IMPLICATIONS

- Improved math achievement, decreased OSS, and positive principal survey responses support SWPBS logic and previous research.
- Study findings support SWPBS school-based implementation component.
PRACTICAL IMPLICATIONS

- Consider varying resources for SWPBS implementation in relation to school size
- Review training and resources to advance tertiary level interventions
- Review math interventions for at risk learners

STUDY LIMITATIONS AND FUTURE RESEARCH

Scope: Only two variables, school size, math achievement beyond SWPBS implementation and effectiveness
  - Include socioeconomic variable
  - Students with disabilities
  - Students in ESOL programs

Scope: Distribution of opinion survey to only one actor, school principals
  - Include teacher, PBS coach, parent perspectives

Instrumentation: TIC, OSS, principal survey
  - More survey questions school programming, implementation of tertiary level
STUDY LIMITATIONS AND FUTURE RESEARCH

- Generalization: Conducted in only one school district
  - Replicate study across districts
  - More qualitative data such as principal and/or teacher interviews or focus groups

CONCLUSIONS

- No statistical relationship between school size and SWPBS effectiveness, but some principals agreed that school size may influence the amount of resources and time needed.
  - 100% principals agreed that SWPBS had positive impact on student behavior, students with disabilities, teacher time; 96% agreed had positive impact on teachers' behavior management; however, statistics showed only 42% of schools reduced OSS.

CONCLUSIONS

- Statistically significant relationship between SWPBS effectiveness and improved math achievement in medium size schools, supported by 69% of principals agreeing SWPBS resulted in increased student engagement in math and increased time for math instruction
CONCLUSIONS

- All but one (96%) principals agreed schools were implementing SWPBS with fidelity, with 100% principals agreeing universal interventions in place, but only 50% agreed tertiary level interventions implemented, and only 44% additional math interventions.

For more information please contact
Dr. Jane Stephenson
janestep@iupui.edu
Indiana University-Purdue University
Indianapolis, Indiana

“An up and coming school that everyone should be watching.”