Intervention Fidelity, Dosage, and Related Student Outcomes in High-Risk Elementary Schools

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Introduction
- Effective interventions implemented with high fidelity results in positive outcomes (Froen, Nazom, Brasil, Friedman, & Wallace, 2005)
- Fidelity: Is intervention implemented as designed?
- Dosage: How much of the intervention is provided?
  - Most school-based professional development is “train and hope”
  - 6 reviews involving >1600 experimental studies published between 1968 and 1990 found that 6%-20% monitored and reported treatment fidelity
  - When assessed, implementation fidelity varies substantially
  - Factors associated with high fidelity:
    - Skill-based training with practice, coaching to application, program evaluation (Froen et al., 2005; Joyce & Showers, 2002)

Method
- Research question
  Is there a relationship between implementation fidelity and dosage of a school-wide classroom management and social skills program and student social and academic outcomes?
- Design
  Using a posttest-only comparison group design, the study examined the effects of low and high doses of GBT WMC components on student classroom behavior, suspension rates, and student academic performance.
- Participants
  56 teachers from 8 Partnership Project elementary schools’ 2nd, 3rd, and 4th grades participated in the study. School enrollment ranged from 358 to 780.

GBT WMC Core Components

Teachers
- Explain expectations for student social and academic performance
- Post classroom and school rules, procedures, and consequences
- Teach behavioral expectations
- Implement a social/life skills curriculum on a daily basis.
- Frequently tell students when they do well academically and socially.
  - Recommended praise-to-correction ratio is 4:1
- Correct student misbehavior and practice appropriate behavior.
  - Use consequences immediately; avoid repeated warnings
- Develop and evaluate strategies using classroom and school discipline data.
  - Focus efforts on frequently disruptive students

Administrator Training
- Goal: Reduce ODR and suspensions
- Increase school-wide WMC use
  - Measure implementation and effects
  - Deal with office referrals
  - Evaluate discipline strategies
  - Implement school-wide discipline plan
  - Support staff with implementation

Coaching
- Goal: Increase WMC implementation
  - Coaching provided by HPS district and school and GBT staff
  - Assess implementation progress via class observations
  - Review w/ staff implementation data and improvement goals
  - Identify challenging staff, students, and situations
  - Devise strategies to address problems
GBT WMC Core Components

**Administrators**

- Use data and school and community resources to help school staff provide support and services for frequently disruptive students.
- Teach referred students alternatives to the referral behavior, behaviors that enable successful re-entry into class.
- Provide teachers with information regarding consequences/strategies for helping the referred student.
- Set clear expectations for and support implementation of the GBTM.
- Implement a school-wide social/life skills curriculum on a daily basis.
- Monitor classroom implementation of the GBTM program.

**GBT WMC Dosage and Assignment to Implementation Groups**

<table>
<thead>
<tr>
<th>Points received</th>
<th>Prompts: Minute</th>
<th>Praise: Minute</th>
<th>Praise: Correction</th>
<th>% Compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0 - 0.8</td>
<td>0 - 0.9</td>
<td>0 – 66%</td>
</tr>
<tr>
<td>1</td>
<td>0.1 - 2</td>
<td>0.9 - 1.2</td>
<td>1.0 - 2.7</td>
<td>67% - 99%</td>
</tr>
<tr>
<td>2</td>
<td>0.3 – 1.1</td>
<td>1.3 - 2.4</td>
<td>2.5 - 18.0</td>
<td>100%</td>
</tr>
</tbody>
</table>

- Points assigned based on teacher use of components
- Total score from 0-3 → low implementation group (n=20)
- Total score from 6-8 → high implementation group (n=18)
- Inter-rater agreement for group assignment was 81%

**Fidelity Measures**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Structured Classroom</strong></td>
<td><strong>Observation VI</strong></td>
</tr>
<tr>
<td></td>
<td>• Praise rate</td>
</tr>
<tr>
<td></td>
<td>• Preventive prompt rate</td>
</tr>
<tr>
<td></td>
<td>• Praise-to-Correction ratio</td>
</tr>
<tr>
<td></td>
<td>• Percent of student compliance with teacher correction</td>
</tr>
<tr>
<td><strong>Teacher surveys</strong></td>
<td>• 23-items (4-point Likert scale)</td>
</tr>
<tr>
<td></td>
<td>• Teachers rate:</td>
</tr>
<tr>
<td></td>
<td>• Their use of GBTM techniques</td>
</tr>
<tr>
<td></td>
<td>• Student classroom behavior</td>
</tr>
<tr>
<td></td>
<td>• Admin. use of GBTM techniques</td>
</tr>
<tr>
<td><strong>Administrator surveys</strong></td>
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</tr>
<tr>
<td></td>
<td>• Teacher use of GBTM techniques</td>
</tr>
<tr>
<td></td>
<td>• Student classroom behavior</td>
</tr>
</tbody>
</table>

**Low vs. High Implementers**

<table>
<thead>
<tr>
<th>GBT WMC Strategies</th>
<th>Praise, Prompt, &amp; Correction Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Compared with Low implementing teachers, High implementing teachers</td>
</tr>
<tr>
<td></td>
<td>• Praised 3 times more often</td>
</tr>
<tr>
<td></td>
<td>• Prompted 4 times more often</td>
</tr>
<tr>
<td></td>
<td>• Corrected 3 times less often</td>
</tr>
<tr>
<td></td>
<td>• Had a praise/correction ratio</td>
</tr>
<tr>
<td></td>
<td>of 4:1 (low implementers had a 1:2 ratio)</td>
</tr>
</tbody>
</table>

- High implementing teachers rated themselves significantly higher than low implementing teachers on use of GBT WMC ($t_{(10)} = -3.31$, $p = .003$)
- Administrators rated high implementing teachers significantly higher than low implementing teachers on use of GBT WMC ($t_{(10)} = -3.46$, $p = .002$)

**Dependent Measures**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Structured Classroom</strong></td>
<td><strong>Observation VI</strong></td>
</tr>
<tr>
<td></td>
<td>• 56 classrooms observed</td>
</tr>
<tr>
<td></td>
<td>• Academic engagement</td>
</tr>
<tr>
<td></td>
<td>• % of students on-task at every 1-min observation interval</td>
</tr>
<tr>
<td></td>
<td>• Inter-rater agreement for off-task rate was 100%</td>
</tr>
<tr>
<td><strong>District reported out-of-school suspension records</strong></td>
<td>• Frequency of events</td>
</tr>
<tr>
<td><strong>Student Report Card Grade</strong></td>
<td>• Compared 1st &amp; 4th quarter GPA</td>
</tr>
<tr>
<td><strong>Point Average (GPA)</strong></td>
<td>• GPA a composite of 23 grades:</td>
</tr>
<tr>
<td></td>
<td>• Reading</td>
</tr>
<tr>
<td></td>
<td>• Listening</td>
</tr>
<tr>
<td></td>
<td>• Writing</td>
</tr>
<tr>
<td></td>
<td>• Math</td>
</tr>
<tr>
<td></td>
<td>• Science</td>
</tr>
</tbody>
</table>

**Low vs. High Implementers Compliance & Off-Task**

- Low implementation classrooms = 19.0% of students off-task
- High implementation classrooms = 3.4% of students off-task
Low vs. High Implementers: Low vs. High implementing teachers had, on average, twice the number of out-of-school suspension events as high implementing teachers. Additionally, students from low implementing teachers’ classroom were suspended, on average, for 3 days, while high implementing teachers’ students were suspended an average of 2 days.

- Low implementing classrooms = average of 8.0 OSS in ’04-’05
- High implementing classrooms = average of 4.1 OSS in ’04-’05

Low vs. High Implementers: Alternative Explanations
- Assignment bias
  - At the start of the school year, students were systematically enrolled in either high or low implementing classrooms
- Happenstance
  - By chance, higher performing students were enrolled in high implementing classrooms, lower performing students were enrolled in low implementing classrooms
- Teacher perceptions
  - Teachers in high implementing classrooms perceive that their students are doing better, focus more on the positive things students do in class, and give them higher grades at the first quarter and throughout the school year
- Teacher quality
  - Before training in GBTEM, high implementing teachers were inherently different than low implementing teacher

Low vs. High Implementers: Report Card GPA
- A report card GPA was computed for each student using 23 grades assigned for Reading, Writing, Math, and Science.
- Letter grades were assigned a numerical value: U=1, N=2, S=3, G=4, E=5.
- First quarter grades were compared with fourth quarter grades.

- Students in both low and high implementing classrooms improved significantly during the school year at a similar pace.
- Students in high implementing classrooms earned significantly higher grades at the start of the school year and that difference maintained throughout the school year.

Conclusions
Findings suggest that teachers who provide higher doses of GBTEM core components (i.e., prevention strategies, praise, effective correction, and a positive praise:correction ratio) have:
- a higher percentage of students who are on-task,
- fewer students who are suspended, and
- students with higher GPAs at the start and end of the school year.

Limitations… this was a retrospective evaluation project, not a prospective experimental design so we cannot rule out alternative explanations for our findings.

Implications
Improve our understanding of low and high implementers.
- Do they differ on:
  - Knowledge of effective classroom management strategies?
  - Willingness to use effective classroom management strategies?
  - Ability to recognize situations in which to use effective classroom management strategies?
  - What is the path from low to high implementation?
  - How did high implementing teachers perform prior to the intervention?
  - Can we identify personal and environmental characteristics that set the stage for high implementation?

Improve our understanding of how to help low implementing teachers implement effective classroom management strategies at a high level.
- Assess low implementers’ readiness to change (Prochaska, Noronis, & DiClemente, 1994) and devise strategies based on change stage
- Assess environmental factors associated with teacher implementation, e.g., administrative support and direction
- Test various coaching strategies with low implementers

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## Review of Treatment Integrity
### Literature 1970-1990

<table>
<thead>
<tr>
<th>Author</th>
<th>Years</th>
<th>Setting</th>
<th># Studies</th>
<th>% Op. deficit</th>
<th>% Rx. integrity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gresham, Gansle, &amp; Noell, 1993</td>
<td>1980-90</td>
<td>Experimental studies assessing treatment effects with children</td>
<td>158</td>
<td>34%</td>
<td>16%</td>
</tr>
<tr>
<td>Gresham, Gansle, Noell, Cohen, &amp; Rosenblum, 1993</td>
<td>1980-90</td>
<td>Intervention studies in school settings</td>
<td>181</td>
<td>35%</td>
<td>14%</td>
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<tr>
<td>Kazdin, Bens, Ayers, &amp; Rodger, 1985</td>
<td>1970-88</td>
<td>Research on child and adolescent psychotherapy</td>
<td>223</td>
<td>56%</td>
<td>19%</td>
</tr>
<tr>
<td>Moncher &amp; Potts, 1991</td>
<td>1980-88</td>
<td>Outcome studies in clinics, psych., psychiatry, beh., ther., &amp; met. &amp; fam. therapy</td>
<td>359</td>
<td>32%</td>
<td>18%</td>
</tr>
<tr>
<td>Peterson, Homer, &amp; Wonderlich, 1982</td>
<td>1968-80</td>
<td>Experimental studies</td>
<td>536</td>
<td>&gt;80%</td>
<td>&lt;20%</td>
</tr>
<tr>
<td>Rogers Wilson, 1982</td>
<td>1975-90</td>
<td>Case studies and large group designs, parent effectiveness training</td>
<td>148</td>
<td>77 (c.a.)</td>
<td>45 (gr.)</td>
</tr>
</tbody>
</table>