Using Positive Behavioral Interventions and Supports (PBIS) to Enhance the School Environment and Reduce Children’s Disruptive Behavior Problems

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July 2, 2008

NIMH (1R01MH67948-1A: P. Leaf) & CDC (1U49CE 000728 and K01CE001333-01)
Prevalence & Significance of Children’s Aggressive and Disruptive Behavior Problems

- DSM-IV diagnoses (lifetime prevalence)
  - Conduct Disorder: 9.5%
  - Oppositional Defiant Disorder: 10.2%

- Predict negative outcomes across lifespan
  - School failure and dropout
  - Mental illness
  - Criminal involvement

- Childhood onset important
  - Among adults with disorders, 75% report that the symptoms began in childhood or adolescence
  - Early onset associated with poorer prognosis

(NCS-R; Kessler et al., 2005; Loeber & Farrington, 2000; Nock et al., 2006, 2007; Weisz, 1998)
An Integrative Model for Linking Prevention and Treatment Research

Weisz et al., 2005, Am. Psychol.
Why prevention through schools?

- Major influence on children’s social and cognitive development
- Experiencing behavior problems first-hand
  - Legislative pressure to provide safe schools
- Opportunity for prevention and early intervention
- Schools as a system of care
  - Referral vs. prevention, assessment, & treatment
- Challenges to both educators & clinicians
  - Exclusion vs. support for behavior problems
  - Additional support & training needed

(Lane & Murakami, 1987; Mayer, 1995; Mayer & Sulzer-Azaroff, 1991; NIMH, 2001; Zima et al., 2005)
What works in school-based prevention of aggressive and disruptive behavior problems?

- Teach social-emotional skills directly in real context
- Foster respectful, supportive relations among students, school staff, & parents
- Support & reinforce positive academic & social behavior through comprehensive systems
- Invest in multiyear, multi-component programs
- Combine classroom, school- & community-wide efforts
- Universal prevention efforts

(Gottfredson et al., 2004; Greenberg et al., 2003; Rones & Hoagwood, 2000)
PBIS Model: Whole-school Prevention

- Application of behavioral, social learning, & organizational behavioral principles
  - Clear behavioral expectations
  - Procedures for managing disruptions
  - Positive rewards
- Public health approach (universal / selective / indicated)
  - Requires a shift from punitive to preventive
- Focus on changing adult behavior
  - Team-based & data-based process
  - Emphasizes staff buy-in
- Can be implemented in any school level, type, or setting
  - Non-curricular model – flexible to fit school context
- Coaching to ensure high fidelity implementation

(Horner & Sugai, 2001; Lewis & Sugai, 1999; Sugai & Horner, 2006)
Overview

- Positive Behavioral Interventions & Supports (PBIS) model
- PBIS organizational structure in Maryland
- Research on PBIS in Maryland
- Integration of PBIS and mental health services
PBIS aims to prevent behavior problems by:

- Increasing positive behavior in all students
  - Expectations and rewards system
MacArthur Middle School

Eagle Code

Be Responsible
Respect Yourself
Respect Others
FOREMAN STUDENTS AND STAFF STRIVE TO BE:

PRODUCTIVE
APPROPRIATE
RESPECTFUL
RESPONSIBLE

ALWAYS
BE
UNCOMMON

KEEP HANDS TO YOURSELF

Move Quickly to assigned class

Positive Language

PLEASE

INSIDE VOICE

Inform security staff of any problems in the hallways.
### MacArthur Middle School’s Eagle Code

<table>
<thead>
<tr>
<th>Expectations</th>
<th>Classroom</th>
<th>Hallway</th>
<th>Cafeteria</th>
<th>Bus</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Be Responsible</strong></td>
<td><em>Be on time</em></td>
<td><em>Walk on the right</em></td>
<td><em>Sit at assigned table</em></td>
<td><em>Follow bus rules</em></td>
</tr>
<tr>
<td></td>
<td><em>Be prepared</em></td>
<td><em>Inside voices</em></td>
<td><em>Throw away trash</em></td>
<td><em>Stay in seat</em></td>
</tr>
<tr>
<td></td>
<td><em>Complete assignments</em></td>
<td><em>Keep personal belongings in locker</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Respect Yourself</strong></td>
<td><em>Do your best</em></td>
<td><em>Report directly to class</em></td>
<td><em>Recycle</em></td>
<td><em>Be at the stop on time</em></td>
</tr>
<tr>
<td></td>
<td><em>Be honest</em></td>
<td><em>Use appropriate language</em></td>
<td><em>Use appropriate language</em></td>
<td><em>Use appropriate language</em></td>
</tr>
<tr>
<td></td>
<td><em>Use appropriate language</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Respect Others</strong></td>
<td><em>Talk in turn</em></td>
<td><em>Keep hands, feet, and objects to yourself</em></td>
<td><em>Eat your own food</em></td>
<td><em>Follow the driver’s directions</em></td>
</tr>
<tr>
<td></td>
<td><em>Follow directions</em></td>
<td><em>Follow directions</em></td>
<td><em>Keep hands, feet, and objects to yourself</em></td>
<td><em>Keep hands, feet, and objects to yourself</em></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><em>Follow directions</em></td>
<td></td>
</tr>
</tbody>
</table>
Posting of School-Wide Expectations

Senn in the HALLWAY...

Be Respectful
• Walk.
• Use appropriate language (No profanity).
• 2 minute grace period.
• Speak in a conversational tone.

Be Academically Engaged
• Be in class when bell rings.
• Give yourself time to get to class.
• End conversations in time.

Be Responsible
• Be aware of the rules.
• Keep hands, feet and objects to self.

Be Caring
• Offer assistance
• Give a friendly word of encouragement

DO THE RIGHT THING
Eagle Tickets

MacARTHUR MIDDLE SCHOOL
EAGLE TICKET
6TH GRADE

Responsibility .................. Respect Yourself .................. Respect Others

Student  Jessica Hurtin  Teacher  Mrs. Friend
PBIS aims to prevent behavior problems by:

- Increasing positive behavior in all students
  - Expectations and rewards system
- Promoting consistency in adults
  - Office vs. classroom managed
Observe Problem Behavior

Warning/Conference with Student

Use Classroom Consequence

Is behavior office managed?

No

Complete Minor Incident Report

Does student have 3 MIR slips for the same behavior in the same quarter

Write the student a REFERRAL to the main office

Yes

Write referral to office

Administrator determines consequence

Administrator follows through on consequence

Administrator provides teacher feedback

Office Managed

• Preparredness
• Calling Out
• Classroom Disruption
• Refusal to Follow a Reasonable Request (Insubordination)
• Failure to Serve a Detention
• Put Downs
• Refusing to Work
• Inappropriate Tone/Attitude
• Electronic Devices
• Inappropriate Comments
• Food or Drink

Classroom Managed

• Weapons
• Fighting or Aggressive Physical Contact
• Chronic Minor Infractions
• Aggressive Language
• Threats
• Harassment of Student or Teacher
• Truancy/Cut Class
• Smoking
• Vandalism
• Alcohol
• Drugs
• Gambling
• Dress Code
• Cheating
• Not w/ Class During Emergency
• Leaving School Grounds
• Foul Language at Student/Staff

SIDEBAR on Minor Incident Reports

• Issue slip when student does not respond to pre-correction, re-direction, or verbal warning
• Once written, file a copy with administrator
• Take concrete action to correct behavior (i.e. assign detention, complete behavior reflection writing, seat change)
PBIS aims to prevent behavior problems by:

- Increasing positive behavior in all students
  - Expectations and rewards system
- Promoting consistency in adults
  - Office vs. classroom managed
- Making data-based decisions
  - SWIS to collect office referrals
Office Referral Form
SWIS Compatible

Name: __________________________
Date: ________ Time: ________
Teacher: _______________________
Grade: K 1 2 3 4 5 6 7 8
Referring Staff: __________

Location: ☐ Playground ☐ Library
☐ Cafeteria ☐ Bathroom
☐ Hallway ☐ Arrival/Dismissal
☐ Classroom ☐ Other

<table>
<thead>
<tr>
<th>Problem Behavior</th>
<th>Possible Motivation</th>
<th>Administrative Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minor Major</td>
<td>☐ Obtain peer attention □ Obtain adult attention □ Obtain items/activities □ Avoid Peer(s) □ Avoid Adult □ Avoid task or activity □ Don’t know □ Other __________</td>
<td>☐ Loss of privilege □ Time in office □ Conference with Student □ Parent Contact □ Individualized instruction □ In-school suspension (____ hours/days) □ Out of school suspension (____ days) □ Other __________</td>
</tr>
<tr>
<td>(Circle One)</td>
<td>☐ Inappropriate language ☐ Fighting/physical aggression ☐ Overt defiance ☐ Disruption ☐ Harassment/tease/taunt ☐ Other __________</td>
<td>☐ Loss of privilege □ Time in office □ Conference with Student □ Parent Contact □ Individualized instruction □ In-school suspension (____ hours/days) □ Out of school suspension (____ days) □ Other __________</td>
</tr>
</tbody>
</table>

Check specific Major problem behavior

Others involved in incident: ☐ None ☐ Peers ☐ Teacher ☐ Substitute
☐ Unknown ☐ Other

If peers were involved, list them

Other Comments:

☐ I need to talk to the student’s teacher ☐ I need to talk to the administrator

Parent Signature: __________________________ Date: __________________________

All minors are filed with classroom teacher. Three minors equal a major.
All majors require administrator consequence, parent contact, and signature.
Graphs showing referrals by location and referrals by time.

- **Referrals by Location**
  - Y-axis: Number of Referrals
  - X-axis: Location

- **Referrals by Time**
  - Y-axis: Number of Referrals
  - X-axis: Time of Day

Additionally, there are bar charts showing:
- **Teachers**
  - Y-axis: Number of Referrals
  - X-axis: Teachers

- **No. Students**
  - Y-axis: Number of Students
  - X-axis: No. of Referrals
PBIS aims to prevent behavior problems by:

- Increasing positive behavior in all students
  - Expectations and rewards system

- Promoting consistency in adults
  - Office vs. classroom managed

- Making data-based decisions
  - SWIS to collect office referrals

- Enhancing support of “higher-need” students
  - 3-Tiered public health approach
Universal programs:
School-/classroom-wide systems for all students and staff

Selective programs:
Specialized, often group-based supports for students with at-risk behavior

Indicated programs:
Specialized individualized services for students with high-risk behavior

PBIS: A public health approach to prevention

~80% of Students

~15%

~5%
An Integrative Model for Linking Prevention and Treatment Research

Dissemination of PBIS
State-Wide, Nationally, & Internationally

- 561 schools in Maryland ≈ 40%
- 6,500 schools in 40+ states

In All 24 Local School Systems
Maryland Organizational Model

**School Level**
- 561 PBIS Teams (one per school) ≈ 40%
  - Team leaders (one per school)
  - Behavior Support Coaches (363)

**District Level (24)**
- District Coordinators

**State Level**
- State Leadership Team
  - Maryland State Department of Education (MSDE)
  - Sheppard Pratt Health System
  - Johns Hopkins Center for Prevention of Youth Violence
  - 24 Local school districts
  - Department of Juvenile Services, Dept. Health & Mental Hygiene
- Management Team
- Advisory Group

**National Level**
- National PBIS Technical Assistance Center
  - University of Oregon & University of Connecticut
Number of PBIS School Teams and Behavior Support Coaches Trained by Year

- **Teams Trained**
- **Coaches Trained**

<table>
<thead>
<tr>
<th>Year</th>
<th>Teams Trained</th>
<th>Coaches Trained</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY99</td>
<td>14</td>
<td>0</td>
</tr>
<tr>
<td>FY00</td>
<td>34</td>
<td>30</td>
</tr>
<tr>
<td>FY01</td>
<td>64</td>
<td>42</td>
</tr>
<tr>
<td>FY02</td>
<td>118</td>
<td>61</td>
</tr>
<tr>
<td>FY03</td>
<td>178</td>
<td>81</td>
</tr>
<tr>
<td>FY04</td>
<td>263</td>
<td>133</td>
</tr>
<tr>
<td>FY05</td>
<td>368</td>
<td>183</td>
</tr>
<tr>
<td>FY06</td>
<td>465</td>
<td>283</td>
</tr>
<tr>
<td>FY07</td>
<td>561</td>
<td>363</td>
</tr>
</tbody>
</table>
Maryland Training and Support Network

- Spring Leadership Forum
  - Attendance: 105 new schools, 600 people

- Summer New Team Training Institute (July)
  - For Coaches & New Teams (1,000 people)

- Summer Returning Team Training Institutes
  - Regional booster training events (3,800 people)

- Coaches Meetings (3 per year) (225 people)

- District Meetings (2 per year) (vary in size)

- Specialized events
  - Special / Alternative Schools (2 per year) (50 people)
  - High Schools (2 per year) (100 people)

(Barrett, Bradshaw, & Lewis-Palmer, 2008)
Pre- vs. Post-Training Suspension Rates for Elementary (n= 31) and Middle (n= 31) Schools

Note. Wilks’ Λ = .924, F (1,60) = 4.91, p=.03. Schools trained in July 2004 (Barrett, Bradshaw, & Lewis-Palmer, 2008)
Randomized Trial of SWPBIS: Project Target

Funding
- Centers for Disease Control & Prevention (P. Leaf, PI)
- National Institute of Mental Health (P. Leaf, PI; C. Bradshaw, Co-PI)

Sample
- 37 voluntary elementary schools across 5 school districts
  - Enrollment 227-983; 60% Caucasian; 48% suburban; 41% urban fringe; 49% Title I

Design
- Group randomized effectiveness trial
  - 21 PBIS & 16 “Focus/Comparison”
- Baseline plus 4 years (spring 2002 - spring 2007)
  - Data from 29,423 students & 3,563 staff
### School Characteristics

<table>
<thead>
<tr>
<th>School Characteristics</th>
<th>PBIS ($n = 21$ schools)</th>
<th>Comparison ($n = 16$ schools)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>School Enrollment</td>
<td>471.76</td>
<td>132.78</td>
</tr>
<tr>
<td>Student to Teacher Ratio</td>
<td>18.48</td>
<td>4.33</td>
</tr>
<tr>
<td>Free/Reduced Meals (%)</td>
<td>42.93</td>
<td>19.22</td>
</tr>
<tr>
<td>Special Education Students (%)</td>
<td>13.24</td>
<td>4.27</td>
</tr>
<tr>
<td>Caucasian Students (%)</td>
<td>53.81</td>
<td>33.16</td>
</tr>
<tr>
<td>Student Mobility (%)</td>
<td>25.88</td>
<td>8.24</td>
</tr>
<tr>
<td>Suspension (%)</td>
<td>7.73</td>
<td>7.43</td>
</tr>
<tr>
<td>Math Performance (%)†</td>
<td>47.20</td>
<td>22.37</td>
</tr>
<tr>
<td>Reading Performance (%)†</td>
<td>50.66</td>
<td>19.32</td>
</tr>
</tbody>
</table>

Note. No overall significant difference between PBIS and comparison schools at baseline, Wilks’ $\Lambda = .89$, $F (5, 31) = .76$, $p = .58$
Data Collected

- **Implementation fidelity**
  - School-wide Evaluation Tool (SET; Sugai, Lewis-Palmer, Todd, & Horner, 2001)
  - Effective Behavior Support Survey (Self-assessment; Sugai, Todd, & Horner, 2000)

- **Organizational health**
  - Organizational Health Inventory (OHI; Hoy et al., 1990)

- **School climate**
  - School Climate Survey (Haynes, Emmons, & Comer, 1994)

- **Disruptive behavior**
  - Teacher Observation of Classroom Adaptation (TOCA-R; Werthamer-Larsson et al., 1991)
  - Student Interactions in Specific Settings (SISS; Cushing & Horner, 2002)
  - Office discipline referrals (SWIS; School-Wide Information System)
  - Suspensions (school-level)

- **Academic information**
  - State standardized test scores (school-level)
**Fidelity: School-wide Evaluation Tool (SET)**

![Bar chart showing mean scores over years for Focus and PBIS categories.]

- **Baseline**: Focus: 37%, PBIS: 43%
- **Year 1**: Focus: 56%, PBIS: 84%
- **Year 2**: Focus: 61%, PBIS: 90% (** indicates significant difference, \( p < .05 \), unadjusted means)
- **Year 3**: Focus: 49%, PBIS: 91% (\* indicates significant difference, \( p < .05 \), unadjusted means)
- **Year 4**: Focus: 48%, PBIS: 95% (** indicates significant difference, \( p < .05 \), unadjusted means)

**Note.** * indicates significant difference, \( p < .05 \), unadjusted means.  
(Bradshaw et al., 2008; ETC)
Repeated measures GLM, baseline vs. year 4, sig. intervention effect: $F(1,28) = 14.36, p=.001$; adj= controlled for student mobility, school enrollment, % Caucasian, % FARMs, student-teacher ratio, & cohort.
Analysis of Organizational Health Inventory (OHI) Data

- OHI: 37 item staff-report measure of 5 aspects of a healthy functioning school (Hoy et al., 1991)
  - **academic emphasis** - students are cooperative in the classroom, respectful of other students who get good grades, and are driven to improve their skills
  - **staff affiliation** - warm and friendly interactions, commitment, trust
  - **collegial leadership** - principal’s behavior is friendly, supportive, open
  - **resource influence** - principal’s ability to lobby for resources for the school
  - **institutional integrity** - teachers are protected from unreasonable community and parental demands
  - overall OHI score (average of all items)

- Analyses
  - Longitudinal analyses were conducted using a 3-level approach in Mplus 5.1 (Muthén & Muthén, 2006)
    - Intent to treat approach (Lachin, 2000) & adjusting for fidelity (SET)
    - Adjusted for staff (sex, race, age) and school (FARMs, student mobility, faculty turnover, & school enrollment) covariates on intercept and slope
Effect of PBIS on Overall OHI

Note. Adjusted means from 3-level model.
* Intervention effect on slope of overall OHI significant at $p<.05$. 

Sig. change (.05)
## Effect of PBIS on Overall OHI

<table>
<thead>
<tr>
<th>Overall OHI (n = 2187)</th>
<th>Intercept</th>
<th>Growth (Slope)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coef.</td>
<td>SE</td>
</tr>
<tr>
<td><strong>Staff Characteristic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.018†</td>
<td>.011</td>
</tr>
<tr>
<td>Minority Status</td>
<td>-.003</td>
<td>.036</td>
</tr>
<tr>
<td>Sex</td>
<td>-.082*</td>
<td>.041</td>
</tr>
<tr>
<td>Role</td>
<td>.013</td>
<td>.019</td>
</tr>
<tr>
<td><strong>School Characteristics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PBIS Intervention Status</td>
<td>.003</td>
<td>.095</td>
</tr>
<tr>
<td>Faculty Turnover</td>
<td>-.012*</td>
<td>.004</td>
</tr>
<tr>
<td>Student Mobility</td>
<td>-.001</td>
<td>.006</td>
</tr>
<tr>
<td>Free/Reduced Meals</td>
<td>-.003</td>
<td>.002</td>
</tr>
<tr>
<td>Enrollment</td>
<td>-.180</td>
<td>.138</td>
</tr>
</tbody>
</table>

*(Bradshaw et al., in press)*
Effect of PBIS on Collegial Leadership

Note. Adjusted means from 3-level model. * Intervention effect on slope significant at $p<.05$, $d=.29$ at Year 3 & 4
**Effect of PBIS on Other OHI Subscales**

![Graphs showing changes in Academic Emphasis, Staff Affiliation, Resource Influence, and Institutional Integrity over study years.](image)

All Sig. change (.05)

*Note.* Adjusted means from 3-level model. * Intervention effect on all slopes significant at \( p < .05 \). \( d \) range from .24 - .34 at Year 4.
OHI and Fidelity

- Baseline fidelity score (“naturally occurring PBIS”) did not predict speed of implementation or baseline OHI.

- (Only) end of Year 1 fidelity predicted growth.
  - Likely a ceiling effect thereafter because all trained schools reached high fidelity.

- OHI intercept and slope negatively correlated.
  - Schools starting with lower levels of OHI tended to take longer to reach high fidelity, but improved the most.

(Bradshaw, Koth et al., under review)
Effect of PBIS on Overall OHI Moderated by Fidelity

Note. SET is fidelity measure, with >80 indicating high fidelity. Adjusted means from 3-level model.
Major Office Discipline Referrals

Note. N= 21 PBIS schools. ODR data not available from Comparison schools
N=21 PBIS schools; Wilks’ Λ = .42, F[3,13] = 5.92, p = .009, η² = .577, adjusted for covariates
Number of Major & Minor Events per Student

N=21 PBIS schools; Wilks’ $\Lambda = .544$, $F[3,13] = 3.633$, $p=.042$, $\eta^2 = .456$, $d = .21$, adjusted for covariates
% Students with a Suspension Event
(Duplicated Count)

School-level data from MDSE. Wilcoxon test: (PBIS) $Z = -2.17, p = .03$; (Comparison) $Z = -1.54, p = .12$
Achievement Data (MSA): School Level (% Prof. + % Adv.)

Cumulative gain in improvement in MSA between Year 1 & 4. Baseline data not available. †T-test for Grade 5 math: t = -1.67, df = 35, p = .105.
Summary of Preliminary Findings

**Main Effects**

- PBIS schools reached & sustained high fidelity
- PBIS increased all aspects of organizational health
  - Effect sizes .24 for AE to .35 for overall (“practical sig.”)
- Positive effects/trends for student outcomes
  - Fewer students with 1 or more ODRs (majors + minors)
  - Fewer ODRs (majors + minors) per student
  - Fewer suspensions (-1/4)
  - Increasing trend in % of students scoring in advanced and proficient range of state achievement test
PBISplus Project

Funding
- Institute of Education Sciences (P. Leaf, PI; C. Bradshaw, Co-PI)

Sample
- 46 elementary schools that have high fidelity PBIS & significant “yellow-zone”
  - Counties: Anne Arundel, Baltimore County, Charles, Howard, George’s & Carroll)

Design
- 3 year group randomized controlled trial
- Random assignment to either “SWPBIS” or “Plus”
Meeting the Social-Emotional Needs of Non-Responders

**Funding**
- Centers for Disease Control and Prevention (K01, C. Bradshaw, PI)

**Goals**
- Identify social-emotional, behavioral, and family characteristic of children who do not respond to universal PBIS program
- Identify contextual factors associated with outcomes of PBIS
- Develop adaptive intervention for non-responders including evidence-based behavioral and social-emotional programs
  - Focus on team-based decision-making and use of data
Acknowledgements

Johns Hopkins
- Phil Leaf
- Katrina Debnam
- Mary Mitchell
- Christine Koth
- Qing Zheng

Maryland State Department of Education
- Milt McKenna
- Andrea Alexander
Sheppard Pratt Health System
- Susan Barrett
- Jerry Bloom

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PBIS Resources
www.PBIS.org
www.PBISMaryland.org

Supported by NIMH (1R01MH67948-1A) & CDC (1U49CE 000728 and K01CE001333-01)