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Implementing Facility-Wide Positive Behavior Interventions and Supports in Secure Juvenile Correction Settings: Results of an Evaluation Study

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Abstract

In this study, we assessed the feasibility and social validity of an adapted approach to positive behavior interventions and supports (PBIS) implementation in secure juvenile facilities. The authors developed a comprehensive model of facility-wide positive behavior interventions and supports (FW-PBIS) for use in secure juvenile correctional facilities, both detention and long term, as well as state and privately run. FW-PBIS leadership team members that included all major facility roles (education, corrections, mental health, medical, recreation) participated in staff development activities and implemented the advocated approaches over the course of the study. We assessed the fidelity, feasibility, and social validity of FW-PBIS in a repeated-measures evaluation study across 50 secure juvenile facilities. We collected intervention fidelity data using a version of the School-Wide Evaluation Tool modified to reflect the unique features of secure juvenile facilities. We also gathered behavioral incident data from the facilities, but it was not possible to combine these data across sites due to the vast differences in data collection, definitions/classifications, and storage systems from state to state. Results indicated that all participating facilities were able to achieve acceptable FW-PBIS implementation fidelity. Staff rated the intervention as acceptable, feasible, and were willing to implement FW-PBIS practices. Staff members also reported gains in sense of efficacy in their roles. Results are discussed in terms of limitations of the current study, future research, and practice needs.

Keywords

juvenile justice, juvenile corrections, fidelity assessment, facility-wide positive behavior interventions and supports, FW-PBIS, efficacy, social validity, organizational health

Placing adjudicated youth into punitive and restrictive environments goes against scientific evidence about supporting healthy adolescent development and restricts opportunities to learn and practice adaptive behavioral and cognitive skills (Lipsey et al., 2000; Nelson et al., 2004; Sprague et al., 2014), and yet, this remains the predominant treatment model in the United States. In the face of this evidence, most state and county juvenile justice (JJ) systems continue to utilize secure incarceration, which impedes effective diversionary, treatment, and rehabilitation practices. Notably, the census in secure juvenile facilities is down significantly from 108,000 in the year 2000 and currently, 48,000 youth were being served in secure juvenile facilities in 2015 (Office of Juvenile Justice Delinquency Prevention: Puzzanchera & Hockenberry, 2017) as more and more states participate in JJ reform. However, juvenile correctional facilities continue to be the de facto placement for youth with disabilities and those with mental health issues even though many of these facilities continue to use reactive and punitive behavior management systems (Jolivette & Nelson, 2010). For example, youth with disabilities received more behavioral infractions and longer and more punitive sanctions for behavioral infractions as compared with peers without disabilities (Leone, 1994); and those youth with comorbid emotional and behavior disorders and mental health issues remained in secure juvenile facilities longer than other youth (Seltzer, 2004).

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Researchers suggest that an effective JJ intervention communicates, promotes, and reinforces desirable behavior and minimizes opportunities for youth to engage in problematic behavior (Jolivette et al., 2016; Nelson et al., 2010). Adults in a responsive JJ system should consistently and fairly provide corrective consequences for rule/behavioral infractions and provide multiple opportunities for youth to engage in positive activities, build skills (academic, vocational, emotional) through direct teaching and facilitation, and use clear and individualized systems of motivation/reinforcement (Sprague et al., 2014). Failure to achieve rehabilitation while incarcerated results in high rates of recidivism and a host of negative outcomes over the life course of these individuals (Houchins et al., 2009).

For the benefit of youth served in JJ facilities, as well as for the larger society, educators and juvenile correctional professionals have a duty to make the JJ system the most effective and humane that it can be with both a rehabilitative and habilitative lens. In our view, a promising path in this regard is to adopt, adapt, and implement the logic and procedures of positive behavior interventions and supports (PBIS; Farkas et al., 2012; Myers & Farrell, 2008; Nelson et al., 2009, 2010; Simonsen et al., 2011) which also may positively affect a student's persistence in the school-to-prison pipeline (Jolivette et al., 2012).

The Promise of PBIS for Secure Juvenile Corrections

The extension and adaptation of PBIS into JJ settings has progressed positively in the past several years (Jolivette et al., 2016) and much progress in adoption and implementation as well as promise has been documented (e.g., Alonzo-Vaughn, Bradley, & Cassavaugh, 2015; Fernandez & McClain, 2014; Fernandez, McClain, Brown-Williams, & Ellison, 2015; Jolivette et al., 2016). State and local leaders, program administrators, frontline staff (e.g., general and special education teachers, residential, law enforcement, mental health staff members, recreation), advocates, and researchers increasingly are adopting PBIS as a promising approach to better meet the complex and diverse needs of youth involved in the JJ system. The PBIS framework with systems, data, and practices is appropriate and needed for incarcerated youth because (a) they have the same rights to a free and appropriate public education as do their same age-peers; (b) they must be afforded all the protections and services under the law that their peers with and without disabilities receive in general education schools; and (c) they need access to a comprehensive curriculum that emphasizes both academic and social skill instructional supports (Scott et al., 2002).

Study Purpose

In this study, we assessed the feasibility and effects of facility-wide positive behavior interventions and supports (FW-PBIS) staff development specific to secure juvenile facilities including short and long term as well as state and privately run facilities in Oregon, Georgia, California, Illinois, Arizona, and Colorado. FW-PBIS leadership team members at the facility level were asked to participate in staff development activities and use the procedures over the course of the study. Program components addressed universal FW-PBIS features of systems, data, and practices. These included establishing universal behavioral expectations, systematic behavior teaching, positive reinforcement systems, systematic supervision in all areas of the facility, instructional and function-based responses to minor problem behavior, defusing aggressive or escalating behavior, and problem-solving using data-based decision-making rules (e.g., analyzing incident report patterns by frequency, type, location, referring staff member, time of day). Our working definition of universal FW-PBIS included the following components for implementation: (a) across all programming hours and activities; (b) by all staff no matter discipline or shift; (c) across all facility environments; and (d) embedded within daily operations and rooted in agency/facility policies and local operating procedures. We conducted an evaluation study to answer the following research questions:

Research Question 1: Is FW-PBIS implemented as recommended/intended within juvenile corrections (fidelity or adherence)?
Research Question 2: Do juvenile corrections staff members like the FW-PBIS framework and believe that it is useful, relevant, and significant (user satisfaction)?
Research Question 3: Do juvenile corrections staff perceive the technology (FW-PBIS) as easy to use and valuable (technology acceptance)?
Research Question 4: Do juvenile corrections staff feel confident in their ability to implement FW-PBIS (self-efficacy)?
Research Question 5: How does FW-PBIS implementation affect organizational health?
Research Question 6: Do youth within secure juvenile facilities appear to benefit academically and/or behaviorally from FW-PBIS (promise of effectiveness)?

Method

Participants and Recruitment

JJ facility staff members from 50 secure short- and long-term juvenile facilities from multiple states (i.e., Oregon, Georgia, California, Colorado, Arizona, Illinois) participated in the feasibility and usability evaluation. A total of 460

facility-level JJ staff members participated in one or more data collection time points. Each facility constructed a voluntary cross-disciplinary team who consented to participate per the approved universities' institutional review board (IRB) protocol and agency-approved research and development plan. FW-PBIS leadership facility team members represented frontline staff from all disciplines represented within each facility including (a) unit staff members, (b) security/probation staff, (c) treatment managers, (d) unit supervisors, (e) facility administrators, (f) teachers, and (g) school administrators. The participants self-reported their age, gender, ethnicity, educational background, and years and types of experiences within juvenile facilities.

Research Team

The research team conducted the feasibility study and consisted of (a) a male university professor with expertise in emotional and behavioral disorders and intellectual disabilities, and 25 years conducting PBIS research within alternative settings; (b) a female university professor with expertise in emotional and behavioral disorders, 15 years conducting PBIS research, and 15 years conducting applied research within educational settings including alternative, residential, and juvenile facilities; and (c) a female doctoral candidate with a master's degree in special education with a focus on intellectual disabilities, 5 years teaching students with disabilities, and 2 years conducting applied research in educational settings.

Design

A repeated-measures design with time (three measurement occasions) as the within-subjects factor (Barlow & Hersen, 1984) was used where each facility served as its own control. We collected baseline measures (T1), provided training and technical assistance (T2), and collected post-training measures (T3) as specified in the "Measures" section. The three points in time allowed observations for differences across time points for (a) staff knowledge, (b) staff self-efficacy, (c) staff satisfaction, (d) staff technology acceptance, and (e) implementation fidelity. Interactions between the within-subject measures allowed the study of the relations between staff knowledge acquisition and practices.

Measures

The success of FW-PBIS implementation depended equally on JJ facility staff and youth outcomes. If staff found the FW-PBIS framework too time-consuming or disruptive to their daily routines, they may choose other, potentially less effective, approaches. Also, if demonstrations of benefits in youth in terms of improved social-behavioral skills could not be observed, gains in JJ staff self-efficacy or their satisfaction with the approach, for example, would be irrelevant. Thus, the design of this study strove to address all three of these fundamental human components. All measures were collected via juvenile facility staff self-report at the specific time points. As these staff did not all have access to technology or employee email, all data were collected via pencil and paper. For each of the measures below, we adapted the language to reflect JJ settings (e.g., instead of "teacher" or "school," we changed the item wording to "staff" or "facility").

Intervention fidelity. The research team triangulated data (interviews, direct observations, permanent products) to measure FW-PBIS implementation using the Facility-Wide Evaluation Tool (FET: Jolivette, Sprague, & Boden, 2015) which is an adapted version of the School-Wide Evaluation Tool (SET; Horner et al., 2004). The FET was adapted to take in to account the contextual variables of juvenile facilities, semantics, and processes. The FET (a) provided equal weight to the anchored interviews of both the juvenile facility director (or their designee) and the facility educational principal/lead teacher (or their designee), (b) included a walkthrough with randomly selected juvenile staff representing all disciplines and randomly selected youth representing all ages and genders whereby they were asked about implementation aspects related to FW-PBIS, the perceived influence on student behavior, motivation, and barriers to implementation; (c) synthesized FW-PBIS permanent products (i.e., FW-PBIS local operating procedures, behavioral incident forms, training materials, FW-PBIS leadership team agendas and meeting notes, agency FW-PBIS policies); and (d) visual analyses of the facility environment for tangibles and adherence items to the FW-PBIS framework (e.g., behavioral matrices, posters, precorrection scripts, master schedule of FW-PBIS teachings). A score was produced from the FET which mimicked the scoring processes of the SET but by taking the average of the corrections and education summed scores; these included the percentage of behavioral expectations taught and an overall score of all dimensions of the instrument. Scores of 80% or higher on both (i.e., behavioral expectations taught and overall score) were determined to be of adequate fidelity of implementation. Also, each FW-PBIS leadership team was provided with a report and cumulative graph based on their FET that included action items for sustainability and capacity-building for continuous improvement.

Attitudes about PBIS. JJ facility staff attitudes about FW-PBIS, its goals, processes, consequences, and benefits were assessed by an adapted version of the Stages of Concern (SOC) Questionnaire (Hall, George, & Rutherford, 1986), a 35-item measure that is psychometrically sound and has strong reliability estimates (test/retest reliabilities from .65 to .86) and internal consistency (alpha coefficients from .64 to .83; Hall & Hord, 2001).

Technology acceptance. The Technology Acceptance Model (TAM; Davis, 1986) items, which uses a 6-point Likert-type-like scale to assess the likelihood of using a program (i.e., FW-PBIS) was adapted. The TAM is one of the most widely used models to examine user acceptance. This model is grounded in social psychology theory in general and the Theory of Reasoned Action (TRA) in particular (Fishbein & Ajzen, 1975). Davis (1986) introduced constructs in the original TAM as (a) perceived usefulness (PU), (b) perceived ease of use (PEOU), (c) attitude, and (d) behavioral intention to use. Among the constructs, PU and PEOU reflect a user's beliefs and predict his or her attitude toward a technology, which in turn predicts its acceptance.

Sense of efficacy. The Teacher's Sense of Efficacy Scale (SOC; Tschannen-Moran & Woolfolk Hoy, 2001), a 12-item survey with three moderately correlated factors—efficacy for youth engagement, efficacy for instructional practices, and efficacy for behavior management, was adapted. Items assessed changes in participants' perceptions of their skill mastery and their self-efficacy in performing them as a result (Tschannen-Moran & Woolfolk Hoy, 2001). This instrument has shown strong internal reliability (coefficient alpha = .90) and construct validity and has been related to a variety of outcomes including (a) youth achievement (Moore & Esselman, 1992; Ross, 1992), (b) teacher planning and organization (Allinder, 1994), (c) inclination to refer youth for special education services (Soodak & Podell, 1993), and (d) commitment to teaching (Trentham et al., 1985). As needed, we changed the language of "teacher" to "staff member" to reflect the JJ setting.

Organizational health. A healthy organization is one in which the institutional, administrative, and staff levels are in harmony, and the facility meets functional needs as it successfully copes with disruptive external forces and directs its energies toward its mission (Hoy & Tarter, 1997). An adapted version of the Organizational Health Inventory (OHI; Hoy & Tarter, 1997) was used to gain an understanding of how each facility functions along multiple dimensions. The subtest dimensions included (a) institutional integrity, (b) collegial leadership, (c) resource influence, (d) staff/teacher affiliation, and (e) academics.

Data Analysis Procedures

Data imputation. Prior to analysis, all survey item variables were checked for out-of-range values and inter- and intra-measure consistency; frequency distributions and plots were examined for unusual data distributions or data points. A primary data management problem was the proportion of missing data across one or two of the data collection periods due to JJ staff retention issues (i.e., staff being dismissed from the facility, staff self-imposed leaving the facility, staff moving to another facility). Of the 460 participants over the multiyear project, 36 completed the TAM across all three time points, 40 completed the self-efficacy measure across all three time points, and 45 completed the SOC across all three time points. To optimize data and maintain statistical power, rather than using listwise deletion we chose to impute missing data. We used the PcAux package (v. 0.0.0.9012) in R v. 3.5 to impute data for the TAM, sense of efficacy, SOC, and OHI "scale" (e.g., factor) values. For missing data estimation, the PcAux package used principal components as auxiliary variables (Howard et al., 2015).

Exploratory factor analysis (EFA). In order to create dependent variables with measurement error accounted for, confirmatory factor analyses were conducted on the proposed factor structure of the instruments. None of these models fit the data well. Rather than going through multiple modification steps, a decision was made to conduct exploratory factor analyses.

Using the fa() function in the psych package in R (R Core Team, 2018), exploratory factor analyses (principal axis factor with oblimin rotation) were conducted on the TAM, SOC, OHI, and the sense of efficacy measures. To identify the number of factors, Parallel Analysis and Velicer's minimum average partial (MAP; Velicer, 1976) were conducted for each measure. Results for each analysis are discussed individually and are in Table 1 for the non-imputed data. Factor scores created by the EFAs were used as dependent variables in the repeated-measures analyses. This has the advantage of using scores without measurement error and being more efficient because fewer Dependent Variables were analyzed.

Results

In this section, we describe the results aligned by the research questions posed above.

Intervention Fidelity

Intervention fidelity data were collected at three time points, with the first time point comprising a baseline performance measure (refer to Figure 1). By Time 3, all facilities in the study had reached or exceeded the goal of 80% implementation for their overall score. Figure 1 illustrates the average FET scores and includes the distribution of scores at each time point. The FET overall average change from Time 1 to Time 2 was statistically significant (sum of squares = 8.50, $df = 2$, $F = 92.75$, $p < .001$). All individual items on the FET improved significantly except for System for Rewarding Behaviors (sum of squares = 0.88, $df = 2$, $F = 1.91$, $p = .15$).

EFA Results

TAM. The most appropriate factor model for technology acceptance was a two-factor model. The two factors were

Table 1. Descriptive Statistics of Participant Measures (Non-Imputed Values).

	Time 1			Time 2			Time 3		
	N	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*
Acceptance Easy	388	4.94	0.96	59	5.17	0.98	123	5.44	0.94
Acceptance Complex	426	4.03	0.78	71	4.09	0.83	127	4.06	0.90
Concern F1	396	5.72	1.42	97	4.64	1.65	145	4.22	1.74
Concern F2	401	5.81	1.35	100	5.24	1.48	147	5.17	1.55
Concern F3	394	3.10	1.23	99	3.26	1.32	145	2.90	1.31
Concern F4	400	4.60	1.28	99	4.44	1.24	148	4.04	12.5
Concern F5	400	6.25	1.43	102	5.32	1.68	151	5.08	1.67
Efficacy	400	6.52	1.42	97	6.64	1.36	150	6.49	1.41
OHI Academics	405	2.65	0.55	84	2.62	0.52	122	2.78	0.53
OHI Leadership	398	3.01	0.60	84	3.00	0.56	127	3.15	0.55
OHI Resource Support	415	2.81	0.74	89	2.80	0.76	133	2.93	0.70

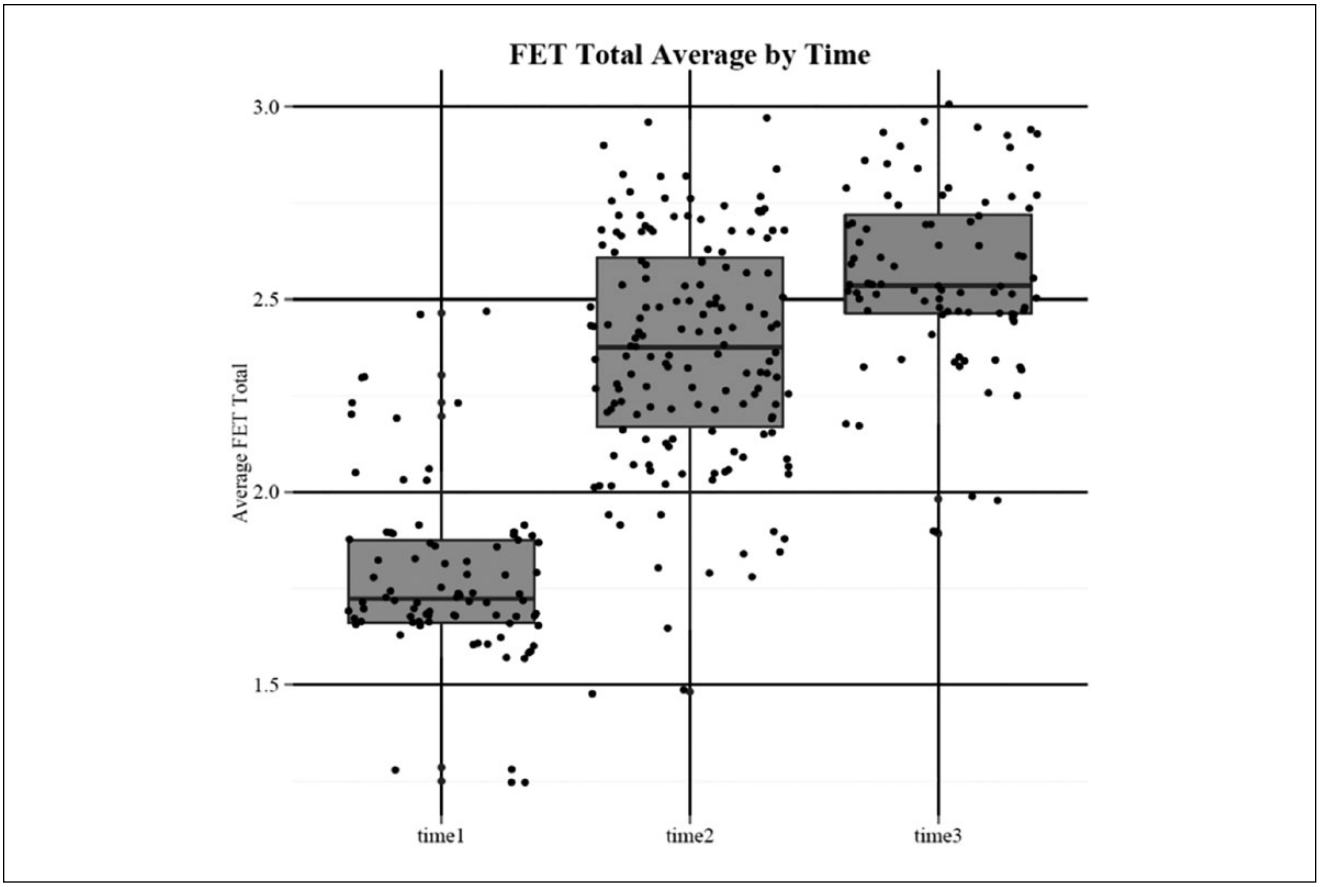

Figure 1. Facility-Wide Evaluation Tool scores by time.

mildly (−.3) negatively correlated. Factor 1 was a combination of PEOU and PU in reducing problem behavior (which we named "Easy") and Factor 2 comprised Perceived Complexity items such as time to implement and complexity of the procedures (which we named "Complex").

SOC. The most appropriate factor model for SOC was a five-factor model; the five factors were moderately (.3–.4) correlated. Stages 1 and 2 combined into a single factor, and Stages 3, 4, and 5 had factors roughly like the original scale. There was a sixth factor that comprised adapted (or newly

Table 2. Repeated-Measures Results (Imputed Values).

	Time 1	Time 2	Time 3
Mean and (Significance)	*M* (*SE*)	*M* (*SE*)	*M* (*SE*)
Acceptance Easy	4.92 (0.04)	5.46*** (0.04)	5.56** (0.04)
Acceptance Complex	4.03 (0.04)	4.01(0.03)	4.10* (0.03)
Concern F1	5.71 (0.06)	4.60*** (0.06)	4.03*** (0.06)
Concern F2	5.79 (0.06)	5.29*** (0.05)	5.12** (0.06)
Concern F3	3.09 (0.06)	3.18 (0.05)	2.87*** (0.05)
Concern F4	4.60 (0.06)	4.39*** (0.05)	4.00*** (0.05)
Concern F5	6.24 (0.07)	5.28*** (0.06)	4.93*** (0.07)
Efficacy	6.54 (0.06)	6.73** (0.05)	6.45***[a] (0.05)
OHI Academics	2.66 (0.03)	2.64 (0.02)	2.77*** (0.02)
OHI Leadership	3.00 (0.03)	2.94* (0.02)	3.14***[b] (0.02)
OHI Resource Support	2.81 (0.04)	2.89** (0.03)	2.92[c] (0.03)

[a]Efficacy increased from Time 1 to Time 2 and decreased from Time 2 to Time 3. But there was not any significant difference in Efficacy from Time 1 to Time 3. [b]OHI Leadership decreased from Time 1 to Time 2 and increased from Time 2 to Time 3. There was a significant increase in OHI Leadership from Time 1 to Time 3. [c]OHI Resource Support increased from Time 1 to Time 2 and was unchanged from Time 2 to Time 3. There was a significant increase in OHI Resource Support from Time 1 to Time 3.
*$p < .05$ (from prior time point). **$p < .01$ (from prior time point). ***$p < .001$ (from prior time point).

created) items across stages; this may suggest that these items could perhaps be dropped without any substantive loss of psychometric power.

OHI. We found three moderately (.6) correlated factors for organizational health: Factor 1 was a combination of Academic Emphasis and Teacher Affiliation items (we called this factor "Academics"); Factor 2 was a combination of Collegial Leadership, Principal Influence, and Institutional Integrity (we called this factor "Leadership"); and Factor 3 comprised Resource Support items.

Self-efficacy. Although a two-factor solution was possible for an efficacy measure, those two factors are highly correlated (.8), and thus, it was decided that efficacy could best be thought of as a single construct. Its value is the average of the items.

Repeated-Measures Analysis of Variance (ANOVA) Results

Using SPSS v24, we conducted repeated-measures ANOVAs using the factors found in the exploratory factor analyses (all factor scores were represented by the mean score of the items) with time as the repeated-measures factor. Table 2 details the results of the repeated-measures ANOVA.

On the TAM "Easy" factor, the imputed means were 4.92, 5.46, and 5.56 for Times 1, 2, and 3, respectively, and there was a main effect for time (sum of squares = 110.27, $df = 2$, $F = 148.39$, $p < .001$). The mean changes from Time 1 to Time 2 and from Time 2 to Time 3 were both statistically significant ($p < .001$). On the TAM "Complex" factor, the imputed means were 4.03, 4.01, and 4.10 for Times 1, 2, and 3, respectively, and there was a main effect for time (sum of squares = 1.95, $df = 2$, $F = 3.21$, $p = .041$). The mean change from Time 1 to Time 2 was not statistically significant, but the mean change from Time 2 to Time 3 was statistically significant ($p = .015$), although the difference between Time 1 and Time 3 also was not statistically significant ($p = .076$).

On the SOC Factor 1, the imputed means were 5.71, 4.60, and 4.03 for Times 1, 2, and 3, respectively, and there was a main effect for time (sum of squares = 672.92, $df = 2$, $F = 218.16$, $p < .001$). The mean changes from Time 1 to Time 2 and from Time 2 to Time 3 were both statistically significant ($p < .001$). On the SOC Factor 2, the imputed means were 5.79, 5.29, and 5.12 for Times 1, 2, and 3, respectively, and there was a main effect for time (sum of squares = 112.69, $df = 2$, $F = 54.07$, $p < .001$). The mean changes from Time 1 to Time 2 and from Time 2 to Time 3 were both statistically significant ($p < .001$ and $p = .005$, respectively). On the SOC Factor 3, the imputed means were 3.09, 3.18, and 2.87 for Times 1, 2, and 3, respectively, and there was a main effect for time (sum of squares = 24.26, $df = 2$, $F = 18.49$, $p < .001$). The mean change from Time 1 to Time 2 was not statistically significant ($p = .076$), whereas the mean changes from Time 2 to Time 3 and Time 1 to Time 3 were both statistically significant ($p < .001$). On the SOC Factor 4, the imputed means were 4.60, 4.39, and 4.00 for Times 1, 2, and 3, respectively, and there was a main effect for time (sum of squares = 85.26, $df = 2$, $F = 50.97$, $p < .001$). The mean changes from Time 1 to Time 2 and from Time 2 to Time 3 were both statistically significant ($p < .001$). On the SOC Factor 5, the imputed means were 6.24, 5.28, and 4.93 for Times 1, 2, and 3, respectively,

and there was a main effect for time (sum of squares = 423.41, $df = 2$, $F = 139.59$, $p < .001$). The mean changes from Time 1 to Time 2 and from Time 2 to Time 3 were both statistically significant ($p < .001$).

On the OHI Factor 1, the imputed means were 2.66, 2.64, and 2.77 for Times 1, 2, and 3, respectively, and there was a main effect for time (sum of squares = 4.85, $df = 2$, $F = 23.48$, $p < .001$). The mean change from Time 1 to Time 2 was not statistically significant ($p = .499$), but the changes from Time 2 to Time 3 and from Time 1 to Time 3 were both statistically significant ($p < .001$). On the OHI Factor 2, the imputed means were 3.00, 2.94, and 3.14 for Times 1, 2, and 3, respectively, and there was a main effect for time (sum of squares = 9.18, $df = 2$, $F = 26.77$, $p < .001$). The mean change from Time 1 to Time 2 was statistically significant ($p = .024$), whereas the changes from Time 2 to Time 3 and from Time 1 to Time 3 were both statistically significant ($p < .001$). On the OHI Factor 3, the imputed means were 2.80, 2.89, and 2.92 for Times 1, 2, and 3, respectively, and there was a main effect for time (sum of squares = 3.20, $df = 2$, $F = 6.65$, $p = .001$). The mean change from Time 1 to Time 2 was statistically significant ($p = .009$), but the change from Time 2 to Time 3 was not significant ($p = .294$); however, the change from Time 1 to Time 3 was significant ($p = .002$).

On the Sense of Efficacy scale, the imputed means were 6.54, 6.73, and 6.45 for Times 1, 2, and 3, respectively, and there was a main effect for time (sum of squares = 18.51, $df = 2$, $F = 11.15$, $p < .001$). The mean change from Time 1 to Time 2 was statistically significant ($p = .001$) and from Time 2 to Time 3 was statistically significant ($p < .001$); the change from Time 1 to Time 3, however, was not statistically significant ($p = .205$).

Discussion

This study was the first evaluation study of implementing the procedures and systems of FW-PBIS in secure JJ facilities. Improvements in FW-PBIS fidelity were found to be significant, indicating that it is possible to implement the FW-PBIS framework, including universal systems, data, and practices across an entire facility per our definition, and not only in the school setting. Repeated-measures ANOVA indicated significant improvement in JJ staff perceptions of FW-PBIS, including willingness to adopt the practices (TAM), reduced concern about the effort and utility of FW-PBIS procedures (SOC), sense of professional efficacy, and improved organizational health. There was little differentiation by JJ staff role with the measures used, and this could be due to the relatively small sample of staff who took the survey battery at all three time points due to facility staff attrition issues.

The collection of standardized measures of youth outcome data such as behavioral incidents across the participating facilities was not possible given the high, consistent, and uncontrolled amount of youth turnover in both the short- and long-term facilities, compromising the validity of traditional PBIS indexes such as the number of behavioral incidences per week/month, per youth, location, and time of day. This is further complicated as each state uses different data collection systems, often mandated by legislative authority. Such differences include various terms and categories of behavioral incidents, incongruent definitions of each term, multiple and varied classifications as to the seriousness of each type of incident, and the number of possible incidents. However, the agencies and FW-PBIS leadership team members from our participant pool have reported improved facility culture with FW-PBIS implementation as evidenced by (a) new data collection systems across the tiers with immediate team access of real-time data for decision-making (e.g., Alonso-Vaughn et al., 2015; Cassavaugh, Alonso-Vaughn, & Bradley, 2014; Fernandez, Doyle, Koon, & McClain, 2015); (b) increased youth programming engagement, more positive youth–staff relations, and decreased youth behavioral incidents (e.g., Jolivette et al., 2015; Kimball et al., 2017; Marten & Withrow, 2014); and (c) the implementation of Tiers II and III (e.g., Alonso-Vaughn et al., 2015).

The results of this evaluation study are very promising for future efforts to adopt, adapt, and implement FW-PBIS in other JJ state agencies and facilities. Demonstration of the ability to achieve high fidelity implementation in a more efficient timeline as compared with SW-PBIS, paired with juvenile staff satisfaction with the systems, data, and procedures suggests that the overall functioning of secure juvenile facilities may be improved by investing in this approach. It remains to be demonstrated whether improvements in youth behavior are achieved consistently in high fidelity facilities, and whether these behavioral improvements are associated with other positive outcomes such as youth well-being, academic success, and staff member wellbeing. However, several of our participating juvenile agencies have since reported improved youth and staff wellbeing (e.g., Jolivette, Swoszowski, Sanders, Ennis, & Boden, 2018; Nuss & Ellison, 2014). We also cannot make inference that a positive experience in a secure facility will translate to better post-incarceration outcomes due to FW-PBIS being a framework and not a single practice, and that is an idea that many have brought forth.

The generality of these findings is limited by two traditional factors. First, the number of juvenile staff members who provided three survey data points across the study timeline was relatively low. Many of the participating facilities across the states reported staff retention as a barrier across their agency with such a barrier continuing to this day, a contextual variable which likely will be very difficult to overcome in future studies. In the same frame, the high level of turnover of youth made it impossible to do any type

of long-term tracking or follow-up measures. Our facility sample included both short- and long-term secure juvenile facilities where the average length of stay varied by facility with a range of 1-week to more than 3 years. Second, since all the facilities volunteered to participate, each served as their own control, thus limiting the experimental validity of our design. It is important to note that in two states representing two geographical locals, every facility within the juvenile state agency participated which may assist with generalization conclusions.

Future empirical studies are needed to further understand the benefits of FW-PBIS as applied within JJ facilities, both short and long term. For example, there is a lack of the full understanding of the costs (e.g., staff professional development, resources) and effects (e.g., youth outcomes across domains and staff outcomes) on FW-PBIS in terms of short- and long-term timelines. Current and future juvenile agencies/facilities implementing FW-PBIS should devise plans to study such effects. Also, it would be ideal if researchers could empirically validate FW-PBIS through a randomized control trial across JJ facilities given the "gold standard" for research benchmarks (e.g., What Works Clearinghouse). However, and unlike traditional schools, it would be very difficult to argue that one JJ facility is similar enough to another to be subject to random assignment to condition as well as the ethical questions of denying the implementation of a promising framework for youth who demonstrate a need for such as compared with a business as usual model. To address the persistent and unlikely to dissipate issue of staff attrition within and across JJ facilities, future researchers will need to plan for such gaps in the data set. We used a data imputation approach with the JJ staff surveys, showing positive results and that may be an appropriate approach for understanding where staff members are at different points in time in a series, even though there is (and likely will be) high turnover over the course of any empirical investigations. Due to resource limitations of this grant and given the high number of juvenile facilities we intervened with, a focus on Tier II and III support systems and their fidelity of implementation was not possible. Since the completion of this study and given our continued work with the participating juvenile agencies and facilities as well as additional facilities who are implementing FW-PBIS across the tiers, we have developed a fidelity measure, Facility-Wide Tiered Fidelity Inventory (Kimball, Jolivette, & Sprague, 2017), that parallels the School-Wide Tiered Fidelity Inventory (Algozzine et al., 2014) to ensure the measurement of the entire FW-PBIS framework for future studies. Finally, future empirical studies should invest in detailed analyses of youth academic and behavioral outcomes as well as staff outcomes related to FW-PBIS implementation. This may be conducted on a state-by-state basis given the different variables collected, defined, and classified.

The premise of our study was that adjudicated and incarcerated youth have a right to the same types of effective treatment and supports as those served in typical education settings, such as the application of a multitiered system of support. This study provides preliminary evidence of the promise of FW-PBIS per our definition and suggests that local, state, and national efforts should include the scaling-up FW-PBIS systems, data, and practices, and that such efforts should systematically support JJ systems that serve our most vulnerable youth. Since the conclusion of this study, the majority of our participating facilities have implemented FW-PBIS across the tiers, built such implementation into their strategic plans and policies, built the data systems to support data-based decision-making, and built in sustainable Full Time Equivalent and resources to ensure sustainability and capacity-building of their implementation efforts. Thus, they are setting the stage to answer the future directions we suggest.

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References

Algozzine, B., Barrett, S., Eber, L., George, H., Horner, R., Lewis, T., . . . Sugai, G. (2014). *School-wide PBIS tiered fidelity inventory*. OSEP Technical Assistance Center on Positive Behavioral Interventions and Supports.

Allinder, R. M. (1994). The relationship between efficacy and the instructional practices of special education teachers and consultants. *Teacher Education and Special Education*, *17*, 86–95.

Alonzo-Vaughn, N., Bradley, R., & Cassavaugh, M. (2015). PBIS in Arizona department of juvenile corrections: How tier II practices build upon tier I. *Residential Treatment for Children & Youth*, *32*(4), 321–333. doi:10.1080/08865 71X.2015.1113458

Barlow, D. H., & Hersen, M. (1984). *Single case experimental design: Strategies for studying behavior changes* (2nd ed.). Pergamon Press.

Cassavaugh, M., Alonso-Vaughn, N., & Bradley, R. (2014). Use of a seamless data system for behavioral monitoring & facility-wide PBIS team decision making. Paper presented at the PBIS Leadership Forum, Rosemont, IL.

Davis, F. D. (1986). *A technology acceptance model for empirically testing new end-user information systems: Theory and results*. Massachusetts Institute of Technology.

Farkas, M. S., Simonsen, B., Migdole, S., Donovan, M. E., Clemens, K., & Cicchese, V. (2012). Schoolwide positive behavior support in an alternative school setting: An evaluation of fidelity, outcomes, and social validity of tier 1 implementation. *Journal of Emotional and Behavioral Disorders*, *20*(4), 275–288. https://doi.org/10.1177/1063426610389615

Fernandez, M. A., Doyle, C., Koon, R., & McClain, D. (2015). Managing disruptive and violent juvenile offenders in the Georgia Department of Juvenile Justice. *Corrections Today*, *77*, 16–19.

Fernandez, M. A., & McClain, D. (2014). Georgia's juvenile justice system applies new framework to modify youth behavior trends. *Corrections Today*, 76.

Fernandez, M., McClain, D., Brown-Williams, B., & Ellison, P. (2015). PBIS in Georgia Department of Juvenile Justice: Data dashboard and radar reports utilized for team data-based decision-making with facility team leader perspectives. *Residential Treatment for Children and Youth*, *32*, 334–343.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. Addison-Wesley.

Hall, G., George, A., & Rutherford, W. (1986). *Measuring stages of concern about the innovation: A manual for use of the SoC questionnaire*. Austin, TX: Southwest Educational Development Laboratory.

Hall, G., & Hord, S. (2001). *Implementing change: Patterns, principles, and potholes*. Needham Heights, MA: Allyn & Bacon.

Horner, R., Todd, A. W., Lewis Palmer, T., Irvin, L., Sugai, G. M., & Boland, J. (2004). The School-wide evaluation tool (SET): A research instrument for assessing school-wide positive behavior supports. *Journal of Positive Behavior Interventions*, *6*, 3–12. http://doi.org/10.1177%2F10983007040060010201

Houchins, D., Puckett-Patterson, D., Crosby, S. E., Shippen, M., & Jolivette, K. (2009). *Barriers and facilitators to providing incarcerated youth with a quality education* (Vol. 53). Taylor & Francis.

Howard, W. J., Rhemtulla, M., & Little, T. D. (2015). Using principal components as auxiliary variables in missing data estimation. *Multivariate Behavioral Research*, *50*(3), 285–299. https://doi.org/10.1080/00273171.2014.999267

Hoy, W. K., & Tarter, C. J. (1997). *The road to open and healthy schools: A handbook for change* [Elementary Edition]. Corwin Press.

Jolivette, K., Kimball, K. A., Boden, L. J., & Sprague, J. R. (2016). The utility of a multi-tiered behavioral system in juvenile corrections: The positive behavioral interventions and supports (PBIS) framework. *Corrections Today*, *78*(3), 42–47.

Jolivette, K., McDaniel, S. C., Sprague, J., Swain-Bradway, J., & Ennis, R. P. (2012). Embedding the positive behavioral interventions and supports framework into the complex array of practices within alternative education settings: A decision-making process. *Assessment for Effective Intervention*, *38*(1), 15–29. https://doi.org/10.1177/1534508412454450

Jolivette, K., & Nelson, C. M. (2010). Adapting positive behavioral interventions and supports for secure juvenile justice settings: Improving facility-wide behavior. *Behavioral Disorders*, *36*, 28–42.

Jolivette, K., Sprague, J. R., & Boden, L. J. (2015). *Facility-wide evaluation tool (FET)*. Unpublished manuscript.

Kimball, K. A., Jolivette, K., & Sprague, J. R. (2017). Agency-stakeholder reflections: Perspectives of state-wide adoption of the PBIS framework in juvenile facilities. *Journal of Correctional Education*, *68*, 17-36. https://www.highbeam.com/publications/journal-of-correctional-education-p62124

Leone, P. E. (1994). Education services for youth with disabilities in a state-operated juvenile correctional system: Case study and analysis. *The Journal of Special Education*, *28*, 43–58. doi:10.1177/002246699402800104

Lipsey, M. W., Wilson, D. B., & Cothern, L. (2000, April). *Effective Intervention for Serious Juvenile Offenders* [Paper presentation]. Paper presented at the Juvenile Justice Bulletin, Washington, DC, United States.

Marten, K., & Withrow, K. (2014). FW-PBIS, what works within a secure juvenile justice population, how do we get this to work these darn kids. Paper presented at the Teacher Educators for Children with Behavioral Disorders Tempe, AZ.

Moore, W., & Esselman, M. (1992, April). *Teacher efficacy, power, school climate and achievement: A desegregating district's experience* [Paper presentation]. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco, CA, United States.

Myers, D. M., & Farrell, A. F. (2008). Reclaiming lost opportunities: Apply public health models in juvenile justice. *Children and Youth Services Review*, *30*, 1159–1177.

Nelson, C. M., Jolivette, K., Leone, P. E., & Mathur, S. R. (2010). Meeting the needs of at-risk and adjudicated youth with behavioral challenges: The promise of juvenile justice. *Behavioral Disorders*, *36*, 70–80.

Nelson, C. M., Leone, P. E., & Rutherford, R. B. (2004). Youth delinquency: Prevention and intervention. In R. B. Rutherford, M. M. Quinn, & S. R. Mathur (Eds.), *Handbook of research in emotional and behavioral disorders* (pp. 282–301). Guilford Press.

Nelson, C. M., Sprague, J. R., Jolivette, K., Smith, C. R., & Tobin, T. J. (2009). Positive behavior support in alternative education, community-based mental health, and juvenile justice settings. In W. Sailor, G. Dunlap, R. H. Horner, & G. Sugai (Eds.), *Handbook of positive behavior support* (pp. 465–496). Springer.

Nuss, J., & Ellison, P. (2014). *Facility director & security perspectives on the adoption & implementation of facility-wide PBIS in juvenile facilities*. Paper presented at the National PBIS Leadership Forum, Rosemont, IL.

Puzzanchera, C., & Hockenberry, S. (2017). *Census of Juveniles in Residential Placement* [machine-readable data files]. Retrieved from https://www.ojjdp.gov/ojstatbb/

R Core Team. (2018). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing. https://www.R-project.org/

Ross, J. A. (1992). Teacher efficacy and the effect of coaching on student achievement. *Canadian Journal of Education*, *17*(1), 51–65.

Scott, T. M., Nelson, C. M., Liaupsin, C. J., Jolivette, K., Christle, C. A., & Riney, M. (2002). Addressing the of at-risk and adjudicated youth through positive behavior support: Effective prevention practices. *Education and Treatment of Children*, *25*, 532–551.

Seltzer, T. (2004, July). Statement of Tammy Seltzer, Senate Committee on Governmental Affairs, Juvenile detention centers: Are they warehousing children with mental illness. Retrieved from www.senate.gov/gove_affairs/index.cfm?Fuseaction=Hearings.Testimony&HearingID=186&WitnessID=332

Simonsen, B., Jeffrey-Pearsall, J., Sugai, G., & McCurdy, B. (2011). Alternative setting-wide positive behavior support. *Behavioral Disorders*, *36*, 213–224.

Soodak, L., & Podell, D. (1993). Teacher efficacy and student problem as factors in special education referral. *Journal of Special Education*, *27*, 66–81.

Sprague, J. R., Jolivette, K. J., & Nelson, C. M. (2014). Applying positive behavioral interventions and supports in alternative education programs and secure juvenile facilities. In H. M. Walker & F. M. Gresham (Eds.), *Evidence-based practices for addressing school-related behavior problems and disorders* (pp. 261–276). Guilford Press.

Trentham, L., Silvern, S., & Brogdon, R. (1985). Teacher efficacy and teacher competency ratings. *Psychology in the Schools*, *22*(3), 343–352.

Tschannen-Moran, M., & Woolfolk Hoy, A. (2001). Teacher efficacy: Capturing an elusive construct. *Teaching and Teacher Education*, *17*, 783–805.

Velicer, W. (1976). Determining the number of components from the matrix of partial correlations. *Psychometrika*, *41*, 321–327.