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DISCUSSION AND REVIEW PAPER

School-wide PBIS: An Example of Applied Behavior Analysis Implemented at a Scale of Social Importance

Robert H. Horner · George Sugai

Abstract School-wide Positive Behavioral Interventions and Supports (PBIS) is an example of applied behavior analysis implemented at a scale of social importance. In this paper, PBIS is defined and the contributions of behavior analysis in shaping both the content and implementation of PBIS are reviewed. Specific lessons learned from implementation of PBIS over the past 20 years are summarized.

Keywords Positive behavioral interventions and supports · Whole-school social culture · Applied behavior analysis

Behavior Analysis in Practice is focused on practical demonstrations of behavior analysis in school, community, work, and home contexts. One current example is the emergence of school-wide Positive Behavioral Interventions and Supports (PBIS) as a framework for improving the academic and social outcomes for students. In this paper, we describe PBIS, the contributions of behavior analysis to defining, evaluating, and implementing PBIS, and initial lessons learned from the past 20 years of implementing PBIS across over 21,000 schools in the USA. Our goals are to both frame the strong tie between PBIS and ABA and suggest lessons learned that may influence both research and large-scale implementation efforts with other examples of behavioral intervention.

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School-wide Positive Behavioral Interventions and Supports

School-wide Positive Behavioral Interventions and Supports (PBIS) is a framework for delivering both the whole-school social culture and additional tiers of behavior support intensity needed to improve educational and social outcomes for all students. PBIS is an applied example of behavioral theory (Baer et al. 1968; Cooper et al. 2007; Dunlap et al. 2008). As Anderson and Kincaid (2005) have noted, the PBIS meets each of the five features used to define applied behavior analysis (applied and behavioral; analytic and conceptual; technological; effective; and generality). Many in the field may in fact argue that positive behavior support is best described simply as an instance of behavior analysis. Others, however, (including Anderson and Kincaid) have argued that elements of PBIS, including person-centered planning (Kincaid et al. 2005), wrap-around mental health supports (Eber et al. 2009), self-determination (Carr et al. 1999; Wehemeyer 2005), prevention science (Catalano et al. 2002; Gordon 1983), and implementation science (Fixsen et al. 2005) include elements that are not yet validated through behavioral science. Regardless of whether PBIS is "only" or "mostly" behavior analysis, a central message is that PBIS grew from and is infused with the principles and technology of behavior analysis.

The impact of behavior analysis on PBIS is most clear in (a) the emphasis on operational definitions of behavior and intervention elements, (b) the logic model used to select environmental manipulations designed to alter student and staff behavior, and (c) an unrelenting commitment to measurement of both implementation fidelity and the impact of PBIS on student outcomes. Two themes that define PBIS are a focus on the whole-school as the unit of intervention (Biglan 1995; Mayer 1995; Mayer and Butterworth 1979), and the simultaneous development of interventions tied to at least three tiers of support intensity (Fuchs and Fuchs 2006). Figure 1 presents
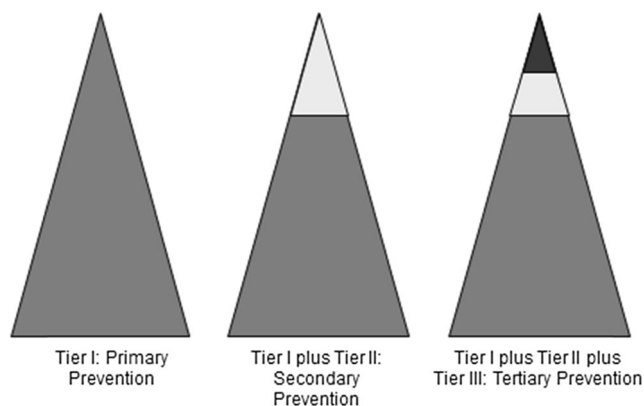
Fig. 1 Multi-tiered prevention model

the frequently referenced multi-tiered prevention approach borrowed from community health and first introduced to education by Hill Walker (Walker et al. 1996). The logic from this approach starts with defining an organization's most highly valued outcomes (e.g., reading, math, writing, and social behavior), and then selecting the smallest set of research-validated procedures needed to deliver these outcomes with at least 80 % of the target population. In schools, this "Tier I" level focuses on establishing a school-wide positive social culture that includes (a) defining and teaching a small set of behavioral expectations (e.g., be respectful, be responsible, and be safe), (b) establishing a ubiquitous system for reinforcing performance of these expectations, (c) implementing a consistent system for interrupting, correcting, and redirecting behavioral errors, and (d) building an efficient system to collect, summarize, and use data for decision-making (Horner et al. 2010; Putnam et al. 2002; Sugai and Lewis 1999; Sugai et al. 2014).

As symbolized by the Tier I (primary prevention) level in Fig. 1, all students experience Tier I behavior support. This level of support is not dependent on documented "need" or some formal assessment protocol. Tier I (primary prevention) is proactive and designed to be administered before error patterns develop. Because all students receive Tier I supports, these practices must be highly efficient and logically integrated with all other elements of the environment. The start of each school year begins by teaching and/or reviewing school-wide behavioral expectations before students have had the opportunity to make behavioral mistakes. Primary prevention is intended to both reduce the likelihood of initial problem behaviors and support the sustained shift toward positive behavior when more intense supports are implemented later in the year.

Tier II (secondary prevention) practices focus on moderate intensity supports that address the most common needs of students with ongoing problem behavior. As indicated in Fig. 1, Tier II supports are added to Tier I supports and are designed for the 10–15 % of students who benefit from additional structure, more overt, and frequent antecedent prompts,

a higher rate of positive recognition, and elevated training in both behavioral expectations and self-regulation skills (Crone et al. 2010; Sugai et al. 2014). The elevated level of risk experienced by these students is matched not only by elevated support intensity, but also by the frequency and specificity with which progress monitoring data are collected. Tier II supports typically are packaged and standardized for highly efficient implementation across multiple students (e.g., first step to success Walker et al. 2009; check-in/ check-out Hawken et al. 2006).

Tier III (tertiary prevention) practices are characterized by individualized assessment, individualized support plan design, comprehensive support plan implementation, and the management of support by a team uniquely organized to meet the preferences and needs of individual student (Scott et al. 2008). The establishment of Tier III supports is an overt commitment by the system to include a full range of students in the school. An important addition to Tier III support practices is a formal process for monitoring both if a support plan is being implemented as well as if it is being effective (Pinkelman 2014). Tier III supports are not new to schools. Special education expectations for individualized support have been required since 1975. The value of this approach, however, now extends beyond special education to all students requiring higher intensity supports. When implementing Tier III behavior supports, teams consider behavioral, academic, mental health, physical, social, and contextual variables (Crone et al. 2010). This is a high-intensity approach to support, intended for 5 % or fewer students within a school. As symbolized within Fig. 1, Tier III supports are expected to be (a) needed less often than Tier I and Tier II supports and (b) more effective when they are implemented within schools that simultaneously offer Tier I and Tier II supports.

Implementation of PBIS has been formally evaluated in a number of descriptive, evaluation, and experimental studies. Findings indicate that PBIS is experimentally associated with reduction in office discipline referrals (Bradshaw et al. 2010, 2012; Horner et al. 2009; Safran and Oswald 2003), reduction in out of school suspensions and expulsions (Bradshaw et al. 2010), improved social emotional competence (Bradshaw et al. 2012), improved organizational efficiency (Bradshaw et al. 2008, 2009), improved academic outcomes (Horner et al. 2009), improved perception of safety (Horner et al. 2009; Ross et al. 2012), and reduction in bullying (Ross and Horner 2009; Waasdorp et al. 2012).

Lessons Learned

A worthy question is why PBIS has been so widely adopted over the past 20 years when so many other examples of behavior analysis have offered impressive research outcomes with limited societal adoption. We offer the following as

"lessons learned" that may guide future research and dissemination efforts.

1. Emphasize Core Features and Evidence-based Strategies. Behavioral theory focuses on the behavioral mechanism(s) by which core features of an environment alter behavior. Core features are the "kernels" or "smallest functional units" needed to produce valued outcomes (Embry and Biglan 2008). Within PBIS, consistent attention has been given to operational descriptions of the core features needed to achieve academic and social gains for students. The focus on core features allows the separation of the strategy being employed (e.g., second step Frey et al. 2005) and the feature being established (e.g., increased instruction of pro-social behavior). Students behave differently when core features are in place, and core features are more likely to be in place when research validated programs are implemented. Too often, however, programs and core features are combined, and users emphasize adoption of the program or package without confirming implementation of functional core features. Emphasizing core features, rather than the practices that are used to achieve the core features, allows school personnel to tailor new strategies and packages to the local cultural and context. For example, while schools using PBIS are expected to define and teach school-wide behavioral expectations, the specific expectations and the method for teaching the expectations are left to match the culture, resources and organizational demands of the local school.

   The focus on core features also has direct relevance for the implementation process. Because adoption of a package or intervention strategy is not adoption of PBIS, school teams need a formal way to assess if core features are in place. This is done through formal fidelity assessment. Implementation of PBIS is not determined by participation in a training workshop, employment of a "certified trainer," or purchasing an instructional product. Implementation of PBIS is assessed by measuring if the core features of Tier I, Tier II, and Tier III support are in place in a school (c.f. Algozzine et al. 2010).

2. Implement "Systems" that Support and Sustain Effective Practices. The likelihood that a school will implement and sustain PBIS with high fidelity depends largely on attention not just to the PBIS core features, but the "systems" that support implementation (e.g., policies, team structures, data systems, funding, and regulations) (McIntosh et al. 2010). Figure 2 provides a summary of the integration of outcomes, intervention practices that change student behavior, the systems that support and sustain adult behavior, and the data needed for adaptation and continued improvement.
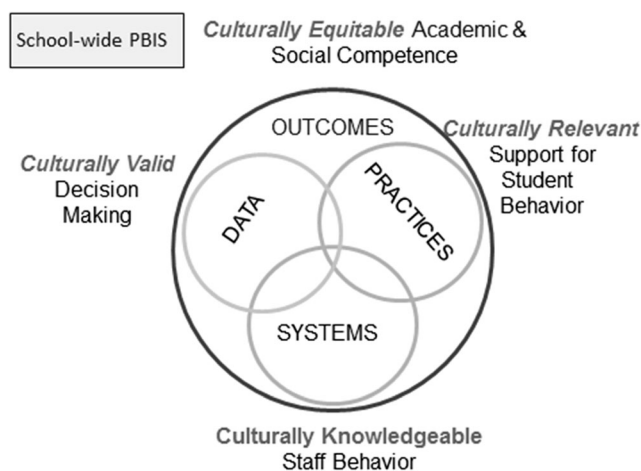

Fig. 2 Role of Systems in PBIS

Behavioral theory teaches us that organizations do not behave, people behave. And people behave differently within social contexts with clearly defined contingencies (Dickinson 2000). Organizational behavioral theory extends what we have learned about developing adaptive individual behavior patterns, to development of similar behavior patterns across coordinated groups of individuals (Abernathy and Lattal 2014). In schools, this means (a) establishing engaged leadership teams, (b) delivering training and support to teams of individuals, (c) providing the resources and time to allow teams to receive training, apply skills/practices learned in training, and (d) adapting procedures in response to data, local cultural, and organizational variables. Schools implementing these practices are more likely to implement PBIS with high fidelity and sustain PBIS with valued student outcomes (Coffey & Horner 2012; McIntosh et al. 2010).

3. Collect and Use Data for Decision-making. Among the great contributions of behavior analysis has been a consistent emphasis on operational measurement (Cooper et al. 2007). Within PBIS, behavioral measurement is central at two levels. The first level focuses on the extent to which adopted procedures have been successful in establishing the core features of PBIS (e.g., measurement of fidelity or intervention integrity; Fryling et al. 2012). Investing in valid, reliable, and efficient measures of implementation fidelity led to over 11,524 schools in 2014 systematically measuring PBIS fidelity with 81 % meeting Tier I fidelity criteria during the year. The second, and more traditional, emphasis is on continuous measurement of student behavior. Within PBIS, school teams monitor student discipline patterns to assess not just the frequency of problems, but the type of problem behavior, locations where problems are most and least likely, time of day, students engaging in problem behavior, and the perceived maintaining behavioral function of problem behavior. By asking every staff member in a school to record not just

who and what a student did that was problematic, but the perceived function of the problem behavior, PBIS builds a system that extends function-based behavior support from Tier III, high-intensity, individual support plans to the Tier II and Tier I levels of school-wide prevention. The key is that data are used not just for policy levels reports to state and district administrators, but for local decision-making at the school and classroom level. Effective use of data by school teams has been demonstrated to improve educational outcomes (Newton et al. 2012), and the repeated use of data at the school level has been associated with improved sustainability of PBIS implementation (McItosh et al. 2014).

4. Implementation Process

A fourth lesson drawn from behavior analysis is an emphasis on the implementation process. Implementation science (Fixsen et al. 2005, 2013) separates intervention practices (what is done to change student behavior) from the practices used to change an organizational system (adoption of the intervention practices). It is as important to define how effective practices are adopted as it is to provide the research demonstrating that these practices both produce desired change in the organization, and desired outcomes for the target population.

Figure 3 integrates the lessons learned from implementation of PBIS. First, implementation of PBIS in schools requires a district or regional implementation team. Students are the unit of impact, schools are the unit of intervention, but districts are the unit of implementation. Teams are the mechanism for comprehensive and sustained implementation. The district leadership team is more than advisory or informative they actively manage and guide the implementation process. Second, there is a tendency for implementation efforts to both start and end

with initial demonstrations. This is ineffective. Effective implementation processes build district and school capacity while establishing initial demonstrations. As initial schools in a district adopt PBIS the leadership team needs to be improving district capacity to (a) conduct PBIS training without reliance on external trainers, (b) provide active coaching of trained skills to ensure that they are applied under natural conditions, at high fidelity, and with the adaptation to local culture needed to achieve the core features, (c) establish the behavioral expertise in behavior analysis needed for moving from the foundational knowledge needed for Tier I practices to the more sophisticated knowledge needed for implementation of Tier II and Tier III supports, and (d) development of the evaluation capacity to assess both school-level and district-level outcomes. Failure to invest in the implementation elements needed to move from "demonstration" to "full implementation" too often results in major fiscal and organizational loss (Horner et al. 2014).

Summary

The promise of applied behavior analysis is that our understanding of human behavior will have direct impact on improving social systems. The challenges faced in schools, families, work places, and communities require better application of behavioral theory. School-wide PBIS is one example of successful implementation of behavioral theory to address a major social concern. It is an example that is still evolving, but with over 21,000 schools in the USA actively engaged in implementing PBIS, and a growing body of scholarship supporting the impact of PBIS on student behavior it is

Fig. 3 Implementation framework
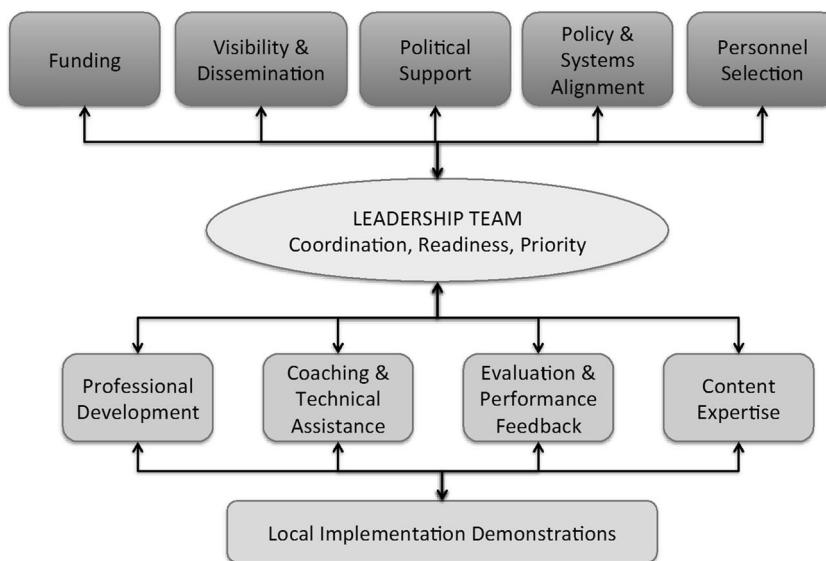
worthwhile to consider lessons learned. A full summary of these lessons is beyond the scope of the present paper, but four key messages have relevance for anyone extending behavioral theory to large social systems.

First, use current science to isolate the smallest number of core features needed in a context to produce valued outcomes. Identify multiple strategies and practices for establishing these core features allows different implementers to select the strategy or practice that best fits their social and cultural context.

Second, implement the "systems" needed for sustained high fidelity use of effective practices. Systems include the policies, teaming structures, decision-making protocols, funding, and organizational practices that allow effective interventions to be adopted with efficiency and effectiveness. Third, a central part of this process is development of data systems that allow all individuals in the system to engage in effective decision-making. Finally, attention to the implementation process is as critical as attention to the research-validated practices. Implementation includes attention to the selection of core practices, the teams needed to achieve functional effects, the stages of adoption, and the development of the drivers and data systems that allow effective practices to flourish.

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