J Child Fam Stud
DOI 10.1007/s10826-017-0813-6

REVIEW

Employing the Principles of Positive Behavior Support to Enhance Family Education and Intervention

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Abstract Positive behavior support (PBS) is an evidence-based approach for supporting adaptive behavior and addressing behavioral challenges. It is critical that families have access to effective evidence-based behavior support practices for both intervention and prevention because they lead to better outcomes for families, and counter-productive family management practices have been shown to further escalate children's behavioral challenges. PBS has been demonstrated to be effective with individual children with serious behavior challenges in family homes and features of PBS are evident in common family-based intervention approaches. Unfortunately, complete application of PBS in family contexts has not been fully explored or conceptualized. The purpose of this paper is to define the core features of PBS including lifestyle enhancement, assessment-based intervention, and comprehensive support plans (i.e., including strategies for prevention, teaching, and management). Examples of how the features of PBS are currently being employed within the field of PBS and within other evidence-based parent education and support programs are provided. Suggestions for how collaboration, assessment, data-based decision making, comprehensive intervention, and tiered approaches to service delivery may be used to enhance behavioral support for families are offered. Lastly, future directions for research and practice are recommended.

Keywords Positive behavior support · Parent education and intervention · Lifestyle enhancement · Assessment-based intervention · Comprehensive support plans

Introduction

Positive behavior support (PBS) is an evidence-based approach for supporting adaptive behavior and addressing behavioral challenges. It combines the principles of applied behavior analysis with approaches from other disciplines (e.g., ecological and community psychology, biomedical science, education) to improve the utility of behavioral intervention within typical home, school, and community environments (Carr et al. 2002; Dunlap et al. 2009; Horner et al. 1990; Kincaid et al. 2016). Although PBS was originally developed to overcome behavioral challenges of individuals with significant disabilities (Carr et al. 2002), the approach has now been used successfully with a wider range of populations and applied within larger service systems (e.g., schools, mental health systems, early intervention programs, community agencies) to promote generalized behavioral improvements (Lucyshyn et al. 2015). Complete applications in family contexts, however, have been limited—even though the potential benefits are clear.

Families often experience significant stress related to childrearing, especially in dealing with children's behavioral challenges (Lecavalier et al. 2006; Neece et al. 2012; Spratt et al. 2007). It is estimated that about 5% of children and youth experience challenging behavior (Pastor et al. 2012), with that figure increasing to 15% for children with disabilities (Einfeld and Tonge 1996; Lowe et al. 2006). Siblings often display similar behavioral challenges (Alexander et al. 2000), making this a family problem. Significant

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Published online: 02 August 2017

behavior problems may delay children's development, interfere with family routines, alienate children and families, and damage relationships.

When parents are knowledgeable and skilled in effective behavioral support practices, they may use these practices proactively, promoting family stability and creating environments in which children thrive (Sanders et al. 2002). When parents face behavioral challenges with their children—an experience integral to family life—and do not possess the necessary skills and knowledge to intervene effectively, they may be inclined to resort to inconsistent, overly passive, or hostile approaches to managing child behavior (Cummings and Davies 1994). Counter-productive family management practices have been demonstrated to further escalate children's behavioral challenges (Burke et al. 2008; Chamberlain and Patterson 1995). Therefore, it is critical that parents have access to effective evidence-based behavior support practices for both intervention and prevention.

PBS has been demonstrated to be effective with individual children with serious behavior challenges in family homes (Durand et al. 2012) and aspects of PBS are clearly evident in a variety of parent education programs (e.g., Webster-Stratton and Reid 2003; Sanders et al. 2002). It does not appear, however, that PBS has been comprehensively applied or assessed within family-based programs. In reviewing the literature, it is evident that some, but not all, features of PBS are incorporated in interventions focused on the child within the family or on the family system as a whole. In this article, we will define the core features of PBS, provide examples of how PBS is currently being employed within evidence-based parent education and support programs, and offer suggestions for how PBS may be used to enhance behavioral supports for families.

Features of Positive Behavior Support

PBS combines the technical foundations of applied behavior analysis with features derived from other fields to improve its practical utility within typical environments and routines. PBS is defined based on three core features: lifestyle enhancement, assessment-based intervention, and comprehensive support plans (Carr et al. 2002; Horner and Carr 1997). Each of these features are described below with supporting literature.

Lifestyle Enhancement

A foundational feature of applied behavior analysis is that the goals, interventions, and outcomes must be important and acceptable to the target individual or have "social validity" (Schwartz and Baer 1991; Wolf 1978). In PBS, social validity has been interpreted as the extent to which interventions address and enhance quality of life, support teams are engaged in the process, and improvements are seen not only for individuals, but also throughout the systems that support them.

Quality of life

Quality of life refers to the extent to which an individual is satisfied and comfortable in their living circumstances (Schalock 2004). Quality of life is a complex multi-faceted concept that includes health and safety, self-advocacy, interpersonal relationships, productive activity, and community engagement. A critical element of life quality is self-determination—the degree to which people who are the focus of intervention efforts have a "voice and choice" in the process (Wehmeyer 2015). The ultimate outcomes of PBS efforts are not only to develop skills and remediate behavior challenges, but to produce substantive improvements in lives of individuals, families, and other support and service providers.

Engagement of support teams

To ensure that PBS efforts are appropriate to the circumstances and ultimately successful, it is necessary to actively engage individuals and those who support them (Benazzi et al. 2006). Support teams commonly include family members, friends, neighbors, teachers, employers, therapists, social workers and a host of other administrative and direct service professionals who may be influential in the success of PBS. The core members of these teams are included in goal identification, assessment, plan design, implementation, and evaluation (Bambara and Kunsch 2014).

Support teams are engaged through planning processes that clarify desired outcomes and encompass action planning to work toward those outcomes. Various person-centered planning methods have been used within PBS (Kincaid and Fox 2002). These planning processes guide support teams to establish a positive, unfettered vision for their future, assess available resources and potential barriers, and create a step-wise plan to work toward the goals. The limited research on the effectiveness of person-centered planning appears promising (Claes et al. 2010), and its pragmatic value in PBS is evident.

Multi-tiered approach

PBS not only focuses on individuals, but also extends to the groups and systems that support them. PBS has been used extensively within schools, resulting in improvements in student attendance, academic performance, and behavior (Bradshaw et al. 2009; Horner et al. 2009). In addition, PBS

is beginning to be employed within mental health and family support programs (Duchnowski and Kutash 2009; McCart et al. 2009). These system-wide applications apply PBS principles within a multi-tiered framework in which effective behavior support practices are provided for everyone within the system proactively and universally, as well as more intensively and systematically for individuals who are at risk or experiencing significant behavioral challenges.

Assessment Based Intervention

Using objective data to inform and evaluate intervention is a cornerstone of PBS. It includes conducting assessments to inform strategy selection, and tracking of both the integrity of implementation and outcomes of the intervention.

Assessing contexts and functions

PBS is grounded on the premise that effective behavioral support must be individualized based on the (1) needs of the focus individuals, (2) immediate and broader circumstances in which the individuals function, and (3) consequences maintaining adaptive and maladaptive behavior patterns (O'Neill et al. 2015; Wacker et al. 2011). It is therefore important to collect data to determine the purposes or functions behaviors are serving. Functions may include seeking attention from other people; acquiring tangible items such as food, money, games, or other desired objects; avoiding, delaying, or escaping unpleasant situations; or obtaining sensory outcomes such as increased stimulation or physical release. It is equally, if not more important, to identify the specific circumstances that set the stage for these functions (Stichter et al. 2005). For example, individuals will most likely seek attention or items when deprived of them and will only endeavor to escape from situations that are uncomfortable or difficult.

Functional (and ecological) assessments in PBS involve systematically gathering information associated with the possible contexts and functions of behavior through interviews, record reviews, and observations (Anderson and Long 2002; O'Neill et al. 2015). A variety of interview tools may be used from simple rating scales (Durand and Crimmins 1992, Iwata and DeLeon 1996, Lewis et al. 1994) to more elaborate questionnaires (e.g., O'Neill et al. 2015). Direct observations are typically structured to obtain information on the antecedents, behaviors, and consequences (Bijou et al. 1968) or patterns of behavior across activities and time frames (Touchette et al. 1985).

Functional Behavior Assessments (FBAs) draw from multiple sources (e.g., interviewing multiple people, observing across settings and situations). Once sufficient data are collected, patterns of behavior are summarized in hypothesis statements. These statements describe the behaviors of concern, the circumstances in which they are most and least likely to occur, and the consequences that reliably follow the behavior (namely, their functions). For example, a hypothesis might be: "When Louis is asked to complete a difficult chore and not provided with frequent supervision, he will 'get into stuff' (e.g., take apart items or construct games). This delays completing the task and results in his parents increasing their guidance and attention." These statements reflect the 'best guess' of the patterns, but must be supported by data to be validated. That is done by either testing the hypotheses by manipulating events surrounding the behavior or implementing interventions based on them and evaluating their outcomes (Hanley et al. 2003; Iwata and Dozier 2008).

Data-based decision making

Objective data are used to assess both the fidelity with which strategies are employed and the outcomes of intervention. These data guide decision-making and determine the need for adjustments to strategies and supports (Hieneman and Dunlap 2015; Todd et al. 2014). For plans to be effective, they must be implemented as designed and with consistency. Therefore, a key feature of PBS intervention is to establish systems (e.g., checklists, periodic observations of strategy use) to ensure fidelity in practice (Sanetti et al. 2011). The data on behavior patterns may also offer insight into whether strategies are used successfully since variations in frequency/intensity can indicate that plans are not being used as intended under every circumstance.

Data are collected on behaviors that are most important and/or the best indicators of progress. These data may include discrete measures (e.g., frequency, duration) of particular behaviors that are a focus of intervention. The behaviors measured may include those targeted for increase such as appropriate communication (e.g., using words rather than physical aggression), independent participation in daily activities (e.g., household chores, work or school, self-care), or use of particular coping strategies. They may also include behaviors individuals need to decrease to be successful or safe including, for example, yelling at or threatening other people, stealing, or engaging in behavior that disrupts valued routines.

In addition to these more narrowly defined behaviors, PBS also assesses quality of life outcomes as described above (Freeman et al. 2014). As a result of intervention, data should capture whether people are able to go more places, do more things, and gain more enjoyment and satisfaction from their daily lives (e.g., Kincaid et al. 2002).

Since PBS is implemented in complex community settings (vs. segregated or controlled environments) and within natural routines, measures often need to be adapted to improve their ease of use for individuals and their

caregivers. PBS practitioners therefore often supplement or replace the direct observation or continuous recording procedures commonly used in ABA with rating scales and sampling practices (Hieneman and Dunlap 2015). By doing so, the rigor may be reduced, but contextual fit and fidelity of implementation are typically increased.

Comprehensive Intervention

Interventions in PBS are directly linked to the patterns identified in the assessment. They include immediate antecedent and consequence interventions, as well as broad lifestyle changes to support the more discrete strategies. A useful framework for selecting appropriate strategies is the competing behavior model (O'Neill et al. 2015). Using this model, we identify interventions that are logically associated with particular patterns.

Components of PBS

PBS interventions are not stand-alone procedures, but include a combination of proactive, teaching, and management elements. These elements are described briefly in the following sections.

Proactive strategies include environmental and social arrangements that prompt positive behavior and make engagement in problem behavior unnecessary by modifying or removing the triggering stimuli (Luiselli 2006). Examples of proactive strategies include:noncontingent access to attention, tangibles, and other reinforcers (Richman et al. 2015); offering choices between items or activities (Shogren et al. 2004); activity scheduling to prepare for upcoming events (Koyama and Wang 2011); and curricular modifications such as embedding easy or interesting features or reducing length or difficulty of tasks (Kern et al. 2002; Wheeler et al. 2006).

Teaching skills includes direct instruction in two types of competencies: (a) replacement behaviors and (b) other desired skills. Replacement behaviors are more appropriate responses that meet the same function as behaviors of concern. Functional communication training, for example, is a well-documented approach in which individuals are instructed to use words or other methods of expression to ask for items, attention, or breaks, depending on the purpose or function of the behavior (Durand and Carr 1991; Tiger et al. 2008). More complex skills such as negotiation and problem-solving may also be taught as replacement behaviors. Other desired skills allow individuals to participate successfully in typical daily routines and meet the expectations of their circumstances. These may include social (e.g., engaging in conversations, playing games) and daily living (e.g., completing chores, homework, or other tasks) skills (Baker et al. 2004).

Managing consequences involves maximizing reinforcement for positive behavior and reducing or eliminating reinforcement for problem behavior (Athens and Vollmer 2010; Ingram et al. 2005; Janney et al. 2013). To manage consequences effectively, the function of the behavior—access to attention or items/activities, escape, or sensory outcomes—must be clear and access to the specific reinforcers controlled. For example, consequences may involve delivering high rates of attention or reducing demands when individuals are cooperative, but not when they are complaining or aggressive.

Implementing PBS plans

Proactive, teaching, and management strategies are combined into comprehensive PBS plans that are tailored to the circumstances. These plans should be in writing and include goals and behaviors of concern, a summary of the patterns affecting behavior, descriptions of strategies and how they will be employed across situations, and methods for monitoring outcomes. For example, if a person's behavior is motivated by attention from peers and the goal is to improve relationships, the plan might include creating opportunities for appropriate interactions (e.g., scheduling supervised gatherings, joining clubs, setting aside time for 1:1 interaction), teaching the individual any communication or social skills needed to obtain attention, and encouraging peers to respond to conversational turn taking instead of name-calling or threats. The individual could track the frequency of his or her interactions with other people and, together with peers, rate their quality.

In addition to these immediate strategies, other supports focused on setting events are often included as well. This means not only focusing on remediating behavioral challenges, but on creating universal, proactive measures to support positive behavior. Examples of these type of supports include restructuring routines or settings to better match people's needs, rebuilding damaged relationships to improve the overall quality of interactions, addressing health or safety concerns that may be affecting behavior, or simply finding ways to offer more choice and personal autonomy.

As the PBS plan is being finalized, it is critical to consider its contextual fit given the people, settings, and systems that will be influenced by the plan (Albin et al. 1996). Questions to guide this consideration include: Is the plan right for the individual(s) for whom it is designed (i.e., given their characteristics, needs, abilities, preferences, and motivations)? Is the plan feasible given the resources available and doable within typical routines and settings? Do caregivers and others involved in supporting the plan have buy-in and the capacity to implement? Are broader systems (e.g., home, school, work, community) aligned

with the plan and therefore likely to enhance sustainability (Hieneman and Dunlap 2000)? Responses to these questions determine whether a plan needs to be adapted or whether accommodations may be needed.

Developing an action plan that addresses the considerations above and spells out how each aspect of the plan will be put in place is important to support implementation (Hieneman and Dunlap 2015). The action plan includes what exactly needs to be done, who will do it, and when it will be completed. Action items typically include rearranging environments, establishing routines, obtaining resources, providing training and coaching, and establishing systems for monitoring implementation and outcomes and communicating about progress. In addition, action planning often includes ways to support and motivate plan implementers (e.g., via reminders, tools, incentives).

A key to ensuring that PBS plans will be implemented consistently and effectively is to embed strategies within typical daily routines (Moes and Frea 2002). Doing so reduces the demands on implementers and increases sustainability as the strategies become part and parcel of routines themselves. Examples of target routines may include tasks (e.g., chores, homework, work responsibilities), personal care, play or leisure activities, errands, and community outings. Effective instructional practices that are inherent in the features of PBS may be used without disruption. These include defining specific skills to teach; arranging settings to promote independence and success; modeling, prompting, and shaping behavior; and using differential reinforcement to establish and maintain skills over time.

Examples of Application of PBS Features in Family Intervention

Many well-established family education and support programs include features that are consistent with those that characterize PBS. In this section, we will highlight some examples, and demonstrate that, although comprehensive family-based PBS is not commonplace, current approaches do embrace these principles. The goal is not to provide an exhaustive review of all possible programs, but to share illustrations from the field of PBS and broader family intervention approaches.

Lifestyle Enhancement

Quality of life

Both researchers and practitioners have emphasized the importance of focusing on lifestyle enhancement when supporting behavior in family contexts. While few examples of direct quality of life measurement at the family level are available, Smith-Bird and Turnbull (2005) demonstrate that the intervention approaches and outcomes reported in past research on family focused PBS align with the key domains of the *Beach Center Family Quality of Life Scale*. Three themes related to quality of life were found in their analysis of past family PBS research: a focus on daily routines that are valued by families, improved family interaction, and increased safety/physical well-being for all family members.

Examples of routines that have been addressed in family-based PBS research include dinner, play, cleanup, bedtime, bathroom, or grocery shopping, or eating at a fast food restaurant (Duda et al. 2008; Lucyshyn et al. 2007; Vaughn et al. 1996). Lucyshyn et al. (2007) also demonstrate ongoing direct measurement of individual quality of life through a community activity inventory. More comprehensive application and measurement of quality of life within family contexts in PBS is surprisingly limited.

Beyond literature in PBS, several evidence-based programs focus on empowering families to determine desired outcomes that will benefit their overall lifestyle. For example, the continuum of interventions offered within the *Positive Parenting Program* (PPP; Sanders 2008) provides choices for families and promotes self-determination, while the *Family Check-Up* (FCU) program capitalizes on parent motivation by providing a menu of intervention options to families after an initial assessment and feedback session (Dishion and Stormshak 2007). Meta-analytic research suggests that involving parents in generating solutions is associated with higher ratings of satisfaction, self-efficacy, and social support (Dunst et al. 2007).

Comprehensive family intervention programs also directly measure outcomes associated with family quality of life. The *Multidimensional Foster Care* program (MTFC; Jonkman et al. 2013) measures quality of life through parent report, and targets other child and parent resiliency outcomes including interpersonal relationships, stability in home context, and social support (Leve et al. 2009). *PPP* has been shown to enhance parent and child well-being and parent relationship quality (Nowak and Heinrichs 2008), and *FCU* led to increased parental perceptions of social support and relationship satisfaction, decreased parenting stress, and fewer child challenging behaviors (McEachern et al. 2013). The *Incredible Years* programs, which target increasing the family support network, have been shown to increase positive family communication and parental self-confidence, and reduce parental depression (Webster-Stratton and Reid 2003).

Engagement of support teams

Given the focus on enhancing quality of life, it naturally follows that programs supporting families would endeavor

to engage people across different systems and settings. This objective is explicit in wraparound (Clark and Clarke 1996; Walker and Shutte 2004) and group action planning (Tumbull and Turnbull 1996), both of which have been combined with PBS. The wrap around process, like PBS, involves a team of individuals working together to develop supports to enhance the life of individuals with disabilities across multiple important life domains (Clark and Hieneman 1999). Group action planning expands on person-centered planning practices commonly used in PBS and is also directed by the preferences of an individual and their family (Tumbull and Turnbull 1996). These approaches focus on coordinating supports by engaging all relevant family members and service providers in assessment, planning, and implementation to remediate challenges.

Coordinating multiple service providers is also common within other family-centered intervention programs beyond PBS, such as *MTFC*, in which weekly meetings are held with the family, clinicians, therapists, and skills coaches to review progress and engage in treatment planning (Chamberlain and Smith 2003).The *FCU* program also includes an "ecological management" option on the intervention menu for families who would benefit from coordination of the intervention with other child and family-focused community services (Dishion and Stormshak 2007). Family and support team involvement in intervention planning, and the measurement of outcomes associated with positive child and parent lifestyle change, are primary themes across a broad range of evidence-based family focused interventions.

Multi-tiered approach

Multi-tiered service delivery can be used within systems that provide support to multiple families to ensure that the level of service provided is aligned with the need demonstrated by the family. Several research teams have proposed the application of a multitier framework to enhance the efficiency of family-engagement practices in early childhood settings (McCart et al. 2010), family support in urban family service agencies (McCart et al. 2009), and parent training for young children with developmental disabilities (McIntyre and Phaneuf 2007). Tier 1 includes low intensity strategies available for all families such as reading materials about positive parenting strategies (McIntyre and Phaneuf 2007; Phaneuf and McIntyre 2011), parent workshops, or parent-teacher conferences (McCart et al. 2009, 2010). Tier 2 involves more intensive group-based parent training or facilitated problem-solving sessions (McCart et al. 2009, 2010; Phaneuf and McIntyre 2011). Tier 3 includes individualized supports for families with more persistent and intensive needs such as home-based sessions with video feedback (Phaneuf and McIntyre 2011), structured reading or home-visit programs (McCart et al. 2010), or direct training (McCart et al. 2009). The model empirically evaluated by Phaneuf and McIntyre (2011), but not frequently utilized in practice, is based on response to intervention logic, with all families starting with tier 1 supports.

PPP is a well-researched example of a multi-tiered model of family support (Sanders et al. 2000). Triple P or *PPP* includes five levels or tiers starting with universal communication strategies such as posters or billboards, TV or radio commercials, or brochures. The aim of this level of support is to reach all families to share parenting strategies and de-stigmatize asking for help (Turner and Sanders 2006). The second level of support involves brief parent support during a routine pediatrician visits, followed by level 3 which includes repeat brief and specific consultation about child behavior. Level 4 is intensive group-based training in positive parenting skills, and level 5 is an individualized *Enhanced Triple P* program (Turner and Sanders 2006). This model of parent training is unique in that it acknowledges the unique needs of families, embeds family support within the broader societal context by implementing universal campaigns to put parenting on the public agenda, and draws upon existing services within the community (Turner and Sanders 2006). These aspects likely contribute to *PPP* being one of the most widely adopted models of parent training internationally.

The *Incredible Years* programs also use multi-tier logic in acknowledging that children present with various needs which may be targeted through varying levels of direct intervention with children, teachers, or parents, or through more comprehensive combined approaches (Webster-Stratton 2005). Within this conceptualization of the tiered model less intensive supports are viewed as those that focus on the child or parent alone, rather than intervening at the level of the family system by working with both children and parents to reduce challenging behavior. Webster-Stratton and Hammond (1997) demonstrated that working with both children and parents (vs. child *or* parent-focused intervention) produced more positive and sustainable outcomes; however, the authors acknowledged that this comprehensive approach may not be needed by all families. The effectiveness of this more intensive combined approach has also been demonstrated by *Parent-Child Interaction Therapy* (PCIT; Brinkmeyer and Eyberg 2003).

Assessment-Based Intervention

Assessment of contexts and functions

Collaboration between providers and families to complete functional assessments (e.g., interviews, observations, rating scales) and inform routine-based functional interventions is common within family-based PBS (Fettigand Barton 2014). Several research teams emphasize partnering

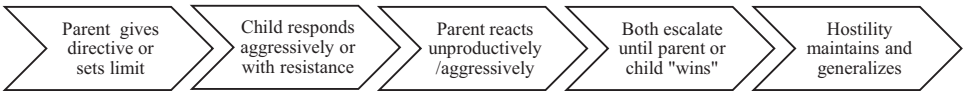

Fig. 1 Coercive family process illustration. This figure depicts a common pattern of parent-child interaction that leads to escalating behavior

with family members during this assessment process or supporting family members to carry out comprehensive functional assessment processes within family homes and during natural routines (Dunlap et al. 2001; Fettig and Ostrosky 2011; Wacker et al. 2013). This process often involves families identifying the most problematic routines for their child to serve as the context for the implementation of PBS, as well as the identification of prioritized target behaviors (e.g., Duda et al. 2008; Dunlap et al. 2006; Lucyshyn et al. 1997, 2007). Moes and Frea (2002) demonstrate that directly interviewing parents to gather information about the family context (e.g., routines, goals, supports, demands) can enhance the effectiveness of family-centered interventions such as *Functional Communication Training*.

Preliminary work by Lucyshyn et al. (2004) also suggests that clinicians should directly assess parent-child interactions to determine patterns of reinforcement between parent and child that may escalate problem behavior. A possible reciprocal interaction between parent and child behavior is depicted in an illustration of the coercive family process in Fig.1 (Patterson 1982) in which child behavior prompts unproductive parental responses, which thereby escalate child behavior. Using this perspective, the child's behavior within the family context is of interest, along with the parent and child reactions that perpetuate those patterns and reinforce continuation of parental behavior.

This reciprocal or transactional relationship between parent and child behavior is the premise of many family-focused intervention programs that teach parents how to change their responses to their child's behavior to prevent further escalation. *PCIT* (Eyberg et al. 2001) involves direct observation of parents and children together, which informs the use of in-the-moment coaching for parents to improve their interactions and reduce coercive processes (Herschell et al. 2003). The *FCU* program also includes observations of parents and children interacting in the home setting as part of a comprehensive assessment, which is used to inform a parent feedback session using motivational interviewing techniques to support parents in their choice of interventions from a menu of treatment options (Dishion and Stormshak 2007).

Data-based decision making

The examples of family based PBS research highlighted in the previous section incorporate multiple systems of data collection including structured observations and standard recording forms to look at the frequency, duration, and intensity of positive and challenging behaviors (e.g., Lucyshyn et al. 2007). These often include intensive direct observation and/or videotaping by the researchers themselves.

Although it would seem essential to engage families in monitoring progress (e.g., in order to capture data across situations throughout the day), there are fewer examples of direct parent involvement in this type of data collection for ongoing decision making (Barton and Fettig 2013; Fettig and Barton 2014). Few studies of family-focused PBS report treatment fidelity data, and those that do tend to use videotaped sessions to complete fidelity checklists rather than involving parents in monitoring their strategy use (e.g., Dunlap et al. 2006), probably due to limitations in translating this type of intensive data collection from research to practice in family contexts. Lucyshyn and colleagues (2007), however, provide a comprehensive example of ongoing data-based decision making in partnership with families by including parent reports of problem behaviors as one source of information to monitor progress and make decisions to alter the intervention.

Family intervention programs beyond PBS provide other examples of data-based decision making within the family context. *PPP* programs include tracking of the fidelity of training components (Sanders et al. 2000) and methods to engage parents in ongoing data-based decision making by teaching independent problem-solving skills, and providing tools and strategies to self-monitor the use of specific skills taught (Sanders et al. 2002). The most intensive individualized version of *PPP*, known as *Enhanced Triple P*, uses assessment data to guide individualization of specific parent training modules based on family needs (Sanders et al. 2000). *PCIT* (Brinkmeyer and Eyberg 2003) and *Parent Management Training* (Kazdin 2005) both use direct and indirect reports of interactions between children and parents to guide the specific components of treatment and to evaluate progress. *PCIT* uses data to inform the length of the intervention; the intervention ends when parents master targeted parenting skills and report that they are confident in managing child behavior (Brinkmeyer and Eyberg 2003).

Comprehensive Interventions

In PBS, interventions are based on assessments and there is some degree of consistency in applying the framework that

includes proactive and preventive strategies to address setting events and antecedents that precede behavioral patterns; teaching of desired and replacement skills; and reinforcement for positive, not problem, behavior in family contexts. Duda et al. (2008), for example, demonstrate that a combination of prevention, instruction, and reinforcement strategies reduced challenging behaviors across multiple home routines (e.g., play, cleanup, dinner). The strategies include social stories, providing choices, increasing proximity to the parent, pre-teaching rules, modeling and prompting appropriate play behaviors, teaching self-monitoring, a reward choice menu, and parent attention and praise. Lucyshyn et al. (2007) use similar prevent-teach-manage strategies, as well as information about family ecology to improve the contextual fit of the behavior support plan. Contextualized programs using family information (such as caregiving demands, family support needs, and social interactions goals) within comprehensive intervention programs are shown to be more effective at increasing replacement behaviors and decreasing challenging behaviors (Moes and Frea 2000) and lead to greater sustainability of communication skills (Moes and Frea 2002).

Pivotal Response Training (Koegel et al. 2002) also incorporates the three elements of comprehensive behavioral support, with an emphasis on teaching parents to use specific prevention (e.g., increasing child motivation through choice), teaching (e.g., modeling of new skills to encourage communication), and reinforcement (e.g., responding to all approximations of behavior with natural reinforcers) strategies within everyday activities and on an ongoing basis to increase skill development. These components are the basis for other intervention programs such as *Prevent-Teach-Reinforce* (PTR; Dunlap et al. 2010, 2017). Recent studies show that comprehensive intervention plans developed using the *PTR* model are effective to decrease challenging behavior and increase alternative behavior in young children, and demonstrate that parents can effectively implement and generalize this intervention approach within family routines (Bailey and Blair 2015; Sears et al. 2013). These PBS components have been integrated in other research as well. For example, Durand and colleagues (2012) demonstrate the effectiveness of combining these core components of PBS with a cognitive behavioral therapy intervention to promote parental optimism.

Kazdin's (2005) *Parent Management Training* is a forerunner in translating behavioral principles into a comprehensive intervention approach for families. Parents are taught specific behavioral strategies relevant to teaching and behavior management such as praise, planned ignoring, time-out, and shaping within the home context. *Incredible Years, PCIT, Triple P*, and *Multisystem Treatment Foster Care* follow suit and incorporate features of comprehensive behavior support, as well as focus on preventing the coercive cycle. This is accomplished in these programs by teaching parents prevention strategies (e.g., increased praise and decreased criticism/commands, limit setting, supervision/monitoring, relationship building), methods to model and prompt new skills and positive behaviors, and specific reinforcement (e.g., structured token economy system, increased attention to positive behavior and decreased attention to negative behavior). A recent randomized clinical trial also demonstrates the effectiveness of parent training that includes prevention, teaching, and management strategies (Bearss et al. 2015).

Programs with Multiple PBS Components

Several books have been written for professionals and parents specifically about parenting and positive behavior support, combining these different features. They include resources for professionals and parents. The first known resource related to family PBS was *Families and Positive Behavior Support* (Lucyshyn et al. 2002), which included practical applications of principles, case studies, and preliminary research in family contexts. Hieneman et al. (2006) made this information accessible for parents in a self-guided problem-solving workbook that also offers suggestions for universal supports. Durand and Hieneman (2008) outlined a similar process for professionals working with families entitled *Positive Family Intervention* (that also includes cognitive-behavioral strategies to overcome parental pessimism as a barrier to implementation). Durand (2011) wrote *Optimistic Parenting* to make these approaches accessible to parents and added components of mindfulness and family social support. Finally, as mentioned earlier, Dunlap and colleagues (2017) have produced a *Prevent-Teach-Reinforce for Families* manual written for practitioners working with families that outlines comprehensive assessment and contextualized intervention approaches for home and community settings.

Recommendations for Practice

Over the years, ongoing research and field-based intervention with families has led to an increasing number of evidence-based clinical practices (Kumpfer and Alvarado 2003). The way in which those practices are organized, selected, and delivered may be informed by both the principles of PBS and the growing body of literature on effective family support approaches. We offer the following recommendations based on this review:

Quality of Life Outcomes

Ensure that the goals of intervention are focused on quality of life improvements and fully embraced by the family—that they have social validity and contextual fit. Align goals with the families' strengths, resources, needs, priorities, preferences, supports, and stressors. This means guiding, rather than directing, goal selection via processes of person and family-centered planning.

Family Engagement

Engage all relevant family members and others whose involvement could influence the outcomes, valuing their input and rights as decision makers. Ensure their involvement in all aspects of the process of goal identification, assessment, plan design, implementation, and evaluation. Empower families to apply the principles (rather than just procedures) of PBS and become collaborative problem-solvers.

Comprehensive Assessment

Conduct structured, comprehensive assessments to develop a valid understanding of immediate patterns and broader ecological variables affecting behavior within the family. Use the coercive family process (Patterson 1982) framework to help families understand reciprocal interactions that may be maintaining problem behavior. Develop and utilize assessment tools (e.g., expanded from O'Neill et al. 2015) to effectively and efficiently capture variables precipitating and maintaining behavior within families.

Support Strategies and Interventions

Develop support strategies and interventions based on the assessments that are truly individualized to children, parents, families, and the contexts in which they live. Use the patterns identified and the categories of proactive, teaching, and management strategies to scaffold plan design and as framework for selecting services. Help families select relevant, evidence-based strategies that fit their needs (rather than simply adopting programs or procedures to which they are exposed), encouraging individualized, creative solutions that are aligned with families' goals, values, and culture.

Monitoring Fidelity and Outcomes

Rely on objective information to assess the fidelity of plan implementation, increases in desirable behavior, decreases in problem behavior, and changes in quality of life. In addition to using clinical judgment and standardized tools, create and use behavioral anchors to structure observations and interviews. Engage parents in evaluating progress, combining simple subjective ratings and feasible recording procedures to capture of specific, meaningful outcomes. Focus data collection not only on child behavior or parental skills, but also overall family functioning.

Tiered Programs

Embrace the ecological multi-tiered conceptualization of intervention. Recognize that supports may be focused on the child within the family system, parent as a conduit for change, family as a whole, and/or broader support systems. Establish tiered programs that offer information and resources on PBS to all families, more tailored supports for those at risk or struggling, and intensive individualized assistance for those with the most significant challenges. Develop methods for "triaging" families, assessing their response to intervention, and transitioning within a continuum of services.

Future Directions

Positive behavior support offers a useful framework for selecting, integrating, and evaluating evidence-based behavior support practices. The focus on lifestyle enhancement and engagement of support and service providers increases the likelihood that interventions will be readily adopted and sustainable. Comprehensive assessments of both contextual issues affecting behavior and functions maintaining interactions among family members allows the tailoring of strategies to family needs, thereby increasing their effectiveness. Finally, employing proactive, teaching, and management strategies within typical family routines offers a conceptually sound and easily adoptable approach.

These features are evident in family-based intervention both within the PBS literature and broader parent education and support programs. What appears to be missing is a comprehensive, integrated model of service delivery that embraces all features equally. This gap may, in part, be due to a few barriers. First, families whose children may be having behavioral challenges have often been viewed as the problem, or as recipient of services, rather than true partners (Elliott and Parker 2012). Current best practice in behavioral intervention and family support emphasizes respect for the strengths, resources, needs, priorities, and perspectives of all participants, with interventionists embracing a more facilitative role (Madsen 2007). Unfortunately, these values are not always evident in practice.

Second, professionals from different disciplines have often worked within their own theoretical and pragmatic "silos", making fusion of knowledge and practices

challenging (Orchard et al. 2005). To bring about lifestyle change, PBS often requires the integration of a variety of services and supports, but it has not always been clear how to make this integration feasible. Wrap around process and strengthening systems of care (Chamberlain and Smith 2003; Clark and Clarke 1996) must therefore become a fundamental part of behavior support within family contexts.

Third, families who need support most are often stressed and discouraged, making them less responsive to education and intervention (Whittingham et al. 2009). This barrier has been addressed through 'adjunctive supports' such as respite, social support, and additional therapies in parenting programs (Sanders et al. 2007). More recently, cognitive behavior therapy techniques such as optimism training (Durand et al. 2012; Durand and Hieneman 2008), mindfulness practice (Singh et al. 2016), and related interventions such as *Acceptance and Commitment Therapy* (ACT; Hayes et al. 1999) and Cognitive Behavioral Family Intervention (Sanders and McFarland 2000) have been more fully embedded within behavioral intervention with families. These approaches not only address behaviors of concern, but help parents overcome emotional barriers to implementation of the plans.

And finally, PBS and other comprehensive interventions may be viewed as highly complex and time-consuming, driven by intensive data collection and circumscribed procedures that may seem difficult to implement fully (e.g., Allen and Warzak 2000). To be acceptable and feasibly adopted, PBS's core components must be distilled and packaged within user-friendly resources that are readily accessible to families and professionals supporting them (see examples of brief resources on apbs.org-families). Progress is clearly being made in integrating PBS features into family-based behavior support, but more work needs to be done to bring a comprehensive approach to complete fruition.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no competing interests.

Ethical Approval This article does not contain any studies with human participants or animals performed by any of the authors.

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