7

Designing and Implementing Individualized Positive Behavior Support

Robert E. O'Neill
University of Utah
J. Matt Jameson
University of Utah

7.07 Direct Observations

Learning Outcomes

1. *Describe the different strategies for collecting data via direct observation.*
2. *Describe how information from direct observations should be summarized in hypotheses/summary statements.*

7.08 Functional Analysis

Learning Outcomes

1. *Describe the general process involved in conducting a functional analysis to test hypotheses concerning challenging behaviors.*
2. *Describe how information from functional analyses should be summarized in hypotheses/summary statements.*

7.09 Behavior Intervention Plan Development

Learning Outcomes

1. *Describe the basic critical aspects of behavior intervention plans (BIPs).*
2. *Describe the components of the competing behavior analysis (CBA) process.*
3. *Describe the different possible formats for writing BIPs.*

7.10 Potential Intervention Plan Components

Learning Outcomes

1. *Describe the different possible support plan components (e.g., motivating operations, antecedent strategies) and give an example of each.*
2. *Describe the process for intervention plan evaluation and monitoring, and why it is so critical.*

7.11 General Issues Regarding Ethical and Professional Behavior

Learning Outcomes

1. *Describe why it is critical to follow ethical and professional guidelines in the PBS process.*
2. *List three professional organizations that provide ethical and professional standards to guide practitioners.*

7.12 Technology Supports for FBA

Learning Outcome

Describe two technology tools/applications and how they can be used in the FBA process.

7.13 Technology Tools to Support Intervention Strategies

Learning Outcome

Describe two technology tools/applications and how they can be incorporated into intervention strategies that are part of a BIP.

The purpose of this chapter is to describe the principles and procedures of positive behavioral support (PBS), and how they are applied to individuals exhibiting severe challenging behavior (e.g., self-injury, aggression, material destruction). Such behaviors have long been documented to occur in a substantial portion of populations of persons with a variety of developmental disabilities, including intellectual disability and autism spectrum disorders (ASD). The prevalence varies across studies, ranging from 5% up to 50% of participants assessed (e.g., Kanne & Mazurek, 2011), but such behaviors clearly represent a significant concern for teachers, parents, and other caregivers. If you work with persons with developmental disabilities on a consistent basis over time, you are likely to encounter such behaviors. Persons exhibiting such behaviors are at risk for a variety of negative outcomes, including placement in more restrictive environments in schools or the community, declines in educational opportunities, negative interpersonal relationships, and exposure to more restrictive intervention strategies (e.g., aversive and intrusive behavioral procedures, psychotropic drugs, etc.) (Benson & Aman, 1999). In addition, challenging behaviors obviously create substantial stress for parents, teachers, and other caregivers (Fox, Vaughn, Wyatte, & Dunlap, 2002; Weiss, 1991). As an example, consider the situations involving Micah and Jamila.

Micah's Story

Micah is nine years old. He has been labeled as having autism and intellectual disabilities. He lives at home with his mother and his four-year-old sister. Micah cannot communicate extensively via typical verbal language, but he can make a handful of requests using single words, and can respond to a variety of one-step requests (e.g.,"Pick up the book!"). He attends his local elementary school, where he spends about two thirds of his time in a self-contained classroom, and about one third in regular class settings and activities. He works on functional skills in the self-contained classroom, including communication and social interaction skills, and pre-academic and academic skills in the regular classroom settings. Micah's parents, teachers, and administrators at his school have become increasingly concerned about his challenging behavior, which includes periodic aggression toward others (slapping and scratching), self-injury (head slapping), and frequent self-stimulatory behavior (hand-flapping and rocking when sitting). These behaviors appear to be related to a variety of situations. His aggression mainly occurs when he is being asked to engage in functional and pre-academic teaching sessions, self-injury is more likely when he is asked to stop engaging in a preferred activity (e.g., turning off the CD player), and the self-stimulatory behavior flares up when Micah has to wait for an activity such as going to recess or getting lunch in the cafeteria.

Jamila's Story

Jamila is 21 years old. She has been labeled as having moderate intellectual disabilities. She lives in a supported living apartment situation with two other housemates, who also experience intellectual disabilities. They receive 24-hour support at home from hired staff persons. Jamila's parents and brother visit her on a weekly basis and go on outings with her. Jamila is able to communicate using three- to five-word sentences to make requests, answer questions, and comment on events in her environment. She attends a postsecondary program in the local school district. Participants in the program spend about half of their time in a sheltered workshop setting, learning various work tasks. The remainder of their time is spent sampling possible local supported work situations and learning community-based skills such as using public transportation and grocery shopping. Jamila's home staff and day program staff have become increasingly concerned about behavioral issues. These include consistent refusal to engage in home and community activities (e.g., saying "No, I won't do that!"), frequent complaints about feeling "weird," and exaggerated fear reactions (cringing, high-pitched vocalizing) to seemingly innocuous situations, such as walking into a grocery store. These behaviors appear to be related to a variety of situations. Refusals occur in response to a variety of requests both at home and in the community, and complaints about feeling weird and loud vocalizing are more likely when Jamila is encountering novel situations.

DEVELOPMENT OF POSITIVE BEHAVIOR SUPPORT (PBS)

For several decades non-pharmacological approaches to dealing with challenging behavior have been based on the principles and procedures of applied behavior analysis (ABA) (Scotti & Meyer, 1999). For many years, strategies for responding to challenging behavior had a reactive or consequence-oriented focus, and, along with reinforcement of appropriate behaviors, often included intrusive and aversive procedures (Carr et al., 1999; Repp & Singh, 1990). For example, in considering Micah's situation, in the past a typical plan might have included (1) social and/or tangible rewards when Micah did not engage in aggression or self-injury (i.e., differential reinforcement of other behavior, or DRO), and (2) physical restraint and/or time out in a separate isolated space when the problem behaviors occurred. Current approaches to behavior support take a much more comprehensive approach to such situations, mitigating the need for intrusive interventions.

Partly in response to these more reactive approaches, beginning in the 1980s, clients, families, advocates, and researchers began to investigate, implement, evaluate,

TABLE 7-1
General Components of Positive Behavior Support (PBS)

1. Identification of valued outcomes/goals in relevant educational, community, social, and vocational areas (Koegel, Koegel, & Dunlap, 1996)
2. Comprehensive functional behavioral assessment (FBA) of the factors influencing the occurrence of challenging behaviors (e.g., setting of events, antecedents, and consequences)
3. Development of hypotheses summarizing these influential variables
4. Use of these hypotheses as the foundation for developing a comprehensive behavioral intervention plan (BIP) that incorporates strategies to (a) manipulate antecedent variables to decrease the probability of challenging behavior, (b) teach and promote appropriate alternative behaviors, (c) provide positive consequences for desired behaviors, (d) minimize reinforcement for challenging behaviors, and (e) collect and analyze data to evaluate the impact of support in achieving the identified desired lifestyle outcomes

and promote what has come to be known as positive behavior support (PBS) (Carr et al., 2002). The primary hallmark of this approach is that it combines the empirically validated principles and procedures of applied behavior analysis (ABA) with an emphasis on achieving community-referenced, valued outcomes for persons receiving support (Bambara, Dunlap, & Schwartz, 2004); and using intervention strategies that are considered acceptable for individuals that do not have disabilities. The primary features of PBS have been described by various authors; a general list is included in Table 7–1. PBS takes a comprehensive approach to pursuing lifestyle change and educational and other goals for students (Sugai et al., 2000).

A critical feature of PBS is functional behavioral assessment (FBA). The FBA process focuses on identifying the full range of behaviors of concern, the immediate antecedents that precede those behaviors, and the consequences that are reinforcing and maintaining the behaviors (O'Neill, Albin, Storey, Horner, & Sprague, 2015). This information can then be used to develop a comprehensive set of strategies to prevent problem behaviors and promote and reinforce alternative positive behaviors (see below for additional details on these strategies). A second critical area involves strategies for teaching and promoting alternative behaviors that can serve the same function as current challenging behaviors. That is, students can be taught to use verbal utterances, sign language, or other alternative communication strategies to obtain attention or desired items/activities, or escape/avoid non-preferred activities (Carr, Levin, McConnachie, Carlson, Kemp, & Smith, 1994; Durand, 1990). These strategies increasingly make use of the rapidly developing technology that can facilitate student communication such as smart phones, various tablets/pads, and other devices (Beukelman & Mirenda, 2013).

DEVELOPMENT OF PBS IN SCHOOLS: MULTI-TIERED SYSTEMS OF SUPPORT (MTSS)

The early stages of PBS development focused on providing more intensive supports for individuals engaging in severe challenging behavior in a variety of settings (Repp & Singh, 1990). Early on in this development process, researchers and school personnel began to expand the application of PBS on multiple broader levels, primarily in school settings (Martella, Nelson, Marchand-Martella, & O'Reilly, 2011). This development was spurred by a variety of conceptual and strategic approaches in multiple fields, including tiered public health models (Walker et al., 1996) and academic response-to-intervention models (RtI) (Burns & Gibbons, 2012). These approaches have converged into what is now typically referred to as multi-tiered systems of support (MTSS) (Sugai & Horner, 2009). MTSS models typically focus on three tiered levels of support for students with a range of behavioral needs, from minimal general support (most students) to students with more intensive needs (Sailor, Dunlap, Sugai, & Horner, 2011).

Tier 1, or the universal level of support, addresses the support needs of a majority of students in a school (75–80%). Such universal support includes establishing a schoolwide PBS team, defining schoolwide behavioral expectations, teaching those expectations and establishing a reward system for appropriate behavior, and ongoing collection and review of data to evaluate impact (e.g., office discipline referrals) (Horner, Sugai, & Anderson, 2010). Not all students will be effectively supported at this level. Tier 2 supports are put into place to support the smaller percentage of students (10–15%) demonstrating greater risk for more serious problem behaviors. These are often students who are receiving more frequent office referrals for disruptive behaviors (e.g., talking out in class, distracting other students, etc.). Tier 2 or targeted interventions employ more standardized strategies that can be efficiently implemented with a larger group of students. For example, the Behavior Education Program (BEP) (Crone, Hawken, & Horner, 2010) is a check-in/check-out system. Students check in at school in the morning and receive a daily progress report listing their behavioral expectations. They carry this form throughout the day, and are periodically evaluated and rated by school personnel. They check out at the end of the day, and receive praise and other positive consequences if they meet their behavioral goals. Other Tier 2 interventions include social skills training groups and mentoring programs.

Finally, Tier 3 supports are for that small percentage of students (5–10%) who are exhibiting chronic severe challenging behaviors. Such students require more individualized and intensive support, including functional behavioral assessment and comprehensive behavioral intervention plans (Bambara & Kern, 2005), which are the primary focus of this chapter. A substantial body of research has documented the effectiveness of MTSS in achieving reductions in challenging behavior and increases in positive behaviors such as academic performance (Horner, Sugai, & Anderson, 2010; Sailor, Dunlap, Sugai, & Horner, 2011).

INCLUSION OF STUDENTS WITH MORE SEVERE DISABILITIES IN MTSS

As the development of MTSS proceeded, a variety of groups began to raise questions about the inclusion of students with more severe disabilities in the process. One notable event was the special issue of the journal *Research and Practice in Severe Disabilities* in 2006 (Bambara, Lohrmann, & Brown, 2006). A variety of authors discussed conceptual issues and practical strategies with regard to the integration of students with more severe disabilities in the MTSS process. Hawken and O'Neill (2006) reviewed the three tiers of the MTSS process and literature relating to the involvement of students with severe disabilities at the three levels. They concluded that there are a number of obstacles and opportunities with regard to including students with severe disabilities in all levels of MTSS. Obstacles could include limitations to these students' receptive and expressive language. As for opportunities, on both the Tier 1 and 2 levels, teachers and students could make use of picture or symbol systems to illustrate behavior expectations, and teachers could make use of similar systems to indicate ratings or evaluations of student behavior and performance (e.g., red/yellow/green vs. written evaluations). Such students might also benefit from smaller group or one-to-one instruction when it comes to behavioral expectations and reward systems.

There is clearly a substantial need for research and evaluation on effective strategies for including students with more severe disabilities at all levels of MTSS. The bulk of research with such students has involved interventions at the Tier 3, or more individualized and intensive levels of support. At this level, the primary stumbling block continues to be the capacity of school personnel to provide effective assessment and support (Hawken & O'Neill, 2006; O'Neill & Bundock, in press). The challenge is to make this happen in typical school settings with typical levels of support. Additionally, research is needed to assess the effects of such strategies when provided within the context of full implementation of all three tiers of support. Some

writers and researchers have speculated that individualized supports will be more effective when all three tiers of support are implemented (Horner, Sugai, & Anderson, 2010).

COMPONENTS OF INDIVIDUALIZED PBS

Three Phases of Implementation

The following sections will go into greater depth on the process of functional behavioral assessment (FBA) and the development of effective and efficient behavior intervention plans (BIPs) for students with severe disabilities. We will first describe the process and procedures of FBA including a rationale for the procedures, the desired outcomes of the FBA process, and who should be involved. We also include here a description of indirect and direct data collection methods for formulating and validating hypotheses/summary statements. Second, we describe processes for moving from FBA data to BIP development, monitoring, and evaluation. Finally, we will discuss some of the new technologies that can support practitioners in both the collection of direct observational data, and also in the design and implementation of interventions at each phase of the competing behavior model.

Functional Behavioral Assessment

FBA includes strategies and tools that may be used in various ways at all three tiers of MTSS (Hawken & O'Neill, 2006). However, it has typically been considered to be a primary component of behavioral support at the Tier 3 level for students engaging in more severe or frequent challenging behavior (Crone, Hawken & Horner, 2015; Westling, Fox & Carter, 2015). An FBA is conducted to gather data that describe a student's behavior, to document the behavior(s) through direct observation, to identify the setting events (e.g., sleep issues, medication effects) and antecedent conditions (e.g., particular staff, difficult academic activity requests) related to those behaviors as well as the maintaining and reinforcing consequences of the behaviors (O'Neill, Albin, Storey, Horner, & Sprague, 2015). These data can then be analyzed and organized to help guide the process of developing comprehensive behavior intervention plans (Bambara & Kern, 2005; Umbreit, Ferro, Liaupsin, & Lane, 2007). Numerous studies have documented the effectiveness of positive behavior support/function-based individualized interventions with students with severe disabilities in classroom and community settings (e.g., Blair, Lee, Cho & Dunlap, 2011; Binnendyk & Lucyshyn, 2009; Cihak, Alberto, & Frederick, 2007; Ervin, DuPaul, Kern, & Friman, 1998). Research has also found that implementing BIP interventions that are not rooted in the function of the behavior(s) can be ineffective at best and, at worst, have potentially negative consequences for students with disabilities and practitioners (Ellingson, Miltenberger, Stricker, Galensky, & Garlinghouse, 2000; Filter & Horner, 2009; Ingram, Lewis-Palmer, & Sugai, 2005; Newcomer & Lewis, 2004).

FBA should be driven by the five primary desired outcomes of the functional assessment process (Crone, Hawken & Horner, 2015; O'Neill et al., 2015; Storey & Post, 2012):

1. The FBA should allow practitioners to develop a clear and objective description of the problem behaviors.
2. The FBA should record the events, times, and situations that predict when the behavior will and will not occur.
3. The FBA should help identify the functions of the problem behavior.
4. The FBA should give practitioners a framework for developing hypotheses or summary statements that describe the relevant aspects of the behavior.
5. The FBA should be based on the ongoing collection and evaluation of indirect and direct observational data.

As mentioned above, careful FBA is critical so that the BIP results in an individual being taught an appropriate alternative skill that honors the function of the behavior, and provides the individual access to maintaining the consequence or function of the behavior. For example, if Jamila demonstrates problem behaviors that result in her escaping or avoiding a novel situation, she could be taught to communicate "I don't want to go here." This alternative communication would honor the function of the behavior in allowing her to escape.

Considerations Before Initiating an FBA

As the technology and tools of PBS have evolved, there is a growing emphasis on the importance of preventive interventions to support students with problem behaviors before assuming that a more intensive (Tier-3 level) intervention is necessary or appropriate. Westling and Fox (2015) present several prevention strategies that might be used to address behavioral issues that are related to the social and communicative challenges many students with severe disabilities experience. These recommendations include (1) responding to the initial problem behavior as having a communicative intent, (2) providing supports for communicative expression, (3) providing information about activity expectations to students in a manner that is understandable, (4) teaching rules explicitly, (5) providing choices, (6) considering the student's physical comfort, (7) maximizing student engagement, (8) providing multiple ways to participate in activities, (9) using the Premack Principle ("If you do this, then you get this."), and (10) providing high rates of positive reinforcement and meaningful corrective feedback. Below we offer several other preventive strategies that should be engaged in before focusing on individualized PBS interventions.

Person-Centered Planning

A significant number of tools have been created that have foundations in the values of person-centered planning. Person-centered planning is informed by a variety of approaches, principles, or "tools" to organize and guide targeted interventions and planning for individuals with severe disabilities, as well as their friends and families. While the majority of the person-centered approaches, or tools, have different formats and processes, they, much like PBS and FBA, are all framed around a common set of principles and values. The use of person-centered planning can be seen as a preventive intervention. Among other factors a person-centered curriculum that is focused on meaningful outcomes may prevent many behavioral issues. The key values and principles that must be present in the person-centered planning process are listed below (O'Brien & O'Brien, 2006):

1. Person-centered planning builds on the individual and the family's strengths, gifts, skills, routines, and activities in order to support meaningful participation and contribution to the family and community.
2. Person-centered planning supports self-determination and provides a structured framework for the individuals and families to identify and express their hopes, dreams, and desires and to develop informed and supported choices and interventions in order to achieve them.
3. Person-centered planning is a framework for providing services, instruction, supports, and interventions that meet the individual and family's needs, and is one that honors the goals and aspirations for lifestyle outcomes that are defined by dignity, respect, and familial interdependence (Kim & Turnbull, 2004).
4. Person-centered planning provides a mechanism for an equitable distribution of resources.
5. Person-centered planning processes are focused on the creation of community connections for both the individual and family. They support the development of a natural community of supports to increase the quality of life and community

participation by supporting meaningful outcomes chosen by the individual and his/her family.
6. Person-centered planning supports individuals and families in the context of their unique cultural and family values. It is imperative that all of the aspects that define an individual and family's "uniqueness" are considered and fully integrated into the person-centered planning process.
7. Person-centered planning supports the creation of positive relationships and collaboration between individuals, families, and practitioners through the recognition that all participants can meaningfully contribute to the planning, and ultimately intervention, process.

The person-centered planning process can utilize a myriad of methods and tools, with the central premise that any method used must be able to accommodate any individual's method/mode of communication. Additionally, the person-centered planning process is focused on providing any needed assistance to the individual with severe disabilities and their families in articulating the support needs, behavioral objectives, and long- and short-term goals. A number of person-centered planning tools have been used in the literature to support individuals with severe disabilities. Description of planning tools, such as Essential Lifestyle Planning (Smull et al., 2005), can be found in Holburn, Gordon, and Vietze (2006), Holburn, Vietze, and Mount (2002), and O'Brien and O'Brien (2007).

Ecological Assessment

An ecological assessment is a comprehensive process in which data are collected about how an individual with severe disabilities functions in different environments or settings (see Chapter 3 for a more comprehensive review of ecological assessment). Information for an ecological assessment is often obtained through observation. However, information can also be gathered through student records and interviews with the student and the family. An ecological assessment begins with defining and prioritizing short- and long-term outcomes through a lens of examining the skills, activities, and routines needed for an individual to be successful in a given environment (e.g., small reading group in the general education classroom, school cafeteria, playground, home, community settings, and place of employment). Ecological assessments and interviews can be conducted to determine students' independence and present levels of performance within the context of naturally occurring routines so that meaningful goals can be set to teach the necessary communication, social, behavioral, academic, or functional skills the students need to be able to achieve the outcomes they and their family prioritized in the planning process. As such, thorough ecological assessment is another strategy that may facilitate changes that may promote effective and meaningful educational and behavior supports across multiple environments and with different people.

Why Conduct an FBA?

O'Neill et al. (2015) identify two primary reasons for conducting an FBA. The first is to gather critical information about setting events, antecedents, and functions of problem behavior. With this information, teams can build effective and efficient behavior intervention plans. The second is the fact that FBA has become mandated professional practice in several states (Crone, Hawken & Horner, 2015; O'Neill et al., 2015), and in some instances is required by the IDEA'97 amendments, which state that schools use the FBA process to develop support strategies for students with disabilities. Specifically, schools must use the FBA process before either suspending (for more than 10 days) or expelling a student with a disability. Crone and Horner (2003) suggest the following decision-making rules for when and what parts of the FBA process to use: (a) If the student poses a danger to him- or herself or others or previous

assessments were not effective or the results were unclear, schools should conduct a functional analysis, (b) If the student is at risk for a change in placement or the team is not confident in the accuracy of its hypothesis/summary statement, then a full FBA should be conducted, and (c) if the student does not pose a danger, is not at risk for a change in placement, and the team is confident in the hypothesis/summary statement, a simplified FBA can be conducted.

Outcomes of an FBA

The basic outcomes of an FBA process are to identify (1) the full range of behaviors that are of concern for an individual, and how those behaviors may co-occur or be related as response classes or escalating sequences, (2) the broader setting events and more immediate antecedents that appear to increase the likelihood of their occurrence, (3) the consequences that appear to maintain the behavior(s) (i.e., their functions), and (4) hypotheses that pull all of this information together into succinct statements that can be used as a basis for developing behavior intervention plans (see below; and O'Neill et al, 2015). An example of such a statement would be "When Micah has had little sleep, and is asked to do functional and pre-academic tasks, he will slap and scratch the instructor and peers in order to avoid those task demands." Such statements/hypotheses include information about setting events (lack of sleep), immediate antecedents (functional or pre-academic task demands), challenging behaviors (slapping and scratching), and maintaining reinforcers (avoidance of task demands/negative reinforcement).

Who Should Be Involved?

The process of individualized positive behavior support requires the collaboration of everyone who serves as a formal or natural support for the individual with severe disabilities. The most current planning approaches have primarily been developed around student support and focuses on supporting the whole family and not just an individual (Kim & Turnbull, 2004). Interdependent family planning focused on family units in accordance with each individual family's strengths and needs (Kim & Turnbull, 2004). Lucyshyn et al. (2002) indicated that family members are critical in identifying the skills activities and routines that can be related to the challenging behavior and impact the overall quality of the individual's and family's lives. LeRoy et al. (2007) found that the presence of a natural community of supports (family, friends, neighbors) at planning meetings is an important component in developing meaningful and effective intervention strategies during the FBA and BIP planning process. In the case of Jamila, residential service providers, state mental retardation/developmental disability agency caseworkers, vocational instructors, friends and family should all be involved in the PBS and FBA process so that meaningful behavioral change can be established and maintained across settings and time.

OVERVIEW OF THE FBA PROCESS

Positive behavior support for individuals with severe disabilities is focused on providing the individual with problem behavior access to the skills, activities, routines, and meaningful relationships that the individual has identified as important (Westling, Fox, & Carter, 2015). There are six main steps involved in conducting an FBA and developing BIPs (Sugai, Horner & Sprague 1999).

Assessment

Through archival review, ecological assessment, interviews, and/or direct observations, data are collected that describe the conditions when the problem behavior is,

and is not, observed. Sugai and Horner (1999) indicate that the FBA is focused on objectively identifying four primary facets of an individual's behavior. First, the setting events that make the problem behavior worse (e.g., medications, diet, medical/mental conditions/illness, sleep) must be identified. This will often be dependent upon effective communication and collaboration between students, family, and practitioners on the BIP team. Second, the antecedent events that predictably come before and are associated with or are hypothesized to cause the challenging behavior (e.g., get/avoid attention of peers and/or teacher, obtain a tangible, escape/avoid difficult/undesirable activities, escape difficult/undesirable requests, self-stimulatory) have to be delineated. Third, additional challenging behaviors that the student uses to serve the same function are objectively defined. Finally, the maintaining consequences of the challenging behavior must be recorded (positive or negative reinforcement).

Hypothesis Development

The data gathered in step one is used to develop testable hypotheses/summary statements that describe when the problem behavior(s) is/are most likely to occur. A hypothesis/summary statement includes (a) an objectively defined problem behavior (i.e., slapping and scratching), (b) setting events that impact the importance of the maintaining consequence (i.e., Micah has an increased motivation to escape/avoid the difficult/undesirable pre-academic and functional instruction when he has not had enough sleep the night before), (c) the antecedent events that predict the problem behavior (i.e., Micah is asked to engage in a difficult/undesirable activity), (d) the maintaining consequence events (i.e., Micah escapes/avoids difficult tasks) (O'Neill et al., 2015).

Direct Observations and Analyses

After testable hypotheses/summary statements are developed, direct observation data are used to verify the accuracy of the hypotheses/summary statements. Best practice is to have multiple observations conducted across multiple settings and situations to determine whether problem behavior occurs in accordance with the hypotheses/summary statements developed by the BIP team. These observations involve the careful ongoing data collection to confirm the antecedent and consequent variables that maintain the challenging behavior.

In cases where hypotheses/summary statement(s) are difficult to verify or when the challenging behavior is not responsive to FBA-based interventions, functional "analysis" may be recommended. A functional analysis involves a systematic manipulation (i.e., removal and addition) of antecedents and/or consequences that are hypothesized to cause the challenging behavior (O'Neill et al., 2015). For example, one could test the hypothesis that Micah engages in self-injurious behavior by providing access to the preferred activity of listening to music contingent on self-injurious behavior. There are obvious practical and ethical considerations that should go into a designing and conducting functional analysis and, in most educational and clinical applications, we do not recommend functional analysis without the direct involvement of an experienced behavior analyst.

Development of Behavioral Intervention Plans (BIPs)

Once the hypotheses/summary statements have been validated, individualized behavior intervention plans (BIPs) can be designed that delineate (a) *strategies to address setting events* (e.g., If Micah's sleep log indicates he got little sleep the night before, instructional expectations might need to be modified), (b) *behavioral/teaching interventions* that teach alternative or desired behaviors (e.g., Micah could be taught to use an augmentative and alternative communication [AAC] system to ask for a break

from a difficult/undesirable task or activity), (c) *antecedent event interventions* (e.g.,. task demands could be modified or adapted), and (d) *consequence events* (e.g., differential reinforcement of behaviors). The BIP serves as the framework for defining the implementation of the behavioral interventions in each phase. Unlike the less holistic interventions that have historically focused on reactive and consequence-based interventions (e.g., seclusion, restraint), BIPs, rooted in comprehensive FBA, include multiple intervention components that teach new skills, activities, and routines (i.e., providing instruction on socially valid desired replacement behaviors and desired behaviors); are preventive (e.g., change the environment or the behavior of others before looking at changing the challenging behavior); and are environmentally based (e.g., rearrangement of the problem context).

Specify Who Will Do What and When

Intervention and instructional plans are developed to specify how, when, where, and by whom the different interventions of the BIP will be implemented. Crisis response plans should also be developed if needed. If necessary, support from other individuals or agencies (e.g., mental health, medical) should be arranged at this step. For example, in Table 7–2, Micah's behavior intervention plan indicates that all staff persons will be involved in data collection and that some staff and Micah's parents will meet periodically to review the data and make decisions about his intervention plan.

TABLE 7-2
Sample Behavior Intervention Plan for Micah

Behavior Intervention Plan for Micah

Student: Micah Lewison
Planned Beginning Date: 6/25/2015
Date of Plan: 6/21/2015

BIP Team Members: Ms. Thompson, 3rd grade teacher; Ms. Adolphson, self-contained classroom teacher; Mr. Michaels, district behavior specialist; Ms. Jimenez, classroom assistant; Ms. Lewison, mother

General Rationale and Need for Support
Micah is 9 years old and lives at home with his mother and 4-year-old sister. He has been labeled as having autism and intellectual disabilities. Micah communicates primarily via a handful of requests using single words, and can respond to a variety of one-step requests (e.g., "pick up the book"). He spends about two thirds of his time in Ms. Adolphson's self-contained classroom, and about one third in Ms. Thompson's regular 3rd grade class. He works on functional skills in the self-contained classroom, including communication and social interaction skills, and pre-academic and academic skills in the regular classroom setting. Micah's parents, teachers, and administrators at his school have become increasingly concerned about his challenging behavior, which includes periodic aggression toward others (slapping and scratching), self-injury (head slapping), and frequent self-stimulatory behavior (hand-flapping and rocking when sitting). These behaviors appear to be related to a variety of situations; his aggression mainly occurs when he is being asked to engage in functional and pre-academic teaching sessions; self-injury is more likely when he is asked to stop engaging in a preferred activity (e.g., turning off the CD player); and the self-stimulatory behavior flares up when Micah has to wait for an activity such as going to recess or getting lunch in the cafeteria.

Description of Problem Behaviors
Aggressive Behaviors: Micah will swing his arm wide and attempt to slap other persons with an open hand on the upper body or facial area. This behavior is of relatively lower intensity (i.e., not likely to cause tissue damage). If other persons are not wearing long sleeves, Micah will attempt to use his fingernails to rake down a person's arm between the elbow and wrist. This behavior may cause injury in the form of red marks and may potentially break the skin and cause bleeding.
Self-Injurious Behaviors: Micah will slap himself on the upper part of his head (not his face) with an open hand; this behavior is usually of relatively lower intensity (i.e., not likely to cause tissue damage).
Self-Stimulatory Behaviors: When in a sitting position, Micah will rock back and forth from the waist and flap his hands in front of his eyes.

(continued)

TABLE 7-2
Sample Behavior Intervention Plan for Micah *(continued)*

Summary of FBA and Behavioral Hypotheses
The FBA involved completing a FACTS form with relevant staff, and multiple days of direct observation data using the Functional Assessment Observation form. Based on this information and team discussion, it became clear that the self-stimulatory behavior was not a significant issue in that it could be easily redirected by staff and did not pose a problem for Micah or others. The team members were most concerned about the aggressive and self-injurious behaviors. They developed two hypotheses/summary statements, based on the FBA information and the competing behavior analysis (see example in Figure 7.3). These statements are
Hypothesis 1: When Micah has experienced poor sleep the night before, and he is presented with difficult task/activity requests, he will attempt to slap and/or scratch staff persons to escape from the task demands.
Hypothesis 2: When Micah is asked to terminate a desired activity and transition to another activity, he will engage in head slapping/hitting in order to try to maintain access to the desired activity.

Behavioral Strategies Regarding Aggressive and Self-Injurious Behavior
MOs: Sleep Issues: Micah's mother will attempt to establish a regular bedtime routine for Micah, including brushing teeth, using the bathroom, and then reading 2–3 books. Attempts will be made to maintain a quiet environment until Micah is asleep.
Antecedent Strategies: When presenting Micah with typically problematic task/activity requests, classroom staff will use high-probability requests (e.g., "Give me 5," "Do you like my shirt?" and "What color are your pants?") prior to requesting engagement in the problematic task.
To reduce the likelihood of problems with transitions, classroom staff will implement a picture schedule to communicate the sequence of activities in which he will be engaging. This will be reviewed at the beginning of the school day and then each time he transitions from one activity to another. In addition, staff will use a timer that they will set to let Micah know when he has three minutes left to go in an activity. They will provide precorrection along with the timer (e.g., "Okay, Micah, you have three more minutes to go with the CD player; when the timer goes off, it will be time to move to the next activity.").
Teaching Alternative/Replacement Behaviors: The team has determined that Micah would benefit from learning to request a brief break from undesired activities. Given his limited vocal/verbal abilities, it was decided that Micah will be taught to use the manual sign for "break." Staff will identify 3–4 main activities where escape-motivated behavior is likely to occur. Micah will initially be taught to use the "break" sign in a one-to-one context using a discrete trial approach. Then staff will be taught how to precorrect and prompt the use of this alternative response across problematic task situations. Initially, his use of the "break" sign will be honored each time it occurs. Once he is exhibiting this response consistently, staff will begin a delay requirement; that is, when Micah requests a break, he will be required to work for an additional brief period before being given a break. Based on staff discussion and review of data, this delay will gradually be extended over time.
Consequences for Appropriate and Challenging Behavior: Staff will establish a general reinforcement system linked to the activities and transitions Micah goes through. During task activities staff will provide periodic social praise contingent on task engagement and the absence of challenging behavior, and contingent on successful transitions without challenging behavior. Based on a reinforcer assessment, staff will provide Micah with a variety of more tangible rewards upon successful completion of task activities and task transitions (e.g., stickers, pencils, preferred edibles, etc.). Once Micah's challenging and appropriate behavior has stabilized at desired levels, staff will design and begin to teach Micah the basics of a token system. He will be able to earn tokens for task engagement and successful transitions, and then be able to trade in the tokens for activity and other tangible rewards.
Emergency/Crisis Management Strategies: When Micah engages in challenging behavior, he will be redirected back to the ongoing activity. If his behavior escalates to the point of being imminently dangerous to self or others, staff will employ the strategies taught during their crisis intervention training, including (1) putting distance between Micah and other people, (2) putting objects (e.g., couches, tables) between Micah and other people, and finally, *if the behavior continues to escalate and Micah and others are in danger,* (3) a two-person restraint involving staff blocking Micah's aggressive behaviors and holding him loosely around his upper arms so that he cannot injure others.

Data Collection and Evaluation Procedures
Data will be collected on (1) the frequency of aggressive episodes per day involving slapping and scratching others, (2) the frequency of self-injurious episodes per day involving head-slapping during transitions, and (3) the frequency of alternative communicative responses (using his "break" sign). To the greatest extent possible data will be collected across settings during Micah's school day. Micah's teacher from his self-contained classroom will be responsible for collecting data sheets and summarizing and plotting the data graphically at least once per week (data will be plotted as occurrences per day). Micah's classroom teachers and classroom assistants will meet weekly on Thursday afternoons to review the plotted data and discuss any possible needs for changes to Micah's support program. Family members will be invited to all meetings, and additional meetings will be arranged as needed to accommodate family schedules.

TABLE 7-2
Sample Behavior Intervention Plan for Micah *(continued)*

Staff Responsibilities
All of Micah's teachers and paraprofessionals will be responsible for implementing the behavioral support strategies described above in Micah's self-contained and regular classrooms. Each person working with Micah will be responsible for collecting data on the frequency of challenging and appropriate behavior using a common data sheet. Micah's two classroom teachers and other support staff who can attend will meet on a weekly basis to review his data and discuss possible changes to his BIP.

Ongoing Data Collection and Evaluation

Finally, ongoing data collection on the effectiveness and efficiency of the interventions within the BIP should inform instructional and support plan modifications and adaptations. A formative (e.g., frequent collection) approach is emphasized for regular data collection during the implementation of the BIP, while a summative (infrequent and long-term data summary) approach can be used for communication and progress-monitoring requirements.

INDIRECT DATA COLLECTION

Archival Review

One form of indirect data collection common to almost all the FBA processes is a comprehensive review of all the archived information regarding the individual and the challenging behavior(s); specifically, any archived information relating to potential setting events (e.g., medical/mental illness, medications, medical records, previous BIPs), previous antecedents (i.e., any information related to triggers of the challenging behavior), and information related to consequent interventions used previously such as preference and reinforcement inventories. For example, close examination of Jamila's residential file might record that she is especially fond of bubble gum. Not only could the reinforcer (bubble gum) be used to reduce the challenging behavior of loud vocalizations as a consequent intervention, but chewing the gum could also serve as a potential competing or alternate behavior to the loud vocalizations.

Interviews

FBA interviews are widely accepted as an evidence-based PBS practice (Herzinger & Campbell, 2007). Alone or with other FBA methods such as direct observation, the outcomes of FBA interviews should minimally include an operational definition of the challenging behaviors, identification of setting events, antecedents, and consequence events as well as times, people, skills, activity es, or routines throughout the day that seem to trigger the challenging behavior, and hypotheses/summary statements about the function of the challenging behavior (O' Neill et al., 2015).

A variety of different FBA interviews have been published. For example, the *Functional Assessment Checklist for Teachers and Staff* (FACTS; March et al., 2000) is a semi-structured interview conducted by a behavior specialist for the purpose of interviewing teachers or caregivers and was developed to help identify problematic skills, activities, and routines during specific times. A completed example of a FACTS form for Micah is presented in Figure 7–1. The *Functional Analysis Interview* (FAI; O'Neill et al., 2015) is a more comprehensive interview format than the FACTS and typically takes longer to complete. The individual with disabilities, when appropriate, and two or more people who know the individual well (e.g., family or educators) should be interviewed using the form. There are many other types of interview forms that can be used including the *Brief FBA* (Crone & Horner, 2003). Many of the FBA interview forms can be used specifically with individuals with severe disabilities, such as the *Student-Directed Functional Assessment Interview* (O'Neill et al., 2015). All of the

interview forms give practitioners a tool to record an objective description of the challenging behaviors, identify the setting events and antecedents that predict the challenging behaviors, identify the potential function(s) of the behavior(s), and help develop a hypothesis/summary statement that is used in the process of developing behavior intervention plans.

FIGURE 7–1
Completed FACTS Form for Micah

Functional Assessment Checklist for Teachers and Staff (FACTS–Part A)
Problem in Picture Form (Pro-form)

Step 1 Student/ Grade: Micah L. Date: 6/1/15
Interviewer: Mr. Brown (school psych) Respondent(s): Ms. Thompson and Ms. Adolphson

Step 2 **Student Profile:** Please identify at least three strengths or contributions the student brings to school.

Micah generally has a cheerful and happy demeanor, and looks forward to interacting with adults and peers. He enjoys a variety of activities including listening to music, working with letters, and playing with Legos.

Step 3 **Problem Behavior(s): Identify problem behaviors.**

_____Tardy	__X__Fight/Physical Aggression	_____Disruptive	_____Theft
_____Unresponsive	_____Inappropriate Language	_____Insubordination	_____Vandalism
_____Withdrawn	_____Verbal Harassment	_____Work not done	_____Other
	_____Verbally Inappropriate	__X__Self-injury	

Describe problem behavior: _____

Identifying Routines: Where, when, and with whom problem behaviors are most likely.

Schedule (Times)	Activity	Likelihood of Problem Behavior	Specific Problem Behavior
Morning instruction periods and regular math	Letter/number ID Copying letters Receptive ID	Low High 1 2 3 (4) 5 6	Slapping and scratching others
Free time/leisure; lunch	Music and/or computer; eating	1 2 3 4 (5) 6	Slapping side of head with open hand
		1 2 3 4 5 6	
		1 2 3 4 5 6	
		1 2 3 4 5 6	
		1 2 3 4 5 6	
		1 2 3 4 5 6	
		1 2 3 4 5 6	
		1 2 3 4 5 6	
		1 2 3 4 5 6	
		1 2 3 4 5 6	

Select 1–3 Routines for Further Assessment: Select routines based on (a) similarity of activities (conditions) with ratings of 4, 5, or 6 and, (b) similarity of problem behavior(s). Complete the FACTS–Part B for each routine identified.

FIGURE 7-1
Completed FACTS Form for Micah *(continued)*

Functional Assessment Checklist for Teachers & Staff (FACTS–Part B)—Aggressive Behavior

Step 1 Student/ Grade: Micah L. Date: 6/1/15
Interviewer: Mr. Brown (school psych) Respondent(s): Ms. Thompson and Ms. Adolphson

Step 2 **Routine/Activities/Context: Which routine (only one) from the FACTS–Part A is assessed?**

Routine/Activities/Context	Problem Behavior(s)
Morning instructional sessions and regular class math	Slapping and scratching others

Provide more detail about the problem behavior(s):

What does the problem behavior(s) look like?
- *Wide arm swing to slap others on the upper body or facial area*
- *Use of fingernails to rake down arm from elbow to wrist*

How often does the problem behavior(s) occur?
4–5 times per instructional session

How long does the problem behavior(s) last when it does occur?
Brief duration

What is the intensity/level of danger of the problem behavior(s)?
Slapping low intensity; scratching is dangerous, can cause injury/draw blood

What are the events that predict when the problem behavior(s) will occur? (Predictors)

Related Issues (Setting Events)		Environmental Features	
_____Illness	Other: poor sleep	_____reprimand/correction	__X__structured activity
_____drug use	_____	_____physical demands	____unstructured time
_____negative social	_____	_____socially isolated	____ tasks too boring
_____conflict at home	_____	_____with peers	____ activity too long
_____academic failure	_____	_____other	____ tasks too difficult

What consequences appear most likely to maintain the problem behavior(s)?

Things That Are Obtained		Things Avoided or Escaped from	
_____adult attention	other:_____	__X__hard tasks	other:_____
_____peer attention	_____	_____reprimands	_____
_____preferred activity	_____	_____peer negatives	_____
_____money/things	_____	_____physical effort	_____
		_____adult attention	_____

SUMMARY OF BEHAVIOR
Identify the summary that will be used to build a plan of behavior support.

Setting Events & Predictors	Problem Behavior(s)	Maintaining Consequence(s)
Poor sleep and requests to complete non-preferred tasks	Slapping/scratching others	Avoid/escape task requests

How confident are you that the Summary of Behavior is accurate?

Strategies for Preventing Problem Behavior			Consequences for Problem Behavior		
Not very confident					Very confident
1	2	3	4	(5)	6

(continued)

FIGURE 7-1
Completed FACTS Form for Micah *(continued)*

What current efforts have been used to control the problem behavior?

Strategies for Preventing Problem Behavior		Strategies for Responding to Problem Behavior	
_____schedule change	other:_____	____reprimand	other: block/redirection
_____seating change	_____	____office referral	_____
__X__curriculum change	_____	____detention	_____

Based on March et al., (2000) 4/24/00

Functional Assessment Checklist for Teachers & Staff (FACTS–Part B)—Self-Injurious Behavior

Step 1 Student/ Grade: Micah L. _____ Date: 6/1/15 _____
Interviewer: Mr. Brown (school psych) ___ Respondent(s): Ms. Thompson and Ms. Adolphson

Step 2 **Routine/Activities/Context: Which routine (only one) from the FACTS–Part A is assessed?**

Routine/Activities/Context	Problem Behavior(s)
Free/leisure time involving music and/or computers, lunch time	Slapping side of head with open hand

Step 3 **Provide more detail about the problem behavior(s):**

What does the problem behavior(s) look like?
- *Short arm swing to slap on the cheek or temple areas*

How often does the problem behavior(s) occur?
During approximately 80% of relevant situations (music, computer, lunch)

How long does the problem behavior(s) last when it does occur?
Varies; 2–3 slaps per "burst," possibly several bursts per occasion

What is the intensity/level of danger of the problem behavior(s)?
Reddened skin, possible bruising, possible "internal" damage?

What are the events that predict when the problem behavior(s) will occur? (Predictors)

Related Issues (Setting Events)		Environmental Features	
____illness	other:_____	____reprimand/correction	____structured activity
____drug use	_____	____physical demands	____unstructured time
____negative social	_____	____socially isolated	____tasks too boring
____conflict at home	_____	____with peers	____activity too long
____academic failure	_____	__X__other	____tasks too difficult
		Asked to terminate desired activity	

What consequences appear most likely to maintain the problem behavior(s)?

Things That Are Obtained		Things Avoided or Escaped from	
____adult attention	other:_____	____hard tasks	other:_____
____peer attention	_____	____reprimands	_____
__X__preferred activity	Access to music/ computer,	____peer negatives	_____
____money/things	access to additional food	____physical effort	_____
	_____	____adult attention	_____

SUMMARY OF BEHAVIOR
Identify the summary that will be used to build a plan of behavior support.

Setting Events & Predictors	Problem Behavior(s)	Maintaining Consequence(s)
Requests to terminate desired activities and transition	Slapping own head	Continued access to desired items/ activities

FIGURE 7-1
Completed FACTS Form for Micah *(continued)*

How confident are you that the Summary of Behavior is accurate?

Strategies for Preventing Problem Behavior	Consequences for Problem Behavior
Not very confident	Very confident
1 2 3	4 (5) 6

What current efforts have been used to control the problem behavior?

Strategies for Preventing Problem Behavior		Strategies for Responding to Problem Behavior	
____schedule change	other:_____	____reprimand	other: Prompts/reminders about end of activity, block/redirection
____seating change	_____	____office referral	_____
____curriculum change	_____	____detention	_____

(March, R., Horner, R. H., Lewis-Palmer, T., Brown, D., Crone, D., Todd, A. W., & Carr E. (2000). *Functional Assessment Checklist for Teachers and Staff (FACTS)*. Eugene: Department of Educational and Community Supports, University of Oregon. Used with permission.)

Checklists

Using questionnaires or checklists is another way to help educators gather FBA data. As with FBA interviews, the purpose of using rating scales is to develop an objective description of the setting events, behavior(s), antecedents, and consequence events that are maintaining the challenging behavior(s). Brief assessments used with students with severe disabilities include the *Motivation Assessment Scale* (Durand & Crimmins, 1992), the *Functional Analysis Screening Tool* (Iwata, 1996), and the *Problem Behavior Questionnaire* (Lewis, Scott, & Sugai, 1994).

DIRECT OBSERVATIONS

Data collection by direct observation is an essential part of the functional assessment process. Some research has found that indirect functional behavioral assessments (e.g., interviews, rating scales) do not provide enough information for identifying the function of problem behavior (e.g., Cunningham & O'Neill, 2007). Direct observation procedures and tools should be structured to provide clear and useful information while their use should not be an excessive burden on practitioners in applied settings (O'Neill et al., 2015). This is of particular importance, as researchers have emphasized that it is critical to conduct naturalistic (i.e., conducted in the environment in which the behavior occurs), descriptive observations (Chandler & Dahlquist, 2010), since the contextual variables of where and when the behavior occurs will have significant impact on the validity and reliability of the behavioral observation data and outcomes. It is suggested that a minimum of 15–20 behavioral occurrences over a period of 2–5 days be observed to insure validity of any hypotheses formed (O'Neill et al., 2015). These data, used in conjunction with archival reviews of existing data, indirect FBA assessment, and direct observational FBA tools, can support practitioners in developing robust and accurate behavioral hypotheses that identify the setting events, antecedents, behaviors, and maintaining consequences/functions of problem behaviors before there is any attempt to design or initiate any interventions.

The most basic form of descriptive observation is referred to as the A-B-C model or an antecedent-behavior-consequence assessment (Bijou, Peterson & Ault, 1968; Cipani, 1994; Zuni & McDougall, 2004). For each behavior observed, there is a record of the behavior and the events that occur long before or directly prior to the

FIGURE 7–2

Example of Functional Assessment Observation Form for Micah

													Perceived Functions												
	Behaviors				Predictors								Get/Obtain				Escape/Avoid					Actual Conse-quence			
Time	Slap/scratch others		Head slapping	Self-stim. behavior	Demand/request	Difficult task	Transitions	Interruption	Alone (no attention)	Desired item/activity			Attention	Desired item/activity	Self-stimulation		Demand/request	Activity ( )	Person		Other/don't know	Block/redirect		Comments/ observer's initials
Circle			7, 8							7, 8				7, 8								7, 8		
Instr. #1	1, 2				1, 2												1, 2					1, 2		
Instr. #2																								
Recess																								
Instr. #3	3, 4				3, 4												3, 4					3, 4		
Instr. #4																								
Lunch			9, 10							9, 10				9, 10								9, 10		
Math	5, 6				5, 6												5, 6					5, 6		
Lang. Arts																								
Free			11, 12							11, 12				11, 12								11, 12		
Home																								
Totals																								
	Events: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40																								
	Dates: 6/5/15 – 6/6/15																								

behavior (i.e., setting events and antecedents), the behavior described in objective terms, and the events that follow the behavior (i.e., maintaining consequences or function) (Kauffman, Mostert, Trent, & Hallahan, 1993). For example, direct observation reveals that when Jamila enters a new grocery store, she starts to loudly vocalize. In the A-B-C model, the behavior is first objectively defined in such a way that any observer would recognize the targeted problem behavior during an observation (the B). Behaviors should be described in objective, measureable, and observable terms (Kerr & Nelson, 2002). After multiple observations, the teacher may discover that data show demands and undesirable tasks and activities are antecedents that trigger the problem behavior (the A). Common antecedents identified during the FBA process include requests/demands from others, an absence of attention, transitions, and difficult or undesirable tasks or activities (O'Neill et al., 2015). Finally, the function, or maintaining consequence of the targeted behavior is identified (the C). Common functions include accessing a desired object or activity, obtaining attention, avoiding difficult/undesirable task/demands, and self-stimulation (O'Neill et al., 2015).

Another example of a functional assessment observation tool is the *Functional Assessment Observation Form* (FAO; O'Neill et al., 2015). Similar to an A-B-C approach, the form can be used to record the occurrence of behaviors and their antecedents, consequences, and possible behavioral functions. A completed example of an FAO is presented in Figure 7–2. These data indicate two behavioral patterns. In one case, task requests/demands seem to be consistent antecedents for Micah's aggressive behavior, and the apparent function is to escape those demands. In other scenarios, desired items and activities are antecedents for Micah's self-injurious head slapping, with the apparent function of maintaining access to those items/activities.

Validation of Summary Statements

FBA can be a somewhat complex and lengthy process and has typically been considered methodologically rigorous, but must be efficient and accessible to allow school-based practitioners to implement it (Allday, Nelson, & Russel, 2011; Scott, McIntyre, Liaupsin, Nelson, & Conroy, 2004; Scott, McIntyre, Liaupsin, Nelson, Conroy, & Payne, 2005). During the process, if the hypotheses/summary statements cannot be shown to be accurate through direct observation, or through the results of an intervention, then a functional analysis might be appropriate and necessary to identify the function and maintaining consequences of the challenging behavior.

FUNCTIONAL ANALYSIS

Procedures

A functional analysis (FA) is designed to elicit challenging behavior under some environmental arrangements and observe its non-occurrence under others. It is not recommended unless the hypothesis of the function(s) of the behaviors are not readily identifiable, or the severity of the problem behavior makes naturalistic observation ethically questionable due to potential negative side effects for the individual. FA involves the process of experimentally manipulating previously determined environmental variables (either antecedents or consequences) to determine the function(s) the challenging behavior serves for an individual with disabilities (Iwata, Dorsey, Slifer, Bauman, & Richman, 1994). Functional analyses may involve repeated sessions (typically 10–15 minutes in length) that vary with regard to the contingencies that are being applied (e.g., attention or escape being provided contingent on problem behavior). For example, in Jamila's case she could either be allowed or not allowed to escape from tasks/activities when she engages in challenging behavior.

Bloom et al. (2011) developed a trial-based FA that is more user-friendly for use in classrooms. This approach involves implementing these procedures in periodic four-minute sessions (Bloom, Iwata, Fritz, Roscoe, & Carreau, 2011) interspersed throughout typical classroom activities. In studies implementing trial-based FA procedures in typical classroom settings the results with regard to identifying behavioral functions matched those developed in a full FA the majority of the time. Additional studies have demonstrated that special education teachers and paraprofessionals can be trained to use trial-based FA in their classrooms to effectively identify the function of behaviors of their students, as well as implement appropriate interventions that produce positive effects on challenging behavior (Bessette & Willis, 2007; Lambert, Bloom, & Irvin, 2012). There are many different variations of how to conduct an FA but the key component involves the systematic observation of target behavior(s) while in clearly defined experimental and control conditions (Iwata & Dozier, 2008). For example, we may hypothesize that Micah engages in physical self-stimulation (hand flapping and rocking) when he has to wait for transitions (e.g., waits in line with the class for the bell to release students for lunch). An FA could experimentally evaluate this hypothesis by comparing rates of self-stimulation under a "waiting" condition versus a "no-waiting" condition. In the waiting condition, Micah would be asked to wait in line with his classmates for a brief period of time (e.g., 3–5 minutes). In the no-waiting condition, staff could wait to prompt Micah to go to lunch until the rest of his classmates were already walking out the door. If the frequency of self-stimulation is significantly higher when Micah is asked to wait during transitions as compared to when he does not have to wait, the hypothesis/summary statement of "When Micah has to wait during transitions, he will engage in hand-flapping and rocking while seated in order to get/obtain self-stimulation" can be tested. If this hypothesis/summary statement is confirmed, a BIP can be developed to address the function of the behavior.

BEHAVIOR INTERVENTION PLAN DEVELOPMENT

The second major phase of PBS is the development and implementation of a behavior intervention plan (BIP). The critical issue here is that the development of the BIP is guided by the information gathered from the FBA process (O'Neill et al., 2015).

Important Characteristics of BIPs

O'Neill et al. (2015) delineated four critical characteristics of BIPs. First, it is important that the focus is on the behavior of teachers, parents, and/or other caregivers. That is, the plan needs to specify what such personnel will do differently to alter a student's environment to make things work more successfully. Second, the plan *must* be based on and guided by the results of the FBA. In order to do this personnel can make use of a *competing behavior analysis*, a framework for analysis developed by O'Neill et al. (2015) (see below). Third, the plan should be technically sound with regard to the principles and procedures of applied behavior analysis (Fisher, Piazza, & Roane, 2011). Procedures should make the challenging behavior *irrelevant, inefficient,* and *ineffective* (O'Neill et al., 2015). *Irrelevant* means that the student no longer needs to engage in the behavior since the problematic situation has been modified (e.g., an aversive task/activity has been modified or removed). *Efficiency* refers to how quickly and consistently a behavior is reinforced. Support strategies need to ensure that alternative appropriate behaviors are reinforced more quickly and consistently than challenging behaviors. Additionally, factors such as physical efficiency may come into play. For example, if a student engages in a relatively low-effort behavior such as headbanging on nearby surfaces, any alternative communicative behavior must be as easy, or easier, to physically perform, and be reinforced quickly and consistently. An alternative behavior such as a sign, or showing a card, can be taught to

the student, so that the student can easily communicate his/her desire. Otherwise the alternative behavior will not compete successfully with the challenging behavior (Horner & Day, 1991). *Ineffective* refers to breaking the relationship between the behavior and the consequences that are reinforcing and maintaining it (e.g., discontinuing attention when a student engages in challenging behavior).

Fourth, a critical issue concerns the contextual fit of the BIP. By that, we are referring to whether or not the plan makes sense with regard to the situation(s) in which it is supposed to be implemented. This includes issues such as (1) whether or not the plan fits with the values and skills of persons in the setting, (2) whether it can fit into the natural routines of the setting (home, classroom), and (3) if it can be implemented effectively given the time, money, and other resources available in the setting (Albin, Lucyshyn, Horner, & Flannery, 1996; Lucyshyn, Kayser, Irvin, & Blumberg, 2002). For example, a plan calling for parents to conduct multiple 30-minute training sessions with a child each day if both parents are working outside the home and have four other children with busy schedules may simply not be feasible, and alternative interventions would need to be considered. So, persons developing and implementing BIPs will often need to look at a compromise between the most effective plan possible and what is logistically feasible within necessary settings. For example, in a given situation a student may require attention on a frequent basis to prevent tantrum episodes. However, if the teacher and other staff are busy with many other students this may be difficult to accomplish. In such a situation the teacher and staff may need to review and modify their scheduled activities to accommodate the student's need.

Finally, a major issue with regard to BIPs is that they need to contain a comprehensive multicomponent array of strategies to address *all* of the issues identified in the FBA process (O'Neill et al., 2015). This includes preventive/proactive strategies to decrease the likelihood of challenging behavior (e.g., manipulating antecedent variables), teaching and promoting desired/appropriate alternative behaviors, and arranging consequences to reinforce appropriate behavior as well as remove consequences that might be reinforcing or maintaining challenging behavior. It is also important to note that the BIP development process should be a team effort, with all relevant stakeholders involved and providing input (e.g., parents, teachers, support staff, etc.).

Bridging the Gap from FBA to BIP: The Competing Behavior Model

A significant challenge to many service providers and teams is moving from FBA-derived hypotheses and understanding of challenging behavior situations to identifying relevant strategies to include in a BIP (Van Acker, Boreson, Gable, & Potterson, 2005). Carr (1988), Horner and Billingsley (1988), and others described a framework for understanding the potential "competition" between challenging behaviors and more appropriate desired behaviors. O'Neill et al. (2015) incorporated this approach in presenting a *competing behavior analysis* (CBA) model to guide plan developers in the process. Figures 7–3 and 7–4 present the general outline of this model using examples of analyses completed for Micah's and Jamila's behaviors, based on the FBA information for each described above in previous sections.

The CBA model involves three steps. *Step one* involves diagramming the hypotheses/summary statements developed based on the FBA information. This is laid out through the middle part of the CBA diagram (see Figures 7–3 and 7–4). *Step two* involves identifying two things: First, what is the *desired* behavior that is supposed to occur in the relevant situation (see top part of CBA diagram)? For example, in the first situation, the desired behavior would be for Micah to complete the requested tasks or activities. Second, it is important to identify an alternative or replacement behavior that would *serve the same function* as the challenging behavior, or result in the same outcomes (see bottom part of CBA diagram). In Micah's case, he could be taught to request a break instead of engaging in challenging behavior to escape the nonpreferred tasks. *Step three* is to develop a plan or a list of strategies that will decrease

FIGURE 7–3
Examples of Competing Behavior Analysis Forms for Micah

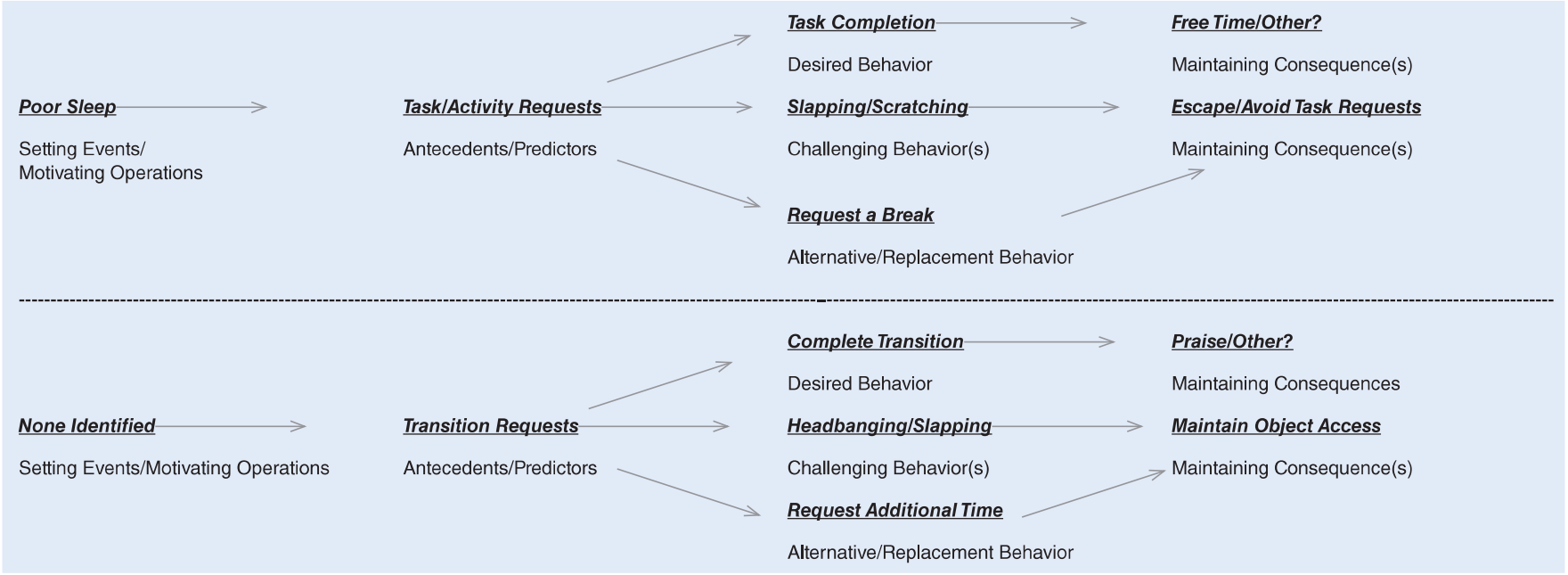
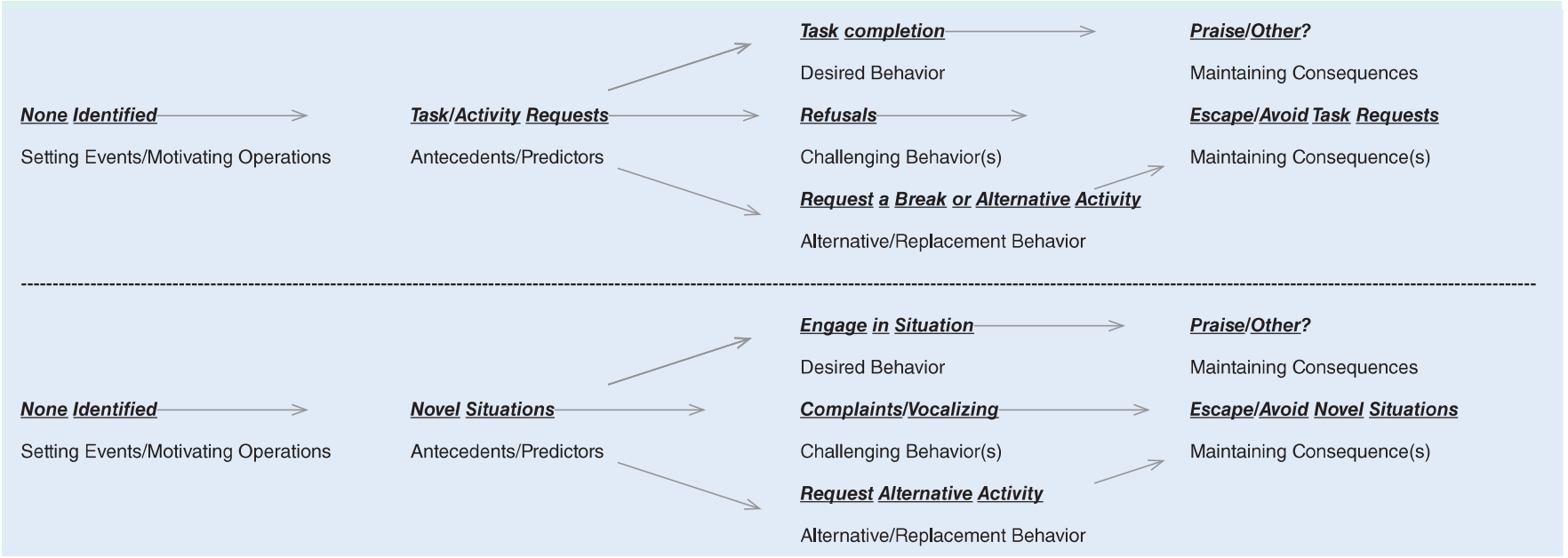


FIGURE 7–4
Examples of Competing Behavior Analysis Forms for Jamila



(From O'Neill/ Horner/ Albin/ Sprague/ Storey/ Newton. *Functional Assessment and Program Development for Problem Behavior,* 3E. © 2015 South-Western, a part of Cengage Learning, Inc. Reproduced by permission. www.cengage.com/permissions.)

the occurrence of the challenging behavior, and increase the likelihood of the desired and alternative behaviors. These plans should include strategies to address setting events (motivating operations), more immediate antecedent issues, teaching strategies, and consequence-related strategies. Examples of such a behavior intervention plan for Micah is presented in Table 7–3 and will be discussed below.

Formats for Behavior Intervention Plans

There are a wide variety of formats that can be used to document BIPs. One approach is to simply make a list of the various strategies to be employed, and how to implement them in various situations (see BIP plan components below). Alternatively, the plan could focus on specific problematic situations and how staff should proceed in those situations. For example, if requests to complete domestic cleaning activities are a consistent issue for Serena, the plan may describe a range of strategies to be used in that situation. Staff could employ high-probability requests (see below) and/or cleaning tools that simplify the task(s), and schedule a highly preferred reinforcing activity at the conclusion of the task. The main issue is to be flexible in adopting a format that will be useful and effective for the staff who are responsible for implementing the plan. This includes decisions about the format of the plan, where it will be located and how it will be accessible, and how relevant staff will be familiarized with and trained on the components of the plan.

POTENTIAL INTERVENTION PLAN COMPONENTS

As mentioned above, behavior intervention plans may involve a variety of components to address multiple aspects of a situation, including prevention strategies, teaching skills, and managing consequences.

Lifestyle Changes

Behavioral support does not occur in a vacuum. As with any person, students with severe disabilities lead lives that involve activities at home, in the community, at school, and potentially, in work settings. Some or all of these situations may be problematic in various ways and contribute to the display of challenging behaviors. For example, in Jamila's case certain interactions with staff and/or her apartment mates trigger challenging behavior at home. As described above, strategies such as person-centered planning (PCP) must be involved to examine the larger picture of an individual's lifestyle, and if potential changes might be in order (Risley, 1996). For example, it may be important to review Jamila's relationships with her apartment mates or support staff, and work with Jamila to focus on how to get along better with these individuals. Or it may be that Jamila wants to live in a different environment and with different people. There are many components that make up the determination of a good quality of life. When this is compromised, an individual may engage in behavior related to these issues (e.g., to obtain attention or to avoid/escape nonpreferred situations).

Classroom Modifications

Because students typically spend the majority of their day in classroom settings, it is important to assess components of the instructional environment that may be contributing to a student's challenging behavior. For example, student behavior may be influenced by factors such as numbers of students, noise levels, student movement and activity, and classroom routines (Alberto & Troutman, 2012). Prior to or as part of the assessment process, support personnel should consider these types of classroom

factors and whether changes in them would positively impact a student's behavior. Such a process might reduce the time and effort involved in an individualized BIP, or remove the need for it entirely. Further, the identified issues may be problematic for other students as well. For example, it may be that greater levels of noise and student activity are aversive for Micah, and may increase his agitation and the likelihood that he will react negatively to task or activity requests. Making changes in classroom routines to reduce noise and activity may result in a decrease in some of his challenging behaviors. (See discussion of setting events/motivating operations below.)

Setting Events/Motivating Operations

Teachers, parents, and other caregivers often notice that events outside of an immediate situation (e.g., a classroom) may impact a student's behavior. A student who arrives in the classroom in the morning ill, tired, or hungry, or had a negative interaction with a sibling before coming to school may react differently than usual. For example, in Figure 7–3, the competing behavior analysis (CBA) indicates that a lack of sleep may be an influential factor for Micah in increasing the likelihood of his responding negatively to task requests. These types of influences have been referred to by different labels over time, including setting events, and more currently, motivating operations (MOs) (Horner, Vaughn, Day, & Ard, 1996).

Michael (2007) defines a motivating operation as an environmental variable that has two effects. First is to change the value or effectiveness of some object or event as a behavior (value altering), and the second is to change the likelihood of behaviors that typically produce those reinforcers (behavior altering). So, in Micah's case, if he has had little sleep the night before, the value of being left alone and rest is going to be increased. If engaging in aggressive behavior typically allows him to escape from task requests (i.e., rest), then this behavior may be more likely to occur (see Figure 7–3). So, you can imagine a wide variety of experiences that might serve as motivating operations. Some of these could be physical in nature, including sleep deprivation, illness, hunger, and the impact of medications. Others could be more social in nature, including fights with a sibling or peer or long periods without social interaction. Horner et al. (1996) described multiple strategies to prevent or minimize the impact of MOs on student behavior.

Strategies to Deal with MOs: Prevention

Perhaps the easiest approach is to try to prevent the MO from occurring in the first place so that it will minimize the likelihood of increased challenging behavior. For Micah this might mean to help his family come up with strategies to improve his sleep patterns and eat more varieties of food. Similarly, parents and other caregivers can do their best to ensure that a student's medications are appropriately administered and monitored on a regular basis. If peer or sibling interactions are potentially problematic, steps could be taken to either keep persons apart, or monitor and facilitate more appropriate positive interactions. Preventive strategies may be very useful, but it may not be possible to always control these factors.

Strategies to Deal with MOs: Minimizing the Impact

In the event that MOs can't be prevented, teachers and others will have to rely on more reactive strategies (i.e., what to do once the MO has occurred) (Horner, Vaughn, Day, & Ard, 1996). Horner, Day, and Day (1997) assessed the impact of *neutralizing routines* on problem behavior associated with MOs during instructional sessions. For example, one participant demonstrated increased challenging behavior when he had less than five hours of sleep during the night. The neutralizing routine was to allow him to have a one-hour nap during the following day. This approach resulted in substantially reducing his aggressive and self-injurious behavior during instructional demand sessions. Another example described by Horner et al. (1996) involved a

student who had difficulty when schedules and events had to be changed unexpectedly (i.e., unpredictability). The support personnel found that a brief two-, three-minute review period explaining the changes and providing information on what would be happening and with whom was helpful in reducing challenging behavior.

Another strategy involves removing or altering the stimuli that typically evoke problem behavior. Dadson and Horner (1993) described a scenario in which a student would become agitated when her bus ride to school was late, which led to her engaging in challenging behavior in aerobic P.E. activities during first period. The teacher arranged for the student's parents to call her if the bus was going to be late, and a teaching assistant would meet the student and facilitate stretching exercises versus the usual aerobic activities. This led to substantial reductions in challenging behavior.

If schedules or activities cannot be changed, support personnel could provide increased prompting for desired behavior. *Precorrection* can be provided to remind the students that they can ask for a break or for help if they struggle with the task requests. Additionally, support personnel could increase the frequency and quality of reinforcement for appropriate behavior. For example, task engagement could be rewarded more often than usual and in greater amounts (e.g., 10 minutes of free time versus 5).

Antecedent Strategies

Antecedent strategies are those that are implemented in more immediate circumstances that typically result in problem behavior in order to decrease the likelihood that the behavior will occur. One result of the FBA is to identify antecedents that likely precede challenging behavior (e.g., teacher requests, lack of attention, presence of a desired object that is out of reach). A wide variety of strategies have been identified that focus on such antecedents to reduce the likelihood of the challenging behavior (Luiselli, 2006). When the FBA process has identified escape from task requests as a primary function, a variety of approaches could be used. Offering choices is one option. Assuming that the student is trying to escape from a non-referred activity, they can be offered choices along a variety of dimensions, including choice of tasks, location, materials to be used, sequence of completion, and type of response format (e.g., computer-based vs. handwritten) (Kern, Vorndran, Hilt, Ringdahl, Adelman, & Dunlap, 1998). Brown, Belz, Corsi, and Wenig (1993) identified a variety of types of choices that may be offered within daily routines. These include providing choices of activities and materials, with whom to engage in an activity, where the activity will occur, choice to refuse participation in the routine, and when to terminate the activity.

High-probability request sequences or behavioral momentum is another strategy demonstrated to be effective (Killu, 1999). This process involves making a series of requests to which the student has a high probability of responding positively before making a request that has a lower probability of a positive response. For example, a student might be asked to touch or label a series of three or four body parts or colors before being asked to sit down and begin working on an academic task. This approach has been demonstrated to be effective in reducing challenging behavior in task request situations (Belfiore, Basile, & Lee, 2008).

Adapting or modifying tasks and curriculum content is another approach to reducing the possible aversiveness of task request situations and related challenging behavior (Dunlap, Kern-Dunlap, Clarke, & Robbins, 1991). A variety of dimensions of instruction and content could be manipulated, including level of task difficulty (too easy or too hard), length of tasks/work periods, functionality of tasks, combinations of harder and easier tasks, and response format (written vs. computer-based responding). Results from the FBA process should provide information that would guide the identification of relevant instructional and curricular aspects that might be altered (Dunlap & Kern, 1996). For example, in Jamila's case, home-based tasks and activities could be modified to make them easier to accomplish so that she would be less likely to engage in problem behaviors to escape the activity requests.

Teaching and Prompting Alternative/Replacement Behaviors

A major development in the area of PBS has been a focus on teaching communicative behaviors that can replace or serve the same function as the challenging behaviors. This strategy is most often referred to as *functional communication training* (FCT) (Carr, Levin, McConnachie, Carlson, Kemp, & Smith, 1994; Durand, 1990). The basic idea is that the student can produce an appropriate communicative response to obtain the same reinforcer that is maintaining the challenging behavior. For example, in Micah's case, he could be taught to appropriately request continued access to a preferred activity instead of engaging in self-injurious behavior (see Figure 7–3).

The FCT approach involves three main steps. First, the main antecedent contexts that evoke the challenging behavior and consequences that are reinforcing and maintaining the behavior are determined from the FBA. Second, the form (or topography) of the alternative behavior must be identified. That is, decisions must be made with regard to whether the alternative behavior would be taught using vocal/verbal responses, signs or gestures, pictures or symbols, or the use of an augmentative/alternative communication (AAC) device. A variety of considerations should be taken into account in this choice (Johnston, Reichle, Feeley, & Jones, 2012). For example, if sign language will only be understood in a limited range of contexts, it might be important to consider alternative forms of communication. The types of responses already familiar to the student might provide an important starting point; in this way the student will likely learn the alternative more quickly.

In line with the competing behavior analysis, the relative efficiency of the challenging and alternative behaviors must be considered (Horner & Day, 1991). Efficiency involves a variety of factors including physical effort. For example, if a student has significant motor limitations then sign language/gestures and use of pictures or symbols might be difficult, versus a simpler AAC device involving touching panels for communication. Efficiency also involves the speed and consistency with which responses receive reinforcement. A classic example is hand raising in a classroom. A student may raise his/her hand, but the teacher's response may be delayed and inconsistent; in contrast, if the student hits or bangs his/her head, the teacher may respond quickly and consistently. So, a third and important aspect of FCT is to attempt to make sure that the challenging behavior receives as little reinforcement as possible, and the appropriate behavior is quickly reinforced. Research has demonstrated that implementing extinction or non-reinforcement for the challenging behavior can be a critical component for the success of FCT (Shirley, Iwata, Kahng, Mazaleski, & Lerman, 1997).

As in teaching any skill, it is important that strategies be implemented to ensure the generalization and maintenance of behavioral performance (Horner, Dunlap, & Koegel, 1988). So, in teaching the alternative behavior, instruction must include a range of settings and persons. In addition, support personnel must ensure that the alternative response is reinforced on an effective schedule and on an ongoing basis to maintain responding (Carr et al., 1999). For example, in teaching Micah to request a break from undesired activities, it would be important to teach and prompt the request in the variety of settings in which he engages in problem behavior, and ensure that the request is honored (i.e., reinforced) by giving him the desired break.

Consequence Strategies for Appropriate and Challenging Behavior

It is important to minimize or eliminate reinforcement for challenging behavior to the extent possible so that appropriate alternative behaviors can successfully compete. Extinction of challenging behavior involves preventing a reinforcer from being delivered when the challenging behavior occurs. So, for example, if a behavior is motivated by attention (e.g., a student engages in a tantrum to get his teacher's attention), personnel would attempt to *not* provide attention when the behavior occurs. For

escape-motivated behaviors (e.g., the student throws his materials on the floor so that he doesn't have to do the work), personnel would attempt to *not* allow the student to escape when the challenging behavior occurs (referred to as escape extinction) (Iwata, Pace, Kalsher, Cowdery, & Cataldo, 1990). It is important to note that in some cases this may be difficult to accomplish. For example, a student may escalate his behavior to the point where it is impossible to ignore the behavior, and intervention is necessary. Similarly, in attempting to force a student to remain engaged in an activity, problem behavior may escalate to the point where it is too dangerous to try to enforce the extinction (see discussion of crisis management below). Again, the basic message is to attempt to minimize or eliminate reinforcement for problem behavior to the maximum extent possible. More constructively, we would want to understand why the student is not engaged in the activity and make modifications to the task to try to increase its interest to the student.

Along with consequences for challenging behavior, it is critical to arrange appropriate reinforcement for desired and alternative behaviors. With regard to desired behaviors such as task completion, the full range of reinforcement procedures should be considered, such as social praise, activity access, tangible/edible items, and point/token systems (Alberto & Troutman, 2012). Reinforcement is critical to teach and maintain alternative communicative behaviors that serve the same function as the challenging behavior. That is, unless the environment responds positively and consistently to the alternative behavior, it will not be established and maintained (Carr, Levin, McConnachie, Carlson, Kemp, & Smith, 1994). This often raises concerns for support personnel who may have issues with providing attention or breaks when requested by the student (e.g., "Am I reinforcing escape behavior?"). In this case, it is important to consider two issues: (1) It is preferable that the student exhibits the appropriate communicative behavior to achieve his or her desired outcome (e.g., taking a break), than to continue to engage in the challenging behavior to achieve the desired outcome; (2) it is critical to consider that the situation can be altered over time so that the student is learning to tolerate delays to reinforcement when requests are made (Reichle, Johnson, Monn, & Harris, 2010).

For example, initially, a student's requests for a break would be granted each time a request is made. Then, over time, the process can be modified so that the student learns to tolerate a delay to being reinforced. This could occur in a variety of ways. One approach would involve increasing the amount of work the student must complete before being given a break. For example, if a student was completing math problems, initially the student would be given a break each and every time it was appropriately requested. As the inappropriate behavior was successfully decreased, and the use of the appropriate request for break was established, the student would be required to complete one or two more problems before being given a break. Over time the number of required problems could be increased to be eligible for a break.

Another approach could involve gradually increasing the amount of time the student would have to be engaged in work before a break. A critical aspect of this approach is that the training context should include a signal to the student that the break is coming after a certain amount of work or a certain amount of time (Reichle et al., 2010). So, when the student makes the request, the teacher can say something like "Yes, you want a break, just work for 30 more seconds and we will have a break."

Teaching and promoting functionally equivalent appropriate behaviors that serve the same function as the challenging behavior should be a critical component of comprehensive PBS plans.

Crisis/Emergency Intervention Strategies

The primary point of this chapter is that the focus of PBS is on implementing strategies to prevent and avoid situations in which challenging behaviors occur, and promote desired behaviors instead. The bulk of the effort of behavior support teams

should be focused in this regard, versus focusing on strategies for reacting to challenging behavior (Carr et al., 1994). However, students that engage in severe challenging behaviors may sometimes escalate to the point where more intrusive intervention is required, such as physical blocking and/or restraint to prevent the individual from hurting himself or others (Peterson, Ryan, & Rozalski, 2013). There are a variety of crisis/emergency training systems that offer strategies for coping with such situations, including Mandt Training and the National Crisis Prevention Institute (NCPI). It is worth noting that these systems, like PBS, have a major focus on preventing and de-escalating behavior situations before consideration of any kind of physical intervention. Physical engagement with a student must only occur as a very last resort, and then only the minimum amount needed for student and staff safety.

Prior to considering physical engagement, teachers or support staff have a wide range of possible options (Colvin, 2006). These include moving other students and staff out of a room while monitoring the student in crisis; keeping furniture or other objects between staff and the student; introducing calming stimuli into the situation, such as a favored staff person, music, etc.; and engaging in active listening. It is also important for teachers and staff to include strategies in their plan for how best to de-escalate the student and situation once the major crisis is over. Again, most training systems have prescriptive strategies in this regard. Typically there would be minimal or no demands placed on the student for a period of time (i.e., a "cool-down" period). Any detailed discussion with the student about the incident or possible consequences should be postponed to a later point in time when the student is calm. Interactions and requests can then be gradually introduced as the student appears to be able to tolerate them appropriately. It is important to note, however, that the implementation of a comprehensive FBA and a function-driven BIP will greatly reduce the probability of crises.

The use of non-emergency restraint and seclusion procedures has recently become a national issue, due to concerns with the potential highly negative outcomes of such procedures, including physical injury and death for students and/or staff. The U.S. Department of Education recently issued a report summarizing concerns and issues in this area (USDOE, 2012). An initial statement from this report exemplifies the concerns:

> *"Physical restraint or seclusion should not be used except in situations where the child's behavior poses imminent danger of serious physical harm to self or others and restraint and seclusion should be avoided to the greatest extent possible without endangering the safety of students and staff."* (USDOE, 2012, p. 6)

National reports of serious injuries and deaths in seclusion and restraint situations have prompted federal lawmakers, including Senator Tom Harkin, to recently introduce the Keeping All Students Safe Act (February, 2014). The goal of this legislation is to stop the use of seclusion in school settings, severely limit the use of restraints, and promote the use of PBS strategies as effective alternatives. It is likely that most crises can be avoided with the skillful use of PBS; what remains at issue is that many educators are not adequately prepared to work with students who engage in such severe challenging behaviors; without such skills, the likelihood of ineffective methods and consequent crises are increased.

For students who may escalate to a dangerous level, it is critical that personnel consider possible physical intervention procedures as part of a BIP. They may be acceptable when support personnel consider (1) obtaining informed parental consent, and, (2) obtaining district review/approval for any proposed procedures. Additionally, the consideration of more intrusive procedures *must* involve explicit and ongoing training of relevant staff, and periodic practice in the appropriate procedures. Finally, as required by most school districts and state agencies, episodes involving restraint or seclusion must be documented and reported to the appropriate administrative personnel. It is important to remember that the need for such

procedures is a sign that the BIP needs revision. If school personnel do not have the skills to conduct comprehensive FBAs and develop function-driven interventions, consultation with more skilled professionals is recommended.

The practice standards of the Association for Positive Behavior Support (**www.APBS.org**) include specific indications that procedures not be used that cause pain or humiliation or deprivation of basic needs.

Intervention Plan Evaluation and Monitoring

The behavior support process begins with data collection and analysis, as described above in the sections on FBA. This focus on data-based decision-making must continue throughout the process as well. Once a plan has been developed and implementation has begun, relevant data are crucial for evaluating its impact on an ongoing basis and possible needs for modification. Several steps are important in this process.

Define the Behaviors to Be Tracked

The BIP should clearly identify and define the behaviors on which data will be collected (i.e., definitions of behavior should be observable and measureable). This could include both student and staff behaviors. For example, for a student both challenging behavior and appropriate alternative behaviors might be tracked. With regard to staff, data may be tracked on rates of positive and/or negative interactions, frequency of prompting particular behaviors, and implementation of consequences. There must be clear definitions of what aspects of behavior are to be recorded (e.g., frequency, duration, etc.). Staff meetings and training may be needed to develop agreement on the definitions of what behaviors will be counted in which categories; this issue may need to be periodically revisited to maintain general agreement across persons.

Who Collects Data and When

Clear responsibilities must be defined with regard to who will collect data, in which situations, and during which time periods. Various types of charts or lists can be included in student program books or other unobtrusive places as reminders to staff. For example, a frequency data-collection sheet can be included in a student program book so that all relevant staff have the opportunity to collect data when they are working with the student.

Who Summarizes the Data, How It Is Summarized, and How Often

Clear responsibilities must also be defined with regard to who will summarize the data, in what form, and how often this will be done. Graphic formats are highly recommended for summarizing data (Farlow & Snell, 1994). For example, if data are being collected on the frequency of both challenging and alternative behaviors, these data can be plotted on a graph as the number per hour or per day, depending on the frequency of the behaviors. Graphs are capable of presenting a clear picture of student performance and whether or not there appear to be increasing or decreasing trends in the data.

Various recommendations exist for how often student performance data should be summarized and reviewed (see Chapter 4 for more on measuring and graphing student behavior). Recommendations may differ somewhat depending on what behaviors and what stages of learning are being tracked. For example, skill acquisition data might require more frequent summary and review (e.g., at least two, three times per week) so that instruction can be maximally effective (Jimenez, Mims, & Browder, 2012). Challenging behaviors that may be occurring on a relatively less frequent basis (e.g., 5–10 times per week) would not need to be recorded as frequently as high-frequency behaviors.

Who Meets to Review the Data and When to Make Decisions

Making data-based decisions is the most critical aspect of the process and the whole purpose for data collection. There should be a consistent process with regard to who meets, when those meetings occur, and the decision-making process. For example, the lead teacher in a classroom could plan to meet each Wednesday afternoon with his/her paraprofessionals to review challenging behavior data. The plotted data can be reviewed by the group to decide if the data are stable or demonstrating increasing or decreasing trends. Obviously depending on the performance being reviewed, this may lead to differing decisions. If the team is reviewing challenging behavior data, the ideal pattern would be a decreasing trend. If instead the data are stable or demonstrating an increasing trend, the team would need to consider possible options for modifying the intervention plan. Input from all team members would be valuable in discussing why the plan is not being successful, and possible changes that may make things work more effectively.

Basic Strategies for Data Collection

There are a large number of resources available in the behavioral literature that provides detailed procedures and tools for ongoing data collection (Alberto & Troutman, 2012; Miltenberger, 2012). The reader is referred to these and other resources for more detailed descriptions and examples of procedures.

As described above, the first step is to make sure that the behaviors of interest are clearly defined. Second, support personnel must decide on what characteristics of behavior they wish to collect data (e.g., duration, frequency, rate). This will determine the types of recording procedures and tools to be used. If staff wish to collect data on the frequency of behavior (i.e., event recording), there are a large number of options. Support staff can make tally marks on a piece of paper, use a golf counter-type device, make tally marks on a piece of masking tape on the staff person's arm, move marbles from one container to another when the behavior occurs, or use a variety of apps on their tablet (see Chapter 4 for strategies for measuring behavior).

It is important to note that there is an increasing number of computer-based applications available to facilitate data collection and summarization (see sections below). Some of these may be available at no cost, an important aspect for many personnel working in school settings. It is recommended that support personnel take the time to explore these options online, as many of them may facilitate the data collection and analysis process to be as easy and efficient as possible.

Example Behavior Intervention Plan for Micah

An example of a BIP for Micah was provided in Table 7–2. The plan includes the main components that have been discussed above, including the bases and rationale for the plan (including the FBA results), the primary components of the plan, and a summary of data-collection procedures, summary, and evaluation. Again, it is important to note that this is only one type of possible formats for BIPs.

GENERAL ISSUES REGARDING ETHICAL AND PROFESSIONAL BEHAVIOR

An important theme running throughout this chapter is that support personnel, along with family members, need to be guided by appropriate standards of ethical and professional behavior in making decisions about support strategies. This starts at the local level with ensuring that support personnel are working appropriately with professional colleagues and supervisors, and are following all relevant school, district, and state guidelines and regulations. This is particularly critical with regard to more intrusive or aversive interventions, such as physical restraints. On a broader national level there are a number of sets of standards available from different professional

organizations that can provide guidance. The Council for Exceptional Children has published a set of ethical principles for special educators (CEC, 2010). These standards focus on the importance of collaborative practice, working with families, and using data- and evidence-based practices. The national Behavior Analysis Certification Board (BACB) has published a set of guidelines for responsible conduct for behavior analysts (BACB, 2010). These cover a broad range of topics, including the use of evidence-based practices in functional assessment and interventions, appropriate interactions and relationships with students/clients and families, and effective supervision and relationships with colleagues. The Association for Positive Behavioral Support (APBS) has published a Standards of Practice document to guide practitioners (APBS, 2007). Similar to the BACB standards, these cover a range of relevant topics such as the foundations of PBS, collaboration with caregivers and families and other professional colleagues, and the use of effective functional behavior assessment and intervention strategies. The APBS Standards of Practice also include a firm position against the use of aversive interventions, and support the use of person-centered assessment and collaboration with families, and emphasize the focus on quality of life as the most critical outcome of behavior support. Along with local and state standards and guidelines it is highly recommended that support personnel familiarize themselves with these national standards as well, especially those that may be established by their particular relevant professional organizations (e.g., CEC for special education teachers).

TECHNOLOGY SUPPORTS FOR FBA

Technology has become a ubiquitous part of the lives of most teachers and students. Public schools use computers for standardized assessment, data for teachers to individualize instruction, data collection to inform instructional planning, online assessment, and to access digital content (U.S. Department of Education National Center for Educational Statistics, 2010). The decreasing cost and increasing availability of computers have stimulated the development of computer-based FBA observation tools in the last several decades. In the 1990s, several such systems were described in the literature (Storey & Horner, 1991; Kahng & Iwata, 1998). These systems were found to increase the fidelity and reliability of observations by allowing direct data entry into a computer, with automatic time stamping and compatibility with other software programs for data analysis and collaborative sharing. For many practitioners, this eliminated the time-consuming and error-prone data transcription process with analog tools (pencil and paper) and enabled the transition to computer-based analysis tools (i.e., Excel, Numbers) and, as a result, increased the efficiency and accuracy of data analysis and graphical representation (Noldus, Trienes, Hendriksen, Jansen, & Jansen, 2000).

Technology use will certainly continue to gain momentum in schools with the increased availability of affordable and intuitive computer technology, data collection software, and intervention tools (Steege & Watson, 2009). While a number of software programs (for a review see Tapp and Wehby, 2000) have been created and used for FBA, they have all previously required a cumbersome desktop/laptop computer or expensive and specialized personal digital assistants (PDAs), which limited both the utility and feasibility of use in a classroom or other school settings. More recently, major advances in PDA software, specifically the iOS handheld operating system, and broadband wireless connectivity have been driving the development of a new generation of technology supports for FBA. We suggest two considerations underlie the application of technology and FBA in classroom and community settings:

1. First, the ultimate purpose of FBA technology is not meant to be an outcome of adopting or documenting its use, but should be seen as the adoption of a

data-collection tool that is one part of a process of comprehensive PBS that will lead to meaningful lifestyle outcomes for students with behavioral challenges (Reid, 2000). If used correctly, technology does have the potential to increase the sensitivity and utility of functional assessment processes in classroom and community settings (Hastings & Brown, 2000). But, it is important to remember that simply documenting challenging behavior does not result in behavioral change without sustained interventions at all phases of the competing behavior model. Thus the simple adoption of FBA "high-tech" tools (the how) is less important than collecting FBA data for the development of function-based PBSs (the why).

2. Second, indirect (e.g., paper and pencil) functional assessment tools are still very frequently reported in scholarly journals (Horner, Sugai, & Anderson, 2010) and there are numerous analog functional analysis techniques that focus on both antecedent and consequent assessment that can be used in applied settings (Crone & Horner, 2003; Horner, Vaughn, Day, & Ard, 1996; O'Neill et al., 2015). However, it seems clear that practitioners would be remiss to ignore the potential of the current and evolving technology that is increasingly present in classroom and community settings to support both FBA and PBS interventions. FBA and PBS intervention technology is still in the early phases of developing an empirical evidence base. The evidence base for current handheld technologies and students with severe disabilities is, with a few exceptions of small subject designs (for a review see Mechling, 2011) still largely in its descriptive phase (Edyburn, 2013).

Direct Observation Tools

FBA Data-Collection Apps/Technology Resources

Direct observation and data collection are an essential part of the comprehensive FBA process. Direct observation procedures and tools should be structured to provide clear and useful information while their use should not be an excessive burden on practitioners in applied settings (O'Neill et al., 2015). This is of particular importance, as researchers have emphasized that it is critical to conduct naturalistic/ecological (i.e., conducted in the environment in which the behavior occurs) descriptive observations (Chandler, Dahlquist, 2010). The contextual variables of where and when the behavior occurs will have significant impact on the validity and reliability of the behavioral observation data and outcomes. Additionally, the number of observations within and across days can be time consuming and a challenge to accomplish in typical school- and community-based settings. As discussed above, observational data, used in conjunction with archival reviews of existing data and FBA interview tools, can support practitioners in developing accurate behavioral hypotheses that identify the setting events, antecedents, behaviors and maintaining consequences/functions of problem behavior, which in turn, can be used to develop a functionally relevant intervention. Use of FBA observation apps and PBS intervention technologies can potentially reduce some of this time burden. Often there is an initial time investment to learn how to use the technology, and then, once fluent with the tool, more efficient and accurate observation becomes possible.

In the following section, we introduce the reader to a number of "high-tech" tools that can be used for FBA observations. There will be an emphasis placed on iOS-based applications (apps) as recently, in perhaps the most rapid technological evolution, handheld touch-interface devices with video capture capacity, such as the iTouch, iPad, and iPhone, have become increasingly common for both student and teacher use (Jameson, Thompson, Manuele, Smith, Egan, & Moore, 2012). Conservative estimates suggest over 4.5 million iPads are currently being used in schools (Etherington, 2013). If one were to count educational apps along with other apps used to access content, such as electronic books, organizational and productivity tools, reference tools, and search engine apps, then the total number of apps would

likely exceed 200,000 apps (Walker, 2011), with over 200 new apps being submitted for distribution each day. At this point, the number of FBA apps is limited, but the number and sophistication of the apps continue to evolve at a dizzying pace and technology to support PBS and FBA will certainly decrease in cost while experiencing an increase in the sophistication of the tools and ease of use over time.

The majority of the FBA direct observation apps use the A-B-C theoretical approach described earlier (Bijou, Peterson, & Ault, 1968; Cipani, 1993; Zuni & McDougall, 2004). For each behavior observed, there is a record of the behavior and the events that occur long before or directly prior to the behavior (i.e., setting events and antecedents), the behavior described in objective terms, and the events that follow the behavior (i.e., maintaining consequences or function) (Kauffman, Mostert, Trent, & Hallahan, 1993). For example, *ABC Data* (CBTAonline, 2009), is an app allowing professionals to collect data on the frequency of behaviors while also recording session duration. It has three configurable buttons that can be assigned any label. These three buttons could be assigned to potential antecedents, behaviors, and functions or assigned to three different behaviors. It could be a very useful tool for behavior tracking especially if time/frequency is an important dimension of the target behavior. A more powerful tool, *ABC Data Pro* (CBTAonline, 2010), allows the user to configure more buttons (nine) for tracking more antecedents, behaviors, and functions and allows for behavior and/or event counting, partial-interval recording, full-interval recording, and A-B-C event recording. Automatic data summary is possible for frequency and interval data.

Other direct FBA observation tools include *iBAA* (Future Help Designs, 2012), an FBA app for the iPhone designed for professionals to observe and record qualitative observations, develop cumulative tabulations of behavioral occurrences, conduct interval recording, and collect FBA data. The *Functional Behavioral Wizard* (WhizzWhatt Software, 2014) allows practitioners to simultaneously conduct FBAs for multiple behaviors using frequency or duration counts and allows for the individualization of each assessment to accommodate the observation of several individuals with the same app (which is a common feature in almost all of the described FBA apps). *BehaviorSnap* (SuperPsyched, 2013) is a behavior observation tool created to identify the frequency, duration, and function of the targeted behavior(s). *ABC Logbook* (CBTAonline, 2011) is a data-collection app that allows for the concurrent observation of a large number of behaviors for many individuals. The app comes with built-in data analyses and the ability to calculate reliability data. The *FAO Observer Tool* (JBROS Software, 2012) is basically an A-B-C recoding tool, but with each behavioral incident there is a time-stamped competing behavior summary pathway developed that prompts school personnel to teach competing and desired behaviors while honoring the function of the observed behavior.

Perhaps the most promising FBA tools are the ones that incorporate built-in video recording of behaviors. This function allows individuals to not only record live data, but to revisit the behavior to code it at a later time, both to obtain interrater reliability and to reconsider the testable hypotheses derived during the initial stages of the FBA. These direct FBA observation apps include the *Tantrum Tracker* (Grant Technology Services, 2013), which has the ability to record video or take photos of behavioral incidents from within the app. However, the data collection and analysis are not linked directly to the recorded video, so one might argue that all the apps described to this point have the same capacity, given that all iOS devices have video-capture capacity as a built-in feature. *Behavior Tracker Pro* (Marz Consulting, 2011) allows practitioners to track behaviors and automatically develop a graphical representation of relevant behavioral dimensions (e.g., A-B-C, frequency, and duration). This app has the option to record video. Perhaps the two most powerful FBA apps are the *ABC Video Pro Lite* (CBTAonline, 2013b) and *ABC Video Pro* ($49.99) (CBTAonline, 2013a). Developed by CBTAonline (2013), these apps combine the capacity to analyze both video recordings and live observations. The *ABC Video Pro* app is the most powerful

one and has 30 configurable buttons that can be prepopulated to identify antecedents, behaviors, and functions of observed behaviors. As a result, data entry is quick and easy and helps maximize the reliability of the FBA data. Sharing the data with team members and other pertinent stakeholders is simple as the user can easily email the data from within the app. Data output is automatically organized by a time-based index of observed events. The apps also include measures to ensure security and confidentiality of student data while facilitating sharing with pertinent stakeholders. Based on the examination of the previously described tools, Jameson, Bruhn, and Hawken (2015) have identified five key features of an FBA direct observation app:

1. The app should allow practitioners to track antecedents, behavioral occurrences, functions, and maintaining consequences of the behavior.
2. The app should allow the ability to assign values to buttons/fields to simplify and streamline data collection that is automatically time-tagged and automatically organized.
3. The app should be able to track multiple individuals and have individualized assignable buttons to record the observed A-B-Cs of challenging behavior to validate the hypotheses/summary statement(s).
4. The app should have the capacity to easily export data to other software for graphical representation, or the ability to develop graphs within the app.
5. The app should have the ability to easily export data to relevant stakeholders via email or other file formats.

TECHNOLOGY TOOLS TO SUPPORT INTERVENTION STRATEGIES

In addition to the assorted technology tools for collecting FBA data in the classroom, multiple "high-tech" tools exist for developing/implementing function-based interventions for students with severe disabilities and with challenging behaviors. In this section, we examine apps that may be used to address setting events, or antecedent-based strategies for prompting desired behaviors. Other apps may be used to identify instructional options targeting deficits in specific skills, activities, or routines. Finally, we describe how apps can be used as consequence-based interventions. These apps address maintaining consequences through the use of reinforcement and provide practitioners guidelines for the selection of FBA and PBS apps.

Setting Events

As discussed previously, setting events often provide the environmental, social, or physiological context for challenging behavior (Alberto & Troutman, 2012). Specifically, setting events can create the context for behaviors to occur, or for behaviors not to occur, as well as alter the relative value of reinforcers or maintaining consequences (Kazdin, 2011). Setting events can help explain why antecedents (i.e., events immediately preceding behavior) trigger problem behaviors. Thus, setting event-based interventions may be used to decrease the likelihood an antecedent will trigger negative behaviors. Setting event technologies are often rooted in developing effective methods of communication with families or support providers about environmental, social, and physiological variables both proximal and in the past that will impact the occurrence of challenging behavior. For example, *Track & Share* (Track & Share Apps, 2013) is an app for self-monitoring that allows individuals and families to track sleep patterns, mood states, diet, levels of stress, and pain, and communicate with practitioners on an ongoing basis. *Medication Tracker (iMedications)* (iHealth Ventures, 2013) is an app that allows an individual and family to track and manage medications as well as monitor changes that occur over time. *Day One* (Bloom Built, 2014) is a journaling app that allows users to chronicle the events of each day. The app

automatically records the location, time of day, weather, and other variables associated with the environment and social interactions that might influence the occurrence of challenging behaviors. Due to the number of similar apps that could be used to support individuals at the setting event level, a comprehensive review is impossible; however, much like the selection of interventions, practitioners will need to become skilled at locating apps and evaluating the quality of the information they can get from a specific app related to the environmental, social, and physiological setting events that are impacting the individual's behavior.

Antecedent Interventions

Antecedent-based interventions involve immediate adaptations and modifications to the environment that will encourage the individual with severe disabilities to perform the alternate or desired behavior rather than the challenging behavior. Antecedent interventions typically focus on the environment, scheduling and routines, organizational tools, visual or audio cues, securing student attention, methods of instruction, opportunities to respond, self-management procedures (e.g., self-monitoring, goal-setting), sensory stimulation, and communication aids (Jameson, Bruhn, & Hawken, 2015; Kern & Clemens, 2007). For example, Micah was hypothesized to engage in self-injurious behavior while waiting during transitions. *iPrompts* (Handheld Adaptive, 2013) allows for the creation and presentation of visual supports, such as visual schedules or task analyses to help students prepare for transitions and the process involved. This app could help Micah receive visual prompts to wait appropriately during transitions as well as make the daily schedule and transition times visually apparent to him. Antecedent apps are designed and selected around six basic areas of support (Jameson, Bruhn, & Hawken, 2015): (a) the physical environment, (b) apps that facilitate organization, scheduling, and routine development, (c) apps that provide preventive visual or audio cues about the sequence of an activity or self-regulation strategies, (d) apps that support differentiated instruction that targets the student and family's needs, interests, and strengths, (e) apps that provide instructional cues, (f) apps that focus on issues of sensory stimulation and allow access to or avoidance of sounds and visual cues that are desirable or undesirable to the student with severe disabilities, (g) apps that incorporate self-management strategies to help students take more ownership in defining the challenging behavior and setting goals to reduce it, and (h) communication apps and that can be used to assist students in communicative efforts (Kern & Clemens, 2007). There are literally thousands of iOS-based apps that could be used in individualized PBS as antecedent level interventions; therefore, app selection should be guided by the needs identified in the FBA process and the apps should be selected and specifically targeted toward supporting function-based antecedent interventions.

Behavioral Teaching Applications

Self-management should be used not only as an antecedent-based strategy utilized to prompt positive behaviors, but also as a behavior-based strategy because the first part of any self-management strategy (e.g., self-monitoring, goal-setting, self-instruction) involves the student learning what the behavior is and is not. Before students can monitor and record their own behavior, they must be taught what the behavior looks like and how to be aware it is occurring. For example, Jamila vocalizes loudly when placed in novel situations. *Too Noisy* (Walsall Academy, 2014) is an app that could be used to help teach Jamila to self-manage the intensity of her vocalizations as the app displays a noise meter and visual indications of acceptable and unacceptable levels of noise. Other evidence-based behavioral interventions for students with severe disabilities include social stories and video modeling.

Video modeling, or observational learning, involves students using observation of desired behaviors to learn how to demonstrate those behaviors (e.g., positive social interactions, turn-taking, requesting assistance). For example, a student watches a video demonstration of a behavior and then is given opportunities to imitate the same skill (Bellini & Akullian, 2007). Many skills including motor behaviors (e.g., gripping a pencil), social skills, communication, self-monitoring, functional skills (e.g., brushing teeth), vocational skills, athletic performance, and emotional regulation can be taught using video modeling (Hitchcock, Dowrick, & Prater, 2003; Starek & McCullagh, 1999). Researchers have suggested that video modeling is an effective intervention for a variety of students; particularly students with autism spectrum disorder (ASD) are known to benefit from visually-cued instruction (Bellini & Akullian, 2007). Students with ASD tend to respond positively to video modeling for two primary reasons: (1) The anxiety often felt by students with ASD when interacting with other people might be reduced because they are interacting with technology instead; (2) students with ASD may find videos to be highly motivating and, thus, are able to focus their attention on the videos (Bellini & Akullian, 2007). *TherAd for Autism* (Marz Consulting, 2013), *My Pictures Talk: Video Modeling Tool* (Grembe Inc., 2014), and *Stories2Learn* (MDR, 2014) are iOS-based apps that support the easy development of video-modeling lessons with video, audio, and text. There are also a number of social story apps, including *iCreate … Social Skills Stories* (I Get It, LLC, 2014), *Social Stories* (Proteon Software, 2014), *StoryMaker* (Handheld Adaptive, 2013), and the *Social Skill Builder* (Social Skill Builder Inc., 2014). Given the large number, even within specific categories of apps, guidelines for the selection of appropriate and useful apps will be described at the end of the chapter.

Consequence Interventions

Consequence interventions are used after a behavior occurs. These strategies should be used to increase the occurrence of positive behaviors, and reinforcement should match the function of behavior. Reinforcement typically involves attention, access to tangibles, access to preferred activities, and sensory stimulation. While devices themselves have some reinforcing effects (Jameson, Thompson, Manuele, Smith, Egan, & Moore, 2012), there are several apps that can be used to develop systematic reinforcement. Additionally, many apps developed for the purpose of reward-tracking can address multiple functions at once. For example, *ClassDojo* (Class Twist, 2014), *LiveSchool* (Live School, 2014), and *iReward* (Gotclues, 2009) can all be used by practitioners to establish behavioral expectations and to track secondary reinforcers that can be exchanged for more powerful primary reinforcers as desired.

Communication

Communication skills are among the top priorities for students with severe disabilities. Effective communication skills enable students to express their thoughts and needs, to respond to interactions with others, and to obtain or refuse objects or activities. The ability to communicate with teachers, family, and friends supports the development of meaningful social relationships in all settings. Without an effective means of communication, individuals with severe disabilities are too often not able to express preferences and, as a result, lose much of their capacity to live a self-determined life. Participation in lectures, small and large group settings, and individual interactions with others are all contexts for communication that will enable students with severe disabilities to make choices and express desires. Carr and Durand (1985) found that teaching communication strategies, which are evaluated as an intervention for a variety of problem behaviors, resulted in initial reductions in challenging behaviors. There is an increasing number of AAC apps available, including *Pogo Boards: AAC* (Talk To Me Technologies, 2013), *SpeechHero AAC* (McKinney,

2013), *TalkBoard* (Ashley, 2014), *urTalkerPro* (**ProTalker.com**, 2013), *iMyVoice* (Techno M.A.G., 2014), *VoiceSymbol AAC* (Unlimiter, 2014), and *Proloquo2Go* (AssistiveWare, 2013).

Finally, perhaps one of the most important skills current practitioners can have is the ability to locate and evaluate apps among the massive number already in existence and that is growing continually. There has been a number of rubrics developed to help guide app evaluation and selection. As you will see in Table 7–3, Jameson, Bruhn, and Hawken (2015) have consolidated some of the rubrics into the five most important questions to consider when selecting an app to use for PBS (for either observation or intervention).

TABLE 7-3
Questions Used to Guide the Selection of Technology Applications

1. **Is the app user-friendly and intuitive?** Apps should be simple to use. If they require high levels of technological skill or need additional information/instructions to be effectively used, then practitioners should ask additional questions such as the following: Is there a developer website, product description, or instructions the user can access for additional help? Does the app have user tips and instructions built into the tool? In the end, if the app is too complex or does not have enough support resources for the user to learn to effectively use it, the app should not be chosen for use in the FBA process.

2. **Is it cost efficient?** Schools continually struggle with the availability of resources. Many apps advertise as being "free," but many of the apps that claim to be "free" allow the user only limited access to available features and the user is forced to make in-app purchases to effectively use the tool. Practitioners should get in the habit of checking on the in-app purchases available with any app chosen to ensure that the app is truly cost efficient without ongoing subscription costs or limited access to more robust features within the app. In the case of many apps, it is too often true that you get what you pay for. It is essential to carefully search the app store, read the user reviews if available, identify any in-app purchases that are essential to the function of the app, and determine if the app fits within the resource constraints of classroom, school, and community-based support settings.

Is it age and socially appropriate? The app must match the students' abilities (e.g., can they match pictures; read), as well be age appropriate. For example, some students with severe intellectual disability may have a difficult time using complex self-management apps. Also, it would not be age appropriate for a high school student to have an app that has nursery rhyme characters.

3. **Does it support the intervention you are trying to implement and the behavior you are trying to change?** Too often, schools purchase technology without any clearly defined purpose or outcome identified. Unfortunately, when it is not clear how to use the technology, the tools often sit unused in classrooms or the tools are not used in a way that enhances instruction or intervention and are simply used for reinforcement. Technology should be used thoughtfully to enhance what is already being done, to engage the student, and to provide meaningful support for long-term, lifestyle-changing outcomes. Practitioners must be confident that the app supports the strategies most likely to bring about the targeted behavioral change.

4. **Does the app and its intended use address relevant phases of the competing behavior model?** It is imperative that the functional outcomes of the app support practitioners' implementation of targeted interventions to the setting events, antecedents, teaching and promoting alternate and desired behavior, or consequences/reinforcements identified in the FBA process. For example, in Micah's case, a setting event app that would be appropriate would be a sleep-tracking app to address the setting event (sleep patterns) that influence the likelihood of his problem behavior. A medication-tracking app would not be helpful as the FBA process did not identify medications as an influence on his behavior.

(Modified from Jameson, Bruhn, and Hawken (in Crone, Hawken, & Horner, 2015).

LEARNING OUTCOME SUMMARIES

7.01 Development of Positive Behavior Support (PBS)

Learning Outcome

Describe the important changes in the field of behavioral support as a result of the evolution of PBS.

Behavior support for persons with severe disabilities who exhibit challenging behaviors has substantially evolved in recent decades to become more focused on assessment of the motivation for such behaviors, teaching alternative skills, and reinforcement of appropriate behaviors.

7.02 Development of PBS in Schools: Multi-Tiered Systems of Support (MTSS)

Learning Outcome

Describe the three levels of MTSS in schools.

A significant part of the evolution of PBS has involved three-tiered levels of support in school settings. However, more work is needed to understand and ensure the participation of students with severe disabilities in all levels of support.

7.03 Inclusion of Students with More Severe Disabilities in MTSS

Learning Outcome

Describe some of the obstacles to and solutions for the involvement of students with more severe disabilities in MTSS.

A variety of modifications may be needed to facilitate the involvement of students with severe disabilities in all three tiers of MTSS. For example, communication adaptations may be helpful, such as picture systems and alternative communication devices, to facilitate student understanding and participation.

7.04 Components of Individualized PBS

Learning Outcomes

1. *Describe the three phases of implementation of individualized PBS.*
2. *Describe the five desired outcomes of the functional behavioral assessment (FBA) process.*
3. *Describe some of the tools and strategies that should be considered for implementation prior to conducting an FBA.*

More intensive individualized PBS requires (1) a major focus on functional behavior assessment of challenging behavior, (2) multicomponent behavioral intervention plans, and (3) incorporation of technology supports to facilitate the process as needed and appropriate.

7.05 Overview of the FBA Process

Learning Outcome

Describe the six phases of the process for conducting an FBA and development of a behavior intervention plan (BIP).

Functional behavioral assessment may involve indirect assessments (interviews, rating scales), direct observations, and functional analysis manipulations. These assessments are used to collect data to guide the development of comprehensive behavior intervention plans.

7.06 Indirect Data Collection

Learning Outcomes

1. *Describe the different categories of strategies for indirectly collecting relevant information during the FBA process.*
2. *Describe how information from indirect methods should be summarized in hypotheses/summary statements.*

Indirect data collection may include the use of interviews, rating scales, and questionnaires administered to relevant persons (parents, teachers, other caregivers). Information from

such procedures is used to develop hypotheses or summary statements about the factors predicting and reinforcing the occurrence of challenging behaviors.

7.07 Direct Observations

Learning Outcomes

1. *Describe the different strategies for collecting data via direct observation.*
2. *Describe how information from direct observations should be summarized in hypotheses/summary statements.*

Direct observations, such as A-B-C data collection, provide more systematic information on the factors predicting and reinforcing the occurrence of challenging behaviors. This information can help confirm or disconfirm the hypotheses or summary statements being generated regarding challenging behaviors.

7.08 Functional Analysis

Learning Outcomes

1. *Describe the general process involved in conducting a functional analysis to test hypotheses concerning challenging behaviors.*
2. *Describe how information from functional analyses should be summarized in hypotheses/summary statements.*

This is a procedure that involves manipulating environmental events (antecedents and consequences) to assess their influence on challenging behaviors. This procedure may help when initial assessment results are unclear, and may help confirm or disconfirm the summary statements being generated regarding challenging behaviors.

7.09 Behavior Intervention Plan Development

Learning Outcomes

1. *Describe the basic critical aspects of behavior intervention plans (BIPs).*
2. *Describe the components of the competing behavior analysis (CBA) process.*
3. *Describe the different possible formats for writing BIPs.*

A competing behavior analysis (CBA) can help guide the development of strategies for promoting the occurrence of positive desired behaviors and decreasing the likelihood of challenging behaviors. Behavior intervention plans need to be comprehensive and include strategies for preventing challenging behaviors, teaching and promoting positive alternative behaviors, and managing consequences for both.

7.10 Potential Intervention Plan Components

Learning Outcomes

1. *Describe the different possible support plan components (e.g., motivating operations, antecedent strategies) and give an example of each.*
2. *Describe the process for intervention plan evaluation and monitoring, and why it is so critical.*

Behavior intervention plans must address issues with (1) setting events/motivating operations, (2) more immediate antecedents, (3) teaching and promoting positive alternative behaviors, and (4) consequences for both desired and challenging behaviors. In addition, plans must specify who will be collecting data on the plan impact, and who will meet and how often to summarize and assess the data and make decisions about ongoing plan implementation.

7.11 General Issues Regarding Ethical and Professional Behavior

Learning Outcomes

1. *Describe why it is critical to follow ethical and professional guidelines in the PBS process.*
2. *List three professional organizations that provide ethical and professional standards to guide practitioners.*

A wide range of ethical and professional issues may arise in providing support in situations involving challenging behavior. Professional support personnel (e.g., teachers) must be knowledgeable about local, state, federal, and professional guidelines and laws governing the implementation of PBS procedures.

7.12 Technology Supports for FBA

Learning Outcome

1. *Describe two technology tools/applications and how they can be used in the FBA process.*

A variety of technological tools are available to support the FBA process. Support professionals (e.g., teachers) should make themselves aware of these tools that can make the support process both more efficient and effective.

7.13 Technology Tools to Support Intervention Strategies

Learning Outcome

Describe two technology tools/applications and how they can be incorporated into intervention strategies that are part of a BIP.

A variety of technological tools are available to support various aspects of the intervention process. Support professionals (e.g., teachers) should make themselves aware of these tools that can make the support process both more efficient and effective.