

Intensive Intervention Practice Guide: School-Based Functional Analysis

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What is it?

Challenging behavior is prevalent in school settings, and addressing it in the classroom is a pressing concern for teachers (Ducharme & Shecter, 2011). Students who engage in challenging behavior are likely to struggle academically and to experience poor post-secondary outcomes; however, many teachers report lacking the knowledge and preparation to manage challenging behavior (Stormont, Reinke, & Herman, 2011; Coggshall, Bivona, & Reschly, 2012). Applying strategies to assess and treat challenging behaviors, such as functional analysis (FA), is one way to help students struggling with challenging behavior while increasing teacher confidence and expertise. Rooted in Applied Behavior Analysis (ABA), FA is the scientific study of how the environment affects behavior. Students' persistent challenging behaviors—like aggression, noncompliance, or inappropriate vocalizations—serve a function, like communicating a want or need or producing a desirable outcome for the student. Applied behavior analysts identify four main functions of behavior: attention, escape, tangible reinforcement, and sensory/automatic reinforcement (Cooper, Heron, & Heward, 2007; [see Table 1](#) for examples of each function). In some cases, challenging behaviors have a single function, but in others, challenging behaviors have multiple functions.

When practitioners understand why students engage in challenging behavior they can design a function-based intervention to decrease challenging behavior and increase appropriate behavior. While teachers may hypothesize the function of a behavior from simple observation, it is hard to determine the function of a behavior through observation alone. For example, a student's challenging behavior might be followed by attention from the teacher, attention from peers, and/or escape from work. Conducting an FA would help teachers determine which of those consequences maintain the behavior in order to develop an intervention that addresses the underlying function(s) of the behavior.

For whom is it intended?

Initially, FA was used to help develop clinic-based interventions for those with challenging behaviors such as physical aggression or self-injury; however, over the past 20 years its use has expanded widely. FA is now used for those with both severe and less severe challenging behaviors in school, home, and residential settings. Educational policy—starting in 1997 with the Individuals with Disabilities Education Act (IDEA)—supports the use of FA to tailor interventions for students with challenging behaviors (Chitiyo, 2005). Studies have shown FA to be an effective way to develop interventions for a wide variety of behaviors and for students of all ages with

diverse needs (Dixon, Tarbox, & Vogel, 2012). Further, in the multi-tiered school support programs that are commonly replacing traditional special education screenings, FA can be used to inform intensive behavioral interventions for students at the highest tier of support (Hawken, Vincent, & Schumann, 2008).

How does it work?

In FA, the teacher works with a school psychologist or behavior specialist to provide consequences following a specific challenging behavior (i.e., the “target behavior”) in order to determine the effect of those consequences on the behavior. Each of these consequence conditions are compared to a control condition in which the behavior does not typically occur, such as free time. For example, a teacher might, for a brief period of time, give attention after every instance of challenging behavior. If the behavior increases when the student receives attention following the behavior, then the teacher can infer that attention might be a function. If it does not increase, then the teacher can infer that the student does not engage in the behavior to gain attention. This process is repeated multiple times during an FA. For example, the teacher might rotate among providing attention, escape, or a preferred item following the target behavior—occasionally including the control condition—so that each consequences is tested multiple times. FA is a very effective, scientifically validated way to identify the function(s) of a behavior in order to develop an individualized intervention.

When considering using an FA, a teaching team must first assess if they have the experience and resources necessary to conduct it safely and accurately. Because FA conditions occasion the target behavior, when performing FA on a dangerous behavior, like self-injury or aggression, it is important to develop a plan to ensure the safety of the student and others in the classroom. Consequently, it is essential to have the direct guidance of a behavior specialist (such as a Board Certified Behavior Analyst, or BCBA), school psychologist, or other practitioner who is experienced with the FA procedure, as well as additional support staff to manage other students during the procedure. It is also important to obtain parent permission prior to beginning FA: Not only is this required if the student has a disability (IDEIA, 2004), having parents’ support will aid the assessment process and promote the development of an appropriate intervention that can be used consistently at both school and at home following the assessment.

Preparing for assessment

Once a team is ready to conduct an FA, they must identify the primary behavior in need of change. While some students may exhibit a variety of challenging behaviors (such as aggression and talking out), FA might be most effective when one behavior is assessed at a time. Thus,

the team should initially choose the behavior that is most dangerous/disruptive to the student. This target behavior must be defined clearly and unambiguously (i.e., operationally) to ensure all practitioners involved in the FA process—or subsequent intervention—can reliably report the presence or absence of the behavior. For example, instead of defining a behavior in terms that are not clearly measurable (such as a “disruptive”), the team should identify and describe all possible components of the behavior so it can be objectively identified (such as pinching with forefinger and thumb, or being out of seat for three or more seconds). Next, the team must choose the type of FA to conduct as well as the conditions to test. Traditional, full FA consists of an attention condition, an escape condition, and an alone condition. Each condition is repeated multiple times until a clear pattern of responding emerges (Iwata & Dozier, 2008). However, additional conditions can be added (e.g., access to tangible items or social avoidance) and/or different procedures can be used (e.g., brief FA, trial-based FA, or single-function test; Iwata & Dozier, 2008) based on the needs of the individual and resources of the team and school. Finally, the team must locate a time and space (potentially across multiple days) for conducting the FA. Any potential dangers that could occur during FA and procedures for addressing these should be determined and addressed prior to beginning the assessment.

Assessment

During assessment the different conditions are tested, typically back-to-back, either in a single day or over the course of multiple days. At least two practitioners should be present for the assessment: one to conduct the assessment and one to collect data and/or record the session (to permit later review). It is essential that all practitioners firmly adhere to the specific procedure for each condition (see O’Neill, Albin, Storey, Horner, & Sprague, 2015) to ensure that only a single function of a behavior is being tested at a time. Data must be collected during the assessment—via pen-and-paper or a data collection app (such as Countee)—and data can be coded either during or after the assessment using video recordings.

Analysis

Following assessment, all data should be graphed to permit visual analysis of the results by condition; this can be done by hand or electronically (see Dixon et al., 2009 for an explanation of graphing using Microsoft Excel™). When conducting visual analysis, the team should look for any condition in which the target behavior was seen at a higher rate than in the control condition; this will indicate the function(s) reinforcing the target behavior. For example, in the FA of aggression in [Figure 1](#), the student’s aggression is consistently higher in the attention and escape conditions than in the alone and tangible conditions; this indicates that receiving attention and escaping demands are the functions maintaining his aggression, and conversely, that his aggression is not clearly associated with gaining access to tangibles. These results provide the necessary information to inform interventions that target the functions of the student’s challenging behavior.

How adequate is the research knowledge base?

In 1982 Iwata and colleagues published the seminal paper on functional analysis, which examined the use of FA for nine students with developmental disabilities and challenging behavior. The findings suggested that behavioral functions are unique among individuals and do not necessarily have a singular cause. Over the 20-plus years since its publication, numerous studies using FA methodology have been conducted, both in the laboratory and in the applied (e.g., classroom) setting. For example, Solnick and Ardoin (2010) conducted a quantitative review of 39 FA research studies implemented in school settings to analyze the location, participant demographics, assessment procedures, and results of each. They reported that roughly half of the students involved in the studies were assessed in their classroom settings while the other half were assessed in analog (i.e., separate and more highly controlled) settings. Fifty-two point nine percent of students that were assessed in their classroom were in self-contained settings, 31.4% were in general education settings, and 15.7% were in preschool settings. In another review of 90 studies on FA conducted in school settings (between 2006 and 2009) Mueller, Nkosi, and Hine (2011) found that FA identified the consequences maintaining the challenging behavior in 90% of the analyses conducted in school settings; this finding is consistent with many previous reviews of FA. Such research supports the use of FA in a variety of classroom settings to determine the function of school-based challenging behavior.

How effective and practical is it?

Although research indicates that FA can be properly conducted in school settings, it can be difficult to implement FA in classrooms. Because the process requires training and oversight from a professional, input and data collection from multiple team members, and substantial time to implement, FA presents a challenge to already strained educational systems. In order for FA to become a more common practice in school settings, greater system-wide buy-in is needed. Although FA requires additional time, resources, and energy, it is important to remember the end result of students performing to their potential and allowing others in the classroom to do the same. Addressing persistent challenging behavior in the classroom is the first step to providing more access to education for all students in the class. Additionally, research has shown that not only is FA effective, it can be less time-consuming than practitioners expected (Mueller, Nkosi, & Hine, 2011) and can be implemented appropriately by practitioners following training and coaching (Erbas, Tekin-Iftar, & Yucesoy, 2006).

Where can I learn more?

The following resources provide more information on the behavioral principles supporting FA and the specific procedures required to conduct them.

- **About FA / How to conduct an FA:**
O’Neill, R.E., Albin, R.W., Storey, K., Horner, R.H., & Sprague, J.R. (2015). Functional assessment and program development for challenging behavior: A practical handbook. Stamford, CT: Cengage Learning
- **How to conduct an FA:**
<http://archive.armstrong.edu/images/psychology/FunctionalAssessment.pdf?AASUSTID=556f57945edc327c00c5d12179d7486e>
- **Example of Functional Assessment Screening Tool (FAST) Form (used to help select reinforcers to test during FA):**
www.pbisnetwork.org/wp-content/uploads/2011/04/FAST-2002.pdf
- **Example of an FA:**
www.educateautism.com/functional-behaviour-assessment/example-of-a-functional-analysis.html
- **Dr. Iwata speaking on FA:**
www.youtube.com/watch?v=2RFq13r3khY&t=23m14s

What questions remain?

FA a well-established practice; however, important questions still remain. While research suggests that FA can be reliably conducted by teachers, the amount of training and coaching necessary to do so remains unknown. It is also not clear what training and support teachers require to design and implement an intervention based on the results of the FA, nor the extent to which teachers who accurately demonstrate this skill will generalize it to other students. FA is effective but resource intensive, so questions remain about the feasibility of conducting FA in schools on a larger scale. Examining questions about the efficacy of abbreviated versions of FA, like brief FA or trial-based FA, could contribute to a practitioner-friendly and resource-efficient technology for conducting FA in applied settings.

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Table 1. Functions of Problem Behaviors

Function	Definition	Example
Attention	Behavior produces attention from peers or adults, including negative attention like reprimands	When Kara talks out during class, the teacher reprimands her and other students laugh
Escape	Behavior results in escaping an undesirable task	When Joe kicks or hits during class, he gets sent to the office, where he avoids or delays doing classwork
Tangible	Behavior results in obtaining an object	When Amy has a tantrum, other students give her the preferred school supplies
Sensory/ Automatic	Behavior results in sensory input that is desirable to the student	Zack drums on his desk during class, during lunch, and even when he is alone, because he likes the way it sounds

Figure 1. An example of an FA for aggression indicating attention and escape as functions of behavior.

