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### Publication Date

2018

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UNIVERSITY OF CALIFORNIA  
RIVERSIDE

Quality of Behavior Intervention Plans Developed in Schools With and Without  
Functional Behavior Assessments

A Thesis submitted in partial satisfaction  
of the requirements for the degree of

Master of Arts

in

Education

by

Rachel Hinant

September 2018

Thesis Committee:

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The Thesis of Rachel Hinant is approved:

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## ABSTRACT OF THE THESIS

### Quality of Behavior Intervention Plans Developed in Schools With and Without Functional Behavior Assessments

by

Rachel Hinant

Master of Arts, Graduate Program in Education  
University of California, Riverside, September 2018  
Dr. Cathleen A. Geraghty-Jenkinson, Chairperson

Function-based behavior supports are effective at decreasing student problem behaviors and increasing positive behaviors. Behavior intervention plans (BIPs) written in schools are often of low quality and not based on a functional behavior assessment (FBA). This study evaluated the quality of BIPs developed in southern California school districts using two tools: the Behavior Intervention Plan Quality Evaluation Tool, 2<sup>nd</sup> edition (BIP-QE II; Browing-Wright, Mayer, & Saren, 2013), and the Technical Adequacy Tool for Evaluation (TATE; Iovannone & Romer, 2017). BIPs with a corresponding FBA scored higher than BIPs with no FBA, but overall BIPs were of poor quality. Common problems were lack of a functionally equivalent replacement behavior, lack of plan for fidelity and communication among stakeholders, and the lack of an FBA.

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## Quality of Behavior Intervention Plans Developed in Schools with and without Functional Behavior Assessments

Student behavior at school is related to later school success, and behavior problems can impede student progress in school (Sayal, Washbrook, & Propper, 2015). Improving behavior is accomplished by using strategies and interventions based in applied behavior analysis (ABA; Cooper, Heron, & Heward, 2007). ABA is the application of behavioral principles (e.g., reinforcement, punishment) to experiments in real-world, rather than laboratory, settings. ABA is based on the theory that behaviors are shaped and maintained by environmental contingencies; and through environmental modifications, practitioners can change student behaviors. Along with the experimental control of behavior are guiding principles: for example, behaviors targeted for change, and the resulting changes, must be socially significant and generalize to other environments (Cooper, Heron, & Heward, 2007).

Positive behavior supports (PBS) are a framework for applying behavior principles from ABA to socially important behavior changes (Sugai et al., 2000). Traditional school responses to behavior problems have often been exclusionary practices applied after a child engages in a problem behavior (e.g., sending a student to the office, suspension, and expulsion). Rather than only disciplining children for problem behaviors, PBS aims to explicitly teach students different replacement behaviors that are more socially acceptable in the school environment and provide reinforcement to increase those socially acceptable behaviors. Under a PBS framework, students would be provided with reinforcement contingent on desired behaviors, which would increase future



occurrences of those behaviors (e.g., praise for hand-raising), while reinforcement for undesired behaviors would be removed, extinguishing those behaviors (e.g., ignoring calling-out). PBS can be applied as part of a tiered program, including schoolwide, classroom, and individual levels of support. PBS interventions require data-based decision making at all levels, and involve teaching of appropriate behaviors, clear and explicit expectations about student behavior, and redesign of the student environment to promote positive behavior change (Sugai et al., 2000).

### **Function-Based Behavior Supports**

Behavior supports that are based on the function of behavior have been demonstrated as more effective than supports that are not function-based. The function of a behavior refers to the environmental contingencies that maintain that behavior, specifically the antecedents and consequences temporally surrounding the behavior (Cooper, Heron, & Heward, 2007). Functions of behavior are: obtaining attention, obtaining access to a tangible item or activity, escaping/avoiding attention, escaping/avoiding an item or activity, or self-stimulation. For example, if a student screams whenever presented with a math worksheet, and the teacher sends the student out of the room whenever she screams, the function of the student's screaming behavior is hypothesized to be escape.

Research examining function-based interventions compared to interventions not matching or considering function has demonstrated that interventions addressing the function of a student's behavior are more effective at reducing problem behaviors and increasing positive behaviors. Briere and Simonsen (2011) compared a self-monitoring

intervention that provided either attention or escape from a task for two middle school students. For one of the students, the function of his problem behavior was attention; while for the other escape was the function of problem behavior. For both students, there were greater reductions in problem behavior when the functionally related self-monitoring intervention was in place compared to the functionally non-related intervention (Brier & Simonsen, 2011). Similarly, Filter and Horner (2009) conducted a study where two 4<sup>th</sup> grade students received alternating phases of an intervention based on data about the function of problem behaviors with a research-based intervention that was not function based (i.e., environmental contingencies around problem behavior were not changed). Problem behaviors were less frequent during phases with the function-based interventions compared to both baseline and non-function-based intervention phases (Filter & Horner, 2009).

Ellingson, Miltenberger, Stricker, Galensky, and Garlinghouse (2000) compared an intervention matched to the function of students' problem behavior to interventions that addressed an alternative hypothesis (i.e., not matched to function) for three students with intellectual disabilities (ID). Interventions that were matched to the function of problem behavior resulted in decreases in problem behavior for two of the three students, while the third student demonstrated decreases in problem behavior when an "enhanced" intervention was implemented. The functional intervention for this student addressed only the hypothesized function of attention by providing attention for compliant behaviors and removing attention for off-task behaviors. The enhanced intervention added a component to also address the hypothesized secondary function of escape

through the teacher providing verbal and physical prompts following each occurrence of noncompliant behavior. During implementation of the enhanced intervention, no prompting was provided because noncompliant behaviors did not occur during the sessions. However, during the functional intervention the teacher provided attention for 69.5% of the compliant behaviors and for 31% of intervals with problem behavior. During the enhanced intervention, the teacher provided no attention for non-compliant behaviors and attention for 79% of the compliant behaviors. The primary difference between the functional and enhanced interventions was a greater degree of fidelity during the enhanced intervention, indicating all three functional interventions were effective at reducing frequency of problem behaviors when implemented with fidelity.

### **Modifying Manualized Interventions**

Researchers have also examined the effect of modifying existing or manualized interventions to address the function of an individual student's behavior. Campbell and Anderson (2008) modified a check-in check-out (CICO) intervention already in place for two 10-year-old students whose problem behavior was maintained by access to peer attention. To modify CICO to address function of problem behaviors, students who earned points for positive behavior during reading were allowed to choose what peer to sit next to during lunch, providing peer attention contingent on positive behaviors. The modified CICO intervention resulted in greater decreases in occurrence of problem behaviors compared to baseline and the original CICO intervention. Carter and Horner (2009) modified the First Step to Success program to address the function of problem behavior for three kindergarten students. First Step to Success addresses behaviors

maintained by access to adult attention, so the authors selected students whose problem behavior was maintained by peer attention or escape and modified the intervention to address those functions. Modifications differed by student and included strategies to increase attention for positive behavior (e.g., positive behavior slip for good behavior that the student could award to another student) and decrease attention for negative behavior (e.g., class points for ignoring distractions). All three students demonstrated less problem behavior when the modified intervention was implemented, compared to the original, unmodified First Step to Success intervention (Carter & Horner, 2009). Manualized interventions like CICO have demonstrated effectiveness for many students, but when function-based techniques are added they can be more effective for more students.

Interventions that address the function of a student's problem behavior are more effective at decreasing student problem behavior than interventions that do not address function. This is true for interventions implemented by researchers (Filter & Horner, 2009) and when interventions are implemented by classroom teachers (Ellingson et al., 2000). Interventions can be either developed, or manualized interventions can be modified to address behavior function. In order to develop or modify an intervention to address the function of problem behavior, data about the problem behavior and the environmental contingencies in place must be gathered and analyzed. Data about problem behavior are necessary to determine whether a student is making progress when an intervention has been implemented, or if a different approach should be tried because behavior continues to be a problem.

## **Functional Behavior Assessment**

Functional behavior assessment (FBA) is a procedure for gathering information about the environmental contingencies maintaining a behavior, which results in testable hypotheses about the function of a behavior (Cooper, Heron, & Heward, 2007). The process of FBA can include indirect methods, such as interviews, rating scales, and questionnaires, and direct methods, observations of the behavior in a natural setting (Cooper, Heron, & Heward, 2007). When an FBA has been completed, there will be information in six key areas: description of the problem behavior, antecedents that predict the problem behavior, setting events that predict the problem behavior, consequences that maintain the problem behavior, a summary statement or hypothesis about the behavior, and data that support that hypothesis (O'Neill, Albin, Storey, Horner, & Sprague, 2015). Adams and Dunsmuir (2009) group these outcomes into three main outcomes: description of the behavior, prediction (e.g., antecedents, setting events), and function (maintaining consequences). FBA is a flexible process for gathering and interpreting information on the behavior and what in the environment predicts and maintains the target behavior. That information can then be used in developing an intervention to prevent and decrease the problem behavior, while increasing socially acceptable and desired behaviors.

### **Conceptualization of FBA in Research**

While it is generally agreed in the literature that FBA is a process for gathering information about the function of a behavior, there are some differences in how that process is conceptualized. Cooper, Heron, and Heward (2007) described FBA as

including both indirect and direct methods, but other researchers have conceptualized indirect and direct FBA as distinct processes (Fee, Schieber, Noble, & Valdovinos, 2016).

There are also different arguments about functional analysis (FA), with some researchers describing FA as a distinct process from FBA, and others describing FA as an optional component within an FBA (Camp, Iwata, Hammond, & Bloom, 2009; O'Neill, Albin, Storey, Horner, & Sprague, 2015). FA involves manipulation of environmental factors while measuring the target behavior, an experimental way to find the maintaining consequence of a problem behavior. FAs typically include four conditions under which problem behavior may occur: access to tangibles, task demands, social attention, and an alone condition (Iwata, Dorsey, Slifer, Bauman, & Richman, 1982/1994). By manipulating what consequence contingently follows each instance of problem behavior during each condition (e.g., hitting results in escape from task demands in one condition and adult attention in another condition), researchers or practitioners can determine the function of the problem behavior. For some researchers, FA can be included as a final step in the FBA process, either to confirm the hypothesis developed during the FBA process or to clarify in the case where multiple possible functions were identified during indirect and direct assessments (Cooper, Heron, & Heward, 2007; Martens & Lambert, 2014; Steege & Scheib, 2014). Other researchers conceptualize FBA and FA as two distinct assessment methodologies (Camp, Iwata, Hammond, & Bloom, 2009).

## **Effectiveness of FBA**

Despite these differences in definition, meta-analyses of FBAs have generally indicated that the use of an FBA results in effective behavioral interventions. Overall effect sizes for meta-analyses of studies evaluating the effect of FBA based interventions in schools are moderate to high. Bruni et al. (2017) found a Tau-U effect size of .75 across 30 single case design studies including all types of behavioral interventions, some based on an FBA and some not. There was a small but insignificant difference in effectiveness between interventions preceded by an FBA and those that were not. However, Bruni et al. (2017) did include behavioral interventions like cognitive behavioral therapy (CBT), which do not consider or address the function of behavior but have been demonstrated to be an effective intervention (Ishikawa, Okajima, Matsuoka, & Sakano, 2007; Weisz, McCarty, & Valeri, 2006). Hurl, Wightman, Haynes, and Virues-Ortega (2016) found an effect size of .85 across 13 single case design studies when comparing interventions based on data from a functional assessment compared to interventions not based on function. Goh and Bambara (2012) examined the effectiveness of FBA based interventions across different student populations and settings and found overall effectiveness to be high in creating classroom behavior changes in students. Generally, some form of information about behavioral function used in developing a behavioral intervention results in greater changes in student behavior than interventions that do not consider function.

While FBA as a process is flexible, differences in how FBAs are conducted may not significantly impact effectiveness. When Bruni et al. (2017) compared studies

employing indirect or descriptive FBA (i.e., FBAs using interviews, rating scales, and/or direct observation) to studies using an FA, both levels of the FBA type moderator variable resulted in equivalent Tau-U values of .79. Hurl et al. (2016) defined FBA as including indirect assessment (i.e., interviews), direct observation, and an experimental functional analysis (EFA), arguing that some research suggests that indirect and descriptive methods do not provide the requisite information to determine function, and some sort of experimental manipulation of the environment to elicit the behavior is necessary to correctly identify the function of the behavior. While there are some studies that indicate the hypotheses developed from indirect and descriptive FBA methods do not match with the hypotheses developed from experimental analyses (Camp et al., 2009; Wightman, Julio, & Virues-Ortega, 2014), Bruni et al. (2017) found equivalent effect sizes for interventions based on indirect and descriptive methodologies as well as interventions based on experimental analyses. Goh and Bambara (2012) compared effect sizes for types of FBA: descriptive methods only, experimental methods only, or a combination of descriptive and experimental methods. They found effect sizes for all three types of FBA to be very close; percent of non-overlapping data (PND) for descriptive only was 88%, for experimental only was 87%, and for a combination of both was 91%. Using interviews and direct observations to develop a functional hypothesis about a target behavior for intervention appears to be as effective as using experimental methods to test a functional hypothesis and develop an intervention.

Within the studies that Goh and Bambara (2012) and Hurl et al. (2016) included, studies that used indirect and descriptive methods typically followed a similar formula of



interviewing a key stakeholder (i.e., teacher) about the problem behavior, and then directly observing the student in the classroom environment to collect data about the antecedents and consequences that surrounded instances of behavior. Christensen, Young, and Marchant (2004) included a teacher interview, ABC observations, and a reinforcer survey in their FBA procedures, although they did not specify how ABC data were collected. Ellingson, Miltenberger, Stricker, Galensky, and Garlinghouse (2000) used a questionnaire, interview, and an ABC checklist for direct observations of students. Ellingson and colleagues (2000) did describe their ABC checklist with detail and had both classroom teachers and research assistants collect observation data on student behavior using the checklists. Payne, Scott, and Conroy (2007) included in their FBA procedures structured interviews with teachers, parents, and school personnel, a review of student records, and ABC data collection. These different procedures all yield final FBAs with the same contents: a defined target behavior(s), antecedent and consequent events that typically surround the behavior, and a hypothesis statement about function of the behavior. What is unclear is whether any specific procedural element is more or less effective than another; is an interview with the teacher necessary, does it need to be structured or not structured, should ABC data be collected using a structured tool or is narrative recording more effective? The process of FBA may be flexible enough that different approaches can all yield accurate hypothesis statements that can be used to develop effective interventions, or there may be student level differences (e.g., severity of problem behavior) that impact which approaches are the most effective.

## **Behavior Intervention Plans**

After the FBA is completed, information from the FBA is used to develop a behavior intervention plan (BIP), the goal of which is to change the environment to support the student engaging in appropriate behavior (O'Neill et al., 2015). A BIP is a written document, which details strategies to be used by a practitioner (e.g., teacher) before a problem behavior occurs, while it is occurring, and after it occurs to make that problem behavior less efficient and effective. Additionally, a functionally equivalent replacement behavior (FERB) is taught to the student/client to provide them with a more socially acceptable way to access the same function achieved by the problem behavior. The plan, when implemented, should make it more efficient and effective for the student to access the function of the problem behavior by engaging in the FERB (O'Neill et al., 2015). For example, a student who yells out in class during individual reading in order to access adult attention could be taught to raise her hand to access adult attention while adults would ignore all yelling out behavior. In that way, yelling out would no longer result in adult attention, while hand-raising would be immediately reinforced with adult attention.

Blair, Fox and Lentini (2010) provide an example of using an FBA to develop a BIP. Blair and colleagues targeted three children in an inclusive community early childhood program during classroom circle time. Ike was a three-and-a-half-year-old boy with a language development delay, with tantruming and aggressive behaviors. Structured interviews using the Functional Assessment Interview (FAI; O'Neill et al., 2015) were conducted with Ike's teacher and mother, and unstructured interviews were

conducted with two administrators. After interviews, two fifteen-minute observations with ABC data collection were conducted, and then the team working on the FBA together developed hypotheses about the function of Ike's behavior: behavior occurred when preferred items were not available, when peers received turns, or when classroom staff gave directions, in order to obtain preferred items, obtain teacher attention, or to avoid task demands. Each BIP included prevention strategies, replacement behavior(s), and response strategies. For Ike, prevention strategies included frequent noncontingent attention through teacher proximity, offering choices of activities, and providing preferred activities. Ike was taught to ask for a turn, make choices, and wait for his turn, which would allow him to access the same function (adult attention, access to preferred items) as his problem behaviors. If Ike engaged in problem behaviors, reinforcers were to be withheld (e.g., planned ignoring), and Ike was to be prompted to use the replacement behaviors, making his problem behaviors less efficient at accessing attention or preferred items or avoiding task demands. After intervention was implemented, Ike's frequency of problem behaviors dropped significantly, from about 35% of intervals to less than 10% of intervals.

Writing a BIP requires some technical knowledge of behavioral theory, as well as knowledge about the student in question and the classroom environment. When BIPs are written by a team including members with technical knowledge and knowledge of the classroom (e.g., classroom teachers), the quality of the BIP is higher than plans developed by teams with only people with technical knowledge (Benazzi, Horner, & Good, 2006). Technical adequacy of the BIP was high whether it was developed by a

team with people with both types of knowledge (technical & classroom) or a team of only people with technical knowledge, but contextual fit (i.e., how well the plan matches the values, skills, and resources of those who will implement the plan) was higher for BIPs developed by teams with only people with classroom knowledge or teams with both types of people. Contextual fit is important because it represents how well a BIP will fit into a classroom, and how much the classroom teacher (typically responsible for implementation) will prefer the plan and how likely they are to implement with fidelity. A BIP may be technically adequate, but if it is not implemented with fidelity there are unlikely to be any benefits for the student. Ensuring good contextual fit can increase the chances of full implementation of the BIP.

The concept of fidelity of implementation, or treatment integrity, is important because it can impact student outcomes. The quality of BIPs has been found to be related to student outcomes, decreases in problem behavior and increases in positive behavior, as reported by practitioners (Cook et al., 2012). BIP quality was rated using the Behavior Support Plan Quality Evaluation Tool (BSP-QE; Browning-Wright, Saren, & Mayer, 2003). Higher quality plans were more likely to be implemented with higher fidelity than lower quality plans, possibly because practitioners who develop higher quality plans are more likely to implement those plans with fidelity (Cook et al., 2012). Well-designed BIPs based on functional information about behavior are an effective tool in improving student behavioral outcomes.

### **Limitations in Practice**

In practice, FBAs and BIPs are often of low quality (Van Acker, Boreson, Gable, & Potterton, 2005; Cook et al., 2007). Blood and Neel (2007) collected BIPs from a school district in eastern Washington to evaluate the quality of BIPs being developed by school-based practitioners. They found that a of 43 students with behavior goals in their IEP, 23 had a behavior plan with no FBA included in their file. Quality of the behavior plan was not affected by presence or absence of an FBA; a majority of the BIPs were hierarchical stock lists, about 20% of BIPs with and without FBAs were lists with an individual component, and none of the BIPs were individualized plans. Hierarchical stock lists were BIPs that included lists of common behavioral strategies (e.g., praise appropriate behavior, token economy) that were not specific to the problem behavior of the individual student. Lists with an individual component were stock lists that included at least one strategy that was specific to the individual student. None of the BIPs collected were plans that were developed to specifically address an individual problem behavior with antecedent and consequent strategies and a FERB. Cook et al. (2007) found that of BIPs developed by teams without training in positive behavior support (PBS) were of inadequate quality, unlikely to result in positive student outcomes.

### **Legal Guidance**

Poor quality of FBAs and BIPs developed in school settings may be related to lack of training (Cook et al., 2007), or to the lack of clarity in the research literature on what an FBA and BIP should be (e.g., descriptive vs. experimental methods, type of ABC data collection), or related to limited legal guidelines for when and how to conduct an

FBA and develop a BIP. The Individuals with Disabilities Education Act (IDEA) requires that an individual education plan (IEP) meeting regarding conducting an FBA and writing a BIP within 10 days of a student being removed from school for more than 10 days (e.g., suspended), removed in a way that would constitute a change in placement, or placed in an interim alternative education setting (IAES) due to a drug or weapons offense (Drasgow & Yell, 2001). IDEA also requires an IEP team to consider the use of strategies that include positive behavioral interventions and supports in the case where a student's problem behaviors impede his or her learning or the learning of other students (Drasgow & Yell, 2001).

Beyond those requirements, federal legislation does not offer guidance on the FBA or BIP process. IDEA does not specify who is responsible for conducting the FBA, how it should be conducted, or what is necessary to be included in an FBA (Collins & Zirkel, 2017). Similarly, the specifics of how a BIP is to be written are not clear in IDEA, only that the BIP must be individualized for the student (Drasgow & Yell, 2001). State laws are similarly limited. Most states provide few additional situations requiring a BIP, or consideration of a BIP, usually in cases where seclusion or restraints were employed or for certain delinquent acts (Collins & Zirkel, 2017). Few states require anything specific to be included within the FBA or BIP, and specifications are usually naming elements to include (e.g., "function" in FBA, "interventions" in BIP) rather than clear requirements of how and what kind of information should be gathered (Zirkel, 2011). As researchers have pointed out, there is a disparity between how FBA and BIP are defined and

conceptualized in federal and state law versus in best practice (Collins & Zirkel, 2017; Zirkel, 2011).

In the same vein, case law has generally been narrower than federal or state laws on when an FBA or BIP must be included. Typically, as long as the district has considered an FBA and BIP, the district is not required to provide an FBA and BIP to meet requirements of a free and appropriate public education (FAPE) for the student (Collins & Zirkel, 2017). Courts also typically do not require specific components or processes included in an FBA or BIP and will often side with the district in cases where a parent is arguing the BIP is not appropriate (Collins & Zirkel, 2017). For example, in *Alex R. v. Forestville Valley Community Unit School District* (2004), parent argued that the BIP in place for the student was not appropriate and did not meet substantive requirements. The court ruled in favor of the district, arguing that because there are not any substantive requirements they cannot judge the BIP. What is best practice in FBA and BIP is not reflected in federal or state law, or in case law.

### **Practitioners and Training**

Limited information is available on what is being done by school-based practitioners (e.g., school psychologists) in practice when conducting FBAs and BIPs. Among surveyed school psychologists, a majority conducted fewer than 10 FBAs in a typical school year (Lewis, Truscott, & Volker, 2008). Among school psychologists who are NASP members, at least half of respondents reported having some graduate coursework, supervised fieldwork, and/or having attended some workshops or conferences on FBAs (Sullivan, Long, & Kucera, 2011). Types of training were

associated with school setting and the practitioner's education level: practitioners in rural schools were more likely to receive supervised experience related to FBA than those in urban schools, those with nondoctoral degrees were more likely to have received in-service trainings and supervised experience in FBA. A majority of respondents (82%) reported that their school site used FBAs (Sullivan, Long, & Kucera, 2011). What procedures school psychologists use when conducting FBAs and developing BIPs, as well as under what circumstances they typically engage in the FBA to BIP process, is lacking.

Research on trainings to improve practitioners' development and use of FBAs and BIPs has targeted different aspects of the FBA to BIP process, and different groups of people (e.g., school psychologists, teachers). Most training research has focused on the process to developing a BIP. Borgmeier, Loman, Hara, and Rodriguez (2015) provided completed FBAs to school staff and trained them to use the information in an FBA to develop a BIP. Other trainings have taught both the FBA process (i.e., how and when to conduct an FBA) as well as how to develop a BIP using FBA information (Chandler, Dahlquist, Repp, Feltz, 1999; Christensen, Renshaw, Caldarella, & Young, 2012; Crone, Hawken, & Bergstrom, 2007). Some studies have focused training efforts on teachers (Christensen et al., 2012), while others have included a variety of school personnel (e.g., special and general education teachers, administrators, social workers, psychologists, counselors, paraprofessionals) in training efforts (Borgmeier et al., 2015; Chandler et al., 1999; Crone et al., 2007). Including a variety of school personnel in trainings is logical given the lack of specification in legislation over who is expected to conduct FBAs and



write BIPs, as well as the likelihood that multiple people (e.g., teachers, paraprofessionals, administrators) will be involved in data collection and plan implementation.

Outcomes measured during research on FBA and BIP trainings have also varied. Ideally, conducting an FBA and developing and implementing a BIP will lead to observable and measurable improvement in student behavior, but this data is often more difficult to collect or utilize in an experimental research study. Researchers have developed and used measures of participants knowledge of the FBA and/or BIP process before and after training (Borgmeier et al., 2015; Crone et al., 2007), average student behaviors (positive and negative) across classrooms with teachers who had received training versus those who had not (Chandler et al., 1999), or behavior of a target student before and after intervention implementation (Christensen et al., 2012). Crone et al. (2007) also included measures of implementation of the FBA to BIP process as reported and documented by the school and of the social acceptability of FBAs and BIPs reported by school staff. Other researchers have evaluated the technical adequacy of plans developed by school personnel after attending trainings on function-based supports (Strickland-Cohen & Horner, 2015).

Deciding what aspect of FBAs and BIPs to target, who to train, and how to measure outcomes is difficult given the limited information on why many FBAs and BIPs developed in schools are of poor quality, limited legal guidelines on the FBA and BIP process, and limited information on how and why practitioners are conducting FBAs and completing BIPs. Different researchers have taken different approaches in improving the

knowledge and practice of a variety of school staff in conducting FBAs and developing BIPs, no one approach can be claimed to be more important or effective than others. The current study was undertaken to examine what is currently being done by schools in terms of FBAs and BIPs. While Blood and Neel (2007) found that often FBAs were not completed before a BIP was written, the type of information typically included in an FBA (i.e., interviews and rating scales administered to key stakeholders & direct observation of the student) may be included in other assessment practices typically completed by school practitioners (e.g., psychoeducational reports). If this information is routinely collected and then not utilized in development of a BIP, it presents an opportunity for future work in training school practitioners to use existing data to arrive at a functional hypothesis of the target student's behavior and then develop a BIP to implement. The following research questions were developed:

1. What is the overall quality of BIPs written in the school context, based on scores on technical rating measures?
2. Are BIPs that include a corresponding FBA of better quality than BIPs that do not have a corresponding FBA?
3. Do school-based documents (e.g., psychoeducational reports, IEPs) contain information similar to information in FBAs (e.g., interviews, rating scales, & direct observations) that could be used to write a BIP?

## **Methods**

### **Participants**

Existing FBAs, IEPs, psychoeducational reports, and BIPs were collected from school districts in southern California. Personnel within school districts (e.g., school psychologists) were contacted and asked to provide de-identified copies of student documents to the researchers. Due to the de-identified nature of the documents, demographic information (e.g., age, ethnicity, gender) about students for whom FBAs and BIPs were written was not available. Districts included elementary, middle, and high school students, and typically had majority of Hispanic or Latino students and White students with fewer African American and Asian students. Information about who conducted the assessments and wrote BIPs was also not available in all cases.

### **Measures**

Quality of BIPs was assessed using the Behavior Intervention Plan Quality Evaluation Tool, 2<sup>nd</sup> edition (BIP-QE II; Browning-Wright, Mayer, & Saren, 2013). A gold standard tool for evaluating FBAs and BIPs does not exist, and much prior research of FBA and BIP quality has utilized researcher developed checklists of components of FBAs and BIPs deemed essential based on theory. The BIP-QE II was developed based on research and theory of important components of BIPs in practice, and includes 12 items each scored either zero, one, or two points. Possible scores range from zero to 24 points, and the developers give guidelines for how many points are required for a weak plan, underdeveloped plan, good plan, or superior plan.

Quality of BIPs was also evaluated using the Technical Adequacy Tool for Evaluation (TATE; Iovannone & Romer, 2017). The TATE was developed based on theoretically essential components of FBAs and BIPs, and revised following review by national experts. Inter-rater reliability of the TATE is good ( $ICC = 0.94, p < 0.01$ ), and convergent validity with the Behavior Support Plan Quality Evaluation (BSP-QE), an earlier version of the BIP-QE II, is large ( $d = 0.49, p < 0.01$ ) (Iovannone & Romer, 2017). The TATE includes nine items related to FBAs, and nine items related to BIPs, also scored either zero, one, or two. The total BIP score ranges from zero to 18, with higher scores indicating more adequate plans.

Presence or absence of an FBA was determined if there was a document labeled as a functional behavior assessment or not. Documents that were not labeled as an FBA (e.g., psychoeducational reports, IEPs) were examined for both direct and indirect FBA data commonly included in assessments. FBA data included interviews with information on problem behavior(s), direct observation of students in a natural environment (e.g., classroom, lunch) measuring problem behaviors or appropriate behaviors, and rating scales that target information about function of behavior (e.g., motivation assessment scale, problem behavior questionnaire). While research has indicated that indirect measures, particularly rating scales, are not a reliable way to assess function, indirect measures can be used to guide observations and/or experimental methods to assess function (e.g., interviews could highlight potential times of day to target, potential functions identified on a rating scale could be targeted during FA) and were therefore included in searches for FBA data in school documents (Floyd, Phaneuf, & Wilczynski,

2005). Each of the three FBA data types (i.e., interviews, observations, rating scales) was scored as either present or absent.

### **Interrater Reliability**

A random sample of 22% (n=8) of the BIPs were selected to be rated by two additional raters. Both secondary raters were graduate students in school psychology with at least two courses on ABA and function-based behavior supports. Raters were trained for two one-hour sessions on each rating tool until all three raters were in 100% agreement on example BIPs. Agreement was calculated by taking the number of items that all three raters agreed on and dividing it by the number of items agreed on plus the number of items disagreed on. If two raters agreed on an item but the third dissented, it was counted as a disagreement. Agreement on the BIP-QE II scores for the eight BIPs was 31%, and agreement on the TATE scores for the eight BIPs was 53%. Overall agreement across all items on both rating tools was 40%. Other research has found higher interrater reliability scores for both the TATE (ICC = 0.94,  $p < 0.01$ ; Iovannone & Romer, 2017) and a prior version of the BIP-QE II, the Behavior Support Plan Quality Evaluation (BSP-QE; IRR estimate = .79; Cook et al., 2012). These estimates of interrater reliability may have been higher because training procedures were continued until all raters were in 100% agreement, while the current study included only two hours of training which did not continue, due to time constraints, even though agreement was not at 100%.

## Results

### Research Question One

A total of 36 BIPs were collected from participating school districts. Of the 36 BIPs, 14 were accompanied by an FBA for the same student. The remaining 22 BIPs had either a psychoeducational report (n=13), an IEP (n=5), or some other form of report such as a temporary special needs assessment (TSNA) or an educationally related mental health services (ERMHS) report (n=4). In answer to the first research question, overall quality of BIPs, average score on the BIP-QE II was 8.72 (range = 2 to 18), and average score on the TATE was 4.91 (range = 1 to 12). BIP scores on the BIP-QE II fell into the score ranges characterized by the developers as a weak plan or an underdeveloped plan, with only one plan falling into the range characterized as a good plan. TATE scores were similarly low, with only four plans earning more than half the possible points. The difference in total scores on the BIP-QE II from the different raters of the same BIP ranged from 2 to 10 points, while the difference between total scores on the TATE from different raters of the same BIP ranged from 1 to 4.

Common issues with BIPs were the lack of an FBA, lack of specific strategies to provide functionally equivalent reinforcement for the replacement behavior, lack of plans for tracking fidelity of implementation of the BIP or communication among stakeholders, and no analysis of why environmental events predicted problem behavior. Frequency of scores on all TATE and BIP-QE II items are included in Table 1.

**Presence of FBA.** TATE items 10 and 11 both had a high percentage of all BIPs earning scores of zero, 81% and 69% respectively. Both items related to the presence of an FBA

for the BIP. Item 10 requires the presence of an FBA written fewer than 60 days before the BIP to score higher than zero. A majority of BIPs either did not have a corresponding FBA or had an FBA that was dated later than the date on the BIP. Item 11 gives a score of zero to BIPs that did not include the same hypothesis statement (i.e., antecedent, behavior, and/or consequence) as the FBA; BIPs without an FBA earn an automatic zero on this item. The BIP-QE II did not require an FBA for any items.

**Functional equivalence and reinforcement.** 61% of BIPs earned a score of zero for Item 14 which awards scores of one or two when a strategy to provide the same outcome for the replacement behavior as the problem behavior. BIPs often included reinforcement strategies that did not match the identified function of the problem behavior, or a function was not identified so developing a reinforcement strategy to meet that same function was not possible. Most BIPs were also scored zero on BIP-QE II item F (75%), which relates to the replacement behavior and allows only scores of two or zero: the replacement behavior either meets the same function, or it does not. BIPs scoring zero on this item typically included a desired behavior, such as task completion, that did not meet the same function as the problem behavior, such as escape from tasks.

Additionally, BIPs often failed to specify how reinforcement was to be used: 89% of BIPs earned a score of zero on BIP-QE II item H which required a plan to specify reinforcement strategies (e.g., contingency, frequency) to earn a score of one or two. BIPs that earned a zero typically listed potential reinforcers but did not include a plan for what behavior reinforcement was contingent on, how frequently reinforcement should be

delivered, and evidence that the reinforcers chosen would be effective (e.g., past preference for those reinforcers, preference assessment).

**Fidelity and communication.** All BIPs (100%) were scored zero on TATE item 18. To earn a score of one or two on item 18, a BIP would need to include a plan to collect data on fidelity of implementation of the BIP with more specific plans earning the higher score. None of the plans included had any indication of a plan to collect fidelity data or monitor that the intervention was implemented fully as written in the BIP. A majority of BIPs (89%) also failed to include a specific plan for communication among stakeholders and earned a score of zero on BIP-QE II item L. BIPs earning scores of zero often failed to demonstrate reciprocity of communication or specify the information to be communicated, stating that “daily progress” would be sent home to parent, but not indicating what “daily progress” included or how parents should respond, beyond a signature.

**Analysis of predictors.** BIPs were typically lacking in analysis of why environmental predictors supported students' engagement in problem behavior: 78% of BIPs earned a score of zero on BIP-QE II item C. Item C requires analysis of why predictors of problem behavior support the student engaging in the behavior, for example a statement that “Billy needs to be allowed to work with a peer buddy” when predictors for problem behavior were “requested to do work without peer support.” Plans often included environmental predictors of behavior and antecedent strategies to address those predictors, but do not explicitly state why the predictor supports behavior. There was no equivalent to item C on the TATE.



Table 1

*Frequency of BIP scores for each item of the TATE and BIP-QE II*

Item	Score of 0	Score of 1	Score of 2
TATE Item 10	81%	0%	19%
TATE Item 11	69%	9%	22%
TATE Item 12	17%	83%	0%
TATE Item 13	42%	58%	0%
TATE Item 14	61%	36%	3%
TATE Item 15	36%	56%	8%
TATE Item 16	56%	39%	5%
TATE Item 17	6%	94%	0%
TATE Item 18	100%	0%	0%
BIP-QE II Item A	3%	33%	64%
BIP-QE II Item B	14%	58%	28%
BIP-QE II Item C	78%	17%	5%
BIP-QE II Item D	27%	47%	25%
BIP-QE II Item E	38%	17%	44%
BIP-QE II Item F <sup>a</sup>	75%	0%	25%
BIP-QE II Item G	58%	42%	0%
BIP-QE II Item H	88%	6%	6%
BIP-QE II Item I	36%	19%	45%
BIP-QE II Item J	72%	11%	17%
BIP-QE II Item K	8%	92%	0%
BIP-QE II Item L	89%	8%	3%

<sup>a</sup>The only possible scores for this item were 0 and 2, scores of 1 were not possible.

**Research Question Two**

In answer to the second research question, whether BIPs that include a corresponding FBA are of better quality than BIPs that do not have a corresponding FBA, BIPs that included an FBA had slightly higher scores than BIPs without an FBA. For BIPs with FBAs, the average BIP-QE II score was 10.07 (SD = 4.05) and the average TATE score was 7.07 (SD = 2.92). For BIPs without FBAs, the average BIP-QE II score was 7.86 (SD = 3.72) and the average TATE score was 3.55 (SD = 1.44). Scores using both tools are presented in Table 2. Some of the difference in TATE scores between the BIPs with and without FBAs can be attributed to items that specifically require the

presence of an FBA to score higher than zero (items 10 & 11). While the sample size was too small to determine the statistical significance of the difference in scores for BIPs with and without an FBA, BIPs that included an FBA and scored higher were still not scoring in a technically adequate range.

Table 2  
*Scores using the TATE and the BIP-QE II*

Rating Tool	With FBA		Without FBA	
	<i>M (SD)</i>	95% CI	<i>M (SD)</i>	95% CI
TATE	7.07 (2.92)	[1.35, 12.79]	3.55 (1.44)	[0.07, 6.34]
BIP-QE II	10.07 (4.05)	[2.15, 17.99]	7.86 (3.72)	[0.57, 15.15]

*Note.* CI = confidence interval.

### Research Question Three

In answer to the third research question, FBA information that could be used in writing a BIP was generally missing from school-based documents (e.g., psychoeducational reports, IEPs). Assessments other than FBAs are routinely conducted in schools (e.g., psychoeducational reports) and could include information about student behavior that could be used during BIP development. Interviews with relevant stakeholders were common, present in 68% of the reports, but were often more general than a targeted interview addressing only the behavior of the student: 18% included information about targeted behaviors and possible antecedents or consequents. Observations in the natural environment (e.g., classroom, recess) were also common, present in 59% of reports, but observations that included information about a specific problem behavior and/or related environmental events (e.g., frequency of problem behavior, antecedents and consequences surrounding behavior), was only present in 22% of the reports. Rating scales were also very common, present in 82% of cases, but were

mostly broadband or narrowband rating scales that do not assess possible behavioral functions (e.g., BASC, Connors). Rating scales related to behavioral function were present in .05% (n=1) of reports. The number of non-FBA assessments that included each type of information is included in Table 3. The types of information that are important to an FBA to make a BIP that addresses the function of the behavior was missing from many of the other types of assessment reports and documents that might accompany a BIP developed in a school.

Table 3  
*Frequency of Information Included in Assessments other than FBAs*

Type of Information	Assessments Including Information	
	<i>n</i>	% of Total Assessments
Interview	15	68%
Interview + Behavior <sup>a</sup>	4	18%
Observation	13	59%
Observation + ABC <sup>b</sup>	5	23%
Rating Scales	18	82%
Rating Scales + Function <sup>c</sup>	1	5%

<sup>a</sup>Interviews included information about specific problem behaviors that could be targeted and/or antecedent and consequent events around the behavior.

<sup>b</sup>Observations included explicitly identified antecedents and consequences that typically surrounded target behavior.

<sup>c</sup>Rating scales targeted function of behavior (e.g., MAS, PBQ).

## Discussion

The results of this study are in line with findings from other studies indicating generally poor BIP quality in the school context (Blood & Neel, 2007; Van Acker et al., 2005). The majority of BIPs were of poor quality as measured by two rating scales of BIP adequacy: the BIP-QE II and the TATE. Quality was not better for plans, which included an FBA compared to plans with no FBA; indicating that either the FBAs do not provide the necessary information or the information in the FBA is not being used to develop a

function-based intervention. For BIPs that were related to other documents (e.g., psychoeducational reports, IEPs), those other documents typically did not include the necessary information an FBA would theoretically provide.

It is important to note that the rating tools used (i.e., TATE & BIP-QE II) do not have empirical evidence indicating that a BIP with a higher quality rating will result in better outcomes for the student when implemented. Both rating tools were developed based on theory and the broad research base on function-based behavior supports and reviewed by experts in the FBA to BIP process. Research explicitly examining the difference (or lack thereof) in student outcomes for BIPs with different quality ratings using the TATE or BIP-QE II is yet to be published. There is theory to suggest that the plans examined in this study would not result in positive student behavioral outcomes after being implemented because they were all rated low using the TATE and BIP-QE II. Strong empirical evidence exists that function-based interventions are effective in reducing problem behaviors and increasing positive behaviors (Bruni et al., 2017; Hurl et al., 2016; Goh & Bambara, 2012), but the link between quality evaluation using the TATE or BIP-QE II is yet to be empirically evaluated.

BIPs examined were generally successful in identifying a target behavior or behaviors (BIP-QE II Item A) and identifying antecedent strategies (BIP-QE II Item C, TATE Item 12). BIPs were most often lacking in an accompanying FBA (TATE Items 10 & 11), a replacement behavior that met the same function as the problem behavior and strategies to provide reinforcement (BIP-QE II Items F & H, TATE Items 13 & 14), and in specific plans for communication and fidelity (BIP-QE Item L, TATE Item 18). There

were small differences in overall BIP quality for BIPs with versus without FBAs, but generally all BIPs were of low quality.

A crucial element of function-based behavior interventions is the inclusion of a replacement behavior that meets the same function (i.e., results in the same consequences) as the target behavior (O’Neill, et al., 2015). The overarching goal of conducting an FBA is to arrive at a hypothesis about the function of the problem behavior, the environmental contingencies that maintain the behavior. For a majority of BIPs reviewed in this study, there was no available information or data that could be used to hypothesize function (e.g., no FBA, no observation of antecedents and consequences). Even for the BIPs for which there was an FBA, half did not include a plan to provide the same reinforcement to the replacement behavior as followed the problem behavior (i.e., 50% of BIPs scored 0 on TATE item 14), and more than half did not include a replacement behavior that met the same function as the problem behavior (i.e., 64% of BIPs with an FBA scored 0 on BIP-QE II item F). Texts on conducting FBAs to develop BIPs highlight the importance of a functionally equivalent replacement behavior (FERB) in the BIP (O’Neill et al., 2015; Crone & Horner, 2003), and studies included in meta-analyses include a FERB (Bruni et al., 2017; Goh & Bambara, 2012). A core principle of PBS is the teaching and reinforcement of socially acceptable behaviors (Sugai et al., 2000). BIPs, like the majority reviewed here, that do not include plans to reinforce a socially acceptable replacement behavior that meets the same function as the problem behavior are unlikely to be successful in causing positive student behavior change.

Absence of any plan for tracking or promoting fidelity of implementation is problematic because fidelity is linked to student outcomes (Cook et al., 2012). If a plan is written but not put into place, it is not likely to have any effect on student behavior. If the plan is implemented inconsistently, then student behavior would be expected to be inconsistent. Tracking fidelity of implementation is also important in evaluating outcomes: if a plan has been implemented but student behavior has not improved, then the plan should be revised. Lack of data on fidelity will lead to difficulty in decision making about intervention.

In examining the assessments that accompanied BIPs without an FBA, almost all (82%) of these assessments included at least one rating scale. These rating scales were often broadband measure such as the Behavior Assessment System for Children (BASC), or narrowband measures like the Conners Comprehensive Behavior Rating Scales (Conners CBRS). Only one assessment, an Educationally Related Mental Health Services (ERMHS) assessment, included a rating scale specific to behavioral function: the Functional Assessment Screening Tool (FAST). Fewer assessments included interviews with stakeholders (68%) or observations of the student (59%). The frequent use of rating scales may not translate into better BIPs, as the use of rating scales (e.g., FAST, MAS, QABF), also referred to as screening tools or indirect assessment tools, as part of the FBA process has limited evidence of effectiveness. Research examining the agreement between function identified using a rating scale (e.g., QABF, MAS) with the function identified following a brief functional analysis (BFA) of behavior has found that rating scales yield the same identified function as BFA about 50% to 75% of the time (Fee,

Schieber, Noble, & Valdovinos, 2016). When the Motivation Assessment Scale (MAS), a structured interview, and a direct observation procedure (ABC data collection) were compared to the results of an FA, both the MAS and the structured interview had low agreement with the FA (i.e., identified different behavioral functions), but the direct observation results was in high agreement with the FA results (Alter, Conroy, Mancil, & Haydon, 2008).

### **Implications for Practice**

Without legal guidelines, there is some legal flexibility in how practitioners go about trying to gather information for and develop positive behavior supports. Moderate shifts in how to gather data and conceptualize that data to develop interventions may be more feasible for in-service trainings of school practitioners than policy statements or legal requirements that may overwhelm practitioners or be misinterpreted. FBA itself is already a flexible process that looks different from case to case, and research has yet to determine an exact FBA process that is better than any other. Trainings and efforts that target shifts in conceptualization of behavior supports to a function-based framework may be successful, so that when data is collected it is used efficiently to design interventions that address behavioral function.

In order to improve the quality of BIPs developed in the school, and potentially improve student behavioral outcomes, it may be of value to train school-based practitioners (e.g., teachers, school psychologists) to use the type of data from an FBA or from an alternate assessment to develop an individualized, function-based intervention. In cases where FBAs are present, practitioners developing BIPs do not reliably utilize that

data to provide antecedent and consequent strategies as well as a FERB to be taught and reinforced. In most cases, FBAs are not being conducted when a BIP is developed (Blood & Neel, 2007). School practitioners who are already in positions of collecting data on students for individual decision making (e.g., ERMHS reports, psychoeducational reports) could be trained to adjust their assessment process slightly to gather information relevant to target behavior and the environmental contingencies around that behavior. Interviews, direct observations, and rating scales are routinely part of many different types of assessments but are not used to get information on specific behaviors and contingencies. Practitioners could be trained to include a few extra questions or administer additional indirect measures and alter their observation data and then to interpret that information to develop a hypothesis about the function of the target behavior. Because of the limitations of using only rating scales or even interviews, an emphasis would likely be warranted on changing observation practices and developing summary hypotheses from that data (Floyd, Phaneuf, & Wilczynski, 2005).

### **Limitations**

Results of this qualitative look at BIPs developed in schools are limited both by the small sample size gathered, and the lack of quantitative analysis. While BIPs were in general of poor quality, it is beyond the scope of this analysis to determine why they were poor quality. It may be related to training of the person writing the BIP, lack of information about function of behavior, lack of integration of functional information in the BIP, lack of legal guidance or requirements, or low social acceptability of FBA and BIPs among the districts included. Additionally, interrater agreement on the two tools



was low between the three raters. Raters were only trained for two one-hour sessions, a longer training period may be required to reach desirable levels of agreement for research. The low agreement does point to the limited utility of these tools as practical instruments for practitioners to evaluate their own BIPs, without extensive training on how to use the tools. Further research would be needed to determine why BIPs are of poor quality, or how to improve BIP quality effectively, and what is necessary for a BIP to improve student behavior outcomes.

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