THE USE OF ELECTRONIC FEEDBACK TO STRENGTHEN TEACHER
INTERVENTION BELIEFS, KNOWLEDGE, ATTITUDES AND INTENTIONS

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Doctor of Philosophy

by
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The undersigned, appointed by the Dean of the Graduate School, have examined the dissertation entitled

THE USE OF ELECTRONIC FEEDBACK TO STRENGTHEN TEACHER
INTERVENTION BELIEFS, KNOWLEDGE, ATTITUDES AND INTENTIONS

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Doctor of Philosophy

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DEDICATION

To everyone who has ever offered me support and encouragement on this journey, I dedicate my work to you. My research is largely the result of, not only my ideas, but the constant push I receive from others to pursue my dreams. Because of this encouragement, I felt as though my ideas mattered; because of you, I felt that my work was purposeful, which, I might add, is the best gift of all.

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TABLE OF CONTENTS

ACKNOWLEDGEMENTS	ii
LIST OF TABLES	iv
ABSTRACT.....	v
CHAPTER I: INTRODUCTION	1
Background	1
Statement of the Problem	1
Purpose of the Current Study	5
Research Questions	5
CHAPTER II: LITERATURE REVIEW	7
Evidence Based Practices	7
Classroom Behavior Interventions	8
Teacher Use of Behavior Management Strategies	9
Barriers to Implementation	10
Behavior Intentions	17
Motivational Interviewing	18
Personalized Feedback	20
Adapted Intervention Models	23
Current Teacher Development and Support	27
Summary of Major Findings	28
CHAPTER III: METHOD	33
Study Design	33
Participants & Setting	36
Measures	36
Procedures	39
Data Analysis	40
CHAPTER IV: RESULTS	43
Correlations	43
Teacher Attitudes and Beliefs	44
Current Behavior and Intentions	48
Social Validity	48
CHAPTER V: DISCUSSION	50
Summary of Findings	50
Limitations	55
Future Directions	57
Conclusion	58
REFERENCES	60
APPENDICES	77
Appendix A	78
Appendix B	85
VITA	86

LIST OF TABLES

Table 1: Teacher Characteristics Across Control and Treatment Groups	35
Table 2: Pearson Correlations Among Model Dependent Variables	43
Table 3: Summary of Standardized and Unstandardized Regression Coefficients for TAEBB Factors	46
Table 4: Summary of Standardized and Unstandardized Regression Coefficients for Teacher Behavior and Intentions	47

ABSTRACT

The present study examined the efficacy and usefulness of an electronically-delivered feedback intervention on overall teacher perceptions of classroom-based behavior interventions, implementation behavior and intentions. Participants consisted of 95, full and part-time elementary and secondary teachers across 13, public K-12 educational institutions in Missouri. Following an initial assessment, teachers were randomized to either a feedback intervention condition or control condition (i.e., business-as-usual). Findings indicated that teachers who received the intervention, which consisted of an emailed individualized feedback profile and access to a website with electronic resources, reported significantly increased self-efficacy and perceptions of evidence-based interventions at the 2-month follow-up, compared to teachers assigned to the control condition. Despite the lack of statistical significance across the other measured variables, effect sizes comparable to existing feedback and motivational interviewing literature, were found. Additionally, of the teachers who received the intervention, the majority provided positive feedback about its usefulness and feasibility, and reported being willing to recommend the use of the intervention to others. Limitations and future directions regarding the use of electronically-based teacher supports to enhance classroom behavior management, are discussed.

Keywords: Behavior Management, Electronic Feedback, Evidence-Based Practices, Evidence-Based Interventions, Teacher Attitudes, Classroom Management, Motivational Interviewing, Brief Interventions, Personalized Feedback

CHAPTER I

Introduction

One of the most important aspects of teaching involves the ability to manage a classroom of students. Most educators experience disruptive behavior in their classrooms at some point in their career, and many report it being among the primary challenges they face (Reinke, Stormont, Herman, Puri & Goel, 2011). As the literature has demonstrated, problem behavior is linked to many negative student outcomes, including low academic achievement, peer rejection, substance abuse and an increased risk of school drop-out (Hughes, Cavell, & Jackson, 1999). Also, well-emphasized, is the impact of ineffectively managed classrooms well beyond the individual student level, having potentially adverse influences on a teacher's overall decision to remain in the field (Sass, Seal, & Martin, 2011; Brouwers & Tomic, 2000).

Despite the myriad of research-based, efficacious practices designed to increase student engagement and appropriate behavior in the classroom, actual implementation of these practices is inconsistent (e.g., Burns & Ysseldyke, 2009; Reinke et al. 2013). Prior experience with certain strategies, peer influence, as well as school-level norms and expectations, can largely influence teacher strategy selection within the classroom (e.g., Boardman et al., 2005). While insufficient dissemination practices may play a role in the lack of uptake regarding evidence-based interventions (EBIs), implementation science literature highlights the multi-faceted and complex nature of school implementation as a key challenge within itself (Kelly & Perkins, 2012). Because of this, researchers in this field recommend strategic and targeted involvement at various stages within the intervention-adoption process (Kelly & Perkins, 2012).

Unfortunately, the dominating framework for teacher professional development consists of brief, bi-annual workshops, despite documented evidence that traditional professional development methods alone are insufficient for promoting lasting change (e.g., Joyce & Showers, 2002; Garet, Porter, Desimone, Birman, & Yoon, 2001, Guskey, 2000). To add, teachers' continued expression of the need for more training in this area (e.g., Maag 1999; Merrett & Wheldall, 1993; Reinke et al., 2011), highlights the need for more meaningful practitioner supports above and beyond current attempts.

Variables related to the practitioner, or the intended user of an intervention, have repeatedly shown to predict and influence intervention outcomes (e.g., Aarons, 2004), yet small consideration is usually given to supports that build individual teacher capacity for implementation, prior to strategy adoption. Intervention desirability can largely be viewed as a function of individual practitioner perceptions. The degree to which an educator believes a particular intervention is feasible, usable, and effective, for example, influences their personal motivation to engage in the behaviors necessary for successful implementation (Briesch, Briesch, & Chafouleas, 2015; Aarons, 2004). Furthermore, teacher skill-level, understanding of the strategy and self-efficacy in relation to the strategy, can all reciprocally influence a teacher's attitudes towards an intervention, thus impacting the likelihood of adoption (Witt et. al., 1997).

Equally relevant is research that highlights the influence of teacher causal attributions for student behavior on teacher actions. Studies have revealed associations between perceived internal causes for problem behavior and the selection of more punitive strategies to address undesired student behavior (e.g., Soodak & Podell, 1994). More importantly, teachers have shown to largely attribute student problem behavior to

factors that are considered internal to the student, in comparison to more external (e.g., situational) causes for behavior (Miller, 1995). When viewed as a whole, these variables have the potential to largely account for implementation outcomes. Thus, further consideration of these factors is warranted when districts, schools, and classrooms engage in decision-making processes for adopting new behavior-management practices, as it is likely that strengthening these areas prior to implementation could enhance intervention outcomes. (Wiley, Tankersly, & Simms, 2012).

The Theory of Planned Behavior (TPB; Azjen, 1988; Fishbein & Azjen, 1975) provides a fine model to better understand how the above factors influence teacher implementation actions. Through the use of TPB, it is likely that along with teacher beliefs surrounding intervention implementation, school and colleague norms relating to the intervention, as well as the degree of control they feel they have over implementing a practice successfully, has a direct effect on their overall intention to implement. Thus, to adequately address behavior change in teachers, efforts to support their classroom management skills should theoretically span these highlighted areas.

Motivational Interviewing (MI), while more recently adapted for school contexts in comparison to health professions, has consistently shown to be an effective strategy for encouraging behavior change. As a non-confrontational, style of conversation designed to increase motivation to change, MI is incredibly adaptable, rendering it a practical solution for a variety of concerns within the educational setting (Miller & Rollnick, 2002; Herman, Shepard, Frey, & Reinke, 2014). MI has been utilized to increase student engagement, participation, and academic achievement (e.g., Strait et al., 2012; Strait, McQuillin, Terry, & Smith, 2014), as well as parental engagement in goal-related

behaviors (Dishion & Kavanagh, 2003) and teacher praise (Reinke, Lewis-Palmer, & Merrell, 2008).

The use of personalized feedback is also well-established within the educational literature and considered a highly effective method for increasing desirable behavior among teachers (e.g., Cavanaugh, 2013). While often embedded within MI interventions, feedback as a standalone strategy has also shown to be efficacious for producing behavior change, particularly within more adapted, brief interventions targeting rapid change across shorter periods of time. Furthermore, the nature of feedback renders it extremely versatile, allowing it to be provided in less-traditional methods (i.e., electronic or mailed feedback), while maintaining its effectiveness. Studies have repeatedly demonstrated the effectiveness of these brief, no-contact feedback interventions, and in many cases, they prove to be equally effective to in-person feedback and other treatment options (Cronce & Larimer, 2011).

The practice of supporting teachers through coaching and consultation methods, is highly suggested due to their ability to positively impact implementation efforts and skill transferability (Joyce & Showers, 2002). Many of the existing consultation models, however, are resource-intensive, requiring extensive funding and/or organizational partnerships, which do not always exist across schools (Stormont, Reinke, Newcomer, Marchese, & Lewis, 2015). An example being the Classroom Check Up intervention, which utilizes both MI and feedback, among other evidence-based strategies, to increase teacher classroom management skills. While the intervention is categorized as brief consultation, it can still be considered relatively time-intensive with multiple observations and meetings required for implementation (Reinke, Herman, & Sprick,

2011). Although not an issue across all school contexts, the potential for these constraints to inadvertently limit its access to teachers in need does warrant consideration.

Furthermore, as indicated above, individual motivation, perceptions, and beliefs may, in fact, preclude successful behavior consultation and coaching efforts.

Brief feedback interventions have been largely efficacious in producing behavior change among teachers (Lundahl, Kunz, Brownell, Tollefson, & Burke, 2010).

Electronically provided interventions have also demonstrated promise and can potentially provide a more cost-effective and efficient method to aid in teacher development efforts (e.g., Collins, Carey, & Sliwinski, 2002; Martens, Arterberry, Takamatsu, Masters, & Dude, 2015; Martens, Buscemi, Smith, & Murphy, 2012). Considering some of the limitations associated with in-person consultation models to support teacher behavior management skills, the current study sought to investigate the application of a more sustainable development method for promoting the use of evidence-based interventions in the classroom. The goal of the current project is to determine if an electronic, brief feedback intervention, can positively impact teacher intervention beliefs and increase the likelihood of future implementation behaviors.

The following three research questions will be examined:

- Research Question 1a: After controlling for years of teaching experience, student population and grade-level, do intervention-assigned teachers significantly differ from control-assigned teachers on measures of behavior beliefs, and intervention self-efficacy, attitudes, and knowledge?
- Research Question 1b: After controlling for years of teaching experience, student population and grade-level, do intervention-assigned teachers

significantly differ from control-assigned teachers on measures of current intervention behavior and intentions?

- Research Question 2: Do teachers view the electronic feedback intervention as helpful and easy to use, and would recommend it to others?

CHAPTER II

Literature Review

The current chapter presents a review of relevant literature across the following areas: evidence-based, classroom behavior interventions, influential factors on teacher implementation behavior, brief motivational interviewing and feedback interventions, and existing teacher supports for the management of problem behavior.

Evidence Based Practices

Recent legislative mandates have emphasized the use of quality practices and early intervention efforts to promote academic achievement within educational institutions (No Child Left Behind [NCLB], 2002; Individuals with Disabilities Education Act [IDEA], 2004). As a result, practices grounded in research, or evidence-based practices (EBPs), quickly became the focus of school districts and administrators, thus leading to their adoption within education (Odom et al., 2005). While the understanding of what constitutes a practice as “evidence-based” was once misunderstood, society has now come to see these practices as those deemed effective by reliable and valid research (Cook, Tankersley, Cook, & Landrum, 2008).

Since the beginning of this nationwide focus on school improvement, the goal has been to identify evidence-based practices (EBPs), share them with practitioners, and promote their use across a variety of educational contexts (Sanetti, Collier-Meek, Long, Kim, & Kratochwill, 2014). Thus, attempts have been made to disseminate information regarding EBPs evidenced to work within school settings (e.g., What Works Clearinghouse, Evidence-Based Intervention Network, Intervention-Central).

Classroom Behavior Interventions

Research on EBPs suggests that classroom-wide interventions can readily serve as an effective means of addressing behavior on a universal level, in addition to targeted prevention efforts (Daunic, Smith, Brank & Penfield, 2006; Trussell, Lewis, & Stichter, 2008). The availability of classroom-based EBPs designed to decrease problem behaviors range from simple procedures that can be easily embedded within instruction or used with an entire classroom (e.g. Good Behavior Game, Token Economy), to more targeted interventions designed to address specific student behaviors (e.g., Check-In, Check-Out, self-monitoring) (Hawken, & Horner, 2003; Barrish, Saunders, & Wolfe, 1969; Gureasko-Moore, DuPaul, & White, 2007). Much research has employed behavior interventions for use within the classroom and demonstrated increased academic and behavioral gains among students receiving these supports (Mayer, Acker, Lochman, & Gresham, 2009; Stage & Quiroz, 1997). A meta-analysis of 99 studies researching classroom behavior interventions revealed an average effect size of -.78 reflecting a significant reduction in disruptive student behaviors, when compared to control groups (Stage & Quiroz, 1997). Furthermore, less complex procedures such as token economies, differential reinforcement, group contingencies, and self-management were found to be the most effective among students, resulting in at least a 90% reduction of problem behavior across students (Stage and Quiroz, 1997). These classroom-based behavior strategies work across a variety of grade levels and have shown to promote substantial gains in functioning in students regardless of disability or learning impairment, also demonstrating their versatility (Stage and Quiroz, 1997).

In a recent study examining the effects of the Good Behavior Game (GBG),

Donaldson and colleagues (2017) found that the GBG reduced problem behavior for 75% of the participants. While this finding is consistent with the literature, the authors also highlighted the extended use of this group-level intervention. Implementation of the GBG allowed for the identification of the remaining 25% of students whose behavior was not significantly impacted by the intervention, suggesting that the GBG has the potential to serve as both an intervention and screening mechanism for students in need of more intensive supports (Donaldson, Fisher, & Kang, 2017).

Teacher Use of Behavior Management Strategies

Despite the vast amount of literature concerning efficacious classroom behavior practices, numerous studies have found inconsistent and inadequate practice delivery in schools (Forman, Olin, Hoagwood, Crowe, & Saka, 2009; Burns & Ysseldyke, 2009). During their classroom observations of teachers, Reinke and colleagues (2013) found that the majority of teachers exhibited low ratios of positive to negative interactions and levels of labeled praises, both of which are examples of simple, evidence-based behavior management strategies. While there is evidence that some teachers use interventions that are research-based in their classrooms, the majority use those that they feel work best, based on their personal experiences (Boardman et al., 2005; Brophy & McCaslin, 1992).

Moreover, among the teachers that agree to adopt an intervention in their classroom, many do so with low treatment fidelity. A large number of studies have found that implementation fidelity among teachers is in general, fairly low (e.g., Wickstrom, Jones, LaFleur & Witt, 1998), and in many cases, continues to decrease across the implementation period, when sufficient supports are not provided (Noell et al., 2005). For example, upon an examination of overall treatment implementation using a recording of

permanent products (i.e., completed intervention materials), Noell and colleagues (2005) found that across all four conditions, fidelity decreased following initial implementation. Moreover, these observations proved to be vastly different from high teacher self-report ratings, which on average, were all at or above 6.5 on a 7- point Likert scale.

In other cases, however, teacher ratings support the findings of low fidelity regarding intervention use. Fallon, McCarthy, and Hagermoser Sanetti (2014) found that at least 25% and up to 40% of teachers rated practices considered to be effective for reducing and preventing problem behavior, such as providing consistent consequences for problem behavior, providing praise for desired behaviors, operationally defining problem behavior, as only being implemented “somewhat consistently.” Additionally, almost 40% of teachers surveyed indicated that disruptions in classroom instruction that occur from student problem behavior, remain a concern (Fallon et al., 2014). Furthermore, at least fifty-percent of teachers rated these same areas (i.e., providing consistent consequences, praise, and operational definitions of behavior) as “somewhat challenging” (Fallon et al., 2014). Interestingly, of those surveyed, the number of years teaching ranged from one to more than 5 years, teacher education included Master’s and Doctoral-level degree-holding educators, and settings ranged from pre-school to high school (Fallon et al., 2014). This information might suggest that the use of effective behavior practices and challenging perceptions of managing student behavior are not a result of a lack of teaching experience, degree attainment, or the age of children taught.

Barriers to Implementation

A variety of impeding factors make successful intervention implementation a challenge in the educational setting (Cook, Tankersley, Cook, & Landrum, 2008;

Bambara, Goh, Kern & Caskie, 2012). Many interventions, although initially deemed as relevant for classroom use, encounter issues that decrease their likelihood of being fully implemented or sustained at the classroom level (Rogers, 2003). Specifically, Durlak and DuPre (2008) meta-analysis identified 23 factors relating to the intervention, delivery system, support system, community, and the implementer, that all interact to influence the implementation process. Due to the complexity of implementation, a multi-faceted approach is suggested when schools plan to adopt new practices (Durlak & DuPre, 2008; Sanetti et al., 2014).

Variables related to the individual practitioner are considered to be among the primary components to address for successful implementation of practices across educational settings (Kelly & Perkins, 2012). Researchers have found that there are distinct features related to practitioner attitudes towards EBPs that can influence whether practices are adopted and sustained (Aarons, 2004). A teacher's own experiences with an intervention, colleague perceptions, administrative support, and perceived divergence between their current practices and the newly proposed practice, can all play a role in the adoption of EBPs (Aarons, 2004). A teacher's knowledge base and skills regarding the intervention, as well as their perceived efficacy, can impact a teacher's initial choice to implement a new practice and can also serve as a barrier to successful implementation (Aarons, 2005; Fixsen et al., 2005; Wiley, Tankersley, & Simms, 2012; Kelly & Perkins, 2012). Due to the teacher's extensive role in the implementation process, their perspective is deemed critically important when developing frameworks of support for students (Reinke, Herman, & Sprick, 2011).

Teacher Efficacy. Teacher efficacy (TE), or the extent to which a teacher believes they can influence a desired outcome, has shown to be a large predictor of teacher behavior in the classroom (e.g., Allinder, 1994; Gibson & Dembo, 1984). Expanded from Bandura's (1977) self-efficacy research, studies have explored TE as it relates to variables such as special education referrals, use of instructional strategies, and classroom management of student behavior (e.g., Woolfolk, Rosoff, & Hoy, 1990; Allinder, 1994; Tschannen-Moran & Woolfolk Hoy, 2001). TE influences a teacher's willingness to try different strategies in the classroom and their persistence when presented with challenges (Gibson & Dembo, 1984; Allinder, 1994). Teachers with a higher sense of self-efficacy have also been found to be more willing to work with a student exhibiting problems, and less likely to view a student's potential as limited by factors such as home influences and background (Gibson & Dembo, 1984; Soodak & Podell, 1993; Hoy & Woolfolk, 1993). Bandura (1997) suggests that self-efficacy is impacted by previous task performance, the persuasion of others, and internal aspects of the individual. Thus, TE has shown to be fluid, changing throughout different stages of the implementation process (Stein & Wang, 1988). Because of its predictive power, researchers suggest that TE be addressed throughout program implementation, as it has the potential to influence teacher motivation, persistence, and performance (Brouwers and Tomic, 1999; Bandura, 1997). Additionally, Bandura (1997) contends that efficacy is best measured in specific contexts because of its context and task specificity.

Teacher Knowledge. The competence level of a treatment provider has long been hypothesized to be a major contributor to low-levels of implementation (Yeaton & Sechrest, 1981). Thus, it is to be expected that the extent to which a teacher understands

all of the required components of a practice, similarly, can impact their likelihood of adoption and degree of maintenance. A fairly recent study conducted by Reinke and colleagues (2011) highlighted that approximately 45% of teachers surveyed indicated lack of familiarity with the term “EBP,” with the remaining portion indicating they had, in fact, heard of the term. These findings could be a result of the fact that many teachers, despite having completed a teacher education program, do not receive adequate training regarding specific behavior management strategies (Dutton, Tillery, Varjas, Meyers & Smith-Collins, 2010; Merrett & Wheldall, 1993). Often, it is expected that when implementing new interventions at the school and classroom levels, teachers already have a basic understanding of the foundational concepts. Dutton and colleagues’ (2010) findings that many of the educator participants in their study were unfamiliar with positive behavioral intervention and supports (PBIS) and effective strategies to manage the behavior of groups of students, suggest limitations in the knowledge of teachers.

There are also studies suggesting differences between the foundational knowledge of general education teachers and special education teachers. Following analysis of the responses to a survey administered to assess school mental health needs, Stormont, Reinke and Herman (2011), found that special education teachers, in comparison to general education teachers, were more likely to identify practices that were truly evidence-based. Similarly, practices that were not evidence-based were more likely to be identified by general educators. In fact, it was reported that 63% of general education teachers rated "have a detailed discussion about the problem with a child following their misbehavior," as an evidence-based practice when it is not (Stormont, Reinke, & Herman, 2011). The authors commented that this finding could likely be due to the

observation that practices that entail “processing” following a student’s problem behavior (i.e., “think sheets”), are often encouraged in by school administrators and colleagues, despite the potential for them to actually reinforce problem behavior (Stormont, et al., 2011). Together, the above information indicates an apparent lack of consistency with which teachers receive education related to research-based techniques for managing classroom behavior.

Teacher Intervention Acceptability. Teacher acceptability has also been considered a major factor impacting teacher implementation of classroom EBPs. Teacher acceptability (TA) refers to the extent to which a teacher perceives an intervention to be usable in the current context. Various factors have shown to be responsible for teacher acceptability ratings such as the complexity of the intervention, the severity of the behavior being addressed by the intervention, and whether or not the intervention is perceived as effective (Eckert & Hintze, 2000; Von Brock & Elliot, 1985). Research has also suggested that an implementer’s personal characteristics, such as level of knowledge and perceived self-efficacy, can influence intervention acceptability ratings (McKee, 1984; Wood, 1992). For example, Wood and colleagues (1992) found that levels of perceived self-efficacy significantly impacted teacher acceptability ratings of intervention recommendations provided via school consultation. Teachers with lower scores on the Teacher Efficacy Scale (TES; Gibson & Dembo, 1984) had significantly lower ratings of acceptability than teachers with higher scores.

TA is linked with overall treatment fidelity and a reciprocal relationship is suggested to exist between TA, treatment fidelity, intervention use, and overall intervention effectiveness (Witt & Elliot, 1985). Recent conceptualizations of TA suggest

that it remains a key component in the intervention selection and implementation processes and can provide valuable information relating to intervention usage and outcomes (Elliott, 2017). Through the use of acceptability measures, such as the Usage Rating Profile-Intervention (URP-I; Chafouleas, Briesch, Riley-Tillman, & McCoach, 2009), more specific information can be uncovered about why teachers may favor some intervention strategies over others. For example, in their study investigating the perceptions of classroom management strategies among elementary school teachers, Briesch and colleagues (2014) found that group contingencies were rated the least acceptable. Interestingly, as the authors also note, this particular strategy, which was rated the lowest, has the most evidence-base for classroom management use (Briesch, Briesch, & Chafouleas, 2014). As revealed in this study, teacher ratings of acceptability may have implications for both enthusiasm of implementation and overall fidelity of use.

Teacher Perceptions of Behavior. Teacher perceptions of classroom behaviors can also be a barrier to the implementation of EBPs. The Theory of Attribution (AT; Heider, 1958), posits that an individual's perception of behavior is influenced by their beliefs and experiences (Miller, 1995). Thus, the reasons to which teacher's attribute problem behaviors may play an important role in the implementation of behavior interventions (Wiley, Tankersly, & Simms, 2012). The rationale for AT is that the perceived cause for an action or situation is likely to influence how an individual chooses to respond to that situation (Weiner, 1993). For example, Wiley and Siperstein (2011) discovered that conservative states had lower identification rates of behavior disorders as a result of their causal attributions for behavior. In this particular study, "conservatism" reflected a decreased willingness to attribute student problem behavior to internal causes

or disability, thus reducing the need for labeled behavior disorders (Wiley & Siperstein, 2011). Attributions for student behavior, or what the behavior is believed to be a result of, have also been shown to impact the ways in which teachers respond to a student misbehavior (Miller, 1995; Soodak & Podell, 1994). Studies examining causal attributions for problem behavior among teachers have demonstrated that teachers largely attribute student problem behavior to factors internal to the student (Miller, 1995). Teachers who make internal causal attributions for behavior have an increased likelihood of selecting more punitive strategies to address student behavior (Soodak & Podell, 1994). Teachers who attribute student problem behavior to more external causes (e.g., classroom environment, situational) are more likely to seek additional help (Soodak & Podell, 1994).

Teacher Motivation. When new practices are introduced in the school setting, little attention is given to whether or not teachers are ready or willing to utilize them. One noteworthy detail mentioned across the literature about the implementation process is that it when something new is introduced, the readiness for change among those involved is a key factor (Kelly & Perkins, 2012). In order for change to occur at the larger, organizational level, it must also emerge at an individual level for each person involved in the process. Fixsen and colleagues (2005) describe the initial implementation process as fear, confidence, and status quo all working together to impact one's decision to change or invest in the new practice. In order to overcome these variables, teacher motivation is required for successful outcomes. Unlike the focus of teaching of academics, teachers are not often pressured to meet certain emotional and behavioral standards and expectations. Despite the linkage between the academics and student

behavior, teachers usually need more buy-in to adopt certain non-academic practices, thus making it difficult to sustain practices at the classroom-level (Anyon, Nicotera, & Veeh, 2016).

Behavior Intentions

The Theory of Planned Behavior (TPB; Azjen, 1988; Fishbein & Azjen, 1975) can aid in the conceptualization of how individuals move toward behavior change. According to the TPB, a person's (a) beliefs about a behavior, (b) perceived norms regarding the behavior, and (c) perceived control over being able to perform the behavior, all work together to influence the likelihood of executing an action. Perceived control encompasses both internal (e.g., skills, emotions) and external (e.g., outside resource availability) factors related to the individual, suggesting that the more resources and less barriers that are perceived, the greater their degree of control over performing a specific behavior. Within TPB, behavioral intentions play a critical role in predicting actual behavioral outcomes. Intentions can be defined as the extent to which an individual is willing to put forth effort to perform a behavior, thus is analogous to person's actual motivation to perform the behavior. It is postulated that the above variables affect the decision to follow through with performing a behavior and that intentions are the best predictors of behavior, as they convey an individual's level of readiness for making a change (Ajzen, 2002).

TPB has shown to account for a substantial amount of variance in behavior, as well as reliably predict individual intentions, thus it is widely used to influence behavior change efforts (Ajzen, 1991; Hardemann et al., 2002). However, some research indicates that individual motivation and intentions alone, sometimes do not sufficiently predict

actual behavior (Webb & Sheeran, 2006). While evident, meta-analyses reveal only small to medium effects on behavior ($d = .36$) following a substantial change in behavior intentions (Webb & Sheeran, 2006). In addition, some mixed conclusions exist across efficacy studies assessing interventions developed to specifically target a person's intention to perform a behavior (Gollwitzer, 1999; Hardemann et al., 2002). While many TPB-specific interventions have been successfully able to promote the desired changes in behavior, other researchers have suggested the need to target additional variables to address the planning process following an initial intention (i.e., implementation intentions; Gollwitzer, 1999). Implementation intentions refer to the development of specific plans outlining how an individual intends to attain an identified goal, specifically including the “when, where and how” (Gollwitzer, 1999, p. 82). Several studies have shown more successful outcomes (i.e., medium to large effects; $d = .65$) regarding goal-directed behavior in participants who develop implementation intentions following goal intentions, compared to those who do not (Gollwitzer & Sheeran, 2006). However, the positive impact of implementation intentions relies heavily on both a strong identification of goal importance and being highly committed to goal attainment (Sheeran, Webb, & Gollwitzer, 2005). Therefore, while the impact of behavior intentions is important to consider when developing behavior-change interventions, it is equally important to address additional goal-related factors that may enhance or suppress the likelihood of successful outcomes across individuals.

Motivational Interviewing

Much research has highlighted the effectiveness of interventions encompassing Motivational Interviewing techniques (MI; Miller & Rollnick, 2002). MI can be defined

as a style of communication that integrates core communication skills into the arrangement of conversations that specifically favor change, aiming to address the readiness of change in others and attend to their individual motivations for change. MI-centered interventions have largely been used to address clients who exhibit issues adhering to treatment plans, taking their medication, and engaging in self-destructing behaviors to include alcohol and drug abuse, but also extends its use to other health-related concerns and settings (e.g., Heckman, Egleston, & Hofmann, 2010; VanBuskirk & Wetherell, 2014). Within MI, there is an absence of confrontation or persuasion in MI and an emphasis on collaboration, partnership, respect, and the idea that the client has all of what is needed to transition further into the change process (Miller & Rollnick, 2013). The main focus of MI is to help people explore their own ambivalence and talk themselves into changing their own behavior (Miller & Rollnick, 2013). In an analysis of interventions to reduce the consumption of alcohol in college students, MI has not only shown to be effective, but is usually regarded as the treatment method of choice (Appiah-Brempong, Okyere, Owusu-Addo, & Cross, 2014). A multitude of studies have shown that MI can promote significant improvement in adult behavior and its effects can be maintained well after the intervention phase ends (Dunn, DeRoo, & Rivara, 2001; Miller & Rollnick, 2002). A meta-analytic review of MI-centered treatments showed no significant differences in intervention effect sizes at approximately five-months post-treatment ($d = .13$) and at an average of sixteen-months post-treatment ($d = .11$; Burke, Arkowitz, & Menchola, 2003). MI can be offered as a stand-alone intervention or in conjunction with other treatments, and both methods have shown to be relatively similar in effectiveness (Frey et al., 2011).

MI's use within school contexts, while only fairly recently emerging in the literature, has shown to be an effective tool for producing changes in teachers, students and families (Herman et al., 2014). MI is considered an extremely promising intervention in the area of enhancing the implementation of interventions within schools (Frey et al., 2011), likely due to its noteworthy effects witnessed in variety of areas across the literature and adaptability. Within school-based interventions, MI is usually embedded into an existing coaching model and used to provide feedback and facilitate discussion on goal setting (Herman et al., 2014). For example, MI is embedded into the aforementioned Classroom Check-Up (CCU) model, which has demonstrated to be efficacious in increasing teacher behavior-specific praise and subsequently decrease the occurrence of classroom problem behavior (Reinke et al., 2008). The MI components within the CCU have also been used to increase teacher use of culturally responsive practices, and implementation of social-emotional and behavior interventions (Pas, Larson, Reinke, Herman, & Bradshaw, 2016; Reinke, et al., 2012).

Personalized Feedback

Feedback, also referred to as performance feedback or personalized feedback (PF), is an evidence-based practice that is regularly included as a treatment component within BMIs. While PF can serve as an intervention on its own, it is often, particularly within the substance abuse literature, accompanied by the use of MI strategies, to increase effectiveness (Miller & Rollnick, 2012). The inclusion of PF, among a few other BMI components, has shown to moderate intervention outcomes, thus making it an important variable to consider when focusing on changing client behavior (Lundahl et al., 2010; Marlatt et al., 1998). Kluger and DeNisi (1996) define PF as “actions taken by an

external agent to provide information regarding some aspect of one's task performance" (p. 255). PF usually involves providing a client with information related to their own responses to treatment-related assessments, either physically (i.e., on paper) or orally (e.g., therapist delivered), often through a summary of the client's pattern of responses to questions (Riper et al., 2009). In many studies, PF is also accompanied by a comparison of the client's responses to what is considered typical based on context-specific norms (i.e., normative feedback). Other components included in PF interventions include an exploration of the negative consequences associated with the behavior of concern and a discussion of strategies to decrease client problem behavior (Carey, et al., 2007). A primary role of PF interventions is to promote self-evaluation and help the client develop discrepancy between their current behavior and that which is typical of others (Walters & Neighbors, 2005).

PF intervention implementation can vary depending on the nature of the intervention and is somewhat inconsistent across studies (i.e., included components, delivery; Walters & Neighbors, 2005). The immediacy, specificity and nature of the feedback can reportedly make a difference in overall intervention effects (e.g., Scheeler, Ruhl, & McAfee, 2004). In an attempt to determine components central to effective delivery, Miller and colleagues (2013) conducted a meta-analysis of 41 studies that investigated the use of PF interventions on decreasing alcohol misuse among college students. They identified 43 separate PF profiles provided across all study conditions and while specific format varied, 11 general PF components were observed within studies (Miller et al., 2013). The authors found that despite moderate correlations, the actual number of PF components does not have a significant impact on intervention

effectiveness (Miller et al., 2013). All interventions that used a summary to deliver PF (98%), included some type of normative comparison, with the majority using percentile ranks to communicate that information and 88% providing an explanation of the comparison (i.e., explaining the student rankings in reference to normative information; Miller et al., 2013). In addition, 86% of feedback profiles included a didactic component (e.g., educational information, safety tips) and 77% discussed risk factors for future problems related to alcohol consumption (Miller et al., 2013). Most importantly, the authors found significant differences in effect sizes for two feedback components: reframing the practical costs (e.g., financial, time) of alcohol misuse and the inclusion of strategies to limit risk factors (Miller et al., 2005).

PF has effectively been implemented within a variety of educational settings to improve teacher behavior. Utilized across elementary, secondary and special-education contexts, PF has been employed across areas such as mathematics and literacy instruction, as well as individual student behavior plan and systems-wide interventions (e.g., Coddling, Feinberg, Dunn, & Pace, 2005; National Council of Teachers of Mathematics, 2009; L'Allier, Elish-Piper, & Bean, 2010; Sweigart et al., 2016). Solomon and colleagues (2012) also identified PF as a moderately effective strategy for improving initial and sustained treatment integrity in teachers. PF has shown to be an effective strategy when used to increase teacher praise in the classroom, even when delivered as a standalone intervention. Furthermore, Cavanaugh (2013) identified that certain teachers, through a review of feedback literature, appeared to need less intervention supports in comparison to others. As a result, he suggested that the provision of differential feedback and intervention according to teacher variables such as prior experience, knowledge,

efficacy and motivation to change their behavior, be explored in future research efforts, as it could potentially increase the efficiency and effectiveness with which teacher supports are provided.

Adapted Intervention Models

Brief Motivational Interventions. Emerging from the substance abuse literature was consensus surrounding an increased need for early intervention models. As a result, attempts to develop shorter versions of MI interventions, while maintaining efficacy, were introduced. Brief Motivational Interventions (BMIs) are among the commonly used, and refer to time-limited approaches focused on changing individual behavior. The actual time component for delivery, however, varies across disciplines, with the alcohol literature indicating interventions can range from 5 minutes to multiple follow-up sessions, and general healthcare referring to any consultation of “short duration” representing a BMI (Aalto et al. 2001).

Two critical components have emerged within the literature surrounding BMIs: thorough assessment and motivational interviewing (MI) strategies (Dimeff, Baer, Kivlahan, & Marlatt, 1999). In alcohol research, assessment typically involves obtaining an understanding of the quantity and frequency of an individual’s drinking habits, while the use of MI strategies can span a variety of components, most often being personalized feedback coupled with normative comparisons (e.g., Brief Alcohol Screening and Intervention for College Students, Drinkers Check-Up, Miller, Sovereign, & Kreege, 1988). Within the BMI literature, several practices have been identified as the most effective components within brief-intervention models. Miller and Sanchez (1993) identified key components using the FRAMES acronym: providing feedback related to

current performance, emphasizing responsibility of the individual and personal control over their actions, goal-related advice, offering a menu of alternative options and strategies, and the use of empathy and strategies to increase the individual's self-efficacy.

Brief intervention models have received much attention due to their efficacy, which in many cases is comparable to that of more time-consuming and intensive motivational interventions, and is more effective than no treatment at all (Bien, Miller, and Tonigan, 1993). BMIs have resulted in small to medium effects (Walters & Neighbors, 2005), and found to be successful across a variety of contexts, including education (e.g., Classroom Check-Up; Reinke, Lewis-Palmer, & Merrell, 2008).

Electronically Delivered Interventions. While in-person feedback interventions are still considered brief in nature compared with other motivational interventions, they require a great amount of resources and time to implement adequately, such as a clinically trained implementer, as well as at least one in-person session. Consequently, researchers have continued to search for more time- and resource-efficient methods of BMI delivery. Often referred to as personalized feedback interventions (PFIs) due to the absence of personal contact (PFIs; Cronic & Larimer, 2011), computer-delivered PFIs can encompass a variety of delivery methods such as mailed or emailed feedback, and in many cases, still include MI-specific components. PFIs offer benefits that traditional, in-person PFIs simply cannot including broader dissemination of an intervention, as well as reduced cost and implementation time (Cronic & Larimer, 2011).

While MI is most often delivered in-person, it has demonstrated to be efficacious across studies using an online, or electronic, component. For example, King and colleagues (2015) investigated the use of an online-delivered intervention in promoting

help-seeking behaviors in students who exhibited elevated suicidal risk. The authors found that students who received the MI-centered intervention were more likely to have received mental health treatment and reported increased readiness related to their likelihood of talking to others about seeking treatment, at the 2-month follow-up period (King, et al., 2015). The authors found significant differences despite limited engagement in the online counseling portion of the intervention, suggesting that simply being given the option to participate in online counseling impacted student behavior alone (King, et al., 2015).

Personalized feedback, as to be expected, has more often been investigated in a no-contact fashion, due to its ease of implementation in this manner. Studies, primarily in the alcohol and substance abuse literature, have indicated that mailed or electronically-provided feedback can be effective on its own, compared to a no-intervention control group, and in many cases, is equally as effective as feedback provided in-person, and other more extensive treatment options (Walters, Bennett, & Noto, 2000; Agostinelli, Brown, & Miller, 1995; Walker et al., 2017). Electronic or mail-provided feedback has shown to be efficacious particularly for short-term reductions in college student drinking (Collins, Carey, & Sliwinski, 2002; Martens, Arterberry, Takamatsu, Masters, & Dude, 2015; Martens, Buscemi, Smith, & Murphy, 2012). When investigating the impact of mailed feedback delivered via pdf on college student drinking, Collin and colleagues (2002) found that at the 6-week follow up, students in the intervention condition indicated a larger normative discrepancy and consumed fewer alcoholic drinks, than the students who only received an educational brochure. Also, the authors noted that there were no differences between the two groups at the 6-month follow up, suggesting the use

of the intervention be limited to short-term applications (Collins et al., 2002). In another study, Martens and colleagues (2015), investigated the effects of three conditions on college student gambling habits. Following an initial assessment, the participants were either a) provided educational information about gambling, b) given a printed personalized feedback, or c) not given any information at all. Significant differences were found between participants who were given feedback and those who were not provided with any information (i.e., assessment only; $p < .01$). Furthermore, no differences were found between students who were either given feedback or given information (Martens et al., 2015). It is possible, however, that non-significance is attributed to the specific types of information provided in the study (i.e., normative information, gambling risk factors, reduction strategies), suggesting that informational material selection was sufficient for the participants in this group.

While there are many benefits to computer-delivered PF, its drawbacks should also be considered. As to be expected with interventions not including an in-person component, within PFIs, it is difficult to ascertain whether or not a participant actually engages in reviewing the feedback (Walter & Neighbors, 2011), and no-contact may reduce the likelihood of further participant understanding related to feedback content (Cadigan et al., 2015). It is suggested that the differences between indirect and direct, in-person, methods at long term follow-up are attributed to the in-depth, MI-focused conversation afforded by feedback delivered. Specifically, the opportunity to review the feedback, discuss current behavior and develop discrepancies between that and participants' values and goals, may lead to more long-lasting changes in participants who received feedback from actual clinician, compared to those who do not. Ultimately, it is

recommended that additional research be conducted on PFIs to better ascertain key intervention components as well as for whom these specific types of interventions are best suited (Cronce & Larimer, 2011).

Current Teacher Development and Support

Now more commonly understood, interventions that specifically target teacher behavior have the potential to result in a greater range of benefits, for students (Reinke et al., 2008). Thus, it is crucial that effective methods of delivery are employed when developing interventions to support teacher. The traditional methods for promoting the use of practices within schools (e.g., full- or half-day trainings) only produce relatively moderate gains in teachers' abilities to effectively implement new practice (Joyce & Showers, 2002). Despite these limitations, however, they continue to be the primary mode of delivery for teacher professional development. Additional supports are recommended to supplement traditional methods teacher training methods, as they alone lack the follow-up needed to help teachers learn and effectively embed these practices into their daily routines (Fixsen, et al., 2005; Kutash et al., 2009; Spencer & Logan, 2003).

Teacher coaching and feedback about a teacher's performance have shown to markedly increase implementation fidelity and teacher transferability of skills to the classroom (Joyce & Showers, 2002; Noell, G. H., et. al., 2005). Specifically, ongoing coaching and consultation to support teachers is effective at addressing the varying levels of change present when implementing evidence-based interventions in schools (Fixsen et al., 2005; Reinke, et al., 2008; Wandersman et al., 2008). Consultation and coaching at the school level, aside from simply providing support throughout the implementation

process, involves the development of a partnership between the practitioner and coach, a collaborative atmosphere, and a belief that the practitioner has the ability to succeed (Herman et al., 2014).

Among interventions that include teacher behavior-management skills as the primary focus, some do include embedded coaching and consultation components to further support teachers' application of newly learned strategies during implementation (e.g., Incredible Years – Teacher Classroom Management; Webster-Stratton, 1994; Classroom Check-Up; Reinke, Herman, Sprick, 2011). Within these particular models, the role of the intervention coach is to help facilitate the understanding of new concepts through modeling and direct observations, as well as providing performance feedback regarding individual teacher-developed goals (Reinke, Stormont, Webster-Stratton, Newcomer, & Herman, 2012; Reinke et al., 2008). Despite the abundance of research on the positive effects of consultation, external support (e.g., behavior consultants) is often required to meet schools' needs, as many districts do not employ staff specifically to serve in this capacity (Chafouleas, Briesch, Riley-Tillman, & McCoach, 2009).

Summary of Major Findings

Evidence-based classroom interventions can readily serve as an effective means of supporting school-wide prevention efforts to address student behavior (Daunic, Smith, Brank & Penfield, 2006). However, teacher use of effective strategies to reduce problem behavior in the classroom remains inconsistent (Burns & Ysseldyke, 2009), despite traditional training methods provided throughout the school-year. A variety of impeding factors, namely practitioner attitudes and perceptions, can serve as barriers to successful teacher implementation of interventions (Cook, Tankersley, Cook, & Landrum, 2008;

Bambara, Goh, Kern & Caskie, 2012). Perceptions of an intervention based on experiences, as well as perceptions of external support, and their own knowledge and self-efficacy, have a notable impact on a teacher's motivation to initial adopt and sustain a practice (Fixsen et al., 2005; Wiley, Tankersley, & Simms, 2012; Kelly & Perkins, 2012; Yoon, 2004; Brophy, 1985). These factors are important to consider within interventions designed to support teachers, as they can be highly predictive of future behavior (Webb & Sheeran, 2006).

Motivational Interviewing (MI) is viewed as a promising strategy to promote change in both teacher and student behavior in schools (Frey et al., 2011; Herman, et al., 2014). Additionally, personalized feedback (PF) has proven to be an equally effective component that has shown to moderate intervention outcomes (Lundahl, Kunz, Brownell, Tollefson & Burke, 2010; Marlatt et al., 1998; Reinke, et al., 2008). Brief, no-contact versions of interventions encompassing MI and PF components (e.g., mailed and electronically-provided feedback), can be an equally effective alternative to more extensive, in-person treatments, and are advantageous for short-term applications (Walters, Bennett, & Noto, 2000; Agostinelli, Brown, & Miller, 1995).

While there exist brief interventions to support teachers with classroom behavior management (e.g., Classroom Check-Up), current intervention models may not be feasible for schools due to the lack of access or few resources to support teachers in their use of interventions (i.e., remote rural school districts; Stormont, et al., 2015). Furthermore, larger-scale implementation is challenging because these supports require well-qualified individuals, time, and resources that many schools lack. Given the promising effects of indirect intervention methods, more evaluative research is needed for

brief and cost-effective strategies to improve teacher behavior management practices in the classroom.

The Theory of Planned Behavior offers a framework to better understand teacher influences on implementation behavior. When using this framework, one can conclude that if a teacher's attitudes about a behavior intervention are positive, provided they have all of the resources needed and feel confident in their ability to implement the intervention, their intentions to carry out the behavior increase, directly affecting the likelihood of actually performing the behavior. Taking this model into consideration, a natural next step would be to assess each of these variables (i.e., implementation barriers), and provide support, based on individual teacher needs. Additionally, because the development of implementation intentions (i.e., a specific plan to address an identified goal) have shown to be superior to targeting intentions alone, providing this combined support has the potential to increase a teacher's likelihood of engaging in a desired behavior (e.g., EBP implementation).

Currently, no studies have exclusively investigated the efficacy of a feedback intervention with motivational components, provided in an electronic method, for the purposes of strengthening teacher behavior intentions to engage in a specific behavior. As the apparent need for increased behavior support at the classroom level is evident, an investigation of the application of more sustainable and efficient strategies to increase the likelihood of EBP use is warranted. The purpose of the current study is to determine the usefulness of a no-contact, personalized feedback intervention for the purposes of a) enhancing teacher beliefs, self-efficacy, and attitudes related to classroom behavior

management and b) increasing intentions to engage in activities to support personal development in the area of evidence-based, classroom management practices.

The present study seeks to investigate the following hypotheses:

- Research Question 1a: After controlling for years of teaching experience, student population and grade-level, do intervention-assigned teachers significantly differ from control-assigned teachers on measures of behavior beliefs, and intervention self-efficacy, attitudes, and knowledge?
 - Hypothesis 1a: Post-intervention assessment will reveal significant increases for teachers assigned to the intervention condition, across the areas of a) behavior beliefs, b) self-efficacy, c) intervention attitudes, and d) knowledge, compared to those in a business-as-usual condition.
- Research Question 1b: After controlling for years of teaching experience, student population and grade-level, do intervention-assigned teachers significantly differ from control-assigned teachers on measures of current intervention behavior and intentions?
 - Hypothesis 1b: Post-intervention assessment will reveal significant increases for teachers assigned to the intervention condition, on measures of a) current behavior and b) intentions, compared to those in a business-as-usual condition.
- Research Question 2: Do teachers view the electronic feedback intervention as helpful and easy to use, and would recommend it to others?
 - Hypothesis 2: It is expected that at follow-up, intervention-assigned teachers will report some degree of usability and helpfulness for the

newly developed intervention, and be willing to recommend it to other teachers.

CHAPTER III

Method

This chapter focuses on the research methods of the current study. The following sections are discussed: (1) study design, (2) participants and setting, (3) study variables, (4) procedures, and (5) data analysis.

Study Design

The current study used a randomized control trial to evaluate the impact of an electronic feedback intervention (EF) on teacher attitudes, behavior and intentions surrounding the implementation of evidence-based classroom management practices, compared to business as usual (BAU).

BAU (Control) Condition. Because teacher participants were recruited from a variety of school districts, the nature of what was considered BAU varied across subjects. In general, teacher participants receive a variety of professional development opportunities during the school year, consisting of workshops and trainings related to different educational topics. BAU, for the purpose of the current study, simply refers to the existing professional development structure offered within each participant's employed school. Teachers who were randomly assigned to the BAU condition received a pre-assessment, without an associated feedback profile, and a post assessment following the two-month follow-up period.

EF (Intervention) Condition. Following a pre-assessment, participants assigned to the EF condition received an individualized feedback profile associated with their assessment responses, which included a) descriptions of each construct measured in the Teacher Attitudes Toward Evidence-Based Behavior Interventions (TAEBB) assessment,

b) visual representations of scores for each construct (i.e., high, medium or low), and c) response-based recommendations with electronic links to resources. Participants also received a guided action plan template attached to their feedback profile. Participants had an option to use the action plan template to identify relevant behavior management goals, and outline the implementation of goal-driven behaviors. Feedback profile and action plan development were influenced by relevant research on effective PF intervention components (e.g., Miller et al., 2013) and included a focus on building self-efficacy through ratings of participant level of importance and confidence, and the inclusion of language emphasizing personal responsibility and empathy (Miller & Rollnick, 2002).

In addition to the above components, participants in the intervention condition were provided exclusive access to a website (i.e., The Behavior Café; www.thebehaviorcafe.org) developed for the sole purpose of streamlining evidence-based resources for reducing problem behavior in the classroom. The primary researcher created the website as a supplemental resource after encountering specific barriers that hindered quick and easy, electronic access to effective strategies (e.g., difficult site navigation, jargon-heavy text, scattered resources). Intervention-assigned teachers were allowed to access all of the resources available on the first iteration of the site, which extended beyond what may have been recommended in their individual feedback profile. Through the website, teachers were also able to request specific content to be published on the site. Specifically, the development of the Behavior Café sought to provide a user-friendly experience for teachers seeking a variety of reliable, evidence-based resources for their classroom management needs. A sample feedback profile and snapshot of the resource website can be found in Appendix A.

Table 1

Teacher Characteristics Across Control and Treatment Groups

Measure	Control	Treatment	<i>p</i> value	Range
Sample Size ^a	47	48		
Gender (%)				
<i>Male</i>	6 (12.7)	5 (10.4)		
<i>Female</i>	41 (87.2)	43 (89.5)		
Teacher Age (M/SD)	39.36 (9.01)	34.77 (9.00)	.01	22-61
Years of Experience (M/SD)	12.22 (7.05)	9.22 (7.19)	.05	1-32
Population Taught (%)			.11	
Regular Education-Core	30 (63.8)	36 (73.5)		
Regular Education-Non-core	6 (12.8)	8 (16.3)		
Special Education	11 (23.4)	5 (10.2)		
Grade Level (%)			.33	
Elementary	32 (68.0)	28 (58.3)		
Secondary	15 (31.9)	20(41.6)		
Ethnicity (%)			.72	
White or Caucasian	44 (93.6)	45 (93.8)		
Black, African American,				
African or Caribbean	1 (2.1)	2 (4.2)		
Hispanic or Latino/a	1 (2.1)	0		
Mixed Race	1 (2.1)	1 (2.1)		
TAEBB Factors (M/SD)				
Behavior T1	14.06 (2.00)	14.22 (1.95)	.72	3-15
Behavior T2	14.31 (1.14)	14.23 (1.63)		6-15
Knowledge T1	12.60 (2.05)	12.37 (2.73)	.70	3-15
Knowledge T2	12.71 (2.12)	13.00 (2.41)		6-15
Perception T1	12.21 (1.88)	11.90 (2.36)	.50	7-15
Perception T2	12.31 (1.97)	12.70 (1.80)		9-15
Efficacy T1	15.45 (2.05)	15.55 (1.77)	.77	10-20
Efficacy T2	15.93 (1.83)	16.80 (2.40)		11-20
Current and Future Behavior (M/SD)				
Current Actions T1	6.76 (1.58)	6.63 (1.67)	.70	2-10
Current Actions T2	7.29 (1.55)	7.07 (1.66)		3-10
Intentions T1	7.62 (1.62)	7.37 (1.56)	.44	2-10
Intentions T2	7.98 (1.57)	8.23 (1.44)		4-10

Note: ^asample size at baseline

Participants & Setting

Participants in the current study included 95 elementary and secondary teachers recruited across a total of 13 public schools in Missouri. Inclusionary criteria were full or part-time status as an educator, and employment as a teacher in a general, special or alternative education setting. Exclusionary criteria consisted of status as a pre-service teacher. Collected baseline data (i.e., Time 1) indicated the majority of teachers being white (94%, $n=89$) and female (88%, $n=84$), teaching regular core-education classes (68%, $n=65$). Teacher age ($t = 2.48$, $p = .01$) and years of experience were significantly different across the two groups, ($t = 1.20$, $p = .05$). Because teacher age and teaching experience were highly, positively correlated ($r = .77$), the decision was made to retain years of experience as a covariate in regression analyses. See Table 1 for a full summary of participant demographic information using baseline data.

Measures

Demographic Variables. In addition to the basic demographic information (e.g., age, gender, ethnicity), the following information was gathered from each teacher participant: whether the teacher was teaching at the elementary or secondary level, if the teacher primarily taught students in general or special education, and total years of teaching experience.

Teacher Attitudes and Beliefs. The *Teacher Attitudes Toward Evidence Based Behavior Interventions* (TAEBB; Copeland, 2016) rating scale, designed to be used as an informative measure within teacher classroom consultation, was developed to collect data predictive of teacher thoughts and feelings towards classroom-wide behavior and evidence-based interventions (EBIs). The TAEBB includes 14 items which represent four

domains: attitudes towards student behavior, attitudes toward behavior interventions, behavior intervention knowledge, and perceived efficacy in relation to intervention use. Items are rated using a 5-point Likert-type scale requiring the rater to indicate the degree to which they agree or disagree with each statement. The TAEBB factors represent four subscales of educator attitudes toward the implementation EBIs in the classroom. Behavior beliefs (three items; $\alpha = .71$) represents an educator's overall beliefs about what influences student behavior. Knowledge (three items; $\alpha = .79$) represents the teacher's perceived level of understanding regarding classroom EBIs. EBI attitudes (four items; $\alpha = .77$) reflects the practitioner's overall perception of classroom EBIs as a result of previous experiences and peer influence. Self-efficacy (four items; $\alpha = .79$) refers to the teacher's beliefs about his or her own ability to implement EBIs in the classroom and help students who are exhibiting problem behaviors. The TAEBB has a full-scale alpha of .82. For the current sample, coefficient alphas for each subscale (using baseline scores) were .87, .86, .71, and .60 for behavior beliefs, knowledge, self-efficacy and perceptions of EBIs, respectively. Full scale alpha for the current sample was .80. Note: due to extremely low alpha levels for the teacher perception TAEBB factor, the decision was made to improve reliability (i.e., decrease measurement error) by removing one item (i.e., item 11). The removal of this item resulted substantial reliability increases ($\alpha = .85$) across the three remaining items within the factor. Correlations across study dependent variables at follow can be found in Table 2.

Importance, Openness and Confidence. Three items, modeled off of Motivational Interviewing (Miller & Rollnick, 2002) language, were included to determine teacher importance, openness and confidence related to improving skills in the area of managing

student behavior in the classroom. Using a 5-point Likert-type scale, respondents indicate the degree to which each statement was true for them (1=Not at all; 5=Extremely true). Participant responses for these items were incorporated into the individual feedback profile for the purposes of aiding in participant motivation and the personalization of content. The three survey items included:

- How important is it for you to improve your management of student problem behavior in the classroom?
- How open are you to trying new strategies to help you manage student behavior?
- How confident are you that you can successfully implement strategies to address student behavior?

Current Behavior and Intentions. Four items were included to assess teacher current behavior and future intentions surrounding any implementation of evidence-based strategies to manage behavior. Specifically, participants responded using a 5-point Likert scale (1=Not at all; 5=A great deal) to two questions about their current actions (e.g., “to what extent are you currently implementing evidence-based strategies in your classroom to address student behavior and/or classroom management”) and two similar questions about future intentions (e.g., “to what extent do you plan to engage in activities to improve your behavior management skills (e.g., behavior coaching, self-study, implementation of a new intervention”). Teachers were asked these items both at Time 1 and at follow-up (i.e., Time 2).

Social Validity. To measure the social validity of the newly developed intervention, intervention-assigned participants were asked to respond to six items using a 5-point Likert scale, addressing aspects such as the usability, feasibility and likelihood of

recommendation. Specifically, teachers were asked to rate the degree of usefulness and feasibility with regard to each intervention component (i.e., feedback profile, web resources, action plan), the extent to which they actually used each intervention component (two items), and the likelihood that they would recommend the intervention to other teachers (one item). Additionally, one final open-ended item was provided to give participant an opportunity to submit comments and/or suggestions related to the intervention materials and/or process.

Procedures

The entire study occurred across approximately three-months, with the exception of the participant recruitment process. IRB approval was sought and obtained prior to the start of recruitment and data collection. School administrators were contacted via email to determine interest in project participation and asked to forward the email to all teaching staff within their respected buildings. Administrators were sent a copy of the IRB-approved project information sheet, instructing any interested teachers to contact the principal investigator (PI) for more information. Teachers who emailed the PI received a sign-up link and informed when to expect the full survey link. When the initial, two-week pre-assessment period begun, all interested teachers were sent an email with survey link and completion instructions. Following the two-week period, the decision was made to extend the pre-assessment period an additional week to obtain more participants. At the end of this final week, the pre-assessment period was closed and survey responses were obtained. Approximately two weeks following the collection of survey responses, participants were randomly assigned to either the intervention (EF) group or the control (BAU) group at the individual level, using random number generation. All participants

assigned to the EF group ($n=48$), were emailed an individualized feedback profile, compiled using their survey responses. All feedback profiles were sent within two weeks of response collection. Participants assigned to the BAU group ($n=47$) did not received a feedback profile. Approximately two months following feedback delivery, all respondents (EF and BAU conditions) were emailed a link with instructions for completing the follow-up survey. Participants were given two weeks to complete the survey. Teachers received \$10 following the completion of the first survey and \$15 following completion of the follow-up survey. Additionally, to encourage participants to complete the follow up assessment and reduce attrition, teachers were provided an additional \$15 for completing the follow-up survey within the first half of the second assessment period (i.e., first week) and teachers who completed both surveys by the deadline were entered into a drawing to win one of three, \$100 prizes.

Data Analysis

All data analytic procedures were conducted using R Studio Version 1.0 (R Core Team, 2016).

Missing Data. Despite very low attrition, item responses were first reviewed to identify and correct for any patterns of missing data that exist. Analyses indicated approximately 10% of data were missing within the merged dataset (i.e., pre- and post-responses combined), which was to be expected due to 9 teachers failing to complete the follow-up survey (i.e., 5 in the control group, 4 in the intervention group). A non-statistically significant Little's (1988) test indicated the data were, in fact, missing at random ($X^2=25.31, p=.23$). All missing data were accounted for using list-wise deletion. Subsequent analyses were completed using the remaining 86 teachers.

Correlations. Pearson product-moment correlation coefficients (r) were calculated to examine relationships between each TAEBB scale and the current actions and intentions items, specific to the present study. In accordance with Cohen's (1988) recommendations, correlations equal to or greater than .30 were considered medium, and those equal to or greater than .50 were considered large.

Regression Diagnostics. Regression diagnostics were obtained to ensure that basic regression assumptions were met (i.e., normality of distributions, homoscedasticity, presence of outliers). A visual analysis of plotted residual terms indicating a relatively normal distribution of observations. The Breusch-Pagan test, used to test for heteroskedasticity, also revealed no initial concerns with residuals, suggesting random equal distribution ($BP = 5.88, p = .44$). Additionally, Cook's Distance test revealed no influential outliers to the data, with the maximum distance being less than .5 ($D_i = .12$).

Regression Analyses. While randomization was done at the individual level, it is still to be expected that some degree of clustering exists among the data. Because grouping (i.e., school) effects are not of interest, a multi-level modeling procedure was not needed to adequately analyze the data. However, attention should be given to any evidence of clustering among the data, even when the degree of clustering may be small (Huang, 2016). Thus, six ordinary least squares regression (OLS) analyses using cluster robust standard errors were conducted to determine intervention effects on each of the identified dependent level 1 (i.e., teacher) variables (i.e., behavior beliefs, perceptions of EBIs, self-efficacy, knowledge, current behavior, future intentions), and account for any level 2 clustering. An alternative to traditional multi-level modeling, the use of cluster robust standard errors within standard OLS regression is viewed as an appropriate, yet

simple method to account for grouping variables in nested data. Covariates were also included in model estimates to more reliably calculate any intervention effects. Covariates included baseline measure scores and the following teacher demographic variables: years of teaching experience, elementary or secondary level and student population taught (i.e., special education, general education). For the purposes of simplified interpretation, continuous variables were standardized. Student population was recoded as either general (core and non-core teachers) or special education placement. Because multiple regression analyses were run, *p*-values were adjusted using Bonferroni adjustment methods.

Social Validity. To assess teacher social perceptions of the electronic feedback intervention, item responses from the four, social-validity items were assessed. To aid in interpretation, each item response was first categorized into binary, comparison terms (i.e., disagree vs agree), and categorical frequencies were used. Likert responses that reflected ‘not at all’ or ‘very little’ were recoded as 0, and all other items (i.e., ‘somewhat,’ ‘very much,’ ‘a great deal’) were recoded as 1. Likelihood of recommendation responses were recoded as follows: ‘very unlikely’ and ‘not likely’ were recoded as ‘0’ and ‘somewhat likely’ and ‘very likely’ were recoded as ‘1.’ All neutral responses were kept the same (i.e., not recoded).

Chapter IV

Results

Research results are described in this chapter and include the following sections:

1) correlations between dependent variables, 2) regression analyses, and 3) social validity of the intervention.

Correlations. Pearson correlations between subscales were reviewed for the purposes of establishing the relationships among dependent variables. Upon examination, all dependent variables appeared to be significantly correlated in the expected direction (i.e., positively correlated). Items across the four TAEBB subscales were somewhat correlated with the actions ($r < .21$, $p < .05$) and intentions ($r < .21$, $p < .05$) items. Some correlations between the behavior beliefs TAEBB subscale and other subscales (e.g., perceptions, current actions, intentions) were lower (i.e., less than .30), however still statistically significant.

Table 2

Pearson Correlations Among Model Dependent Variables^a

	1	2	3	4	5	6
1. Behavior Beliefs	--					
2. EBI Perceptions	0.24*	--				
3. Self-Efficacy	0.29***	0.47***	--			
4. EBI Knowledge	0.33***	0.46***	0.51***	--		
5. Current Actions	0.21*	0.34**	0.42***	0.49***	--	
6. Intentions	0.22*	0.44***	0.21*	0.29**	0.52***	--

Note: $n = 86$

^aUsing data collected at follow-up

*** $p < .001$; ** $p < .01$; * $p < .05$

Teacher Attitudes and Beliefs. The first research hypothesis sought to determine if significant increases would be observed across teachers assigned to the intervention condition, compared to those in a business-as-usual condition, across the following TAEBB factors: a) behavior beliefs, b) self-efficacy, c) intervention attitudes, and d) knowledge. After controlling for years of teaching experience, special education vs regular education placement, elementary vs secondary level, and baseline scores across each outcome variable, two significant differences were identified when using intervention assignment to predict TAEBB follow-up scores. Teachers who received the feedback profile demonstrated significantly improved self-efficacy at Time 2 ($t = 4.39, p < .01$), compared to those randomly assigned to the BAU-condition. Specifically, intervention-assigned teachers scored 0.47 standard deviations above ($M = 16.80, SD = 2.40$) teachers assigned to the BAU-control condition ($M = 15.93, SD = 1.83$). The effect size for this analysis ($d = .47$) was just shy of what Cohen (1988) would consider a ‘medium’ effect (i.e., .50). Additionally, there was a significant difference ($t = 1.92, p = .10$) between groups on ratings of behavior intervention perceptions at follow up, with the intervention group ($M = 12.31, SD = 1.97$) scoring approximately .38 standard deviations above the control ($M = 12.70, SD = 1.80$).

Mean scores across behavior beliefs and knowledge were higher at Time 2, but were not statistically significantly different between intervention and control groups. Trends across factors were in the predicted direction, however, with scores increasing at Time 2 for knowledge ($M = 13.00, SD = 2.41$) and behavior beliefs ($M = 14.23, SD = 1.63$), and effect sizes in the small range ($d = .06 - .30$). Additionally, it was found that elementary teachers demonstrated higher scores across all TAEBB variables, compared

to secondary teachers, regardless of assignment. Refer to Table 3 for a complete summary of results.

Table 3

Summary of Standardized and Unstandardized Regression Coefficients for TAEBB Factors^a

Predictor	Behavior Beliefs			EBI Perceptions			Knowledge			Self-Efficacy		
	β	<i>B</i>	SE <i>B</i>	β	<i>B</i>	SE <i>B</i>	β	<i>B</i>	SE <i>B</i>	β	<i>B</i>	SE <i>B</i>
Assignment	0.05	0.07	0.31	0.38	0.71	0.24*	0.23	0.51	0.42	0.46	1	0.25**
General/Special Education	0.49	0.69	0.39	0.13	0.26	0.42	0.22	0.49	0.44	0.28	0.6	0.32
Elementary/Secondary	-0.41	-0.58	0.23*	-0.33	-0.63	0.26*	-0.33	-0.74	0.3*	-0.35	0.75	0.28*
Teaching Experience	0	0	0	0.01	0.03	0.02	-0.01	-0.03	0.01	0.01	0.01	0.02*
Behavior Beliefs T1	0.14	0.2	0.07*									
Perceptions T1				0.3	0.56	0.03***						
Knowledge T1							0.28	0.65	0.05***			
Self-Efficacy T1										0.27	0.59	0.07***
<i>R</i> ²		0.13			0.49			0.52			0.39	
Cohen's <i>d</i>		0.065			0.337			0.301			0.471	

Note: Placement and teaching-level variables represented as two dummy variables with 'general' and 'elementary' serving as reference groups; TAEBB = Teacher Attitudes Towards Evidence-Based Behavior Interventions

^aCluster robust standard errors

*** $p < .001$; ** $p < .01$; * $p < .05$

Table 4

Summary of Standardized and Unstandardized Regression Coefficients for Teacher Behavior and Intentions^a

Predictor	Current Behavior ^b			Future Intentions ^c		
	β	<i>B</i>	SE <i>B</i>	β	<i>B</i>	SE <i>B</i>
Assignment	-0.08	-0.14	0.31	0.4	0.61	0.33 ^d
General/Special Education	-0.15	-0.24	0.39	0.38	0.58	0.54
Elementary/Secondary	-0.2	-0.33	0.23	-0.54	-0.81	0.25 [*]
Teaching Experience	0.01	0.02	0	0	0.02	0.01
Current Behavior T1	0.28	0.45	0.07 ^{**}			
Future Intentions T1				0.25	0.37	0.1 ^{**}
<i>R</i> ²		0.27			0.28	
Cohen's <i>d</i>		0.337			0.443	

^a Cluster robust standard errors

^b*n*=85; ^c*n*=86; ^d*p*=.10

*** *p* < .001; ** *p* < .01; * *p* < .05

Current Behavior and Intentions. The second research question sought to determine if significant increases would be present across teachers assigned to the intervention condition, compared to those in a business-as-usual condition, for a) current teacher behavior and b) future intentions. No significant differences were found between intervention and groups at Time 2 for items measuring current behavior actions ($t=.33, p=.75$) and future intentions ($t=1.84, p=.11$). In fact, teachers assigned to the control group actually had slightly higher scores on average at Time 2 ($M = 7.29, SD = 1.55$) in current behaviors, than teachers who received the intervention ($M = 7.07, SD = 1.66$). This same trend was not observed for intentions, with the teachers in the intervention condition scoring approximately .40 standard deviations above the control group. However, effect sizes for these two variables were relatively consistent with the majority of the above TAEBB variables: small for current actions ($d = .34$) and approaching medium for intentions ($d = .44$). The same finding as above, regarding elementary teachers, was found for intentions, in that compared to secondary teachers ($M = 7.45, SD = 1.64$), scores at follow-up were higher ($M = 8.51, SD = 1.27$). Refer to Table 4 for a complete summary of results.

Social Validity. Finally, we were interested in finding out the extent to which teachers found the newly developed intervention both helpful and feasible, as well as if they would recommend it to others in the future. Social validity data were collected at follow-up for teachers assigned to the intervention condition only. A total of 44 teachers completed social validity measures. Upon analysis, we found that the majority of teachers reported the intervention materials as being both helpful ($n = 42, 95\%$) and easy to use ($n = 42, 95\%$). Additionally, 86% ($n = 38$) reported using the web-based information at

least 'somewhat' and 75% ($n = 33$) of intervention-assigned teachers reported using the action plan. When asked about the likelihood of recommending the intervention to others, 79% participants ($n = 35$) indicated they would recommend the intervention to others, with 18% remaining neutral ($n = 8$).

Chapter V

Discussion

The present study sought to determine the efficacy of an electronic, feedback (EF) intervention for supporting teacher implementation of evidence-based behavior interventions in the classroom. It was hypothesized that teacher beliefs about student behavior, as well as their perceptions, self-efficacy, and knowledge about behavior interventions would increase, following exposure to the EF intervention. Additionally, we hypothesized that as a result of receiving the intervention, teacher scores on measures of current intervention-related behaviors and intentions, would increase. Results supported our initial hypotheses for self-efficacy and perceptions of interventions, with teachers assigned to the intervention condition reporting feeling significantly more efficacious with regard to managing student concerns, and more positive attitudes toward behavior interventions, compared to the business-as-usual condition. Across all other variables, while increases in mean scores were observed, mean scores at Time 2 for intervention participants were not significantly different from those in the control condition.

When evaluating whether or not intervention assignment predicted current teacher behavior and future intentions at follow-up, our initial hypothesis was not supported, as no significant effects were evident across groups. Upon investigation, it was observed that scores across intervention and control groups for behavior beliefs, was relatively high at Time 1, which could be related to the lack of significant changes across Time 1 and Time 2 for both groups, even considering some positive changes did, in fact, exist. This finding might help explain the lack of significant differences observed across the two groups. Nonetheless, it is important to note that every dependent variable measured,

aside from current behavior, showed higher increases in the intervention-group at follow-up, compared to the control.

Effect sizes for all of the measured variables, despite significance, were consistent with what is found among existing electronic feedback literature (d range: .34 - .47 for statistically significant effects; .06 - .47 across all variables). While little information is available about the effects of interventions examining electronic teacher supports for implementation and teacher behavior, cross-comparisons can cautiously be made using similar interventions within the alcohol and substance abuse literature. Across electronic feedback intervention research, specifically, effects ranging from small to large are found (e.g., .28 – 1.01; Agostinelli et al., 1995; Walters, 2000), however many fall within the small to medium range (e.g., Neighbors, Larimer & Lewis, 2004). Of course, intervention components and follow-up periods vary widely across studies, however, this research still provides a good example of the effect sizes one might expect when conducting similar research using electronic methods of support. Additionally, one might conclude that the potential to disseminate low-cost electronically-based teacher behavior supports using minimal effort, actually strengthens the effect sizes found in the present study.

In addition to the above, when excluding the assignment variable, we found that scores across both groups were still significantly different across Time 1 and Time 2. While these differences cannot be attributed to the intervention due to the lack of statistical significance between intervention-assigned and control-assigned teachers, it might suggest that simply completing the pre-assessment may have contributed to increases across these different variables regardless of intervention assignment. Since both intervention and control groups completed the initial survey, the specific items

included on the TAEBB scale may have encouraged teachers to think about the various categories related to their behavior management efforts in the classroom. While this interpretation cannot be empirically supported using data from the current study and individual school data were not collected to indicate differences in training across schools, it might be helpful to explore the degree to which the TAEBB might influence teacher perceptions of their own management practices, without any subsequent intervention, in the future.

The current research was also interested in obtaining more specific information regarding the social validity of the newly developed intervention, to determine its feasibility and appropriateness as a first-step intervention within the school setting. The majority of teachers reported having used the feedback, resources, and action plan, which supports our initial hypothesis. However, there were also a few teachers ($n = 6$, 14%) who reported only engaging in the web-resources or action plan ($n = 11$, 25%) components within the intervention, to a small extent or not at all. It is quite possible that the nature of the study influenced the degree to which teachers engaged in the material. The actual ‘use’ of the intervention materials was not a requirement of participation; thus, the statistics might provide a good estimate of the percentage of teachers who felt the information was useful enough to engage with the various intervention components on their own. Additionally, these data indicate that an overwhelming majority of teachers, not only feel that the intervention was at least somewhat useful, but would also recommend the use of the intervention to other educators.

Nonetheless, the most notable outcome of this study was the significant finding across teacher self-efficacy and intervention perceptions, through the use of the TAEBB

scale. Regression analyses indicated that across even a short, 2-month period, the simple action of reviewing visual and descriptive feedback and being provided resources, made teachers feel more efficacious in their ability to effectively address student behavior needs and increased teacher attitudes towards classroom-based behavior interventions. Furthermore, effect sizes across significant variables ranged from small to medium, which is consistent with some of the literature for brief feedback and motivational interviewing interventions. Despite the non-significant results obtained across the other measured dependent variables, self-efficacy and perceptions, alone can be extremely influential factors, as they can directly influence behavior choice and future intentions. Many have debated the role of self-efficacy within well-known behavior intention theories, such as Azjen's Theory of Planned Behavior (Ajzen, 2002), and have included it as a component of an individual's perceived behavioral control. Research has supported this theory, repeatedly demonstrating that individuals, especially teachers, who feel more efficacious about their abilities in a given area are more motivated in their actions related to that specific area (e.g., Soodak & Powell, 1993).

We also discovered that intervention-assigned teachers reported increased intentions, while scores for their current behavior actually decreased. An explanation for this finding could simply be that intentions, or the behaviors people plan to engage in, in the near future, are more proximal than actual behavior change. Additionally, the follow-up period for the present study could be considered to be relatively short-term (i.e., 2-months) impacting the amount of time available to meaningfully engage in new behavior. Because the nature of this research did not include a long-term follow-up component, it would be helpful to examine in the future, the degree to which intervention-assigned

teachers actually exhibit behavior change, compared to those in a control condition. Furthermore, taking this finding into consideration, it could be offered as justification for the conclusion that positive changes in self-efficacy and perceptions resulted from the intervention itself, rather than from the increased implementation of behavior interventions, themselves. Understanding the predictive power of efficacy and the finding that the differences in reported intentions between intervention and control groups were approaching significance ($p = .10$), we could interpret these results as suggestive of an increased likelihood, among intervention-assigned teachers, to engage in more activities to further their expertise in this area in the future, pending further exploration of this hypothesis in future research. So, while no significant differences actually existed across behavior intentions for the two groups, increased self-efficacy among intervention teachers, alone, may be a driving force for engaging in future behavior management-related, professional development.

Finally, we uncovered that, with the exception of current behavior, elementary teachers had higher scores across all measured variables at follow-up, regardless of assignment. Upon further examination, these differences between the two groups were also evident at baseline. This finding might suggest that elementary teachers have more positive experiences with behavior interventions, than secondary teachers, considering the higher scores across variables such as efficacy, knowledge and perceptions. It is possible that these experiences influenced their perceptions of classroom behavior interventions, thus positively impacting their willingness to seek support and engage in development-related activities. While we cannot attribute these increased scores to the feedback intervention because these findings were independent of condition assignment,

they might suggest that a different type of intervention and/or support may be necessary for secondary teachers. Some research has examined the differences in the needs of secondary teachers compared to elementary teachers (e.g., Positive Behavior Interventions and Supports; Flannery, Frank & Kato, 2012), suggesting that additional variables need to be considered when implementing interventions at the high school level. While the content provided within the current intervention can be applicable across both educational levels, this finding could point to the need for more specific research examining the needs of secondary teachers as it relates to classroom behavior management.

Limitations

No study is free from limitations. Although positive results were obtained for participants in the EF group, it is possible that other intervention effects were not observed due to the relatively short follow-up time (i.e., 2 months). While studies have existed demonstrating efficacious intervention results, the variables of current interest may not be sensitive enough to detect changes across such a short period of time (e.g., changes in overall beliefs about student behavior). There exists only one other study examining sensitivity to change with the TAEBB factors, which consisted of a 5-month intervention period (i.e., Copeland, 2018). This limitation, not unique to other computerized feedback studies, was to be expected and was supported by anecdotal comments provided by some participants. Teacher comments reflected, to some degree, a desire for more time to review intervention materials, suggesting that an extended intervention period, and possibly completing the intervention during a different time of the year (e.g., summer) would yield different results. Selection bias may also evident in

the present research considering that teachers self-elected to participate across Missouri. It is quite possible that teachers who participated in the study were more willing and open to learning how to better manage their classroom, therefore being more willing to engage with the intervention material. This in turn, impacts the range of improvement actually available, as well as allows for less generalization of results across the greater population (e.g., does the intervention result in similar effects among less willing teachers?).

Another limitation of the present study was the relatively small sample size ($n = 86$). While every attempt was made to obtain a larger number of participants, eligible teacher recruitment was less than ideal. Technically, considering the effect size and group distribution, the sample size was adequate to detect significance across teacher self-efficacy, it is possible that average effect sizes for this type of intervention across other measured areas (e.g., behavior beliefs) are much lower. This potentially creates an issue, as more participants might be needed to detect an intervention effect between the two groups.

A primary limitation of the present study, consistent with previous computerized feedback study outcomes, is the unknown aspect of actual engagement estimates for each participant regarding time spent reviewing and exploring intervention materials. Short follow-up time coupled with the time of year in which the intervention was implemented, possibly provided less time for adequate use and reflection of intervention materials. As previous research has indicated, in-person feedback and consultation allow the consultant to somewhat control the degree of participant engagement with the material, while electronic methods might have a more difficult time with ensuring a certain level of engagement takes place across participants (Cadigan et al., 2015). While many teachers

reported having used the materials, it is unknown the degree to which they explored each recommended resource, as well as used the action plan template. Additionally, because of the structure of the intervention, in that teachers were given the choice of whether or not to complete the associated action plan and interact with the resources, some teachers may have not prioritized feedback and strategy review.

Future Directions

More supports are needed to better enable teachers to implement behavior EBPs with high fidelity. Despite the lack of significance found across the majority of outcome variables, the results of preliminary study do have some implications for future research. Most importantly, as replication of intervention studies is a constant necessity within the educational literature, future research could expand on the present study, addressing sample size and time-frame limitations. Conducting the study with at least double the number of participants, and possibly during a different time of the year, may yield different results, reducing the limitations presented by lack of statistical power, and increasing the amount of time teachers are actually able to engage in the intervention materials.

Another suggested avenue for future consideration, is one that has been highlighted previously by Cavanaugh (2013). Through his review of the literature, he found that studies containing a feedback component and no subsequent training were efficacious, suggesting that feedback alone (i.e., without a training component) increased teacher's use of praise statements; Cavanaugh, 2013). Based on this finding and the fact that goal setting, when used in conjunction with feedback, has also been successful, he suggested the use of future studies to examine the degree to which different supports

prove to be efficacious for different types of teachers (i.e., years of experience, efficacy, knowledge, motivation). When examining teacher responses to the open-ended social validity item in the present study, some teachers explicitly requested additional consultation, feeling as though the resources provided were helpful, but they needed more specific instruction to aid in further implementation (e.g., classroom observations, in-person meetings). These limitations may have prevented these teachers from engaging more in the intervention material, resulting in the observation of less intervention effects. While this particular support exceeded the scope of the current research, it alludes to the need for a tiered approach, similar to Cavanaugh's suggestions, when reviewing appropriate behavior supports for teachers. To further understand the types of individual support needed for specific teacher typologies, one could explore the effects of multiple variations of electronic interventions on teacher intervention attitudes and behavior (e.g., the addition of virtual feedback sessions upon request, more detailed implementation planning and follow-up). In order to best determine this, research would also need to include methods for obtaining a better understanding of what 'business-as-usual' represents for each school. It is likely that some schools might have engaged in more behavior-management related development activities than others, influencing overall intervention outcomes. Obtaining this information will help better determine where the current intervention might be of greater need and further aid in the development of a multi-tiered model for addressing behavior EBP needs across all teachers.

Conclusion

The present study examined the efficacy and usefulness of an electronically-delivered feedback intervention on overall teacher perceptions of classroom-based

behavior interventions, implementation behavior and intentions. The development of this intervention was based on existing research indicating the influence of teacher perceptions on goal-related professional development behaviors, as well as the need for more efficient and cost-effective teacher classroom management supports. We found that teachers who received the intervention, consisting of an individualized feedback profile and access to a website with electronic resources, reported significantly increased self-efficacy and perceptions of evidence-based interventions at follow-up, compared to teachers who received the standard professional development offered at their school. The majority of teachers who received the intervention had positive feedback about its usefulness and feasibility, and were likely to recommend the use of the intervention to others. Scores across the other measured dependent variables (i.e., intervention knowledge, behavior beliefs, current teacher behavior and intentions) demonstrated increases at Time 2, but were not statistically significant from control-assigned teachers at follow-up. Limitations consistent with previous computerized research studies were evident in the current study to include shorter follow-up time and the degree in which actual engagement can be measured across participants without an in-person component. Despite these limitations, however, preliminary findings within the current study indicate a promising future for electronically-based feedback interventions within the school context. It is suggested that additional research in the area of differentiated, or tiered, teacher management supports, as well as the degree in which electronic interventions can be utilized for behavior management development purposes, be conducted.

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Appendices

Appendix A. Intervention Feedback Profile

Appendix B. Website Snapshot

Appendix A.
Intervention Feedback Profile
TAEBB[®] Feedback Profile

Sample Teacher
sample@samplemail.com
1/17/19

Thank you for completing the TAEBB[®]. An individualized profile has been created for you, based on your responses, reflecting your attitudes about the following areas related to classroom behavior- management:

1. Knowledge
2. Perceptions of Evidence-Based Interventions (EBIs)
3. Beliefs about Student Behavior
4. Self-Efficacy

For each area, you will find 1) a description, 2) your score, calculated using your responses to corresponding item, and 3) hyperlinked recommendations to address your specific needs. Areas shown in **green** indicate strengths, while those in **yellow** suggest potential concerns, and **red** indicating areas of needed improvement.

Knowledge

This domain represents a teacher's thoughts about their level of understanding regarding researched-based interventions to address classroom behavior.

Your score fell in the **medium** range for Knowledge. Your score in this area suggests having some experience with evidence-based interventions (EBIs), but possibly not fully understanding their purpose or application. You may know what an EBI is, but have difficulty using them to effectively address behavior concerns. Teachers with mid-range knowledge scores have found it helpful to both increase their basic understanding of EBIs and practice implementing them in the classroom. You can find ways to do this, here:

- [Using a tiered framework to effectively manage behavior](#)
- [Using function-based strategies to reduce behavior](#)
- [Effectively using the Acting Out Cycle to manage behavior](#)

Perceptions of EBIs

This domain reflects a teacher's thoughts and opinions related to evidence-based interventions designed to be implemented in the classroom setting.

Your score fell in the **medium** range for Perceptions of EBIs. Your score in this area suggests varying previous experiences using evidenced-based interventions. You may have implemented EBIs and not witnessed any benefits, or the intervention may have seemed too time consuming to implement consistently. On the other hand, you may have also implemented EBIs with *great* success, witnessing the benefits they offer both to you *and* your students! These experiences are *not uncommon*. Teachers, like you, have expressed wanting strategies that are *simple*, yet *effective*, and build on what is *already working well* in their classrooms. They have found that filling their toolkit with easy, go-to strategies, reduces the stress that problem behavior can create, and actually improves their classroom management confidence! Here are some resources to get you started:

- [Three of the *easiest* EBIs you can implement tomorrow](#)
- [Simplify behavior data collection in your classroom](#)

Behavior Beliefs

This domain represents an educator's thoughts surrounding the reasons why student misbehavior occurs.

Your score fell in the **high** range for Behavior Beliefs. This indicates that when confronted with problem behavior, you understand the importance of identifying the *external* (e.g., classroom environment, educational supports) factors that can impact a student, rather than spending too much time focusing on *internal* factors (e.g., motivation, skill deficits, medical concerns) that are less easily altered. This suggests you would rather focus on *malleable*, or changeable, aspects of a student's life. Research shows that this is actually *a more effective* way of promoting student improvement and teachers who exhibit this type of thinking, feel more confident in their ability to manage behavior, compared to those who primarily focus on internal factors! A safe, supportive, and nurturing environment can dramatically change a student's experience, but also has the potential to *improve their trajectory* later in life! Take a look at these resources to find ways to assess your classroom and further promote student success:

- [Connecting with your most challenging students](#)
- [Effectively using the Acting Out Cycle to manage behavior](#)
- [12 Common Classroom Management Mistakes](#)

Self-Efficacy

This domain refers to a teacher's beliefs about their ability to help students who are exhibiting problem behaviors and successfully implement effective strategies in the classroom.

Your score fell in the **medium** range for Self-Efficacy. This indicates that while you may feel successful in your ability to manage behavior at certain times, there are equally as many that have left you feeling like you had no clue what to do! Many teachers who score mid-range have strategies that they know can be effective, but when they encounter different groups of students, they find that these strategies no longer work as well. As a result, you may be experiencing inconsistency with the level of disruptive behavior in your classroom, at any given time. Many teachers in your position seem willing to try new strategies, thus benefit from resources aimed at increasing their knowledge-base of interventions and what make them effective. A teacher's score in Knowledge is often similar to their score in this area because the two operate simultaneously; as your knowledge about EBIs increase, you feel more confident using them in your classroom, which leads to increased efficacy! Explore these resources for more information:

- [Easily find reliable strategies to reduce behavior in your classroom](#)
- [Behavior resources to have in your teacher tool-kit](#)
- [Elementary and Secondary examples of Tier 1 strategies](#)

Next Steps

Now that you have completed your "self-check-up," the next step is deciding what you want to tackle first! In your responses, you indicated that improving your management of student problem behavior in the classroom is something that is **very** important to you, as an educator, and that you **would be open** to trying out new strategies. That is great news and we would like to help you with that!

Many teachers working on achieving their classroom management goals, find it helpful to have a variety of options to help guide their self-paced learning. All of the recommendations above and more **free** behavior resources can be found at:

www.thebehaviorcafe.org

The Behavior Café® was developed by a teacher, **specifically for teachers** to help them with common behavior concerns in their classroom. This website was designed to address all of the existing barriers associated with many of the current teacher resources that exist.

The Behavior Cafe was designed for the purpose of streamlining *evidence-based* resources that reduce problem behavior, providing teachers with quick and easy access to *reliable* strategies to implement in the classroom.

On this website, you can expect:

- Access to some of the best evidence-based resources to address specific behaviors
- Tips for successfully navigating helpful websites to access behavior-related resources
- The ability to work at your own pace, to address your specific management needs when it is convenient for *you!*
- A user-friendly experience, reducing the stress associated with complicated website navigation
- Content written in easy to understand language, helping to bridge the gap between cutting- edge research and classroom implementation

We have also created an action plan template (on the next page) to help get you started on your self- paced journey to **Classroom Management *Expert!*** This action plan will help you identify specific areas to address *first* and create a feasible plan to move you in the direction of attaining your goals.

Use it, along with [the website](#), to **develop a plan that works *for you!***

Behavior Management Action Plan

Regarding classroom behavior interventions, I feel I do the following well:

I would like to work on improving my ability to do the following:

Now, choose one area to work on first (or two if you are ambitious!).
Write it and the reason why it was chosen, here:

(if you are finding it hard to choose, think about which area would give you the most “bang” for your “buck!”)

How *important* is it for you to improve this area?

(least important) 1 2 3 4 5 6 7 8 9 10 (most important)

Why is it *important*?

Now let's create a plan!

First, you'll want to identify what you specifically would like to achieve in the above area.

What is your goal? *Make sure it is realistic and measurable.*

When do you think you can *reasonably* meet this goal?

Write both of these below.

Specifically, my goal is to:

_____ (goal),

using the following plan, by _____ (date).

How will you know when you've achieved your goal?

Next, you'll need to develop your plan for success!

How will you go about achieving your goal? In other words, what *smaller steps* will you need to take to meet your *larger* goal?

What resources (e.g., materials, people) will you need and how are you going to get access to them?

Write these below.

My plan to address this goal includes the following actions (*e.g., websites to visit, people to consult with, books to read*):

- _____
- _____
- _____

To reach this goal, I need the following resources:

- _____
- _____
- _____

My plan for obtaining these resources is:

- _____
- _____
- _____

Lastly, it is important to anticipate anything that could get in the way of meeting your goal
(*e.g., time*) and make a separate plan for overcoming these barriers!

Things that could get in the way of meeting my goal:

- _____
- _____

I can address the above barriers by...

- _____
- _____

Now, stop and rate your confidence toward achieving your goal!

How *confident* are you that you can meet your goal?

(*not at all* confident) 1 2 3 4 5 6 7 8 9 10 (*extremely* confident)

What gives you confidence about achieving your goal?

Congrats! You are all set to begin your plan!

**You can modify this form in the future and re-use it to develop additional plans to
address your evolving behavior management needs.**

We know that teaching is a very challenging profession. We also know that you are making a
difference every single day with the students in your classroom. We hope that you can use
the information provided here to further strengthen what you are already doing to support
your students!

If you have any questions related to the above information, you can contact: Christa
Copeland at cbhgg6@missouri.edu.

Appendix B.
Website Snapshot
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Matching the Intervention to the *Need*: Tiered Systems of Support

While schools are in a prime position to offer social, emotional and behavioral supports to students, services must be *strategically provided* in order to maximize resource efficiency. The use of multi-tiered systems of support (e.g., [Positive Behavior Interventions and Supports](#)) can provide schools with a framework to appropriately match students' needs with an *appropriate level of support*, and sustain practices focused on *preventing* new problem behavior from occurring.

Tier	Percentage	Description	Interventions
TIER 3	5%	Individualized interventions for students with intensive/chronic behavior challenges	<ul style="list-style-type: none">Individual TherapyFunctional Behavior Assessments (FBA)Behavior Intervention Plan (BIP)Wraparound SupportCrisis Response
TIER 2	15%	Specialized interventions for learners who are at-risk for academic or social failure due to behavior challenges	<ul style="list-style-type: none">Check-in Check-outSocial Skills GroupsSmall Group CounselingRestorative JusticeCircles & Conflict Resolution
TIER 1		School-wide interventions for all	<ul style="list-style-type: none">Behavior Expectations

VITA

Christa Copeland was born and raised in St. Louis, MO. After graduating from McCluer High School in 2006, Christa began studying at the University of Missouri in Columbia, MO. In July 2010, Christa graduated with a Bachelor of Arts in Psychology and a minor in Sociology. Afterwards, Christa attended Columbia College from 2011 to 2015, where she received a Master of Arts in Teaching and a Master of Education in Educational Leadership. Prior to beginning her doctoral career, Christa also gained experience teaching students at the secondary level in both Alternative and Special Education settings. Christa entered the University of Missouri School Psychology Program in July 2015. During her time as a doctoral student, Christa conducted research and provided psychological services to youth and adults in both school and clinical settings. Christa completed her pre-doctoral internship with the Boone County Schools Mental Health Coalition in Columbia, MO in June 2019 and will graduate with her doctorate in School Psychology in July 2019. For the 2019-2020 school year, Christa has obtained a position as a Postdoctoral Fellow in the department of Educational, School and Counseling Psychology at the University of Missouri.